BEHIND THE SCENES OF LIFE SCIENTISTS ON STAGE

enacting upstream public deliberation on the moral desirability of new life sciences and biotechnologies

KOEN DORTMANS
behind the scenes of…

LIFE
SCIENTISTS
ON STAGE

ENACTING UPSTREAM PUBLIC DELIBERATION
ON THE MORAL DESIRABILITY
OF NEW LIFE SCIENCES AND BIOTECHNOLOGIES
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preface
From a dramaturgical perspective, the scientific report you are about to read can be considered as my front stage performance as an academic scholar in the interdisciplinary and “multi-staged” field of Science and Technology Studies. As some scholars in this field have noted, scientific texts, and particularly reports of qualitative research, are not only rhetorical devices to persuade critical audiences but they are also a means for self-presentation that “the performer uses to project his or her ‘voice’ and create the desired impression on the audience: the production, editing, and presentation of written texts become means of impression management,” as Stephen Hilgartner (2000) writes about scientists who are on stage. The impression junior scientists on stage ought to convey is that of independence, creativity, autonomy and wit. On stage the candidate’s act is one of soliloquy.

One of the dangers of comparing social practices – such as doing science – with staged performances and drama is that it tends to neglect the endless search, the hard work and the almost insurmountable dissensus between actors, directors and producers behind the scenes. Behind this printed dissertation the discord and despair remain hidden from the audience. As with the many public discussions I have organized in the last decade (some of which were chosen to be put center stage in this study) the production of this book contains the – more and less visible – work of many. Although it is custom to theatrical productions to acknowledge the people behind the scenes after the performance, to me the beginning of this book seems the proper place to offer them a stage.

Prize winning actors always start their acknowledgment speeches thanking their directors. I make no exception. Dear Tsjalling, I am truly grateful for adopting me as a PhD student from almost the very first moments I started staggering on the academic stage. Without your discernment to reduce matters to the heart, your frankness about your own struggles as an author, your hospitality, culinary art and strictness that kept me focused on my writing, and finally your commitment, I simply would not have passed auditions.

Without suggesting that I committed the deadly academic sin of plagiarism, I thank you, dear Maud, for your solid role as prompter who accompanied me on a daily basis. I could always rely on your meticulous reading of substantial pieces of text. Your comments rendered my words into a considerably more readable version so that I was able to understand again what I was trying to say. I also thank you so
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much for your commitment after you had to continue your career elsewhere when the CSG Next program had finished. Directors, actors, promoters etcetera depend on the unremitting work of producers. Without a stable financial basis, the casting of a good team and the promotion of the project, these professionals cannot even think about starting their work. Special thanks I owe to Annemiek Nelis, former director of CSG who acted as the producer of the research project.

Much gratitude I also owe to the people who have been starring in the public deliberations described and analyzed in this book, first and foremost the life scientists who were willing to act not only as protagonists of new and emerging life sciences and biotechnologies, but also as research subjects. I admire your dedication with which you perform in the scientific community. I am thankful for your willingness to interrupt the demanding work in your research labs to engage with society. Unfortunately, the codes of conduct prescribing ethical research restrain me from mentioning your names, but it is beyond doubt that you all deserve a red-carpet treatment.

I would also like to thank my colleagues at the Department of Philosophy and Science Studies at Radboud University, particularly Meggie Pijnappel, Erwin van Rijswoud en Sanne van der Hout. Inge Mutsaers, thank you for our moments of reflection on supervision. I particularly thank my former roommates: Jan van Baren (I hope you will celebrate your moment of personal victory soon), Jochem Zwier (God, how much I miss your don’t-mention-the-war jokes) and Martin Ruivenkamp (thank you for your vivid narratives that remind me of the excitement of the life outside academia ...). Also thanks to my colleagues at the Center for Society and the Life Sciences (CSG), particularly Maria Cantore, Marjolein Schrauwen, Frans van Dam, Gis van der Starre and principal investigator of the Education and Communication program Arend Jan Waarlo.

For the solid introduction into the fluidities of Science and Technology Studies I very much thank Willem Halfman, Teun Zuiderent-Jerak en Sally Wyatt for coordinating the workshops and summerschools. I also thank all my fellow WTMC-students I met at the bar of the Soeterbeeck convent or elsewhere in Ravenstein, particularly Yvonne Cuijpers and Dirk de Haen for appreciating my facilitation skills I was asked to demonstrate in their workshops on responsible innovation. And I thank WTMC for financially supporting the printing of this dissertation.

The members of the supervisory committee also need to be mentioned for the fruitful and enjoyable discussions in the early stages of the project: Huub Dijstelbloem, Jessica Mesman, Hans Harbers, Pieter Leroy, Jos Kessels, Jacqueline Broerse. Many thanks of course to the manuscript committee — Hub Zwart, Hedwig te Molder, Jacqueline Broerse — for approving the text and their constructive criticism. The last academic network worth mentioning in these acknowledgments is the Center of Ethics and Politics of Emerging Technologies (EPET) particularly Simone van de Burg and Marianne Boenink. Thank you for the informal and fruitful academic discussions on emerging technologies.

This research project started at the hey-day of the department of public discussions of the LUX. I sometimes nostalgically think back about the most interesting part of our work as dramaturgists of public debate: the conversations we had with Dutch opinion leaders and politicians after the show was over, our Tuesday meetings, our reflections on our profession. Allard Koers, Hedzerd de Boer, Piet-Hein Peeters, and of course Michel Schemkes, I will always cherish these memories.

I would also like to thank the members of the crew without whose helpfulness the production of this book would have gone far less smoothly. Inge de Weerdt en Herman Balkenende of the Nederlandse Diabetesfederatie (NDF), thank you for co-producing the last deliberative production on emerging technologies and the preventive care for diabetes. Pieter van Terheijde, dramaturgical advisor, thank you for your help with becoming familiar with dramaturgical jargon of scripting, staging and setting as well as your refined observation. Sheile van de Sande, personal coach, how much I appreciate your personal involvement and professionalism. Els Brevink, text editor, thanks so much for your accuracy and punctuality in your translation and transcription work. Also many thanks for the numerous managers who were willing to put their comfortable houses to the mercy of my untidy writing habits: Marieke en Jeroen, Remco en Sabine, Gonny.

I would also like to thank my colleagues of the Institute Applied Sciences of HAN University of Applied Sciences for a warm welcome, the financial support and editing work: Kelly Vellinga-Chan, Beatris Linford, Pedro Hermkens and Michiel Geursen.

Fortunately, I am in the position to be surrounded by supportive friends and family. Gerald, I hope to continue our always amusing Huttenheugte Conferences. Dear Kelme-cyclists, I am looking forward to future explorations of the world by bike, following in the green train’s wake, panting for breath. Thank you dear indoor soccer friends, Bas, Eric, Erwin, Remco, Remy, Theo, Wil, for always giving me a hearty welcome after weeks and weeks of absence. And of course thank you Jeroen, Brabant buddy, I love you, man. And Antoon, remote friend, hopefully my dissertation is a hand that helps you stepping out of the proverbial “same boat” we have been in for far too long.

Dear Mom and Dad, although life scientists couldn’t quite convince me of the heridity of human behavior, I am grateful that somehow you succeeded in transferring an unhealthy amount of perseverance I admire you for. I also thank you for the many encouraging postcards and later on, as you smoothly switched to more
modern communication technologies, Whatsapp messages. And what is more, it is always a consolation to know that during insomnia you know that someone out there is sharing your useless staring at ceilings.

Cathalijne, dear sister. Our trip to Washington DC and our visit to the Library of Congress to immortalize this piece of work came too early (or was I late? I just can’t remember which ;-)). But I am more than willing to return to Hollywood for Ugly People for a second attempt. I promise you to do all of my West Wing homework this time! Apart from your material support – your house in The Hague, your Van Dale dictionary, your West Wing DVDs – I am so happy to have you as my companion in our absurd human existence littered with “gedoe.” Remember, we must imagine us happy.

And to sweet little Moos, I want to say that from now on I will be a father in holiday times and weekends again so that we can dive for as many golf balls at the bottom of swimming pools as we want and that we can stroke iguanas anytime we feel like it.

And last but not least, dearly beloved Esther. Most authors keep their words to their loved ones private. I refuse that because everyone has to know how much I owe to you. Most of all, thank you for enduring my poor back stage performances at home (that indeed better remain concealed from any audience altogether). A few times Tsjalling said to me: “Tell Esther she is about to get you back.” Now that this thesis has been finished I will again rehearse my interpretation of the Good Husband. I will even be open to (OK, only some of) your director notes. Dear Esther, rather than my director you are my ghost light, the dim light at the center of our stage modestly shining to prevent me from falling into orchestra pits or tripping over the set pieces of life. You are the light that appeases the many ghosts cursing the performances of a poor player like me who struts and frets his hour upon this stage. And then is heard no more...
1

Introduction
1.1 Scientists engaging with society

“Citizens will participate in decisions on academic research.” Thus read the headline on the front page of a national Dutch newspaper on 25 November 2014. The article highlights one of the spearheads of the new science policy as presented in a report by the Dutch Ministry of Education, Culture and Science. To set a new National Research Agenda, academic scientists and researchers will have to engage with society, because, as the report states, “[s]cience and society are increasingly interwoven. On the one hand there is an increasing social need of science contributing to the solution of problems. […] On the other we see that scientific findings will fundamentally change society in the upcoming years” (Ministry of Education, Culture and Science 2014: 46).

The new policy plans proved controversial within the academic community. Scientists and academic researchers sought out the spotlight of the public sphere to argue for or against the new political plans. Opponents of the plan feared a reduction of academic autonomy. A prominent Dutch astrophysicist and columnist wrote that the new policy “with its emphasis on social relevance, valorization and collaboration” is “an attempt to tie the hands of science under the veil of efficiency” (Icke, December 6 2014). Academic freedom is “important because arguments can be provided to change a situation. Science has to produce a lot of critical knowledge,” as other critics argued (Bartl and De Ruiter, December 6 2014). Again others asserted that it is dangerous to presume that “the contribution of citizens […] will give us a complete picture of the research worth producing” (Jongepier, December 6 2014).

At the same time there were prominent scientists that also supported the new policy of the Ministry. “If scientists cannot convincingly show that they are investigating issues that people worry about (health care, climate) or [issues] that increase the quality of life (history, art) the social legitimacy of scientific research is under pressure” (Abma, December 30 2014). “There is no single other social sector that can spend other people’s money freely and at the same time can determine present and future of other people. […] As a tax payer […] I am pleased with one
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1 aspect [of the new policy] in particular: the government supports the internationally increasing understanding that the exceptional position of the scientific sector can no longer be justified” (Dehue, December 27 2014).

Indeed, the new Dutch science policy is in line with a recent trend in the European governance of science. The report of the Dutch ministry explicitly refers to the concept of Responsible Research and Innovation (RRI) that is prevailing in today’s European science policy context. On the European Commission’s website, the concept of RRI is described as a process where “societal actors (researchers, citizens, policy makers, business, third sector organizations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society.”

Despite the resistance of scientists and researchers, public engagement with science has by now become central in European science policy. As an integral part of RRI, public engagement is firmly-rooted in the Horizon2020 framework, the funding program of the European Commission to invest nearly 80 billion Euros in research and innovation to address the so-called Seven Grand Challenges, cross-border social problems such as climate change, secure and clean energy, health and wellbeing and secure societies. European as well as Dutch administrators increasingly expect that scientists and researchers engage with (civil) society “to gear their research projects to the needs and the potential concerns of citizens and stakeholders” (Ministry of Education: 44).

This thesis is about the practice of facilitating the engagement of scientists with society. As its title suggests, I compare public engagement with theater. This metaphor allows me to spotlight two aspects of how public engagement is enacted that are mainly overlooked by scholars but that are crucial for its quality. The first aspect concerns the front stage performances of scientists performing public engagement as well as facilitators directing the discussion process towards deliberation (engagement as public performance). As I will explain below, deliberation refers to the particular normative quality of reasonableness of a discussion or dialogue. The second aspect is about the back stage process of how professional organizers of public engagement set the scenes of public deliberation in their role of dramaturgist (dramaturgy of public engagement).

In this dissertation I investigate these two aspects of public engagement with science from the vantage point of facilitator of public dialogue. For I argue that combining the roles of analyst and facilitator of public engagement improves the knowledge about the quality of the deliberative process.

In this introductory chapter I explain first why an increased understanding of these two aspects is relevant in the context of public engagement with science (Section 1.2). Secondly, I present the problem definition that constitutes the starting point of my research project (Section 1.3). Next, I formulate the research questions that guided my investigation. In the presentation of these questions, I integrate the methodological approaches I adopt to investigate these questions (Section 1.4). Finally, I will provide an outline of the book (Section 1.5).

1.2 The importance of process: lessons from the past

Why do European policymakers and political administrators attach great importance to involving the public in science? Andy Stirling, Professor of Science and Technology Policy at the University of Sussex in the UK, has distinguished three different types of arguments or “types of imperatives” (Stirling 2008) that indicate the motivations, intentions or justifications underlying the increasing demand for more public engagement with science. Firstly, citizens should participate in decisions on research...
agendas for normative reasons. It is simply the right thing to do from a democratic perspective. Tax payers should have more control over how their money used to fund scientific research and technological innovation is spent. As Tineke Abma, Professor of Participation and Diversity at the Free University of Amsterdam stated in the discussion on the new Dutch science policy: “Dutch citizens are increasingly highly educated, critical and articulate. They do not accept anymore that scientists can just go their own way” (Abma, December 30 2014). All the more, since technoscientific research encroaches deeply on society at large and people’s individual lives in particular as the Dutch minister indicated. According to democratic ideals people should be able to influence collective decisions that affect them.

However, the new Dutch science policy to promote more public participation in science rather seems to reflect the other two imperatives: the instrumental and the substantive. Whereas normative imperatives concentrate on the process of public participation, the focus of instrumental and substantive imperatives is on the outcomes. On the one hand, the Dutch science policy is instrumental since engaging the public serves specific favored outcomes, particularly restoring public trust. “The big impact science can have on society can put pressure on the [public] trust in science” (Ministry of Education 2014: 43). Indeed, for today’s academic scientists, researchers and engineers unconditional support of the public is not self-evident. Even though hardly anyone questions the public value of new scientific knowledge for economic growth, well-being and the quality of life, public controversies in the past also indicate the reverse effects of new technological innovations. History shows that new science and technology can also produce devastating environmental effects (e.g. the insecticide dichlorophenyltrichloroethane or DDT), life threatening risks on a global scale (nuclear energy) and genetically modified organisms (GMOs) or “monsters” (e.g. Roundup Ready Corn and Herman the Bull).

On the other hand, the new Dutch vision on science is substantive. According to Andy Stirling, who has analyzed public participation initiatives in the UK, the focus of the substantive imperative, “lies on general qualities such as environmental quality, public health or broader human well-being”, “rather than aiming instrumentally to yield specific forms of acceptance or trust” (Stirling 2008: 271). It holds that engaging stakeholders, patients, end-users and citizens in setting research agendas will produce better science. “Interaction with users urges researchers to reflect on the opportunities and risks of the products that can result from their research” (Ministry of Education 2014: 44).

More public involvement is increasingly regarded as a necessary condition for instrumental ends (restoring public trust, increasing public acceptance) or substantive ends (improving the quality of health care). However, simply increasing public participation is not sufficient, as has been demonstrated in the past. Indeed, it turned out that the process matters significantly. Even though events to engage public discussion about genetically modified crops in the Netherlands (Eten en Genen, 2001) as well as in the United Kingdom (GM Nation? 2003) were innovative, evaluators assert that these initiatives suffered from serious flaws (Horlick-Jones et al. 2006; Gutteling and Hanssen 2001). In the Dutch case, sixteen non-governmental organizations (NGOs) that were involved in organizing Eten en Genen terminated their collaboration through an announcement placed in a national newspaper, complaining that not only the organisms at issue, but the national public debate itself was “manipulated.”

Several lessons about the process of public engagement have been drawn from these and other past examples. First, the discussion of public issues was narrowly framed in terms of the undesirable impact of new science and technology: unsafe food and, to a lesser extent, decrease of biodiversity and loss of traditional forms of agriculture. However, the public resistance towards genetically modified organisms did not only originate from these undesirable consequences, as I will discuss extensively in Chapter 2. Because of this narrow framing a variety of other ethical issues inextricably bound up with modern knowledge production that the public articulated were ignored. Can we interfere with natural order? Who will benefit from these new developments and who will not? What is the purpose of new scientific knowledge and new technological innovations? How desirable are these ends? Where do we invest our financial resources for scientific research in? Public engagement also has to address this wider spectrum of possible ethical issues concerning the purposes, needs and expected benefits, i.e. the moral desirability of new and emerging science and technology (or NEST) as imagined or envisioned by scientists and technology developers.

The second lesson is closely related to the first. It is important to involve the public as early as possible to anticipate potential benefits and harms as well as openly discuss the research priorities that are set (where do we invest money?) and the moral visions that drive scientific developments so that the contribution of participants can have an impact on innovation trajectories (How desirable is the purpose of new science?). The biggest complaint of Non-Governmental Organizations (NGOs) about Eten en Genen and GM Nation was that the discussion came too late in the process. Even if governments had used the results in political decision-making, these NGOs thought...
that there was no reason to believe that the outcome still could have been able to influence the direction of biotechnological research and innovation. In the 1990s, a boycott against GMOs was felt to be the only option that consumers had to refuse this new technology while its developers wanted to recover the costs of the research and development of these new products. This explains the entrenched positions in the GMO controversy. So, public engagement with science also has to take place upstream in the process of scientific and technological development and not merely downstream where technologies are finalized and ready to hit the market.

Third, public engagement with science needs a deliberative turn as some commentators assert (Felt et al. 2007). As I will also elaborate extensively in Chapter 2, this line of argument resonates with a body of thought within political theory called deliberative democracy that has become influential since the early 1990s. According to deliberative democrats, public deliberation is an approach to decision-making based on reasonable political judgment. This means that citizens who morally disagree on issues (e.g. emerging from new science and technology) do not settle these issues on the basis of power, majority rule (voting) or rhetoric and strategic communication in public debate. Instead, citizens can enter freely in a deliberation where individual views and perspectives are called into question. These views need to be justified with good reasons that are acceptable to the people who think differently. Deliberation is an informed debate where views of others are both taken seriously and are critically tested in social interaction, just like one’s own perspectives. According to deliberative democracy theory, the preferences of citizens on collective problems (e.g. secure and green energy, sustainable agriculture) are not the fixed input of decision-making (e.g. by voting). Instead, people’s perspectives on issues are the output of a learning process in which reasonable critics can, in the end, revise their opinions.

Deliberative democrats argue that only collective decisions (on moral issues) made as a result of such a deliberative process of reason-giving are mutually acceptable and therefore legitimate (according to the normative imperative) and effective (according to the instrumental and substantive imperative). Public deliberation is a concept referring to a good discussion. It refers to particular norms of the public engagement process that are necessary conditions for legitimate outcomes, be they instrumental or substantive.

The fourth lesson that can be drawn from past experiences with public engagement with science relates to the facilitation process itself. Some commentators have argued that how public engagement is organized has contributed considerably to the public uneasiness with new science and technology (Felt et al. 2007). In their analysis the methodologies used in public engagement – consensus conferences, citizen’s juries etc. – are overstressed. Facilitators adopt, in their view, a kind of “mechanistic” view on public engagement: as long as the protocols and guidelines of these methodologies are correctly applied a legitimate outcome will automatically be generated. In this narrow focus on the “hardware of public engagement” (Wilson et al. 2005) the experimental and hence unruly character of public deliberation is neglected. Since the facilitation process itself influences the outcome, these commentators also call the form of deliberative mechanisms into question.

1.3 Omitted aspects in evaluating upstream public deliberation

Thus, proponents consider upstream public deliberation on the moral desirability of NEST to be a necessary condition for democratic, widely supported decisions on the direction of techno-scientific innovation for normative (deliberative and democratic), instrumental (restoring trust, increasing acceptance, minimizing controversy) or substantive (improved quality of life, better environment) reasons. Public engagement has been a popular topic of academic analysis and evaluation, mainly in the fields of Science and Technology Studies (STS) and political sciences. However, scholars in these fields have paid scant attention to the deliberative process itself and the effects of facilitation on this process and its quality. On the one hand, evaluative research in STS is mainly concerned with providing normative conceptual frameworks for assessing the conditions of a valuable outcome of public engagement. Which criteria need to be used for evaluating the quality of public participation exercises (such as representativeness, transparency, impact on policy etc.), how must these criteria be operationalized and measured and how can concrete public engagement events be evaluated with respect to these criteria? Yet, this approach to evaluation of (upstream) public deliberation on NEST fails to acknowledge how the deliberative process influences the outcome and hence, the legitimacy, of public engagement.

David Ryfe, scholar of political communication, who wrote one of the few reviews on empirical research on public deliberation states: “theorists remain silent about what deliberation looks like on the ground, where real people discuss concrete issues. Perhaps more surprisingly, the empirical literature has not addressed the issue either. Researchers have been less interested in deliberation itself than in measuring its effects” Ryfe (2005: 54). As I will argue in Chapter 2, the few attempts to investigate the quality of reasoning in deliberation in empirical deliberative democracy literature are methodologically problematic and empirically inaccurate.
On the other hand, the question how a “particular setting influence[s] what is said, what can be said and what can be said with influence” (Hajer 2005) is, as far as I am aware, subject of discussion in only one study, that deals with a public participation process in regional planning in the Netherlands (cf. Gomart and Hajer 2003; Hajer 2005). The few studies in STS that are focused on deliberation in action do not take the effect of settings on this process into account (cf. Felt et al. 2009; Kerr et al. 2008; Karner and Wieser 2010).

The main concern in this book is the facilitation of quality upstream public engagement with science. The main question reads: How to facilitate quality face-to-face upstream public deliberation between life scientists and citizens on the ethical issues emerging from the new life sciences and biotechnologies? Facilitation is usually referred to as the practice of conducting discussions on stage. Facilitation, according to this view, comprises the elicitation of viewpoints from all participants without hinting at own opinions, the encouragement of participation, the enhancement of mutual understanding, the management of time and the help offered to groups to work toward its objectives (De Vries et al. 2011; Quick and Sandfort 2014). Of course, these aspects are part and parcel of the facilitation process and key to implementing deliberative processes. Facilitation in this study, however, particularly refers to the interventions on stage to maintain the reasonableness of the discussion among participants, i.e. to enhance the quality of argumentation which is quintessential to deliberation (as I argue below and in Chapter 2). In my view, this aspect of facilitating deliberation has mainly been overlooked in the literature.

The same applies to the efforts of professional organizers of public dialogue behind the scenes to set the conditions for a fruitful discussion. Indeed, facilitating deliberation also refers to the process of designing public engagement. As John Forrester (2013) argues, skilled facilitators are doing “not just the pragmatic work of facilitating a discussion, but the critical pragmatic work of thinking through the procedural design, thinking through the politics and ethics, the normative structuring, of that discussion in the first place” (p. 19; original italics).

In the last decade I have attempted as a facilitator in a Dutch debating center (the LUX) to organize and study face-to-face upstream public deliberation on the moral desirability of NEST in the life sciences. In close collaboration with the Center for Society and the Life Sciences (CSG) we invited key players in (inter)national life sciences research to engage in a dialogue with the public. Using a learning-by-doing or interventionist approach (see Section 1.4), my aim is to unravel the process of deliberation in order to improve its quality.

I concentrate on face-to-face social interaction, even though the public sphere where open and reasoned discussion takes place also comprises media discussions on the internet, in newspapers and television broadcasts, as the controversy on the new Dutch science policy demonstrates. Many of the public engagement methodologies that have been developed over the last decades, however, are based on face-to-face deliberation as the most ideal form of reason-giving debate (Engage2020 2014).

Secondly, I particularly focus on the public performances of life scientists. How do these participating researchers do public deliberation? Despite the increasing influence of governments and industry on the research agendas and the daily practice of science, life scientists and biotech engineers remain key players in the actual production of new knowledge and technologies as well as the setting of research agendas. Particularly now that European policy makers demand a different role as active participants in upstream public engagement with society, it is important to understand how they actually do public deliberation.

Finally, I focus on participating researchers in the life sciences, the broad field of science that involve the scientific study of living organisms – such as microorganisms, plants, animals, and human beings – mainly on a molecular level (DNA, RNA etc.). Since the 1970s, advances in the life sciences such as recombinant DNA techniques, GMOs and the human genome project have been the subject of public discussion and controversy; continuing developments in life sciences ensure this interest will remain relevant.

1.4 Research questions and methodological approach

As the title of this thesis suggests, I draw on the metaphor of the theater to highlight the deliberative process and its facilitation “on the ground.” I am not the first to compare public engagement with theater. In fact, its advocates themselves use the metaphor of the theater to draw a parallel with upstream public deliberation. “In the theater of science and technology, the time has come to dismantle the proscenium arch and begin performing in the round” (Wilson and Willis: 24).

The theatrical metaphor allows me to spotlight the two aspects of the facilitation
of upstream public deliberation that have been largely “underexposed” in the public engagement literature: engagement as public performance and the dramaturgy of public deliberation. To analyze these two aspects I draw on two theoretical frameworks that make use of the metaphor of the theater. First, in dramaturgical analysis in social sciences interaction among people – such as deliberating ethical issues of NEST – is studied in terms of public performances. So, how do life scientists perform in the public sphere while doing public engagement? The second theoretical framework also draws a parallel with theater to analyze how the dramaturgical process behind the scenes affects the performances on stage. I first discuss the performance of life scientists and subsequently the dramaturgy of public deliberation. I conclude this section with a description of my methodological approach.

Life scientists as public performers

Introduced in The Presentation of Life Itself (1959), the sociologist Erving Goffman developed an analytical approach to study face-to-face everyday human interactions in terms of a staged performance. Within this sociological perspective theatrical concepts are used to describe and analyze the behavior of people – the actors – in social interaction. To complement the existing literature on the evaluation of public engagement, Harvey (2009) indicates that dramaturgy, as a sociological perspective, is a valuable tool for understanding face-to-face deliberative action, for “[i]t is particularly important for such actors to manage and turn in their ‘best performance,’ appropriate to their individual (or institutional) goals” (Harvey 2009: 150).

Drawing on the work of Goffman in his work on scientific advisors as performers in a public drama, STS scholar Steven Hilgartner (2000) refers to two important theatrical techniques scientific advisors use to perform as credible experts: persuasive rhetoric and impression management. First, I discuss persuasive rhetoric. I return to impression management later.

Similar to Hilgartner’s scientific experts presenting their advice to policy makers, my hypothesis in this study is that scientists and researchers in the life sciences use a variety of rhetorical strategies to persuade their publics of the benefits of their scientific endeavors. Indeed, as Harvey notes, in their close inspection of the deliberative process researchers will undoubtedly find “strategic, success-oriented speech” aimed to “achieve an ulterior purpose and influence others” (Harvey 2009: 148).

In this book the strategic maneuvers that life scientists use in upstream public deliberation in order to be credible, are an important focus. I borrow the theoretical concept of strategic maneuvering from the pragma-dialectical argumentation theory, developed at the University of Amsterdam, to reconstruct, analyze and evaluate argumentative discourse. I use this concept to study argumentation of life scientists. Whereas sociologists and STS scholars such as Harvey and Hilgartner confine themselves to analyzing the persuasive rhetoric in the public performances of scientists and scientific advisors, pragma-dialecticians not only empirically study argumentative discourse as a phenomenon of ordinary language use, but they are also aiming at critically evaluating the soundness of argumentation. Not every move in a discussion is allowed; participants are bound by a set of discussion rules that can be violated.

In pragma-dialectics the concept of strategic maneuvering was developed to draw attention to the delicate balance which participants in public deliberation have to observe between on the one hand the rhetorical aim of effectiveness (having their important claims accepted) and the dialectical aim of reasonableness (sound reasoning) on the other.

The dialectical dimension of argumentation refers to the reasonable resolution of differences of opinion. Pragma-dialecticians have developed a model of critical discussion which stipulates a set of norms discussants agree to observe in order to resolve their difference of opinion. As I have discussed above, deliberation is a normative concept indicating the quality of the discussion process. It refers to a good discussion. For a proper evaluation of the deliberative process, the articulation of rules that define appropriate deliberative behavior is paramount. The pragma-dialectical model of critical discussion provides a code of conduct for participants of public deliberation. The first set of research questions read:

What are the pragma-dialectical norms for upstream public deliberation on NEST-ethical issues emerging from the life sciences? What dialectical instruments can be derived from pragma-dialectics to direct the discussion towards deliberation?

The pragma-dialectical model of critical discussion reflects an idealized discussion situation. Since everyday discussions will hardly follow the model’s stages and rules for the resolution of differences of opinion, it is not a means to empirically describe actual deliberation. Rather, it is a normative framework to evaluate argumentative discourse for its soundness.

Moreover, pragma-dialecticians stress that these norms are not carved in stone. The rules themselves can (and must) be subject of discussion since all discussants have to accept them. What is more, the norms of a critical discussion allow for rhetorical effectiveness. In addition to convincing reasonable critics discussants also attempt to have their standpoints accepted preferably without violating the rules of a critical discussion. “[P]eople are also, and perhaps even primarily, interested in resolving the difference of opinion effectively in favor of their case, i.e. in agreement
with their own standpoint or the position of those they represent” (Van Eemeren 2010: 39). In their attempt to be effective, discussants can violate the norms of a critical discussion. In that case, their strategic maneuvering has derailed. If persuasive rhetoric is an important technique in their public performance, the question is:

**How do life scientists’ strategic maneuvers in upstream public deliberation NEST-ethical issues relate to the pragma-dialectical discussion norms?**

In addition to persuasive rhetoric, Hilgartner draws attention to a second technique used in the dramaturgical analysis: impression management. As Goffman defines, impression management is about how people present themselves to the public in an attempt to get the public to see them as they want to be seen. It refers to “the ways in which he [!] guides and controls the impression [the public] form[s] of him and the kind of things he may or may not do while sustaining his performance before them” (Goffman 1959: ix). This concept has also been used in sociological studies of scientific advisory bodies (Hilgartner 2000; Bijker et al. 2009).

To get a hold on how participants of upstream public deliberation control information and how they constitute a public character or persona, studying the behavior of participants on stage does not suffice. To understand the goals and strategies in deliberative settings that drive their contributions, one needs to relate the discourse participants produce with their off stage behavior. Thus, one can learn how life scientists manage their impressions on stage by looking behind the scenes as well.

**How do life scientists participating in upstream public engagement on NEST present themselves as dramatic persona?**

--- Facilitators of upstream public deliberation as dramaturgist

The theatrical metaphor also sheds light on a second aspect of the production process behind the scenes of upstream public engagement: its dramaturgy. Calling attention to the dramaturgical work of facilitators of public engagement puts the work of practitioners, social scientists and philosophers in the spotlight. As some have argued, social scientists and philosophers have a robust role to play in the production process of public engagement with science and technology. “Potentially this would involve social sciences becoming, modestly, actors in those worlds and not only observers and commentators of them” (MacNaghten et al 2005: 287).

However, when social scientists and philosophers claim their part in organizing upstream public engagement perhaps they are dramaturgists rather than actors. Indeed, as Maarten Hajer writes, public deliberation is a form of dramaturgy and

the scripting, staging and setting of a deliberative event affects the performance of deliberators (Hajer, 2005). How to do deliberative democracy is not a settled issue. This prompts a reflective turn that is addressed in the last research question of this thesis:

**How does the dramaturgy (its scripting, staging and setting) of upstream public deliberation affect the performances of participants and the quality of deliberation?**

--- Methodological approach

To study deliberative action I organized two deliberative events at the LUX that I present as case studies in this book. The first case study is a series of three public discussions on behavioral genetics/genomics, each of which had a particular psychiatric disorder (Attention Deficit Hyperactivity Disorder (ADHD), delinquency and Autism Spectrum Disorder (ASD) as its focus). Behavioral genomics was considered to be a controversial field of biomedical research that could spark discussion. Similarly, the second case study is a public deliberation on the moral desirability of new omics technologies in the early detection and prevention of type two diabetes. In all of these public discussions life scientists were invited to engage into dialogue with representatives of the public and the public itself (people visiting LUX). In the table below, more details about the discussions are presented (see Table 1.1).

To find answers to the abovementioned research questions, I employ a range of both quantitative and qualitative research methods for data collection and analysis: questionnaires, interviews, document analysis, discourse and argumentative analysis and ethnography. Discourse analysis is a diverse and complex field in the social sciences that is difficult to grasp. Discourse analysis can be defined loosely as the qualitative study of language use (both spoken and written) in social interaction. It is concerned with how people act as they speak (or write). In addition to a communicative goal, language allows us to do things and to be things (cf. Gee 2010). As I will argue in Chapter 4, in my view discourse analysis also comprises the study and analysis of argumentation as part of everyday discourse, even though the fields of argumentation theory and discourse analysis are separated. The empirical object of study of discourse analysts is written or spoken discourses that can be preliminarily defined as particular ways of talking about and understanding the world (or an aspect of the world; cf. Jørgensen and Phillips 2002; see also Chapter 4). In Chapters 3 and 4 I will present a more detailed framework of analysis.

Since its history and origins are too complex to provide a conclusive definition of what ethnography entails, I follow the strategy of Hammersley and Atkinson (2007) to describe the term based on what ethnographers do. One of the most
## Table 1.1 Characteristics of case studies

<table>
<thead>
<tr>
<th>Case study 1a</th>
<th>Case study 1b</th>
<th>Case study 1c</th>
<th>Case study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>The Preprogrammed Human ADHD</td>
<td>The Preprogrammed Human delinquency</td>
<td>The Preprogrammed Human ASD</td>
</tr>
<tr>
<td>Topic</td>
<td>Behavioral genomics and ADHD</td>
<td>Behavioral genomics and delinquency</td>
<td>Behavioral genomics and ASD</td>
</tr>
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<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Time (duration)</td>
<td>08.00 - 10.00 p.m. (2 hrs)</td>
<td>08.00 - 10.00 p.m. (2 hrs)</td>
<td>08.00 - 10.00 p.m. (2 hrs)</td>
</tr>
<tr>
<td>Time (duration)</td>
<td>01.00 - 05.00 p.m. (4 hrs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of invited speakers</td>
<td>1 • Professor in Child Psychiatry</td>
<td>7 • Professor in Child Psychiatry</td>
<td>9 • Biopsychologist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Professor in Developmental Psychology</td>
<td>• Professor in Child Psychiatry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Psychiatrist PI</td>
<td>• Head of the Genetics Dept. Child Psychiatry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Psychologist PI</td>
<td>• Chair Parents Council Care Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Member of Parliament</td>
<td>• Psychiatrist Care Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ex-convict</td>
<td>• MD in Child Health Care Center</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Researcher Biological Factors Delinquency (cancellation)</td>
<td>• Representative Dutch Association Autism</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>• Representative National Network Autism</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>17 • Professor in Ethics (prevention)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Administrator Diabetes Federation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Professor in Diabetology</td>
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<td></td>
<td></td>
<td></td>
<td>• General Practitioner</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Administrator Association Obesity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Local young politicians (n=4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Diabetes patients (n=2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Life scientists (n=3; 1 cancellation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Medical product developer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Science writer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Philosopher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Member Patients Organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Manager Public Health (Prevention)</td>
</tr>
</tbody>
</table>

(continues table 1.1)

<table>
<thead>
<tr>
<th>Case study 1a</th>
<th>Case study 1b</th>
<th>Case study 1c</th>
<th>Case study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of members of the public</td>
<td>80</td>
<td>80</td>
<td>247</td>
</tr>
<tr>
<td>Main question(s)</td>
<td>• What does the genomics research on ADHD yield for society?</td>
<td>• What does the production of knowledge of the biology of criminal behavior yield for society?</td>
<td>• What does the development of genetic tests for autism yield for society?</td>
</tr>
<tr>
<td></td>
<td>• What (perhaps unintended) consequences can this form of knowledge production have for the practice of detention and prevention of criminal behavior?</td>
<td>• What (perhaps unintended) consequences can the production of knowledge in the field of behavioral genomics and autism have in practice?</td>
<td>• How do we want to use genetic tests for autism?</td>
</tr>
<tr>
<td></td>
<td>• How morally desirable is the (future) application of systems biological technologies (such as iPOPs) for the (preventive) care of type II diabetes?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
important features of ethnographic work is to study people’s actions in everyday situations and their accounts thereof. Originally used to study foreign cultures in cultural anthropology, ethnography is by now widely used to study communities, (sub)cultures and practices on site such as scientific laboratories (e.g. Latour and Woolgar 1979, Gilbert and Mulkay 1984), hospitals (e.g. Mesman 2008) etcetera. Unstructured and semi-structured interviews, informal conversations, field notes, memory and participant observation are typical research methodologies that ethnographers employ. Participant observation is a method of data collection that is used through a close and intensive, long-term involvement in the social practices in which the people ethnographers study interact. Recordings of the observations as written field notes are important empirical data. Participant observation is typically used to gain access to practices that normally remain unaccessible; to reduce the people’s reactivity as a result of being observed; to better understand what really happens in certain practices (Kawulich 2005). The vantage point of a facilitator working as a dramaturgist of upstream public deliberation enables such a close examination of the practice of upstream public deliberation and the people who enact it.

In this study, I adopt the following research design (see Figure 1.1). This figures depicts the different moments of data collection and data analysis and their interrelationships during the organization process of the deliberative events at the LUX from the very start (doing research for finding a suitable issue for discussion) to the very end (the closing remarks of the facilitator of the deliberation). As I will discuss in the conclusion section of Chapter 5, I added a few elements to extend data gathering and analysis (indicated in green). Together, the collected data and the analysis thereof results in the reconstruction (“thick description” of you will) of the deliberations at the LUX, which I present in Chapters 5, 6 and 7 (see below for a short introduction into these chapters).

To study life scientists’ strategic maneuvers in upstream public deliberation, I use first and foremost transcriptions of the texts produced during the deliberative events at the LUX as empirical data. To reconcile the methodological differences between pragma-dialectics and most branches of discourse analysis, I have decided to represent the texts ad verbatim.7 For a proper reconstruction of the discourse, other empirical sources were added: interviews after the events at the LUX (to clarify occasional ambiguities), video-recordings (to analyze non-verbal communication) and written documents (scientific articles, newspaper articles or philosophical literature) that were explicitly referred to during the discussions (intertextuality) or that constituted the macro-context. Subsequently, these transcriptions were systematically analyzed in terms of strategic maneuvering. I also use additional ethnographical material (in particular interviews) to study life scientists’ own reflections on their performances, intentions, rhetorical aims and experience. After the public engagement activity, I conducted interviews with the participating scientists in which we discussed selected passages of the video-recordings that were shown to them. The transcripts of the deliberative events at the LUX were analyzed using the framework developed in Chapters 3 and 4.

To study the impression management of the life scientists, I compared the discourse analysis of the transcribed public deliberations (particularly the constructions of their identity) with the analysis of the preparatory interviews I conducted with every participating scientist. Ethnographic material (interviews afterwards, personal observations and the notes of several observers) was additionally analyzed and coded to investigate the differences between backstage and front stage behavior.

The effects of the dramaturgical work behind the scenes were studied in two steps. Firstly, the organizational process was reconstructed by means of a document study. I closely examined all the documents that were produced directly or indirectly in the course of the organization of the deliberative events: draft versions of scripts; briefings for participants; promotional texts; e-mail correspondence; journalistic accounts of the events published on the website of the LUX. Secondly, questionnaires as well as interviews with participants and members of the public were used as a

7 Pragma-dialectical argumentation theory and for example discourse psychology differ considerably as far as empirical data are concerned. Pragma-dialectics offers four different transformations that are used to reconstruct the argumentative discourse. Text can be deleted when considered irrelevant, added when relevant parts remain implicit, substituted by unambiguous text or parts of the text can be rearranged (permutatation) in order to prepare the discourse for analysis and evaluation (see Van Eemeren and Grootendorst 2004: 100-110). In discursive psychology, on the other hand, recordings of conversations and discussions are transcribed following sophisticated notation conventions so as to include overlapping text, (micro)pauses, pitch and emphasis, laughter, error corrections and even unclear speech (cf. Veen et al. 2013).
**INTRODUCTION**

**Participation observation**
- Email correspondence
- Field notes

**Document collection**
- Invitations letters
- Briefings
- Meeting documentation
- Handouts
- Online discussions
- etc.

**Literature search**
- Articles popular press
- Professional publications
- Scientific literature
- Policy reports

**Interviews scientists**
- Collecting socio-technical imaginaries

**Discourse analysis**
- Socio-technical imaginaries

**Observation**
- Observation reports

**Observation**
- Audiovisual recordings
- Transcripts

**Before deliberative event**

**Interviews scientists**
- Investigating motivation for participation, experiences, aims etc.
- Investigating position on moral desirability issues
- Investigating socio-technical imaginaries

**Interviews life scientists**
- Investigating motivation for participation, experiences, aims etc.
- Investigating position on moral desirability issues
- Investigating socio-technical imaginaries

**After deliberative event**

**First analysis**
- Audiovisual recordings
- Transcripts

→ First selection excerpts for interviews

**Second analysis**
- Transcripts

→ Detailed discourse and argumentative analysis

**Detailed, thick description**
- Deliberative action on stage
- Dramaturgy: back stage process

**Participative research**
- Life scientists analyzing excerpts

**Document collection & analysis**
- Texts used for understanding context
- Texts explicitly referred to during deliberation

**Questionnaires**

Figure 1.1 Methodological approach

added in second case study
source to study the effects of the dramaturgical work. For a more detailed and quantified overview of the data collected in the two case studies, I refer to Appendix A. For the details of the questionnaires, see Appendices B, G and H. In Appendix D the interview guide with one of the participating life scientists is demonstrated.

The final remark about my methodological approach is about the iterative research design I chose. This means that the results of the evaluation of one deliberative event inform the design process of the next. So, I first reconstruct, analyze and evaluate the deliberative process. Subsequently, I develop strategies to improve the next upstream public deliberation. Finally, the effects of these interventions – both front stage and backstage – are closely examined. The analysis and evaluation of this second round constitute the basis for new interventions. In this dissertation I present one complete “loop.”

1.5 Outline of the thesis

In Chapter 2 I explore the problem setting in depth. I develop two perspectives on the quality of upstream public deliberation on ethical issues emerging from NEST. First, I discuss the discursive perspective. Drawing on the theoretical work of deliberative democracy (esp. the work of Gutmann and Thompson), I argue that the central procedural principle of reciprocity indicates an important direction for a conception of discursive quality. According to the principle of reciprocity people who morally disagree have to find mutually acceptable reasons to justify a mutually binding decision. As deliberative democrats hold, the quality of deliberation is about the quality of the reasons given to defend a particular (science) policy. However, the theories of deliberative democracy do not elaborate a theory how to analyze and evaluate everyday argumentative discourse.

As I will argue, literature in STS on the evaluation of public participation with science is not helpful either. Dominant evaluative frameworks have an eye for the input quality criteria of public engagement (e.g. inclusiveness and representativeness) and output quality criteria (e.g. influence on policy agendas) but fail to address the throughput quality of public deliberation, i.e. the quality of the deliberative process itself. Furthermore, I assert that the few attempts to develop instruments to determine the quality of deliberation within political sciences are methodologically problematic and/or are hardly useful for the task of facilitators to direct the discussion towards deliberation.

Secondly, I discuss the performative perspective on quality public deliberation. Drawing on Actor Network Theory (esp. the work of Gomart and Hajer), I argue that methodologies or “technologies of community” used for facilitating upstream public deliberation on NEST are not neutral instruments that only produce an unbiased representation of consensus. Just like other technologies, these methodologies affect the outcome. Using the work of Hajer (2005), I elaborate the dramaturgical concepts scripting, staging and setting introduced to analyze how the work behind the scenes affects the public deliberation process. I use the example of the widely applied consensus conference to illustrate how the role of scientists as neutral, distanced information provider is scripted in this public engagement methodology. Empirical research demonstrates, however, that some scientists feel restricted in this role as information provider. They also wanted to act as an issue advocate (Burchell et al. 2009), but the format of the consensus conference does not allow scientists to play this role. So, the dramaturgical setting of the consensus conference co-determines what can be said. Furthermore, I argue that this role as information provider does not concur with the characteristics of modern knowledge production.

In the next two chapters, I introduce the pragma-dialectical argumentation theory that provides a normative framework to reconstruct, analyze and evaluate everyday argumentative discourse to complement existing evaluative frameworks of public participation. In Chapter 3, I investigate the first set of research questions: what are the pragma-dialectical norms for upstream public deliberation on NEST-ethical issues emerging from the life sciences? What dialectical instruments can be derived from pragma-dialectics to direct the discussion towards deliberation? First, I focus on the dialectical dimension of argumentative discourse in general. Using the pragma-dialectical model of critical discussion that serves as a normative framework to evaluate argumentative discourse, I discuss the norms of a reasonable discussion, a set of norms discussants have to observe in order to resolve their difference of opinion. I particularly pay attention to the quality of the reasons that people give to substantiate their claims. As pragma-dialecticians hold, argumentation needs to be confronted with a maximum of doubt. This means that standpoints can only be deemed conclusively defended when the protagonist has satisfactorily answered a set of critical questions that different argumentation schemes raise.

Second, I focus on the dialectical quality of argumentative discourse in public discussions and controversies on the ethical issues emerging from NEST in particular. Since pragma-dialectics is not particularly concerned with these NEST-ethical discussions, I draw on Swierstra and Rip’s so-called NEST-ethics, a description of recurring moral argumentation patterns in public debates on NEST. I subject these argumentation schemes – particularly pragmatic argumentation, deontological and justice argumentation – to the norms of critical discussion to derive a set of critical questions that need to be satisfactorily answered in order to conclusively defend
claims based on these argumentation schemes. Together, these critical questions (or stock topics) constitute a taxonomy of matters of concern that can be at issue in a public controversy on NEST. This taxonomy, I argue, is an instrument to increase the quality of public deliberation on NEST. I illustrate the conceptual work in this chapter with a recent public controversy on a new biotechnological innovation: the genetic modification of agricultural products using genetic material from biologically related species (cisgenesis).

In Chapter 4, I focus on the rhetorical dimension of argumentation. First, I explore the first part of the second research question doing a literature review: how do (life) scientists strategically maneuver in public discussions on NEST based on discourse analytical studies in STS? To investigate this research question, I discuss the pragma-dialectical concept of strategic maneuvering that is central to pragma-dialectical argumentation theory. Strategic maneuvering is defined as keeping the delicate balance between the rhetorical aim for effectiveness in argumentative discourse and the dialectical aim of maintaining reasonableness as discussed in the previous Chapter 3. To have their standpoints accepted, participants in discussions can employ several discursive strategies in addition to argumentation as pragma-dialecticians define it.

Since pragma-dialectics is not specifically concerned with public discussions on NEST, I present the results of a literature review of studies that have rhetorical devices that advocates and opponents of NEST use as their focus. These studies use Discourse Analysis (or DA for short) and, as I will argue, these studies in DA are useful because of their focus on a) the rhetorical function of constructed versions of the (social) world and b) other discursive strategies than argumentation (in the pragma-dialectical sense) alone. From these studies in DA I identify three types of strategic maneuvers that frequently recur in public discussions on NEST and can be expected to be utilized: boundary work, subject positioning and future expectations. Next, I investigate the second part of research question 2: how these strategic maneuvers relate to the dialectical dimension of reasonableness, as discussed in Chapter 3. Again, I illustrate how these strategic maneuvers were used in the Dutch public controversy on cisgenesis.

In the next three chapters I present the empirical analyses and evaluations of the face-to-face upstream public deliberation on ethical issues emerging from new life sciences and biotechnologies I have facilitated. Using a) Hajer’s dramaturgical concepts of scripting, staging and setting as discussed in Chapter 2, b) the pragma-dialectical model of critical discussion, elaborated in Chapter 3 and c) the strategic maneuvers in NEST-ethical discussions as identified in Chapter 4, in Chapter 5 I analyze three public deliberations on the ethical implications of behavioral genomics. The analysis of these deliberative events is chronological to demonstrate how the experiences after one event informed the interventions of the next.

First, the performances of the life scientists on stage are reconstructed and analyzed in terms of strategic maneuvering and evaluated according to the model of critical discussion (Research Question 2). As I will demonstrate, future expectations concerning the technological feasibility of applications of behavioral genomics (e.g. genetic tests for autism, risk assessment tools for measuring recidivism) proved to be an effective strategic maneuver in these deliberative events. The future visions that scientists constructed closed down critical discussions on the moral desirability of these new technological innovations.

Second, the influence of the dramaturgy of these public deliberations in terms of scripting, staging and setting is investigated (Research Question 4). The empirical analysis of the events in LUX shows that casting (choosing the characters in the play), scripting (who is to speak first) and staging (the public as active participants) influence the course of the discussion. Finally, I discuss two strategies that can help facilitators to open up a more meaningful deliberation on the moral desirability of NEST.

Chapter 6 is a detailed description of the dramaturgical work performed behind the scenes of an upstream public deliberation event on new knowledge and technologies in molecular biomedicine (in particular, integrative personalized omics profiles or iPOPs). Firstly, I present how I implemented the two strategies identified in Chapter 5 as an attempt to improve the quality of the discussion. During preparation, I used the stock topics derived in Chapter 3 as well as the rhetorical parameters for constructing the future as discussed in Chapter 4, to systematically and critically assess the argumentation advocates advance to defend the moral desirability of these new biomedical technologies based on the literature and on interviews with participants. In addition, I applied the critical questions that pertain to appeals to authority to assess claims about the technological feasibility of iPOPs. Both these assessments were used in the information package to prepare the panelists in the forum discussion.

Secondly, I describe the dramaturgy of the deliberative setting (the framing of the issue, the casting of participants, the scripting and staging of the event) and how it affected the performance of participants (Research Question 4). This detailed description demonstrates the practical entanglements of facilitators of upstream public deliberation: the tradeoffs as a result of the application of abstract normative criterions concerning the quality of public participation.
In the final empirical chapter, Chapter 7, I turn the spotlight again to the stage performance of the life scientists participating in the public deliberation the ethical issues concerning the introduction of the iPOP to the preventive care of type 2 diabetes. In this Chapter, I investigate again how the life scientists strategically maneuvered in this public discussion and how these maneuvers relate to the pragma-dialectical model of critical discussion (Research Question 2). The reconstruction, analysis and evaluation of the public dialogue in LUX demonstrate, first, that my dramaturgical and dialectical interventions as facilitator positively affected the deliberative quality. The moral desirability of iPOPs was discussed.

Secondly, I closely examine the strategic maneuvers the participating life scientists used to manage the public's impressions (Research Question 3). The analysis of the argumentative discourse also shows that all three participating life scientists employed the theatrical technique of impression management to position themselves as advocates in the discussion without having to publicly divulge their personal convictions that corresponds to the views of their opponents. Even though the dialectical dimension of a reasonable discussion was respected, their impression management does not fully accord with the principles of deliberative democracy discussants have to respect when moral disagreement is deliberated, I argue. Finally, I also discuss how the deliberative setting contributed to their behavior, addressing Research Question 4.

In Chapter 8, I reflect on how the main research findings of this study can be used to intervene in public discussions on the moral desirability of NEST to realize, improve or maintain the quality of deliberation. I also reflect on the requirements for professionalizing facilitators of upstream public deliberation on NEST.
see-through public engagement

A discursive and a performative perspective on the quality of upstream public deliberation
CHAPTER 2

See-through public engagement
A discursive and a performative perspective on the quality of upstream public deliberation

2.1 Introduction

"Put simply, we recommend the introduction of structured ways of appraising the projected benefits of innovation. This means [...] a shift from expert-dominated to more open deliberative science-informed institutions on ethics, risk and innovation" (Felt et al. 2007: 11; italics KD). This was one of the main conclusions from the report Taking European Knowledge Society Seriously (2007), published by a group of authoritative scholars in the field of Science and Technology Studies (STS).¹ Their research expertise lies in public controversies involving science and technology and the questions that scientific and technological innovation poses for democracy. The European Commission had appointed them to “analyze the growing uneasiness which affects the relations between science and society and to explore ways to develop constructive interactions between techno-scientific expertise and public concerns” (Felt et al 2007: 14). The main conclusion of the expert group illustrates a commitment to the theoretical conception of deliberative democracy and its central principle of reciprocity (see Section 2.3.2). Not only does the public need to be engaged with science, but in turn, the scientific community has to engage with the public (cf. Borchelt and Hudson 2008; Gibbons 1999).

This adage of more public deliberation had already resonated in governance circles as well as the scientific community. In 2000, the House of Lords already observed in their Third Report on Science and Society, that “science is beginning [...] to move out of the laboratory and into the community to engage in dialogue aimed at mutual understanding” (House of Lords 2000: 5.1). And in 2004, the editors of Nature argued that the image of the public as a “babbling hag” has become obsolete.

They enthusiastically endorsed the need to engage the public as soon as possible even though the numerous mechanisms have not yet been properly evaluated (Anon. Nature 2004: 883).

However, as the authors of the EC report observe, the effectiveness of all these engagement endeavors is poor, or at least uncertain. They rhetorically ask: “how if at all [has] this momentous collective effort on public engagement [with science] helped – or hindered – its various sponsors and users, including policy-makers, innovators and scientists, to better understand ‘the public’ in such issues?” (Felt et al. 2007: 56). How public participation has been performed has counter-productively added to the public unease it was supposed to reduce, the members of the EC advisory group indicate. Simply involving the public is not enough. Rather, a more meaningful interaction between science and society is needed. As one of the authors had written earlier, “technologies of humility” are needed for a “richer deliberation” (Jasanoff 2003: 240). This call for “humility” is also directed towards practitioners and social scientists who are in favor of more public deliberation, but who have been focusing too much on the “hardware” of deliberative methodologies, such as consensus conferences and citizens’ juries (Wilsdon et al. 2005: 19).

In this chapter I use the problem analysis of the EC report as the foundation to present the main research aims of this dissertation. To address the issue of more meaningful public deliberation on new and emerging science and technology (NEST) as articulated in the EC report, I elaborate two perspectives on the quality of deliberation. Both perspectives are crucial in the work of organizing public dialogue off stage as well as the work of facilitating dialogue on stage: a discursive and a performative perspective.

Before elucidating the discursive perspective, I first explicate the principally implicit link between STS literature on upstream public engagement and particular conceptions of deliberative democracy. More specifically, I claim that the problem analysis of (European) science and technology governance, as developed in the work of Brian Wynne and others (Section 2.2), is reverberated in the work of Gutmann and Thompson who have developed a problem analysis of economic conceptions of democracy (Section 2.3.1). However, whereas the normative position of public engagement literature in which the democratization of science is advocated or presupposed remains mainly unarticulated, the conception of deliberative democracy of Gutmann and Thompson indicates a valuable criterion of quality of deliberation: reciprocity. Since this procedural principle pertains to the “process of seeking [...] mutually justifiable reasons and reaching mutually binding decisions on the basis of those reasons” (Gutmann and Thompson 2004: 134), deliberative quality is about the quality of argumentation and reasons advanced to defend particular (science) policy (Section 2.3.2).

In Section 2.4, I argue that this discursive perspective on quality is omitted in dominant evaluative frameworks of public participation in STS literature (esp. Rowe and Frewer 2004). Attempts to investigate the quality of argumentation in deliberation in empirical deliberative democracy literature, on the other hand, are methodologically problematic and empirically inaccurate. I illustrate this claim drawing on the Discourse Quality Index (DQI) developed by Steenbergen et al. (2003). My claim is that both shortcomings indicate that developing a conception of quality of deliberation as quality of argumentation is needed.

In Section 2.5, I discuss the performative perspective on public deliberation. Whereas most attention in the little STS literature on the process of deliberation is devoted to the action – (argumentative) discourse – the “dramaturgy of public deliberation” (Hajer 2005) is mostly overlooked. Drawing on the work of Emilie Gomart and Maarten Hajer, I emphasize the experimental character of public deliberation events (and its unpredictable outcomes) and the effects of the script, staging and setting of deliberation on the performance of its participants. Using examples from empirical studies in STS on how public deliberation is performed, I illustrate that the way public engagement with science is enacted affects the quality of the deliberation. Particularly, I use the example of the consensus conference to indicate how the staging of scientists exclusively as distanced and disinterested experts also determines what can and cannot be said. Therefore, I emphasize the importance of including the organizational process and its effects in the analysis of deliberative sessions. It is also time to look behind the scenes of what practitioners and social scientists who act as dramaturgist in public deliberation settings do. In Section 2.6, I formulate the two central research aims of this dissertation.

### 2.2 STS normative commitment to public deliberation

In the EC report, STS scholars Ulrike Felt, Brian Wynne, Sheila Jasanoff, Michel Callon and others offer an alternative analysis of the underlying problem behind public controversies on science and technology, which builds on prior academic work within STS which is referred to extensively. How can the public unease, resistance or even hostility towards science and technological innovations be explained, the authors ask? The problem is not as is often suggested the public who are frequently portrayed as being generally anti-science mainly because of their scientific illiteracy. Large surveys indicate, oppositely, that the European public is quite enthusiastic about science in general. This so-called deficit model came to be the dominant paradigm for understanding public controversy. If the public’s understanding of science is improved,
the resistance towards science and technology will decrease, the general line of argument was. This thinking was effectuated in policy (see e.g. Bodmer report 1985). As social scientific research in the public understanding of science has indicated, this public deficit paradigm has proven to be problematic. More public understanding of science does not automatically result in less uneasiness. Furthermore, in particular scientific contexts, citizens have proven to possess valuable sources of knowledge and information (Irwin and Wynne 1996).

Contrary to this explanation, Felt et al. argue that the dual-track governance of science and technological innovation in most European countries is problematic. On the one hand, there are investments in scientific research and technological innovation that should stimulate national and European knowledge economies (governance of science). On the other hand, there is scientific expertise which is called in for assessing and calculating the risks resulting from these new technological innovations, to address and reassure public concerns (science for governance). Thus, a particular problem framing is imposed as Wynne has repeatedly argued (Wynne 2001, 2003, 2006; Leach, Scoones and Wynne 2005): policy makers perceive the possible negative effects of technological innovation as constitutive for the main public concern. These effects are reduced to scientifically predictable and calculable variables: risks.

The reduction of public concern to scientific risks is problematic for two reasons, Felt et al. argue. First, risk is an equivocal concept: risks cannot be scientifically objectified, they are uncertain and even embody normative values. Subdividing risks analytically into simple, complex, uncertain and ambiguous risks (cf. Bijker et al. 2009), even supposedly simple risks do not meet the cognitive values of predictability and control, as Wynne has shown in his famous Cumbrian sheep farmers case study (Wynne 1992). Complex risks, such as the effects of the introduction of genetically modified crops in developing countries on sustainability or economic growth, are even more difficult to assess. Should these effects count as risk in the first place? What the risks are cannot be solely determined on scientific standards alone. Neither can the issue of acceptability. Here too, normative considerations are decisive in defining the level at which risks are acceptable. Uncertain risks, such as the health effects of nanoparticles, are unknown by definition, because assessment frameworks are still lacking or scientifically controversial at best. In sum, questions such as “What are the risks?”, “Are GMOs crops safe for food consumption?” and “What are the health risks of nanotubes?” are difficult to answer.

What is more, a scientific definition of these risks frames the issue, which is the second reason why this science for governance is problematic. Framing entails the selection of “some aspects of a perceived reality and make them more salient […] in such a way as to promote a particular problem definition […] and moral evaluation” (Entman 1993: 52). It limits the perspective on public issues concerning science and technology to “downstream” effects or output. This reflects the technological deterministic purport of the linear argument which prevails as master narrative in European science governance culture, Felt et al write. It presupposes that scientific and technological developments are autonomous, indifferent towards social influence, but with serious societal impacts (see Section 4.2.2 for an elaboration of technological determinism as a rhetorical device). Regulation and policy are directed towards prevention or mitigation of potential negative consequences. Scholars in STS, however, have made an effort to demonstrate that, contrary to technological determinism, science and technology are also the result of social work. This is captured in the ideal of co-production (Jasanoff 2004; Harbers 2005; Rip et al. 1995). “Briefly stated, co-production is shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it. Knowledge and its material embodiments are at once products of social work and constitutive of forms of social life; society cannot function without knowledge any more than knowledge can exist without appropriate social supports” (Jasanoff 2004: 2-3).

The effects of science and technology are also intended even though not all consequences can be anticipated in advance. A technological artifact embodies particular values and beliefs. In terms of Actor Network Theory, it contains a script, a particular “vision of (or prediction about) the world” (Akrich 1992: 208) that innovators inscribe in their products even though anti-programs reflect the conflicts between intended use and actual use. The design of technologies (Winner 1986; Bijker and Law 1992), their proper functioning (Akrich 1992) and their use (Oudshoorn and Pinch 2003) cannot be understood apart from society. “Scientific knowledge […] both embeds and is embedded in social practices, identities, norms, conventions, discourses, instruments and institutions — in short, in all the building block of what we term the social. The same can be said even more forcefully of technology” (Jasanoff 2004: 3).

Thus, the making of science is also political (ibid. p. 21). It is the result of a complex and contingent social process in which eventually certain values come to prevail over others. The public unease with scientific and technological innovation, the authors of the EC report argue, has its origins in the way this process is governed. The public is not only concerned with the output of science and technology (as policy
The classic example that demonstrates this problematic dual-track governance of science is the European controversy over genetically modified crops (GMOs). Social scientists found a large discrepancy between public perceptions on GMOs and policy responses (Marris et al. 2001). In a large essay drawing on the results of this study, Wynne (2001) argues how governmental institutions on food safety frame ethical public concerns about the possible consequences of GMOs as risks: are GMOs safe? In addition, he demonstrates how ethical advisory bodies (e.g. the Nuffield Council on Bioethics), in a similar vein as scientific regulatory actors, reduced deontological ethical issues (e.g. are GMOs unnatural?) to issues of labeling which empowers people to make well informed consumer choices (see Chapter 3 for a discussion of consequentialist and deontological moral argumentation patterns).

These framings are in sharp contrast to the wider public issues citizens had raised in the focus groups study. The public challenges the tacit presumption that science is capable of foreseeing all possible risks and predicting them accurately. Furthermore, they articulated issues which cannot simply be settled in liberal terms of consumer choice: public accountability ("Who will be responsible in case of unforeseen harm?"), distributive justice ("Who will benefit from the use of GMOs?"), the politics of scientific innovation ("Who decided that GMOs should be developed and how?") and public participation and control ("Why were we not better informed about their use in our food, before their arrival on the market?").

Wynne comes to conclude – in his (characteristically) slightly activist language – that public alienation or distrust is also a result of the failure of governments and the scientific community to address these public issues, mostly due to a lack of transparency in both policy and science culture. Wynne stresses (2006) that scientists and policy makers themselves contribute to the problem by reinventing public deficit models which reflects a “lack of open institutional selfreflection” (212). Therefore, there is a need to “dig out the implicit human values and ethical pre-commitments which those cultures (including scientific culture) unaccountably reproduce and impose. Our task is to render the very fabric of [this] culture transparent and explicit, open to rational and reflexive public deliberation” (Wynne 2001: 473).

In a similar vein, De Vries and Horstman (2007) have critically analyzed public discussions on innovations in biomedical technologies, particularly in predictive medicine. After the 1980s, in which “tenable claims” and “exaggerated expectations” (ibid. 6) resulted in unrealistic debate, a piecemeal approach became dominant: every new technology is ethically assessed separately. Based on the ideal of a physician-patient relationship, a liberal ethics perspective was guiding, too. Issues were displaced to the private sphere and reduced to matters of informed consent, the equal of consumer choice in medical ethics. The individual patient, equipped with reliable and complete information, must make his or her own decision. Liberal ethics has the advantage that it provides a “political solution in situations where general consensus [...] may not be expected” (ibid. 10), but important secondary or indirect public issues are neglected. And since health care consumers have only the exit option, only hard lessons are learnt, De Vries and Horstman argue. Therefore, they argue in favor of the organization of voice to stimulate (soft) social learning processes.

Opening up the process of defining problems – be it in terms of risks or in terms of ethics – for public deliberation is the main message of the 2007 EC report. Even more so, since scientific innovation is likely to intensify as it is the ambition of the European Union to become the most competitive knowledge economy. If public unease with science and technology is also and perhaps even primarily rooted in the input, then the governance of science must be opened up for civic involvement. Public deliberation has to move upstream so as to include a critical reflection on the social needs, benefits and priorities of scientific and technological innovation. “In the theatre of science and technology the time has come to dismantle the proscenium arch and begin performing in the round” (Wilson and Willis 2004: 24), so as to render publicly visible the backstage process of scientific and technological activity which is now hidden from a public view. This reflects, as I argue below, one of the main three procedural principles of deliberative democracy: publicity.

Despite their commitment to the normative political theory of deliberative democracy, Felt cum suis do not articulate elaborate ideas of public deliberation. Nor do they address important questions such as why public deliberation is to be preferred...
2.3 Upstream public deliberation and the principles of deliberative democracy

It is not self-evident to connect the work of Felt, Wynne and others with deliberative democracy theory. First of all, there are hardly explicit links between STS literature and deliberative democracy, except for the work of Hamlett (2003) and Lövbrand et al. (2011); Brian Wynne (2007) refers to the literature only to indicate the limitations of deliberation (see Section 2.4). Furthermore, the authors of the EC report do not explicitly refer to authoritative adherents of deliberative democracy. Additionally, as I will elaborate below (Section 2.4), the deliberative perspective is missing in dominant evaluative frameworks of public participation in STS literature, particularly the work of Rowe and Frewer (2000, 2004).

To answer the question of what deliberative democratic theory entails and what it has to offer STS, I use the work of Amy Gutmann and Dennis Thompson (1996, 2004). Not only are they authoritative theorists, but they have been actively engaged in academic discussion with critics within deliberative democracy theory (e.g. Macebo 1999 which contains a set of essays in response of Democracy and Disagreement). Furthermore, Gutmann and Thompson offer in Why Deliberative Democracy (2004) a thorough elaboration in which they explicitly take position in the discussions between deliberative democracy and rival political theories as well as the main issues within deliberative democracy theory (its value, status, aims and scope).

Finally, I show that there is no paradox between STS conceptions of democracy and Gutmann and Thompson’s conception of deliberative democracy, as Lövbrand et al. (2011) argue.

2.3.1 Linking STS to Deliberative Democracy
Deliberative democracy theory can be positioned as a response to minimally liberal or economic conceptions of democracy. According to these conceptions citizens have the democratic right to vote for representatives who will make decisions about legislation and public policy on behalf of their constituents in the usual political forums (parliaments). According to Gutmann and Thompson, persons in these conceptions of democracy are treated as “passive subjects to be ruled” instead of “autonomous agents who take part in the governance of their own society, directly or through their representatives” (Gutmann and Thompson 2004: 3).

Three criticisms towards these conceptions, which deliberative democrats have advanced, can link this normative political theory to upstream public engagement. Deliberative democrats a) denounce the liberal preclusion of moral disagreement, b) reject the idea of preference (towards moral disagreement) as fixed and some of them – like Gutmann and Thompson – are in favor of c) extending the scope of public deliberation beyond usual governmental structures so as to include organizations in civil society (including universities and corporations).

The first criticism is directed towards impartial principles that are currently often invoked to remove moral issues off the agenda of public discussion. These principles of preclusion, as Gutmann and Thompson call them, are originally proposed by liberals as a solution to religious conflict but are assumed to dispose of moral disagreements in pluralist societies as well. These principles constitute the foundation for the liberal call for toleration. As these liberals hold, there are no, and cannot be any, true moral beliefs (skeptical premise), and therefore the state should stay neutral towards any such belief (neutrality premise) and therefore, should not act (inaction premise). Every free individual should decide for him- or herself according to their own morality. Here, we recognize the criticisms of STS scholars towards the liberal governance of science and technological innovation. Whereas Wynne and De Vries et al. provide more empirically-informed reasons to challenge these principles of preclusion, Gutmann and Thompson advance a philosophical argumentation why more moral issues should be publicly discussed.

Drawing on an alternative and, in their view, more plausible set of principles of
Deliberative theorists assume that preferences are not given, but are constructed as the result of a reasonable, well-informed deliberation process. Initial preferences can (and will) be revised during such processes. Here, some suggest an explicit overlap between deliberative democrats and (social) constructivists: “The literature on deliberative practices […] shows clear affinities to social constructivism” (Hamlett 2003: 134).

The third criticism deals with the fact that many important decisions that affect people’s lives are taken outside the usual political arena. Even though the theory of deliberative democracy that Gutmann and Thompson developed applies primarily to the usual political contexts (national parliaments and comparable more or less representative governmental bodies), Gutmann and Thompson are proponents of broadening the scope of their conception of deliberative democracy beyond the realm of “ordinary politics” so as to include civil society organizations such as corporations and universities for which “deliberation still may be desirable” too (Gutmann and Thompson 2004: 35).

This reflects the ideas of the STS scholars of the EC report who recommend stimulating public deliberation in innovation trajectories. Their idea of governance includes not only “formal ‘policy’ performed by ‘policy institutions’” but also “agents, collectives and networks of civil society” (Felt et al 2007: 14-5). Crucial decisions in the governance of science and technology are frequently made outside the domain of democratically elected, representative and accountable politicians. Empirical studies in STS have demonstrated that national governments sometimes have to deal with the politics of science and technology as loci of displaced or dispersed politics (Bovens et al. 1995) or sub-politics (Beck 1997). In the Netherlands, for example, the minister of health was left little room for maneuvering in the political debate about the legislation for regulating prenatal screening because it was already established as a practice. In a large clinical trial to obtain relevant statistical data for scientific research to improve prenatal screening, scientists recruited many women to participate. What initiated as a scientific experiment gradually evolved into standard medical practice before public issues such as the medicalization of pregnancy were addressed (Popkema and Harbers 2005).

To conclude, I have argued that there are good reasons to link deliberative democracy theory and STS. Gutmann and Thompson’s alternative to economic conceptions of democracy – with its tendency to privatize public moral issues and to consider individual preferences as fixed – and their advocacy to broaden the scope of deliberation so as to include dispersed political “arenas” (such as industry and universities), shows what they have in common with the authors of the EC report. Nevertheless, Felt and other STS scholars, who are in favor of upstream public deliberation, give only scarce clues as to why deliberation is to be preferred and
what public deliberation entails. In the next subsection, I elaborate on the central concepts that Gutmann and Thompson develop, why deliberative democracy is to be preferred and how these concepts indicate the direction of quality assessment.

2.3.2 The quality of argumentation as quality of deliberation

Primarily, deliberative democracy is a theory about a fair process of decision-making, although Gutmann and Thompson hold the view that apart from procedural principles substantive principles are also needed (in their case: basic liberty, basic opportunity and fair opportunities). The principle of *reciprocity* is the primary prerequisite of fairness. This principle holds that, “citizens owe one another justifications for the mutually binding laws and public policies they collectively enact” (Gutmann and Thompson 2004: 98). This also applies to the mutual acceptability of the principles themselves that guide the process of political agreement seeking; these principles are both morally and politically provisional. Deliberative democracy prescribes how people who morally disagree should engage in a discussion and test the reasons they give and revise their opinions and preferences in the light of new information and arguments that others advance (principles of accommodation). Firstly, citizens should follow the principle of *civic integrity* with respect to their own position. Citizens demonstrate civic integrity by a) consistency of speech (espousal of moral positions independently of the circumstances), b) consistency between speech and action, and c) integrity of principle (accepting the broader implications of the principles presupposed by one’s moral positions). Secondly, citizens should adhere to the principle of *civic magnanimity* with respect to the moral position of others they oppose which means a) acknowledging the position of others as moral instead of political or strategic, b) demonstrating open-mindedness and c) actively seeking an economy of moral disagreement, i.e. a minimum of disagreement (see Gutmann and Thompson 1996: 81-91). Thus, practicing these civic virtues, people attest to mutual respect which is more active than toleration as liberals argue. As Michael Gibbons, argues in his commentary in Nature, reciprocity is a requirement of a new social contract between science and society: “[A] reciprocity is required in which not only does the public understand how science works but, equally, science understands how its publics work” (Gibbons 1999: C83-C84).

Additionally, reasons should be accessible to anyone to whom they are addressed. This means first and foremost, that the process of reason-giving must be public. *Publicity* therefore is a second major principle, which is for instance reflected in the motto of Demos’ pamphlet “See-through science”: “the task is to make visible the invisible, to expose to public scrutiny the assumptions, values and visions that drive science” (Wilsdon and Willis 2004: 24). According to deliberative democrats, publicity has certain salutary effects because people are encouraged to carefully articulate one’s claims and to provide reasons, to take opposing views into account and to adopt a *public* reason that is acceptable to everybody (Chambers 2003).

The final procedural principle is *accountability* which mainly applies to people who represent constituencies or say that they speak on behalf of other people. Politicians, policy makers, corporate business men/women, engineers and scientists, representing the public interest or patients consumers’ needs, who make decisions that affect the lives of fellow citizens, should account for their policy choices, i.e. to publicly explain these decisions. Therefore, Brian Wynne considers upstream public engagement as an “accountable process of debate over driving interests, purposes and expectations shaping innovation” (Wynne 2006: 216). In sum, Gutmann and Thompson typify deliberative democracy as an *accessible* process of *reason-giving*, which is aimed at producing a *binding* decision and which is *dynamic* in the sense that these decisions can be revised when new situations arise.

Although deliberation is concerned with the legitimacy of collective decisions and its primary purpose is to reach a (provisionally) binding and mutually acceptable decision through a process of reason-giving, Gutmann and Thompson emphasize that is not realistic to expect a rational consensus over moral issues in a pluralist society. In this sense, they adhere to a pluralist conception of deliberative democracy as opposed to alternative republican or communitarian conceptions, who argue in favor of a comprehensive notion of the common good, which “fulfills the deepest moral promise of […] a form of cooperation that all citizens could accept despite their deep differences of identity” (Gutmann and Thompson 2004: 27). Instead, Gutmann and Thompson believe there are irreconcilable moral beliefs, but deliberative citizens should practice an “economy of moral disagreement” which means publicly investigate moral disagreement to minimize the rejection of opposed positions.

Some have argued that STS scholars of the EC report which is constructivist in nature, and deliberative democrats are uneasy bedfellows (Lövbrand et al. 2011) since the aim for rational consensus is incompatible with the “the virtue of disagreement and dissensus (p. 479),” emphasized by the STS scholars in the EC report. There is a democratic paradox, Lövbrand et al. claim, for if STS scholars do not endorse the central principle of reason, how can they justify public deliberation as a legitimate form of politics? “If we do not accept reasoned consensus as the final decision rule for citizen-driven engagement with specialists, there is no obvious end point to the discursive process” (ibid. 485).

Here, it is important to differentiate between different *theories*, instead of Lövbrand et al.’s rather monolithic account of deliberative democracy theory in general. Gutmann and Thompson’s pluralist understanding exhibits no claims of “Enlightenment-type rationalism, essentialism and universalism” (ibid. 476) as Lövbrand et al. (2011) state. Reaching consensus is not the only purpose of public
deliberation. Other purposes of deliberative democracy are to “encourage public-spirited perspectives on public issues” (without completely giving up own interests or positions); “to promote mutually respectful processes of decision-making”; and “to help correct mistakes” (Gutmann and Thompson 2004: 10-3). Since incomplete understanding is one of the sources of moral disagreement, moral learning is an important element of deliberation. To obtain a better understanding of opposing views or even to acquire an overview of differences of opinion is an important purpose of public dialogue, that match well with Felt et al. understanding of deliberation, who reject forms of consensus for its own sake, that are fabricated in consensus conferences (Felt et al. 2007: 61).

An essential aspect of deliberative democracy therefore, is reason-giving. Hence, an important aspect of the work of political theorists is “to critically investigate the quality, substance, and rationality of the arguments and reasons brought to defend policy and law” (Chambers 2003: 309). So, someone who is concerned with the quality of public deliberation over moral and social issues in the life sciences could benefit from studying (moral) argumentative patterns in public discussions on (new and) controversial science and technology (cf. Swierstra and Rip 2007; see Chapter 3). This thesis takes the reasonableness of argumentative discourse in upstream public deliberation on NEST as a starting point. What reasons do participants give in defense of their (moral) position? Can these reasons be assessed on their quality and if so, how?

Studying the justification of reasons is an important addition to the (critical) discourse analytical perspective of empirical studies on public dialogue in STS literature (Kerr et al. 2007; Felt et al. 2009; O’Doherty and Davidson 2010; Wieser and Karner 2010). As I argue in the next section, influential STS literature on evaluative frameworks of public participation does not include the quality of deliberation. Suggestions from literature that does include deliberative quality, are methodologically problematic and empirically inaccurate and therefore cannot serve as a handle to answer these questions properly.

### 2.4 Determining the quality of deliberation

#### 2.4.1 The quality of public deliberation as omitted evaluation criterion

With the increased interest in public engagement with science and technology, the awareness of the necessity to assess its quality has increased simultaneously. However, evaluating quality is difficult. One important reason, Rowe et al. (2004) indicate, is the value-ladenness of the concept of participation. Therefore, there is hardly any consensus on a set of evaluation criteria. Indeed, there even is no agreement on how to call that which is being assessed. I prefer and use the notion of quality, but other scholars use different notions, reflecting different political-theoretical discourses. As I explain below, this is due to the particular normative political theory and its premises, on which the evaluation is theoretically grounded.

For instance Rowe and Frewer (2004), whose efforts to systematically investigate evaluation practices have become considerably influential in public engagement with science literature, talk about the effectiveness of public participation, which in my view is problematically narrowing quality in terms of outcomes. After their attempt to formulate a clear, concise but comprehensive list of criteria in 2000, Rowe and Frewer have adopted a different approach to the “problem of evaluation.” They propose a research agenda for evaluation (Rowe and Frewer 2004) which circumvents the difficulties concerning rigid and schematic taxonomies, leaving room for more local and contextualized analyses.

Their agenda comprises a guideline of three steps to follow in the evaluation process. First, one has to define effectiveness – “or success, quality, or whatever synonym one wishes to use” (517) – and one has to determine a) its range (universal vs. local), b) its users (so: whose definition is it, the sponsors’, the participants’ etc.?) and c) its object (process vs. outcome). Second, the definition has to be operationalized, i.e. measurable with social scientific instruments that are valid, reliable and usable. Third, the evaluation has to be conducted and the results interpreted.

Rowe and Frewer conducted a large literature review to investigate how different scholars have defined effectiveness of participatory exercises. Besides the relative lack of systematic evaluation practices, they observe that most of the participation studies focus on (what Rowe and Frewer call) outcome criteria or a combination of outcome and process. However, inquiring into their systematic review, I think that the two categories they use – process and outcome – in their classification is problematic. It is too crude and therefore, it leaves an essential element of quality out of consideration: the quality of deliberation.

I prefer the more refined quality classification that Papadopoulos and Warin (2007) propose. Besides input legitimacy (openness and accessibility) and output legitimacy (efficiency and effectiveness), their classification makes visible an

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5 As I will argue below, participation and deliberation are not necessary synonymous. I prefer the concept of deliberation, but I adopt here the concepts used by the authors I discuss.
essential aspect according to deliberative democrats: throughput legitimacy (quality of deliberation). This classification is more sensitive to the different normative political theories different sets of evaluation criteria are grounded on. Papadopoulos and Warin emphasize the difference between “participationist” and “deliberationist” perspectives on quality. Although often used synonymously – also in the evaluation literature – public participation and public deliberation are not synonyms and in some readings even contradictory. Whereas deliberative democrats “are more attentive to the ‘throughput’ dimension of policy making”, they “pay less attention to practical obstacles to inclusion, problems of representation” (Papadopoulos and Warin 2007: 450). Participationists, on the other hand, “favor questions of open access and care less about the refinement of preferences likely to occur among participants through the deliberation process” (ibid.). For instance, national referenda are participatory, since they promote direct mass participation to important decisions, but they are, from a deliberative perspective, not satisfactory democratic instruments. Some deliberationists, on the other hand, think there is a trade-off between the amount of participants and the quality of deliberation. For this reason, some advocates of deliberative democracy have concentrated on small-scale projects revolving around mini-publics in order to improve the quality of the public sphere (Fung 2003).

While this evaluative criteria triptych of Papadopoulos and Warin is sensitive to the distinction between participatory and deliberative democracy, the influential evaluation study of Rowe and Frewer shows that most quality criteria are in fact concerned with input or output and therefore they are participationist in character. Their own set of criteria, for example, which was adjusted after having utilized it for the assessment of a deliberative conference on food in the UK (Rowe et al. 2004), are clearly evaluation criteria of public participation. Their use of the concept of effectiveness, with its emphasis on outcomes, is telling in this sense. “In many ways,” they write, “the assessment of outcomes is preferable because these will correspond more directly to the desired aims of the exercise. However, these may be difficult to ascertain in a timely manner, and outcomes may to some extent also be due to other variables, such as the occurrence of simultaneous events or externally mediated pressures influencing policy processes. As such, evaluation of exercise processes must often serve as surrogate to the outcomes of the exercise” (Rowe and Frewer 2004: 520; italics KD). Their “dichotomy between outcome and process” is problematic in two ways. First, deliberative democrats do not consider the distinction between deliberative process and outcome as a dichotomy. The possibly revised preferences are an important outcome of quality deliberation. Thus, throughput legitimacy is no surrogate, but an essential aspect of public deliberation. Moreover, what Rowe and Frewer subsume under the category of “process”, such as representativeness and inclusion, most often concern input legitimacy. Therefore, deliberative quality disappears from sight in their review and research agenda.

How to determine the quality of the deliberation processes? In the next subsection, I will discuss a few options from scholars in the field of empirical political sciences, who argue that the normative presumptions of deliberative democracy should be tested in order to settle the academic disputes of deliberationist political theory. Subsequently, I will argue that these methods measuring the quality of (public) deliberation passes over its main characteristic: the quality of reason-giving.

### 2.4.2 Methods for assessing deliberative quality

A first strategy to assess the quality of public deliberation that is common in the literature is to enlarge and to refine the set of criteria so as to incorporate throughput legitimacy (De Vries et al. 2011; Edwards et al. 2008; Goodin 2005; Timotijevic and Raats 2007; Webler 1995; Webler and Tuler 2000; Webler et al. 2001). Drawing on different theoretical frameworks, there is no complete consensus on these criteria, although there exists a considerable overlap in criteria, as the theoretical comparison of “standards of good discursive practice” of Goodin (2005) shows. However, the operationalization of these sets of criteria – the second step of Rowe and Frewer’s evaluation research agenda – the practical difficulties it entails and the different methodological approaches scatter the consensual idea of deliberative quality. Whereas in some studies, evaluators used the criteria to observe the deliberation process (Edwards et al. 2008), others obtain self-reported perceptions of participants using questionnaires (Timotijevic and Raats 2007) or interviews (Webler et al. 2001) or a combination of these (De Vries et al. 2011). Some present their results in qualitative terms (quotes from interviews indicating that the standards are met or not), others use (quasi-) quantitative methods (Likert-scales) or counting (turns taken or words spoken) to indicate quality deliberation. Although most of these studies consider reasoning (De Vries et al. 2011), advancement of critical reasons (Edwards et al. 2008) or redemption of validity claims (Webler 1995) essential to public deliberation, the quality of reason-giving itself, however remains unquestioned.

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6 Besides these three dimensions of quality of public participation, Papadopoulos and Warin discern two overarching criteria distinct from those exclusively connected to a certain stage of the participation process: transparency and accountability.

7 Although the announcement of a referendum will undoubtedly spark public debate, as for example happened in the Netherlands in 2005, when the Dutch people could vote in a consulting referendum on the Treaty establishing a Constitution for Europe.
Behind the scenes of… life scientists on stage

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Edwards et al. do not report any evaluation result regarding reasoning. De Vries et al. indicate that some participants did advance argumentation to substantiate their position. And Webler emphasizes the importance of a consensually chosen “method to resolve validity claim redemption disputes” but provides no suggestion what method could be used. To conclude, the strategy of using criteria for quantitative or qualitative provides important results regarding the theoretical norms and concepts of deliberation, but fail to provide valuable insights into quality of reason-giving.

A second strategy which reflects a more general and sophisticated approach to measuring the quality of deliberation, are coding strategies (Steenbergen et al. 2003; Stromer-Galley 2007). Both methods, although adopting different parameters, do not simply indicate reason-giving, the degree of engagement or respect, but try to indicate the deliberative quality of an entire discussion by systematically coding the transcribed discourse or text. These coding methods are confined to an evaluator perspective and leave no room for self-reported perceptions of participants. Steenbergen et al. (2003) developed what they termed the Discourse Quality Index (DQI), an instrument to quantitatively measure the quality of deliberation. In my opinion, their emphasis on theoretical grounds, reliability (construct validity), observable phenomena and wide applicability makes the DQI undoubtedly the most sophisticated operationalization to indicate the quality of public deliberation. They analyze speeches, relevant parts of public discourse that “contains a demand, that is, a proposal on what decision should or should not be made” (Steenbergen et al. 2003: 27). These speeches are coded with a 0, 1, 2 or 3, indicating the relative weight attached to the degree in which the speech meets a criterion. Steenbergen distinguishes five different categories, derived from Jürgen Habermas’ discourse ethics (participation, level of justification, content of justification, respect and constructive politics). Each speech is coded according to these measurement criteria, added and divided by the total amount of speeches, which results in the DQI, a measure of deliberative quality.

Although I endorse the ambition of Steenbergen et al. to empirically investigate public discourse to develop an idea of deliberative quality, I think their measurement apparatus is problematic, precisely because of its “construct validity” – the extent to which the instrument really measures what it is purported to measure, in this case, quality of deliberation. As Steenbergen already notes, the instrument should be theoretically grounded, but it is very much dependent on which particular theoretical grounds you choose what it is that you measure. In their case, they use Jürgen Habermas’ discourse ethics as the theoretical foundation, which is not undisputed. But apart from that, they only scratch the surface of justification of reasons. They rightly contend that the deliberative quality increases when the justification of reasons increases. But what is a “sophisticated justification”, indicating the level of justification? Who determines that and how? Despite its thorough foundations and its quantifiable and objectifiable measures that the Discourse Quality Index renders, it provides no further insights into the quality of argumentation, just like the extended sets of evaluation criteria of the first strategy.

The discussed methods provide useful tools for researchers to assess the quality of deliberation afterwards (De Vries et al. 2011; Steenbergen et al. 2003) or as a checklist for organizers to increase fairness and competence of the communicative discourse (Webler 1995), but they do not provide useful tools for a) researchers to analyze and evaluate the quality of reason-giving nor for b) facilitators to improve the quality of argumentation during public deliberation (see also the practical aim of this dissertation described in Chapter 1). In Chapter 3, I develop a conception of deliberative quality, based on argumentation theory, which enables both researchers and facilitators to assess the quality of reason-giving substantively.

First, however, I elaborate a second, performative perspective on deliberative quality. As reviews on empirical studies of deliberation demonstrate, its success relies much on the situated conditions in which it happens (Delli Carpini 2004; Mendelberg 2002; Ryfe 2005). “Deliberative theorists sometimes seem to adopt an ‘if we build it they will come’ mentality. If we infuse a context with the right procedures and [if we] organize an encounter to conform to the right norms then deliberation ought to take place” (Ryfe 2005: 63; italics KD). Although Gutmann and Thompson do acknowledge the practical problems of organizing public deliberation, they do not take the effect of organizational considerations and design on the process of deliberation into account. In the next section, I elaborate performative perspective.

2.5 Scientists on stage

2.5.1 Public dialogue as experiment

The theory of deliberative democracy is not uncontested, both theoretically as well as practically. Some critics believe public deliberation does not work in practice. Partly because of social psychological effects, such as groupthink which impedes genuine deliberation, partly because deliberation can lead to undesirable consequences such as the polarizing potential, which exacerbates differences and conflict rather than alleviate them (Tait 2009). Some other critics claim that concrete deliberative encounters are biased since not everyone has equal access to the deliberative forum. Because of the trade-off between group size and quality of deliberation, small-size
deliberations are exclusive. Some even claim that the very style of reasoning and providing arguments, favored by deliberative democrats, contains in itself a certain bias excluding different types of discourse such as storytelling and greeting (Young 1996) and excluding people who have had less chance to develop the required competences.

Felt et al. (2007) demonstrate in their report they are aware of the unruliness of deliberative practice. In fact, they are skeptical towards the seemingly limitless expansion of the “big industry” of public participation. Referring to concrete problematic examples of organized public deliberation exercises – such as GM Nation? in the UK – they even suggest that the “over-concentration on the ‘hardware’ of engagement”, the methodologies of consensus conferences and citizens’ juries has also added to the public unease with science and technology. The authors stress the need to reflect on how public participation is enacted. Important questions organizers of public engagement should address are: “what are the motivations to organize public deliberation (solutions for what problems, solution for whom), who are the actors who are supposed to be participating (construction of the different ‘publics’), how these moments of participation and encounter are conceptualized (the very meaning of encounter and participation), when they are supposed to intervene (at what moment in the R&D process)” (Felt et al. 2007: 56-7).

Here, Felt et al. indicate the performative perspective on public deliberation and the issue of form reflecting the criticism of some science studies scholars that some of their colleagues seem to uncritically adopt modernist procedural conceptions of democracy (cf. Nahuis and Van Lente 2008). Drawing onActor Network Theory (ANT) Gomart and Hajer (2003) for instance attempt to turn politics into an empirical question in a similar vein as ANT has used this research strategy to study the practices of science and technologies. With empirical philosophical work in medical and scientific practices, ANT has drawn attention to the ability of technological artifacts to mediate (e.g. Mol 2000). Technologies are not neutral means of representation but instead, they embody or perform particular capacities to act. Ethnographic research is needed to describe how these scientific or technological settings determine these capacities. Comparably, democratic settings and methodologies such as consensus conferences are not neutral means of representing public opinion. How these “technologies of community” (Irwin 2001) are performed affects the very capacities of its participants. Therefore, it is important to problematize the form of public dialogue settings.

Instead of presupposing how democratic politics look like a priori, Gomart and Hajer suggest that politics “can also be seen as a constant experimentation on a range of forms” (Gomart and Hajer 2003: 34). Similarly, Bruun Jensen (2005) has argued that Danish consensus conferences can be viewed as “democratic experiments” (223), a risky and experimental practice rather than a method which automatically produces a democratically legitimate consensus, as the Danish board of Technology seems to suppose. Hamlett (2003) considers the organization of deliberative events as “intentional and planned interventions” to experimentally perturb the process which can be ethnographically studied as technoscienists in their research labs.

The notion of experiment suggests a process of mutual learning, Gomart and Hajer emphasize. Whereas the scientific experimenter uses an experimental setting to learn something about the nature of things, organizers and facilitators of public deliberation can learn something from the political settings they create. Gomart and Hajer illustrate their argument using ANT’s philosophy of ‘good’ scientific experiments, applied to the performance of experimental settings in psychology research on rat sexuality. As the size of the habitat (cages) changed, female rats in particular demonstrated a dramatic shift in sexual behavior. Where they were rather passive in smaller cages, they showed significantly more initiative in the bigger ones. According to Glickman, one of the main laboratory researchers, the experimental settings embodied particular biases which deformed a truthful representation of the natural phenomenon of rat sexuality. For Glickman, therefore, “[t]he good experiment [...] is a transparent looking glass.” (Gomart and Hajer 2003: 38-9). Similarly, Rowe and Frewer argue public participation exercises should be “independent and unbiased” (Rowe et al. 2004).

Gomart and Hajer present an alternative interpretation of the good experiment. Recognizing the inherent performance of settings, they develop a more positive connotation of bias. The inscription of biases is not a problem per se. “The problem is not that certain elements of the experimental setting refused to be sufficiently silent, transparent, passive or absent. Impurity is not the problem. Rather, a good experiment is on the contrary the one where the setting is present, active enough” (ibid. 39). Variations of the material forms of experimental setting, therefore, allow for surprises, for subverting the expectations of the experimenter.

Gomart and Hajer extrapolate this philosophy of scientific experiments to political settings, analyzing the events during a series of political moments in the regional planning in the Netherlands. Following formal political procedures, the plan for developing the Hoeckse Waard, (a rural area south of the city of Rotterdam) that expert planners and local administrators had prepared, was met with fierce opposition. An activist group mobilized the local inhabitants who have the legal right to comment on regional planning plans. After 6,000 preprinted letters of protest were handed in, the plan was withdrawn. This political impasse was only overcome when some local initiators organized a few public debates discussing an experimental cultural exhibition about the region. These discussions allowed for the local residents to articulate their own ideas about the planning of their environment which resulted...
in a manifesto and ultimately, a vision shared by citizens and politicians that was presented to the Dutch minister of spatial planning.

What Gomart and Hajer intended to illustrate is how experimentation with changing settings from formal political procedures (small rat cages) into an “apolitical” cultural manifestation (larger rat cages) have succeeded in transforming the behavior of both politicians and local citizens.

2.5.2 The performance of public engagement

It is this same case study that Hajer uses to develop a set of concepts (Hajer 2005) derived from dramaturgy to analyze the role of settings in public participation. “To understand the bias in participatory practices we should not merely focus on the type of arguments that are raised but include the conditions (physical, technical, theatrical) as well” (ibid. 625). The first concept is script or scripting. It comprises the selection of actors who are assigned a role in the play as well as the provision of “cues for appropriate behavior” (ibid. 631). Appropriate deliberative behavior is usually expressed in terms of civic virtues. Gutmann and Thompson for instance develop the virtues of civic integrity and magnanimity but some have added deliberative wit, humility and courage (Akin and Clanton 2010).

The second concept Hajer introduces is staging, “the deliberate organization of an interaction, drawing on existing symbols and the invention of new ones” (Hajer 2005: 631). Translated in terms of the recommendations of Felt et al., the staging in upstream public deliberation amounts to an assessment of the normative assumptions implied in technological innovation. Staging also encompasses the distinction between active players and passive audiences. The third concept is setting which refers to the physical situation and the artifacts used to support the staging and these together, form the stage set. Together, these three dramaturgic elements determine the performance, “the way in which the contextualized interaction itself produces social realities like understanding the problem at hand, knowledge, and new power relationships” (ibid.).

These concepts allow an analysis of the dramaturgy of public deliberation on science and technology. Empirical STS research, for example, demonstrates how the public engagement event GM Nation? in the UK was scripted and staged. The organizers’ scripting revealed a particular construction of the public. Stakeholders (such as NGOs) were not invited to prevent them from hijacking the discussions (Irwin 2006). Instead, “ordinary citizens”, or “idiots” (Lezau and Soneryd 2007) – disinterested normal people with no entrenched positions in the controversy – were selected to represent the British population on the issue of genetically modified crops. The consensus conference, at the top of every methodology toolkit, widely used and often praised, is another instance of public engagement hardware which takes the selection of ordinary citizens as its starting point. But, the selection of a group of demographically representative “blank slate participants” whose selection from a number of applicants, influenced the outcome of the final report (Kleinman et al. 2009).

From a pragmatist political theoretical perspective, some scholars in STS have argued that the notion of the public as the people as a predefined and coherent (mostly national) political community is problematic in our technological culture (Marres 2005a; Dijstelbloem 2008). The selection of a random but (according to demographic criteria) representative sample of citizens taken from the British or Dutch population takes such an understanding for granted. Drawing on the work of John Dewey (1991 [1927]), these scholars depart from an issue or a problem that defines or implicates the public as “a grouping of actors who are affected by the actions or events but do not have direct influence on them” (Marres 2005a: 48). These groupings are not necessarily (and perhaps even almost never) social groups consisting of members who share a certain social identity. An important implication is that these publics have to be actively searched for. Another implication is that the “content is the only way that a public gets pulled into politics” (Marres 2005b: 217). Therefore, it is a task for organizers of public dialogue to look for issues that mobilize publics.

Hajer’s dramaturgic concepts also allow for a view on what is missing in the analyses of how participation experiments are enacted. STS literature is almost completely focused on the public. The EC report of Felt et al. is no exception. What is usually missing in these discussions, however, is the staging of scientists. Again, the consensus conference offers an illustrative example. After the recruitment and selection of citizens, panelists are provided with information and prepared to discuss the topic of discussion. During a first deliberative session they determine which (scientific) information is missing to questions that have arisen. In a second meeting, the participants present these questions to a panel of (scientific) experts who have been selected to provide the answers. Besides the practical problems of assembling such a panel of experts (language, budget etc.; see Kleinman et al. 2007), there is a division of (moral) labor (cf. Rip 2009) inscribed in consensus conferences.

On the one hand there are experts providing factual information, on the other there are ordinary citizens discussing the moral and social issues. Qualitative research on the experiences of scientists who have participated in public engagement activities, demonstrates a sense of ambivalence towards the role of “neutral, distanced and responsive information provider” (Burchell et al. 2009), which was either pre-assigned by organizers or actually performed. To use the typology of idealized roles of scientists that Pielke (2007) provides, scientists participating in consensus conferences enact a role of science arbiter, answering factual questions relevant to
the panel of citizens. From the perspective of co-production discussed in Section 2.2, this division is problematic since scientific and technological developments also encompass normative commitments. Furthermore, some of the scientists that Burchell interviewed, stated they would have preferred to act as an issue advocate “to more deliberately direct the course of the dialogues” (Burchell 2009: 74). Therefore, life scientists in my study are staged as issue advocates on the assumption that they – wittingly or unwittingly – endorse the values implicated in their research projects.

Helpful as the concepts of script, staging and setting are, the empirical analysis of performative settings is somehow flawed because of the outsider perspective most social scientists take. Many organizational considerations remain unknown or speculative at best. Studying the role of settings from the vantage point of the facilitator of public engagement can improve the analysis of the scripting (the “politics” of what and why?) and the staging and setting (the “politics” of how?) of public deliberation This is demonstrated by Bruun Jensen’s “quasi-ethnography” in his role as an organizer of a consensus conference regarding electronic patient files in Denmark (Bruun Jensen 2005). Therefore, it is surprising that social scientists who have been in the position to study the performative role of settings from an insider perspective (Felt et al. 2009; Kerr et al. 2007; O’Doherty and Davidson 2010; Wieser and Karner 2010) did not include it in their analyses.6

Social scientists “engaging in and contributing to policy debates in real time” (Macnaghten et al. 2005) as organizers of upstream public dialogue, have to take the performative perspective of settings into consideration as they become partially responsible for the outcomes of these science-society encounters. Therefore, it is also time to “dismantle the proscenium arch” to see how social scientists perform as practitioners backstage.

### 2.6 Conclusions

In this chapter I have explained the problem analysis of a group of STS scholars who were asked to investigate the growing uneasiness between science and society on authority of the European Commission. I use their problem analysis as a starting point for this dissertation to formulate the central research aims of this book.

The first identified problem is the European governance of science which reflects an economic or minimalist liberal conception of democracy that proponents of deliberative democracy, such as Gutmann and Thompson, criticize for its lack of political autonomy. In this economic conception of science governance, science-led technological innovation is stimulated for economic welfare as long as it does not entail harmful consequences (risks). In this “persistently technocratic [...] governance culture” (Felt et al. 2007: 41) harm is reduced to risks whose calculation is delegated to scientific advisory experts. Thus, a particular scientific framing of what the risks are is dominant in the governance of science, rendering articulated issues of the public as illegitimate or even irrational. “The problem is that expert counterparts’ positions on the same issues have been posed as if they were beyond reasonable and legitimate contestation, which stance inevitably and gratuitously depreciates their citizen interlocutors by refusing recognition to their very being as reasoning subjects” (ibid.60).

Liberal principles of preclusion that stipulate the state’s neutrality and inactivity towards moral disagreement (such as on GMOs), remove public issues concerning the normative input that drives innovation research off the political agenda. In economic conceptions of democratic governance citizens are treated as mainly passive subjects to be ruled instead of autonomous agents who take part in the governance of their own society, as deliberative democrats advocate. Instead of giving European citizens a voice in the innovation process of new technologies (such as GMOs), the public is delimited as a collective of (health care) consumers who have a free choice to use these products of innovation or not (cf. Wynne 2001). Each free individual citizen should decide for him- or herself according to their own morality. As the European controversy on GMOs has demonstrated, this economic governance of science does not properly deal with the public’s problem.

Even though the authors of the EC report do not explicitly refer to theories of deliberative democracy, their main recommendation concerns a “shift from expert-dominated to more open deliberative science-informed institutions” (Felt et al. 2007: 11) to publicly discuss the normative understandings about the desirable or expected social benefits and purposes of the research with which innovation-oriented research are imbued. Public deliberation on NEST has to move upstream so as to increase the influence of the public to direct innovation. Using a theatrical metaphor which advocates of upstream public engagement have stressed the importance of making the backstage process of techno-scientific research publicly visible.

However, the authors of the EC report identify the unreflective practice of public engagement – “a big industry now” (ibid. 60) – as the second problem. In their opinion, this very practice intended to be a solution to public alienation, has

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6 Even more so, because Wieser and Karner (2010) adopt Hajer’s terminology, but only to describe the efforts of life scientists to re-stage discussions to their own benefit.
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SEE-THROUGH PUBLIC ENGAGEMENT

considerably contributed to the public unease with science and technology. Felt et al. are concerned with the quality of (upstream) public engagement. In this chapter I have developed two perspectives on deliberative quality.

Drawing on Gutmann and Thompson’s theory of deliberative democracy, its central principle of reciprocity which amounts to a process of seeking mutually justifiable reasons, indicates a first direction for developing a conception of discursive quality: the quality of argumentation advanced to defend particular (science) policy. An important aspect of the work of facilitators of upstream public deliberation then is to critically investigate the quality of the reasons advanced to defend science policy, i.e. the input and direction of innovation trajectories.

However, deliberative quality is lacking in dominant evaluative frameworks for public participation in STS literature (esp. in the influential work of Rowe and Frewer). On the other hand, attempts to operationalize the quality of reason-giving in deliberative democracy literature are problematic. Therefore, the first research focus of this thesis is to develop a theoretical concept of deliberative quality which a) enables a reconstruction, analysis and evaluation of argumentative discourse, particularly in the context of new and emerging science and technology and which b) allows facilitators to intervene in face-to-face public deliberation on NEST. In that sense, this dissertation aims to contribute to argumentative technology assessment (Brom and Van Est 2010) to enrich and deepen public discussion on NEST. For this aim, I discuss two concepts developed in the pragma-dialectical argumentation theory in the context of public debates on NEST: the concept of reasonable discussion (Chapter 3) and the concept of strategic maneuvering (Chapter 4). In Chapter 5 and Chapter 7 I use these theoretical concepts to analyze two upstream public deliberation events in a Dutch debating centre.

The STS scholars of the EC report also refer to the performative dimension of how public deliberation is enacted to indicate the difficulties involved in organizing public dialogue. Deliberation does not automatically occur once the right procedural rules are followed, as empirical research demonstrates. Using the notion of dramaturgy, Hajer (2005) has called attention to the influence of settings on the performances of participants of public deliberation: “To understand the bias in participatory practices, we should not merely focus on the type of arguments that are raised but include the conditions (physical, technical, theatrical) as well” (625).

Following Actor Network Theory, Hajer (and Gomart) turn(s) the form of politics into an empirical question. In addition to the politics of ‘who’, there is also a politics of ‘what’. One criticism articulated in the EC report was the over-concentration of organizers of public engagement on the hardware of mechanisms of public deliberation (such as consensus conferences). But “STS researchers observing and analyzing these [new experiments in public participation] have stressed the power of these concrete constellations over who is given voice or not, what forms of agency can be deployed, what issues or questions can or cannot be addressed, what knowledge counts as adequate, and what weight the outcomes might be given in the on-going institutional governance of science and innovation” (Felt et al 2007: 57).

I have elaborated the dramaturgical concepts of script, staging and setting that Hajer has introduced to analyze the performance of settings. For instance, I have indicated the problematic selection of the characters in the play (as an aspect of scripting), i.e. “who is given voice or not” in consensus conferences. In addition to the questionable framing of the “ordinary citizen” (or idiot), scientists are staged as neutral, disinterested and responsive information providers, or science arbiter. Thus, a particular division of moral labor constitutes the practice of consensus conferences which is not in full agreement with scientists’ own role perception. Indeed, this hardly seems compatible with the idiom of co-production which also calls attention to the normative commitments that are diffused in science-led innovation processes.

As Felt et al. argue these framings of participants are “rarely if ever explicit and probably not deliberate” (Felt et al. 2007: 57). The second research aim of this dissertation is to describe the dramaturgical work implied in public deliberation on NEST and to investigate its performative effects. Borrowing the same theatrical metaphor from proponents of upstream public engagement: in the theatre of public engagement the time has come to dismantle the proscenium arch and begin performing in the round. Descriptions and analyses of the dramaturgical work performed for the two upstream engagement events organized for this study follow in Chapters 5 and 6. The time has come to look behind scenes and to make visible the invisible dramaturgical work of facilitators of public deliberation. Social scientists who have been involved in the organization of public engagement as a social experiment to study the interactions between scientists and citizens have not taken the performative perspective into account. Therefore, the second research aim is linked to increasing the reflectivity of public engagement practitioners (cf. Schön 1983).
reasonableness in public discussions on new and emerging science and technology
3.1 Introduction

In April 2009, two biotechnology plant researchers in the Netherlands engaged in a public debate on, at that time, new developments in the genetic modification of plants: cisgenesis.\(^1\) Cisgenesis is, contrary to its transgenic counterpart, a form of genetic modification of crops “with coding DNA-sequences originating from the species itself or from species that can be crossbred” (Cogem 2006: 5).\(^2\) The plant researchers claimed that their cisgenic crops would be beneficial to the environment because of their natural resistance to plant diseases that – without genetic modification – can only be treated with toxic pesticides. Furthermore, cisgenic crops (such as apples, potatoes and strawberries) were said to be more acceptable to the GMO-skeptical European public because they are “devoid of foreign gene sequences” (Schaart et al. 2011: 105). So, cisgenesis is a form of GMO that could meet the objections of those opposing the ‘original’ transgenic products (that GMOs are unnatural). At the same time, cisgenesis could accelerate the “classical” breeding process which is beneficial to the environment. “In conclusion, the cisgenic plant is, as far as the process is concerned, a GMO but it belongs to classic plant breeding as far as genetic origin is concerned” (Jacobsen and Schouten 2009: 28).

Despite these expectations, a public debate ensued. Plant researchers who were at the heart of the development of the new genetic modification techniques wrote

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1 I define debate as an oppositional discussion where two or more parties attempt to prove each other wrong, whereas in a more neutral sense I use the concept of discussion to refer to different kinds of differences of opinion or to refer to the terminology used in pragma-dialectics. I consider the discussion on cisgenesis as a debate and I will refer to it that way.

2 Because its definition is contested, I borrow this description from the Cogem, which is an independent advisory committee of the Dutch government.
an opinion piece in a newspaper magazine. They complained about the quality of the public debate. In fact, the authors claimed that the debate had “derailed” (Jacobsen and Schouten 2009: 27). According to the plant geneticists, Greenpeace had turned into a “fundamentalist group” that fights against GMOs using “theoretical, unpredictable effects” as argument instead of being committed to improving the environment (ibid: 30). The attitude of Greenpeace (and perhaps subsequently of the public) would threaten to leave Europe’s strict regulations on genetically modified crops, enacted in the 1990s as a policy response to the public resistance towards transgenesis, unaltered. As a result, the valuable time gained in the breeding process would be undone again. Therefore, the authors made an appeal to policy makers as well as society at large to think about changing these regulations for GMOs.

In public controversy, complaints about the reasonableness of the debate and opponents are frequently heard – on both sides. If only “they” would listen to “our” good reasons. But what is a reasonable discussion? What did Greenpeace do that would qualify as unreasonable? And how reasonable were the two plant scientists themselves? In this chapter, I elaborate a notion of the argumentative quality of public discussions over new and emerging science and technology (NEST) on the basis of the so-called pragma-dialectical argumentation theory. According to this theory reasonableness refers to a formal procedure discussants agree to observe in order to resolve their difference of opinion by systematically testing standpoints (and their argumentative defense) for their acceptability.

In Section 3.2, I introduce the philosophical foundations of the pragma-dialectical argumentation theory. At the heart of the pragma-dialectical theory is a normative framework for analyzing and assessing argumentative discourse in practice. Based on critical rationalism pragma-dialecticians assume that discussion involves subjecting views to a “maximum of doubt”. This framework – its different stages, its rules and its notion of fallacies – provides valuable instruments for both researchers and facilitators of upstream public dialogue.

In Section 3.3, I particularly focus on the rules and procedures for analyzing and assessing the quality of argumentation as a product (how a conclusion can be inferred from its premises) in the argumentation stage because this stage “in fact largely determine[s] the outcome” (Van Eemeren et al. 2002: 28) of the discussion. When have standpoints been conclusively defended? This is the case, first, when the propositional content of every individual (“explicitized”) statement or premise of the argumentation is acceptable and second, when the argumentation’s justification force is accepted in the sense that all critical questions are answered satisfactorily.

In Section 3.4, I apply the pragma-dialectical procedure to ethical argumentation patterns within the context of public discussions on NEST, as described by Swierstra and Rip (2007). As an illustration I use the public and political debate on cisgenesis in the Netherlands. I chose this debate about cisgenesis because a) several scientists and plant researchers (like the ones introduced at the beginning of this chapter) acted as issue advocates of this new technology and b) it was the explicit intent of politicians and policy makers to broaden the debate beyond the usual narrow framing of safety (discussed in Chapter 2) so as to include so-called “socioeconomic aspects of GMOs” (Cogem 2009) for the permission of imported and cultivated GMOs in Europe. Although this debate arose more downstream of the innovation trajectory, many ethical arguments described in Swierstra and Rip’s NEST-ethics were advanced. I reconstructed this public debate using opinion sections of both popular and scientific written media and journalistic articles reporting the different standpoints and arguments in the discussion. Most papers were found with an extensive search on the Internet (Google and Google Scholar) and Lexisnexis, a large database of (inter)national newspapers. I also used records of parliamentary proceedings and debates as well as the report of a seminar that the Dutch ministers of agriculture and environmental affairs organized in 2009 and which I attended as a participant observer.

In Section 3.5, I discuss some limitations of the pragma-dialectical approach to argumentation and the methodological additions needed to achieve the second research aim: the influence of the dramaturgy on the performance of participants. Finally, in Section 3.6, I draw some conclusions about the argumentative quality of the public debate on cisgenesis.

3.2 The Pragma-dialectical argumentation theory

3.2.1 Positioning pragma-dialectics: three concepts of reasonableness

Argumentation theorists are interested in the soundness of reasoning in practice. Frans van Eemeren argues in Systematic Theory of Argumentation (2004) that a
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Comprehensive theory of argumentation has to establish “a well-considered link between, on the one hand, insights as they are expressed in normative models such as those of formal logic (for the soundness), and, on the other hand, insights derived from empirical descriptions as provided by discourse analysts that are primarily socially or linguistically oriented [for the language use in practice]” (Van Eemeren and Grootendorst 2004: 9).\(^5\) Van Eemeren regards discourse analysis – as the empirical study of language use – and formal logic as complementary.\(^6\) But viewed exclusively, both have their shortcomings since they are philosophically grounded in problematic concepts of reasonableness.\(^7\)

Formal logic is grounded in a geometrical notion of reasonableness. It is concerned with the validity of argumentation. It aims at demonstrating if and how a standpoint follows conclusively from its premises with indisputable certainty. The geometrical notion of reasonableness – or rationality – is dogmatic and anti-argumentative since a geometrical philosopher does not attempt to convince a rational critic of the acceptability of his claim but to prove the absolute truth of it. Therefore, the geometrical notion of reasonableness is untenable for argumentation theorists.

Empiricist discourse analysis, on the other hand, is founded on an anthropological notion of reasonableness. The acceptability of argumentation according to this philosophical perspective is a consequence of the extent to which the argumentation resonates with a particular historical contingent and cultural set of beliefs. Argumentation is acceptable when it succeeds in being persuasive to the audience for whom it is intended. Reasonableness, in this rhetorical sense, is dynamic and relative to the epistemic background of the members of this culture which can change over time. This is what Van Eemeren calls the anthropological-relativistic perspective.

Van Eemeren himself adheres to what he calls the critical-rationalistic perspective of reasonableness, which is defended as a middle course. Drawing on the work of the philosophers Karl Popper and Hans Albert, this conception of reasonableness has its roots in skepticism. There is nothing humans can be sure of and therefore the acceptability of every claim (whoever makes it) can be called into question. “This critical perspective focuses pre-eminently on discussion; it encourages the systematic submission of the one party’s standpoints to the other party’s critical doubts” (Van Eemeren 2004: 16). The critical-rationalistic ideal amounts to stimulating people to test claims methodically to a “maximum of doubt”. Practically, the corresponding aim is to engage participants into a dialogue and to further reflection.

Reasonableness in this critical sense refers to a regulated exchange of views and their justifications – a formal procedure that discussants agree to observe in order to resolve their difference of opinion by systematically testing standpoints (and their argumentative defense) for its acceptability. Reasonableness in this critical sense is not absolute and definitive – as the geometrical philosopher suggests – but gradual.

The pragma-dialectical argumentation theory provides a framework for analyzing argumentative discourse in everyday conversations (pragmatics) and for evaluating its acceptability on the basis of a normative model of critical discussion that aims at resolving a difference of opinion (dialectics).\(^8\) Although some argue that pragma-dialectics is related to for example Habermas’s theory of communicative action (Knops 2006), Habermas does not provide sufficient tools to assess argumentative discourse practically (Webler 1995). Pragma-dialectics adds “a level of practical detail” (Knops 2006: 600). Therefore, it is suitable for the assessment of argumentative quality in public deliberation which is essential in deliberative democracy theory.

Before explaining this formal procedure of critical discussion (as a set of rules) in more detail in the next subsection, it is important to note that its reasonableness

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\(^5\) In the following text, I only refer to Frans van Eemeren. Although Rob Grootendorst is a co-author of *A systematic theory of argumentation*, he had already passed away when the book appeared in 2004. Moreover, Frans van Eemeren developed his notion of strategic maneuvering (see Chapter 4) as a single author in *Strategic Maneuvering in Argumentative Discourse* (2010).

\(^6\) See Chapter 4 for an elaboration on the relationship between pragma-dialectics and discourse analysis.

\(^7\) For these different notions of reasonableness Van Eemeren refers to Stephen Toulmin who elaborates on these notions extensively in *Knowing and Acting* (1976).

\(^8\) Van Eemeren contrasts the theoretical, pragma-dialectical position with it critical-rationalist understanding of reasonableness with the epistemo-rhetorical approach towards argumentation based on the anthropological-relativistic notion of reasonableness. The latter is aimed at describing the persuasive success of argumentation by identifying different audiences and their beliefs. So, rhetorical analysts are concentrated on an empirical level on the process of persuasion, whereas dialecticians are focused on the *process of convincing* and the extent to which ordinary language users in everyday contexts are predisposed to resolve their difference of opinion following the procedure for critical discussion. Both theoretical positions (and their analytical, empirical and practical corollaries) are clearly demarcated in *A Systematic Theory of Argumentation*, but they are by no means mutually exclusive. In Chapter 4, I will demonstrate in more detail how discourse analytical studies of public debates and controversies over science and technology from this rhetorical perspective can contribute to a pragma-dialectical analysis of public deliberation.
depends, first, on its adequacy to contribute to the purpose it was created for, i.e. the resolution of a difference of opinion. This rather pragmatist criterion is what Van Eemeren defines as *problem validity*. This means that if the rules for a critical discussion contribute, as a necessary (but not sufficient) condition, to resolving disputes, every departure from these rules hampers the resolution process. Put positively, reasonable discussants will abide by such a pragmatic resolution procedure. Second, its reasonableness depends on the extent to which discussants agree with this procedure, the *inter-subjective or conventional validity*. 10

From the critical-rationalistic perspective, nothing escapes systematic doubt. Therefore, the rules of the procedure themselves can be subjected to criticism as well. During the discussion – in a meta-discussion – the application of the rules can be discussed. Before and after the discussion, the rules themselves can be critically examined. As a result, they may be revised when it turns out that the rules are no longer successful in facilitating dialogue.

In the next subsection, I focus on the different elements of the model of critical discussion. This model consists of four different discussion stages that discussants ideally complete; a set of rules that together form a procedure of critical norms that facilitates a reasonable discussion (culminating in a code of conduct for discussants); and the fallacies related to this model.

### 3.2.2 The pragma-dialectical model of critical discussion

Van Eemeren defines argumentation as a “communicative [verbal and non-verbal] and interactional [in dialogue with other people] (speech) act complex aimed at resolving a difference of opinion before a reasonable judge by advancing a constellation of reasons […] justifying the acceptability of the standpoint(s) at issue” (Van Eemeren 2010: 29). This definition applies to argumentation as *product* as well as to argumentation as *process*.

Argumentation as a product concerns “the formal relations between the premises and the conclusions of the arguments” (Van Eemeren and Grootendorst 2004: 58). Here we are dealing only with the relations between propositions. For example, one of the scientific experts demonstrated his advocacy for genetic modification during the seminar the Dutch minister of agriculture organized. “A more sustainable solution for the control of the potato disease [Phytophtora] is the use of GMOs [such as cisgenic potatoes]. […] The use of cisgenesis is a fast, safe and effective method and crops do not need to be sprayed [with 1.4 million kilos of fungicides] anymore” (TK 27 428 nr. 145: 21). Here, reduction of pesticides and crop losses are presented as a reason for thinking about permitting the cultivation of GMOs in agriculture. Moreover, it is tacitly assumed that reducing pesticide use in agriculture is sustainable. I return to the (quality of) argumentation as product in more detail in the next section.

Pragma-dialectics is not solely confined to the evaluation of argumentation as product. 11 Its model of critical discussion also comprises norms for speech acts advanced in the process of argumentation. Argumentation as a process concerns “every speech act in the discourse […] that plays a role in investigating the acceptability of standpoints” (Van Eemeren and Grootendorst 2004: 58). For example, someone could challenge the standpoint of the proponent of biotechnology (“Are you sure that the production of cisgenic potatoes will lead to a reduction of pesticide use?”). Or someone could ask for clarification. A member of parliament stated in the first proceeding after the seminar: “So, there we have a fundamental question. [...] What is it we mean when we talk about sustainable agriculture?” (TK 27 428 nr. 142: 3). Neither of these speech acts (expressing doubt, posing questions etc.) involves the advancement of reasons to support a standpoint. Yet, they are relevant in argumentative discourse and hence they are to be included in the pragma-dialectical model of critical discussion.

This model is a normative standard that is a necessary condition for resolving a difference of opinion by means of “dialectically regulated critical exchanges in which the acceptability of the standpoints at issue is put to the test” (Van Eemeren 2010: 6). As Van Eemeren emphasizes, the model of critical discussion is an idealization, or even utopian as one might object, as in practice a discussion will hardly ever unfold

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9 In Section 3.5.1 return to other higher order conditions for resolving differences of opinion.

10 Van Eemeren has conducted empirical research to investigate the extent to which his own proposed procedure of critical discussion meets these two criteria (see e.g. Van Eemeren et al. 2009). The analyst of argumentative discourse who applies the rules for a critical discussion in practice needs to involve criticisms against the dialectical procedure during public deliberation in his analysis. This demands a certain amount of reflexivity. In that sense, putting these rules into practice and performing interventions during critical discussions based on the situated utilization of them, is yet another opportunity to put them to the test. Consistently to the critical-rationalistic philosophy, even when there is not the slightest bit of opposition against them, one cannot be fully certain of their problem-validity.

11 Argumentation theories, such as Toulmin’s *Uses of Argument* and Perelman’s *The New Rhetoric* that are solely concerned with argumentation as product, suffer from what Van Eemeren calls “justificationism.”
according to this model. Therefore, the model is not a means to describe what actually happens during discussions. Instead, the model is a theoretical standard that can be used to analyze and evaluate argumentative discourse. Nevertheless, a critical discussion should always be promoted to improve the quality of democracy. “In my opinion, the dialectical rules for argumentative discourse that make up a code of conduct for political discourse are therefore of crucial importance to giving substance to the ideal of participatory democracy” (ibid: 4).

The model contains three elements: four discussion stages; ten discussion rules that regulate the exchange of speech acts in these different stages;12 and fallacies (see Table 3.1 below). Before I briefly discuss these elements in more detail, it is important to note that fallacies are generally regarded as illegitimate conclusions inferred from premises or invalid arguments. Thus, they are confined to argumentation as product. In the pragma-dialectical argumentation, theory fallacies amount to “every violation of any of the rules of the discussion procedure for conducting a critical discussion” (by whichever party and at whatever stage in the discussion) (Van Eemeren 2004: 175). This means that fallacies also include the discussion rules pertinent to argumentation as process.

The four discussion stages have to be completed successively in order to determine the acceptability of a standpoint. In the confrontation stage the difference of opinion between two or more interlocutors becomes apparent. A discussion is useless if there is nothing to argue over. A difference of opinion arises when not everybody agrees to a standpoint that has been advanced; someone calls a certain

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12 Actually the notion “rules” is ambiguous in the work of Van Eemeren. Van Eemeren and Grootendorst (2004) talk about fifteen discussions rules and ten commandments that are derived from these discussion rules, which are “too technical for immediate use by ordinary discussants” (Van Eemeren and Grootendorst 2004: 190). These commandments “list prohibitions of moves in an argumentative discourse or text that hinder or obstruct the resolution of a difference of opinion (ibid).” The names of these commandments refer to rules again. Commandment 1 for instance is the “Freedom rule”. When I refer to the discussion rules I mean these ten commandments. In the elaboration of the discussion rules (not being the commandments) in the next sections, I attempt to use the concept of rule as little as possible to avoid confusion.
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claim into question (doubt) or someone contradicts this claim. A politician of the Party of the Animals for example stated in the first political discussion after the seminar: “She [the minister of agriculture] states that GMOs can contribute to crop security and productivity, to improved disease prevention and to a reduction of pesticide use. Apparently without any knowledge of facts she completely ignores that GM soy contributes to the deforestation of South America that it stimulates the use of toxic pesticides and that it most definitely does not lead to better yields. In fact, production can even decrease. That is hardly sustainable I would say” (TK 27 428 nr. 142: 2). Here, the claim of the minister of agriculture is clearly contradicted. Important in this stage is the freedom rule (rule 1) that stipulates the unconditional right for each participant to bring forward standpoints or to call them into question. Some members of NGOs claimed that this rule was violated during the seminar on the future of GMOs since the minister of agriculture had said in her opening speech that “the question ‘Do we want GMOs in Europe?’ is therefore no longer relevant” (TK 27 428 nr. 145: 14). As one of NGO members asked in the closing plenary session: “I thought opponents would have a say as well. Why were we actually invited?” (Van der Lugt, June 10 2009).

A violation of the freedom rule is the argumentum ad hominem: a personal attack that has no direct relation to the standpoint or argument being advanced. “The general public is too ignorant to understand science and technology” which is reflected in the deficit-model, see Section 2.2). The Dutch minister of agriculture stated that opponents of GMOs “acted out of emotion” (Dortmans and Van Dam Lev, May 2010: 16).

After the difference of opinion has become apparent, discussants enter the opening stage of the discussion. In this stage, the interlocutors decide if, and under what conditions they will enter into a discussion to resolve the difference of opinion. In this stage the common ground or “zone of agreement” is investigated, which “may include procedural commitments as well as substantive agreement” (Van Eemeren 2004: 60). Procedural commitments, for example, are the distribution of discussion roles of protagonists (people who have made a certain claim) and antagonists (people who doubt or contradict this claim). Other procedural commitments concern the agreed upon methods to verify facts.

Substantive agreement, on the other hand, refers to what discussants can explicitly indicate what it is they agree on despite their disagreements. The Dutch minister of agriculture stated: “Mrs. Wiegman and Mr. Van der Vlies and Polderman said that first the aim [of GMOs] must be defined before we can determine whether GMOs can be a solution. I agree with that (TK 27 428 nr. 142: 16).” Frequently, the opening stage remains largely implicit since discussants tacitly assume enough common ground to start a discussion.

An important rule in the opening stage of the discussion is the obligation to defend (rule 2). This second rule states that the discussant who has advanced a standpoint, must defend this standpoint if it has been challenged. The discussant – or protagonist – is said to bear the onus probandi (the burden of proof). A well-known fallacy is evading the burden of proof, for instance when a protagonist pretends that his or her contentious standpoint does not need to be defended because it is supposed to be generally accepted. One of the NGO members presented some highly controversial claims in a regional newspaper as facts. “Over 60 studies demonstrate that GM crops are dangerous for people, animals and the environment. [O]ne of the participants [of the seminar] told that over 20 000 Indian farmers have committed suicide because they could not pay their debts after cultivating Bt (genetically modified) cotton. These are basic facts” (Bos June 20 2009).

Another rule pertaining to the opening stage is the standpoint rule (rule 3): antagonists are not allowed to attribute a standpoint to the protagonist that has not been advanced. Discussants who violate this rule, commit the fallacy of the “straw man.”

The third stage is the argumentation stage. In this stage argumentation in defense of the standpoint is advanced and critically tested to establish its acceptability. Without the advancement and critical evaluation of argumentation there is no critical discussion in the dialectical sense. Since the main focus of this chapter is the quality of argumentation as product, I discuss the argumentation stage, the discussion rules that apply to this stage and some connected fallacies in more detail in the next

13 In the latter case, there is a mixed, in the former a non-mixed difference of opinion. This is important for the justificatory obligation to which antagonists are committed in the discussion. If someone advances a counterclaim, this person is supposed to adducing argumentation in defense of this counterclaim as well, just as the protagonist is.

14 In fact, the freedom rule applies to all the discussion stages, as Van Eemeren emphasizes. Most fallacies however, concern the violation of the freedom rule in the confrontation stage.

15 This kind of statements has consequences in the argumentation stage (see 3.3 the Starting Point rule).
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The final stage of the model for critical discussion is the concluding stage. In this stage (all) the discussants draw a conclusion from the discussion efforts aimed at resolving their difference of opinion. Discussants determine whether the initial standpoint was defended successfully (or not). If so, the antagonist must retract his doubts; if not, the protagonist must retract his standpoint (concluding rule). Refusing to do so is a fallacy, violating the closure rule. The question therefore is: when is a standpoint conclusively defended? In the next sections, I first elaborate on the procedures that Van Eemeren identifies to determine the soundness of argumentation as product (Section 3.3). Next, I apply these rules and procedures to recurring moral argumentation patterns in discussions over new technologies (NEST-ethics) to derive a set of critical questions discussants in NEST-ethical discussions must answer once they have advanced one of these argumentation patterns.

3.3 Pragma-dialectics and argumentative quality

After discussants have established a difference of opinion in the confrontation stage and have agreed on how to conduct a critical discussion in the opening stage, they enter the argumentation stage. In this stage, the protagonist provides reasons that support his or her standpoint or claim over which a difference of opinion has arisen. Argumentation is, according to the definition in the previous subsection, a constellation of propositions that together count as a provisional defense of the advanced standpoint until the antagonist has fully accepted the argumentation. Proponents of cisgenesis for example argued that producing GMOs should be allowed because cisgenic crops are (potentially) beneficial to the environment because the use of pesticides can be reduced substantially. Having environmental benefits (pesticide reduction) is a reason for allowing GMOs.

Such a defense is provisional because in a discussion the antagonist can first of all challenge any of the propositions that comprise the protagonist’s argumentation. As happened in the cisgenesis debate, the Party of the Animals Group contradicted the claim that GM crops are potentially sustainable. In this case, the propositional content of “GMOs are sustainable” is questioned. A sub-difference of opinion emerges, a sub-discussion ensues and argumentation needs to be advanced why GMOs are (not) sustainable.17 As the politician of the Animals Group argued GMOs are not sustainable because “GM soy contributes to the deforestation of South America in that it stimulates the use of toxic pesticides and that it most definitely does not lead to better yields. In fact, production can even decrease” (TK 27 428 nr. 142: 2).

Discussants have to abide by a set of five rules in the argumentation stage of (sub)discussion (see Table 3.1 above). The relevance rule holds that the arguments that support the standpoint must be relevant. For example, in a letter addressed to the minister of agriculture, people from a citizen’s initiative raised doubts against the controllability and the independence of scientific expert advice concerning the safety of GM crops: “We remain concerned about the uncontrollability of the [scientific] advice you [the minister] refer to. The minister of health once made an appeal to the transparency and independence of his advisors with regard to the authorization of

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16 It is notable to draw attention to the rules (not commandments) 10 – 13 that regulate the process of argumentation (as opposed to rules 6 – 9 that are about the argumentation as product). They specify the optimal use of the right to attack for antagonists (who can unlimitedly call standpoints and arguments into question); the optimal use of the right to defend for protagonists (who can unlimitedly advance arguments in defense of his standpoint); the right to retract argumentation and standpoints at any moment (for protagonists); the orderly conduct of discussion (discussants must in turn make a argumentative move and not more than one at the time). See Van Eemeren 2004:152-4).

17 The procedure that is aimed at determining the acceptance of the content of all the propositions in the argumentation is the inter-subjective identification procedure (IIP). Ideally and in accordance with the model for a critical discussion, both discussants have during the opening stage of the resolution process formulated their shared premises, “a complete list of propositions both [discussants] accept” and “which may concern facts, truths, norms, values, or value hierarchies” (Van Eemeren 2004: 145). In the ideal situation, both protagonist and antagonist pursue the IIP simply by checking if the proposition appears on the list of shared premises. If so, the antagonist has to accept the propositional content. If not, not. Unfortunately, drawing up such a list does not occur frequently. Therefore, the IIP prescribes that the discussants have decided – again in the opening stage of the discussion – a procedure to determine how the acceptability of the propositional content can be established. For instance, the participants can decide to adopt the view of an authoritative ethicist regarding the status of naturalness of GMOs. These first two options require a considerable amount of providence. Hence, the last option discussants have, beyond the scope of the IIP, is to conduct a sub-discussion to decide to the acceptability of the propositional content which in practice predominantly occurs. Rule 7 of the model of critical discussion stipulates that the protagonist has successfully defended the propositional content if the “IIP yields a positive result or if the propositional content is in the second instance accepted by both parties as a result of a sub-discussion (rule 7a).”
drugs [...]. In spite of signed declarations, it turns out that independence [of scientific advice] is out of the question “(letter Citizens for GM-free food). The alleged lack of transparency in expert advice concerning human drugs seems hardly relevant in defense of the citizens' standpoint that expert advice in the ministry of agriculture is uncontrollable.

Other violations against this rule are the pathetic fallacy and the ethical fallacy (or abuse of authority). The numerous terrifying pictures in the GM debate illustrate nicely the pathetic fallacy. On the other hand, both opponents and proponents in the cisgenesis debate appeal to scientific authority to make contentious claims (more) acceptable. Appeals to authority are not necessarily fallacious of course. But for example on the website of gentechvrij.nl (translation: GMOFree.nl), one can seriously doubt that some claims are solely to be accepted because a long list of scientific experts say so. Under the heading “This is what scientists say about the dangers of genetic manipulation” Vananda Shiva from India is quoted: “Only a fascist society would deny consumers the right to know what they eat and farmers the right to replant what they have grown” (website www.gentechvrij.nl).

Second, discussants always have to observe the starting point rule. Discussants are not allowed to present a claim as an accepted starting point both protagonists and antagonists agree on, when this is not the case. Conversely, they cannot falsely deny accepted starting points. A well-known fallacious application of this rule is begging the question (or: circular reasoning). The protagonist in this case simply repeats his or her claim as a premise (often veiled by implicit language use or verbiage) falsely assuming it to be a common starting point.

Third, advanced arguments have to be logically valid as the validity rule prescribes. The intersubjective inference procedure is used to determine the logical validity of argumentation. For instance, scientific proponents of cisgenesis used the transitive law (A=B, B=C, therefore A=C) to argue that cisgenic crops must be put under the same regulatory regime as normally crossbred plants (Schouten et al. 2006). Their conclusion (“Cisgenic crops are safe”) necessarily follows from its premises (“Cisgenic crops are similar to traditionally bred plants” and “Traditionally bred plants are safe”), if these are true. Even though some have denied the truth of its premises, this reasoning is logically valid and the validity rule is not violated (only the propositional content of the premises is challenged). 18

These formal logical syllogisms are rare in everyday discussions, however. Argumentation is mostly put forward in rhetorical syllogisms (or enthymemes). In its Aristotelian meaning, an enthymeme is a rhetorical syllogism that is a) deductive in form (i.e. from the general to the particular), b) incomplete or “truncated” since (mostly general) premises are omitted for practical reasons in order to let the audience supply them. These omitted premises are c) statements of probable fact or d) reflections of values, beliefs and attitudes (Jasinski 2001: 205-207). 19 These omitted premises are not explicitly mentioned (for example since they are deemed generally known) in accordance with the maxims of efficient communication: not to perform any speech act that is redundant. Even though these enthymemes are incomplete in nature, it does not mean they are necessarily invalid. On the contrary, they can easily be made valid after explicating unexpressed premises. “Invalid reasoning is certainly not the most important cause of failure to reach resolution of a difference of opinion” (Van Eemeren et al. 2002: 131-2).

These unexpressed premises, however, can be contentious and must be defended as well if someone raises doubt against them. The unexpressed premise rule is the fourth rule prescribed to reasonable discussants. It stipulates that “[d]iscussants may not falsely attribute unexpressed premises to the other party, nor disown responsibility for their own unexpressed premises” (Van Eemeren and Grootendorst 2004: 192). To paraphrase the aforementioned statement of the scientific expert during his lecture at the seminar on socioeconomic aspects of GMOs: “Cisgenic potatoes are sustainable because toxic pesticides to control potato disease can be reduced” is an instance of an enthymeme. To support the standpoint (“Cisgenic potatoes are sustainable”), an argument – or a material premise – is provided (“pesticides can be reduced”). This enthymeme contains an unexpressed premise (or warrant in terms of Toulmin’s model or argumentation): “Pesticide reduction contributes prominently to sustainability.” This omitted premise is needed as a statement of probable fact to render the reasoning valid and to warrant the claim. This tacitly assumed general premise is controversial in our pluralistic society since the concept of sustainability includes much more than pesticide reduction alone. If the protagonist’s argumentation is to be evaluated for its soundness, the

18 De Cock Buning et al. 2006 contested the similarity between cisgenic crops and classically crossbred plants. Furthermore, in the scientific literature researchers have warned of “wide-ranging consequences” if cisgenic crops are released into the environment and the human food chain (Schubert and Williams 2006).

19 Jasinski emphasizes the notorious difficulty of defining enthymemes: “But what exactly is an enthymeme? This question continues to challenge scholars in a number of academic fields, especially rhetorical studies” (Jasinski 2001: 205). Since the definition of these technical concepts and their history is not part of this thesis, I rely on Jasinski's Sourcebook on Rhetoric (2001) which provides in my view an eloquent collection of encyclopedic entries into the common concepts of rhetorical studies.
unexpressed premises need to be made explicit and tested as well. The scientific expert, therefore, will have to provide argumentation for this warrant once being challenged by one of his antagonists. Put differently, in order to test argumentation to a maximum of doubt, unexpressed premises in the argumentation must be made explicit. This procedure is called the inter-subjective explicitization procedure.20

Finally, the justificatory force of these enthymemes of the protagonist has to be established, following the inter-subjective testing procedure. The argument scheme rule states that every employed argument scheme must be tested for a) acceptability and b) correct application. Van Eemeren defines the notion of argument scheme as “a more or less conventionalized way of achieving a transfer of acceptability from the explicit premise to the standpoint” (Van Eemeren 2004: 4). He distinguishes between three main categories of argument schemes – causal argumentation, symptomatic or sign argumentation and argumentation based on a comparison or analogy – but he does not systematically develop a classification or typology of different sub-categories of argument schemes (cf. Walton et al. 2008; Hitchcock and Wagemans 2011).21

Some argument schemes are considered as unacceptable. A well-known example is the populist fallacy of argumentum ad populum. In this case, a claim is deemed conclusively defended because it reflects general public opinion. GMOs are sustainable because a majority of the people thinks it is.

Discussants can also incorrectly apply acceptable argument schemes. For instance, a protagonist can prematurely draw a general conclusion from an insufficient amount of particular cases. Such a hasty generalization (or secundum quid) can be recognized in the contribution of the politician of the Party of the Animals, who attempted to refute the general standpoint of the minister of agriculture (“GMOs are potentially sustainable”) by indicating that GM soy leads to deforestation and increasing use of toxic pesticides. It is questionable however that what applies to GM soy in particular applies to GMOs in general.

Another way argument schemes are incorrectly applied is when not all the critical questions relevant for the employed scheme are answered satisfactorily.22 Again, the argumentation of the politician of the Animals Group (Ouwehand) is illustrative. Suppose we accept the hasty generalization for the moment, then an analogy was implied between GM soy and cisgenic crops. Belonging to the same class (GMOs), soy and cisgenic apples or potatoes share certain characteristics. An important critical question Ouwehand should answer is this: are there any significant differences between GM soy and cisgenic apples? Proponents of cisgenics argue that Ouwehand cannot answer this in the negative since there are relevant differences between transgenic GM soy and cisgenic crops.

These procedures for the determination of the conclusive defense of advanced argumentation are helpful to reflect on the ethical issues of new and emerging science and technology. In particular, the testing procedure of argumentation by means of critical questions is the operationalization of the concept of argumentative quality which is crucial for deliberative democrats (see Chapter 2). In the next section, I demonstrate how this testing procedure can be applied to recurring moral argumentation patterns in NEST-ethical discussions: pragmatic (i.e. consequentialist) argumentation (Section 3.4.1), and deontological and justice argumentation (Section 3.4.2). I define a set of stock topics, a list of critical questions that need to be answered satisfactorily. Again, I use the public and political debate on cisgenesis in the Netherlands to illustrate my explanation.

3.4 Pragma-dialectics and the argumentative quality of NEST-ethical discussions

3.4.1 Pragmatic argumentation

Pragmatic argumentation is an argument scheme protagonists use to justify a particular action by indicating its desirable consequence(s). In political discourse, this argument scheme is frequently employed for the justification of public policy. Proponents of new science and technology often use this scheme as well: “In practice,
NEST-ethics starts with a consequentialist pattern of ethical argumentation: the new and emerging technology is deemed desirable, or not, because its consequences are desirable, or not (Swierstra and Rip 2007: 11). Ihnen-Jory represents the argument scheme of pragmatic argumentation as follows (Ihnen-Jory 2011: 146):

**Argument scheme of pragmatic argumentation**

Standpoint: Action X should (not) be carried out

Material premise: [because] action X leads to (un)desirable consequence Y

[Connection premise: [and] if action X leads to (un)desirable consequence Y, then it should (not) be carried out]

Plant researchers who developed cisgenesis argued in favor of an amendment of GMO legislation since legal restrictions “seriously hinder the use of cisgenesis” (Schouten et al. 2006: 750). A restricted use of cisgenesis is undesirable because “given the great potential that cisgenesis has to speed up the breeding process in plants, [...] such [a] decision would greatly enhance the economic and environmental prospects of agriculture” (Ibid: 753). The environmental benefits, the researchers argue, are the reduction of the widespread use of pesticides in agriculture. Thus, cisgenesis contributes to (more) sustainable agriculture. If we restate their argumentation, the plant researchers argue as follows: Regulation for cisgenic crops should be amended because that leads to a widespread use of cisgenesis which will lead (subsequently) to (more) sustainable agriculture and economic growth. As this argumentation was (publicly) challenged, the plant researchers bear the burden of proof (see Section 3.2.2). They have to make a reasonable case for why regulations have to be defended by providing argumentation.

In this case, a new sub-discussion about the propositional content arises. The premise – “Cisgenesis will lead to sustainable agriculture and economic growth” – of the initial pragmatic argumentation then turns into a standpoint which again needs to be defended by providing argumentation.24 The propositional content as well as the justificatory force of the argumentation in the sub-discussions needs to be agreed on et cetera.

Agreeing on the causal proposition of the material premise, however, does not suffice to solve the difference of opinion. All participants have to accept the evaluative proposition that “Sustainable agriculture and economic growth are desirable” as well. Opponents of cisgenesis agreed on the desirability of sustainable agriculture but disagreed on the meaning of the concept. Economic growth hardly ever is generally accepted unconditionally as a reason even though it was not explicitly discussed.

**Discussing the propositional content of pragmatic argumentation**

As Ihnen-Jory (2011) states, the material premise of pragmatic argumentation is composed of a causal and an evaluative proposition. In our example: the development of cisgenic crops leads to a sustainable agriculture and to economic growth; and: sustainable agriculture and economic growth are desirable. To solve their difference of opinion, the discussants have to agree on both the content of these propositions. I first elaborate the causal proposition.

The causal connection between scientific research and its desirable outcomes is frequently projected into the future: the consequences are expected or promised. So, in the case of cisgenesis the proponents stress its “potential” and “prospects”. Literature belonging to the sociology of expectations has demonstrated that such expectations often serve as a public justification for the development of particular scientific and technological trajectories (see Section 4.4.3). As Swierstra and Rip have argued (2007), the plausibility of expected or promised future consequences is frequently challenged. In the case of cisgenesis, opponents indeed challenged the assertion that cisgenesis leads to (more) sustainable agriculture. The Party of the Animals argued that GM soy proved that pesticide use has increased. Others argued that cisgenesis, as an instance of genetic modification, is “incompatible with principles in organic agriculture of sustainability” (Struik et al. 2010: 18).

In this case, a new sub-discussion about the propositional content arises. The premise – “Cisgenesis will lead to sustainable agriculture and economic growth” – of the initial pragmatic argumentation then turns into a standpoint which again needs to be defended by providing argumentation.24 The propositional content as well as the justificatory force of the argumentation in the sub-discussions needs to be agreed on et cetera.

As some commentators argue, in a (neo-)liberal society the burden of proof is reversed: opponents of NEST have to have plausible grounds to stop the development of NEST (cf. Swierstra and Te Molder 2012). See Section 2.2.

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Protagonists may for instance, draw on the frequently used topos of scientific progress to defend it: “the new technology will bring us all kinds of good, because technologies have done so in the past” (Swierstra and Rip 2007: 8). According to the unexpressed premise rule (rule 5), the protagonist has to take responsibility for an unexpressed premise: “What technologies have done in the past, they will do in the future as well.” In the ensuing sub-discussion, the justificatory force of this argumentation must then be assessed i.e. can the protagonist answer all the critical questions satisfactorily? Possible critical questions might read: What specific good does this technology (cisgenesis) produce? What are possible negative side-effects of this technology? I return to the side-effect question below.
Again, a sub-discussion is needed to actually define what sustainable agriculture means.

— Discussing the justificatory force of pragmatic argumentation

After the proponent of cigenic crops has successfully defended the causal and evaluative propositional content of his material premise, s/he will have to satisfactorily reply to a set of critical questions that pertain to the argument scheme of pragmatic argumentation.

The first critical question is about feasibility. As Ihnen-Jory writes: “the presupposition [of the standpoint that someone should do something] is expressed by the familiar principle ‘ought implies can’” (Ihnen-Jory 2011: 150). When new science and technologies are concerned, this critical question most obviously refers to technological feasibility (cf. Lucivero et al. 2011): will the technology be materialized in practice at some moment in time? What will its specific technical possibilities be? Are cigenic crops feasible? These are relevant questions in the context of new technologies since innovation trajectories have proven to be obstinate. Therefore, questioning the plausibility of the expected future technologies is a first strategy to challenge consequentialist arguments in favor of a new or emerging science or technology.

Because plant researchers have demonstrated in their laboratories that cigenic apples and potatoes are indeed feasible, they must answer both the necessary-means question and the best-means question. Are cigenic crops a necessary means for reducing pesticide usage in agriculture or are there (better) alternative solutions to the problem? Adherents of organic farming who generally oppose cigenesis, admit that phytophtora “cannot be controlled [organically] and must be avoided” (Struik et al. 2010: 19) because the damage of this oomycete responsible for late blight in potatoes is enormous. Biotechnologists then could argue that cigenesis is a necessary means for a reduction of pesticide use in agriculture although some argue that alternative agronomic possibilities – “including biological pest control, co-cultivation of different crops, and use of symbiotic relationships between crops and soil organisms” (Jochemsen 2008: 71) and “targeted gene knock-in strategy and genomics assisted breeding” (Schubert and Williams 2006: 1328) – should not be precluded.

Even if such alternatives to cigenesis would exist, proponents may still successfully defend their claim by arguing that their technology is the best means to achieve a more sustainable agriculture. Whether a technology is the best of (technological and/or social) alternatives depends on the cost-benefit ratio of each alternative. For the new technology will probably not only produce benefits, but also costs or harms.

The final set of critical questions plant researchers have to answer concern these possible costs or side-effects. “In the consequentialist pattern of moral argumentation, critics then have to identify undesirable consequences to get a hearing”, Swierstra and Rip write (2007: 11). Opponents of cigenesis argue that genetic modification produces risks for human health, biodiversity and rain forests (Cogem 2006: 17). If the plant developers agree on (some of) those side-effects, they do have to answer the last critical question: do the benefits outweigh the costs?

Although consequentialism is dominant in NEST-ethical discussions, it is not the only argumentative pattern. The moral desirability of NEST can be disputed and defended on several alternative grounds. “[E]specially organic growers would benefit from new varieties, resistant to late blight [i.e. phytophtora] but not [...] at the cost of disavowing the basic principles of organic agriculture” (Struik et al. 2010, 19). This last argument doesn’t mobilize future consequences as justification, but basic principles. This is therefore a different type of normative argument: not consequentialist, but deontological.

Therefore, I propose to broaden Ihnen-Jory’s scheme of pragmatic argumentation so as to include non-consequentialist arguments. Drawing on various ethical theories Swierstra and Rip (2007) identify three other forms of moral argumentation: deontology, theories of justice and “good life” ethics. In the next section, I extend and refine the set of critical questions that make up the critical testing procedure so as to include these alternative moral arguments.

Ihnen refers to deontological arguments in the margin of her discussion of the inter-subjective testing procedure of pragmatic argumentation. The feasibility of action X, which is subject of the first critical question, is taken in two separate meanings. The second meaning - unfeasible as non-permissible – conceived as incompatible with (already) institutionalized forms of (ethical) governance (such as ethical guidelines, codes of conduct or legal/regulatory frameworks) is called deontological.

Swierstra and Rip’s NEST-ethics also comprise meta-ethical arguments (e.g. technological determinism) and good-life ethical arguments. Since the latter are more narrative in character, they do not fit well in the propositional “grammar” of pragmadialectics, and therefore, we decided not to include them in this paper. Assessing good-life ethics arguments is hard, since they draw on different philosophical understandings of the good life, which are mostly used as a warrant for other arguments in the dialogue. This does not mean that it is impossible to have a good dialogue in which these meanings are exchanged.
3.4.2 NEST-ethics: critically questioning alternative moral argumentations

— Deontology

Swierstra and Rip’s (2007) presentation of the dynamics of NEST-ethical discussions provides clues for finding other critical questions to be answered to improve the soundness of a public discussion on NEST. In deontological or duty-based ethical arguments Swierstra and Rip write, “deeply seated moral convictions about duties and rights” (2007: 14) are used to warrant a moral claim. In most cases, such moral principles prevail over desirable consequences as they project basic human interests. Ihnen-Jory’s scheme can be adapted in the following way:

**Argument scheme of deontological argumentation**

Standpoint: Action X should (not) be carried out

Material premise: [because] action X is (not) in accordance with moral principle Y

[Connection premise: [and] if action X is (not) in accordance with moral principle Y, then it should (not) be carried out]

For example, opponents of cisgenesis have argued, that “[a]lthough no natural barriers are crossed when inserting a gene from crosstable species, isolating a gene from its natural genomic context and its random insertion can still be considered as a violation of the genotypic integrity” (Lammerts van Bueren et al. 2007: 408).

Deontological arguments such as this can be challenged along three argumentative lines (Swierstra and Rip 2007) which can be re-formulated into critical questions. First, a different principle of higher order may be provoked. This leads to the following critical question: Is this the only relevant moral principle in this case, and if not, is it indeed the most relevant one? For example, a proponent of cisgenesis may invoke the moral right of an entrepreneur to maximize profits on the condition that others are not harmed. An opponent may accept that no harm may be done but prioritize the principle that the integrity of Creation should be respected.

Second, one can argue that the principle does not apply in the particular situation. Question: Is the moral principle in this case adequately applicable? For example, proponents claim that the moral prohibition on genetic manipulation doesn’t apply in the case of cisgenesis since cisgenic crops “fundamentally differ from transgenesis” and are “similar to traditionally bred plants” (Schouten et al. 2006: 753). Consequently, founding upon the deontological principle of equality they argue that these crops “should be excluded from GMO [regulatory] frameworks and [should be] regulated in the same way as traditional breeding” (ibid.). Critics, however, claim that this principle of equality is not adequately applicable because cisgenesis does not fundamentally differ from transgenesis or that it is not equivalent to traditional breeding (De Cock Buning et al. 2006).

And third one could challenge specific interpretations of applications of general moral principles by providing alternative, contradictory interpretations or applications. The corresponding critical question would be: is the moral principle unequivocally applicable? For example, although an opponent of cisgenesis may argue that this technology is incompatible with our duty to respect nature’s integrity, a proponent may mobilize this same duty in support of cisgenesis, for example by arguing how this technology in fact does respect nature by doing justice to its essence as an ever evolving bricolage.

This list of critical questions is not comprehensive. Other critical questions involving deontological-ethical reasoning are: is the principle widely or even generally accepted or is it itself contested? Are there commonly accepted exceptions? Which (un)desirable effects does the obligatory following of the rule have? These questions too, serve as instruments to critically test appeals to moral principles which are often used for “moral crusade[s]” (Nelkin 1992: xvii).

— Theories of justice

Another important issue in NEST-ethical discussions are issues over distributive justice which are often overlooked (Jasanoff 2003). How will benefits or risks of NEST be distributed? Schematically the argumentation scheme could be:

**Argument scheme of argumentation of justice**

Standpoint: Action X should (not) be carried out

Material premise: [because] action X is in itself or in its consequences (un)just

[Connection premise: [and] if action X is in itself or in its consequences (un)just, then it should (not) be carried out]

Distributive justice is a complex moral concept which revolves around the distribution of benefits or (social) goods (welfare, income, profits, health care, research funds etc.) and burdens (risks, taxes etc.) in situations of scarcity.27 Justice means giving each person his or her due. Most philosophical elaborations on justice start with a formal principle of justice all moral theories share. This minimal principle states that equal cases should be treated equally and unequal cases unequally. For example, proponents of cisgenesis have appealed to this principle to defend a less restrictive

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27 It is clear from this formulation that justice arguments are less basic than consequentialist and deontological arguments. Specific conceptions of justice can be more deontological, more consequentialist, or a hybrid combination of both.
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legislation for cisgenic products. Since cisgenic crops are equal to traditionally bred crops, their apples and potatoes should be treated accordingly. Therefore, biotechnologists could argue that it is unjust to treat cisgenic crops as cases of transgenetic modification. However, the problematic character of this minimal formal principle emerges from the debate on cisgenesis because opponents have applied the exact same principle to argue in favor of subsuming cisgenic crops under existing, more stringent regulation. How are we to determine that cisgenic crops really are an element of the subclass of normally bred plants? A first set of critical questions could therefore be: is the formal principle of justice rightly applied (are equal cases indeed equally treated; and unequal cases unequally)? And: does case C really belong to subclass of cases $S$?

Because the minimal principle lacks discriminative power, material criteria are invoked to provide the substance for determining what relevant differences exist between equal and unequal cases in particular contexts. The most basic substantive criterion is equality or fairness: to each person an equal share. However, the question is whether equality should be the basis in all circumstances. Most people agree that in some cases differences between groups or classes of people are justified. One such relevant material principle is desert. Plant researchers and companies deserve the profits since they had the (lucky) talent of developing the technology and utilized their entrepreneurial spirit to make risky investments. Another justice criterion is need. Technological developments like cisgenesis are undesirable because stimulating agricultural product differentiation and consequently the Dutch economy, is an unfair investment of scarce resources because there are people who need these resources for other purposes more or these technologies more for their development.

In the public debate on cisgenesis in the Netherlands, proponents mobilized justice arguments using this criterion of need. “[C]isgenesis will facilitate the second green revolution in India” (Jacobsen and Nataraja 2008: 1365), implying that people in developing countries benefit from this new technology. India needs a second green revolution (more than other countries) to guarantee a safe and secure food production, because of “global warming, population growth, environmental stresses and diminishing land resources” (ibid.). Therefore, it would be unjust not to allow and develop cisgenic crops. Producing them meets the second principle of justice that John Rawls (1971) stated in his theory of justice: “social and economic inequalities are to be arranged so that they are to the greatest benefit of the least advantaged” (the people in India).

Depending on the particular context these discussions on distributive justice take place, the critical questions discussed in the previous subsection (deontological argumentation) can be formulated. Is the principle of justice discussants draw on the only relevant? In most situations the answer is no. Opponents for example claimed that “it is very unlikely that subsistence farmers in developing countries will be able to buy the expensive seed protected by numerous patents of the GMO varieties” (Struik et al. 2010: 18). These critics refer to the unjust distribution of benefits in India. Cisgenic crops are not to the greatest benefit of the very least advantaged: the Indian subsistence farmers. What is more, because of patents local Indian farmers do not have an equal opportunity to cultivate genetically modified crops to earn a living (which is contrary to another of Rawls’ principles of justice).

If more than one material principle of justice is relevant, as was the case in the public debate on cisgenesis, discussants will have to answer two critical questions: is the material principle of justice the most relevant? Is it adequately and unequivocally applicable? These discussions on justice reflect some of the key questions Wilson and Willis have identified in their pamphlet about upstream engagement: who needs this technology? Who will benefit [and who does not]? What will it mean for the people in the developing world (Wilson and Willis 2004: 28)?

In the table below (Table 3.2) the critical questions pertaining to the various argumentation schemes in public discussions on NEST-ethical issues are summarized. Together these critical questions constitute the stock topics (a taxonomy or classification of critical questions that can be at issue in a NEST-ethical controversy) to be satisfactorily addressed in order to conclusively defend a standpoint based on these schemes.

3.5 Some limitations of pragma-dialectics and methodological additions

The research object of the pragma-dialectical argumentation theory is well-defined. Argumentation theorists are concerned with what people directly or indirectly say or write. Their object of study is discourse as far as it is externalized or can be externalized (in case of unexpressed premises or conclusions). This limitation has methodological consequences for this study in two directions, one going inwards, the other outwards.

The former means that argumentation theorists are not concerned with the psychological dispositions of language users and their motives for holding, rejecting, questioning or attacking standpoints. A proper critical discussion attitude requires a systematic doubt. Criticism is a means to resolving problems and argumentation a means to testing standpoints. “This requires a non-dogmatic and anti-authoritarian approach and a distrust of unshakeable principles and claims to infallibility (Van Eemeren 2004: 189).” Argumentation theorists do not deny the importance of
the psychology of language users. Their analysis, however, is confined to the commitments to which language users can be held based on their speech acts. The model of critical discussion constitutes a set of commitments reasonable arguers should observe in order to resolve their difference of opinion. This model constitutes first-order conditions for a reasonable discussion. These discussion rules are necessary but in themselves insufficient conditions for a reasonable discussion. Second-order conditions or the psychological “state of mind” of arguers are also prerequisites for a reasonable discussion. Nevertheless, these are excluded from the argumentative analysis.28

This also holds for external conditions that (co-)determine what can be said and what cannot be said. These third-order conditions “relate to the social circumstances in which the discussion takes place and pertain, for instance, to the power or authority relationships between the participants and to special features of the situation in which the discussion takes place” (Van Eemeren 2004: 189). At the seminar on biotechnology for instance, opponents who raised issues of risk were silenced as the chairman simply interrupted them, telling that the risks of GMOs were not on the agenda. In Section 2.5, I elaborated Hajer’s notion of dramaturgy of public deliberation to call attention to these third-order conditions or performative dimension of settings. The “contextualized interaction itself produces social realities like understanding of the problem at hand, knowledge, and new power relationships” (Hajer 2005: 631). How do settings affect the deliberative performance of participants?

To include these internal and particularly external conditions (or performing settings) into the analysis of discourse in upstream public deliberation, the analyst has to change his epistemological position of the observer into a position of participant-observer. Facilitators and (social) researchers concerned with the quality of public deliberation have to use additional ethnographic research methodologies (questionnaires, interviews) to take these higher-order conditions of a critical discussion into account. Furthermore, I think that the analysis of argumentative discourse gains power when discussed with participants afterwards off-stage. These empirical data also increase knowledge of the context which allows for a richer analysis of argumentative discourse (see empirical Chapters 5 and 7).

28 This seems to reflect a rather cognitivist approach to language use, “states of minds” and attitudes discursive psychologists have criticized (see e.g. Potter and Whetkerell 1987). As discursive psychologists argue, psychological phenomena are discursively constructed in social interaction (see Chapter 4, Section 4.3).
The exclusive analytical focus on externalized discourse reveals another limitation of the pragma-dialectical framework as presented in this chapter. What does it mean when discussants are silent about some issues? Most of the contributions to the public debate on cisgenesis are written texts, but also for spoken argumentation – as for example in the parliamentary proceedings – holds that many if not most claims remain unchallenged. The plant geneticists for example express no opinion on principles of sustainable agriculture. Does it mean that these technologists agree with ecological farmers on these principles? Perhaps, but the contrary is more likely to be true. The same holds for opponents of cisgenesis. Suppose there is no ecological alternative to GM for the combat against phytophthora to be expected in the near future. Is it an option to revise the principles of sustainable agriculture so as to include GMOs? From the sources reporting on the public debate on cisgenosis I have found, I cannot infer the opponents’ view on the issue. Selecting topics for discussion (and hence, being silent about others) appears to be a powerful strategy in argumentative discourse. As Van Eemeren himself indicates in his later work (2010) strategic maneuvers (such as topical selection as he calls it) reveals a different perspective on a critical discussion attitude without being unreasonable. The average discussant is perhaps only in the second instance a critical-rationalist for whom “doubt is intrinsic to his attitude to life” (Van Eemeren 2004: 189). Discussants are primarily interested in having their critics or antagonists accept their standpoint. In the next chapter, I discuss this concept of strategic maneuvering in context of public discussions on NEST.

3.6 Conclusions: improving reasonable deliberation

According to the normative political theory of deliberative democracy elaborated in Chapter 2, the quality of argumentation and the reasonableness of the deliberation process are key elements for public deliberation. As I have argued in this chapter, the pragma-dialectical argumentation theory and NEST-ethics are both useful for the analysis of public discussions on NEST. Pragma-dialectics’ model for critical discussion offers a formal procedure to analyze and assess the quality of public deliberation on NEST in terms of reasonableness. This discussion model (with its stages, rules and fallacies) provides useful instruments not only for researchers who empirically analyze argumentative discourse but also for facilitators and organizers whose task it is a) to stimulate reasonable discussion conduct for the resolution of differences of opinion (argumentation as process) and b) to improve the quality of reason-giving in public deliberation (argumentation as product).

NEST-ethics, on the other hand, offers a contextualization of argumentative discourse utilized in everyday discussions on new and emerging science and technology: a description of recurring moral argumentation patterns in NEST-ethical discussions that researchers and facilitators of public discussions on NEST can expect. To illustrate the utility of both I have analyzed the Dutch public debate on cisogenesis. This contentious technology defying existing categories, turned out to be a “matter of concern” (Latour 2005), an issue that has called a public into being because of its normative ambitions concerning sustainable agriculture. Although its developers had called this technology prematurely “acceptable to consumers” (Schaart et al. 2011) it sparked considerable debate perhaps because of the relative late stage in the innovation trajectory (Dortmans December 9 2009). Nevertheless, the political debate in the Netherlands is decided in favor of proponents of cisogenesis (TK 27 248, nr. 233) even though the Dutch state secretary has not convinced her European colleagues yet (Anon. January 8, 2014).

Using the model of critical discussion I have attempted to assess the quality of this debate. I identified some major differences of opinion on whether cisgenic crops are safe for environment and consumption, are sustainable and beneficial for the least advantaged. Particularly, the discussion over risks and facts resulted in violations of discussion rules. The Dutch minister had prohibited the discussion on risks during a seminar she had organized to discuss the socio-economic aspects of GMOs. The interventions of the chairperson prevented opponents from advancing their objections freely. Furthermore, it can be argued that the plant geneticists who had called Greenpeace an irrational and fundamentalist group committed an argumentum ad hominem (again a violation of the freedom rule). Greenpeace’s “theoretical problems” were supported by scientists (Schubert and Williams 2006). On the other hand, some opponents presented contentious claims (farmers committing suicide) as facts to evade the burden of proof. Some have argued in favor of experiments in order to settle issues of facts (De Vriend and Schenkelaars November 25 2009). Ultimately, the European Food Safety Authority (EFSA) stated that cisgenic products are as safe as traditionally bred plants (EFSA 2012) but opponents challenge the transparency and controllability of EFSA’s expert advice.

In this chapter, I have particularly focused on argumentation as product. Pragma-dialecticians define three procedures important to facilitators for stimulating critical reflection and confronting argumentation systematically with a “maximum of doubt.” Firstly, it is important to explicate unexpressed premises that remain implicit largely for communicative efficiency reasons. Secondly, the explicated propositional content of every individual statement must be acceptable. If not, the protagonist needs to advance argumentation in a sub-discussion to defend this claim. Third, the
**justificatory force** of every argumentation needs to be critically tested. The facilitator leads the critical testing procedure that is successfully completed when protagonists who defend a claim by advancing argumentation, have answered all critical questions satisfactorily.

I have developed a comprehensive set of critical questions that together form the stock issues to be addressed in NEST-ethical discussions. Is cisgenesis the only or best solution to plant diseases? What moral principles are violated? Are these commonly agreed upon? Who needs cisgenesis and are benefits and risks distributed justly?

These critical questions are first and foremost a measure for deliberative quality, but these stock topics constitute a heuristic in order to fulfill another quality aspect of deliberation: inclusiveness. What are possible issues to be addressed? Issues of justice were only marginally discussed and were absent in the parliamentary debates. Finally, these questions are an indication of possible knowledge deficits. What (scientific) evidence corroborates certain claims, what is still unknown? What do we know about suicide rates among farmers in developing countries and is the widespread use of GMOs indeed the major cause?

In the public debate on cisgenesis, I hardly found any overt violations of the discussion rules pertinent to the argumentation stage. As far as issues were discussed, the debate was reasonable in the sense that a) relevant argumentation was advanced and b) the discourse was deprived of major fallacies. On the other hand, much argumentation was not subjected to a maximum of doubt either and therefore not conclusively defended. Most participants expressed their views in written (popular or scientific) media. This allows both proponents and opponents to strategically select issues at will. This topical selection is a powerful strategy to be effective in discussion without violating the argument scheme rule. Apparently, discussants do not automatically adopt a critical discussion attitude integrating systematic doubt in resolving differences of opinion. In the next chapter I elaborate the concept of strategic maneuvering which pragma-dialecticians have developed to incorporate a rhetorical dimension in argumentation theory.
strategic maneuvering in public discourse on new science and technology
4.1 Introduction

“I witnessed the seminar [on the socioeconomic aspects of GMOs]. First of all, it was very much [sic] disappointing. […] The minister [of agriculture] states [in her speech]: no discussion on biotech [is needed] any longer, we will just have to live with them. She claims GMOs can contribute to crop security, productivity, improvement of disease prevention and to a decrease of use of pesticides. Apparently without being bothered by any knowledge of facts, she completely ignores that GM soy contributes to the deforestations of South America, stimulates the use of pesticides and [it] definitely does not lead to higher yields. Indeed, production can even drop. That is not sustainable really, I would say. Among the key note speakers there was Dr. Bino of Wageningen University, the publicity agent of cisgenesis, apparently. Using slogans such as ‘GMO, the choice for sustainability,’ he wanted to convince us that GMOs do not involve any risk and that biotech can solve all sustainability tasks in agriculture. That promise is not new. In fact, it has been the mantra of [biotech] industry right from the start of the discussion on genetic manipulation. In practice, not a single word has come true. That an independent scientist [such as Dr. Bino] lends himself for such bold statements, is characteristic of the position of Wageningen University in the debate.” (TK 27 248 nr. 142: 2)

In the previous chapter, I discussed the pragma-dialectical model of critical discussion to analyze and evaluate argumentative discourse such as the contribution to a parliamentary proceeding on biotechnology quoted above. The member of parliament (Ouwehand) presents a clear difference of opinion: both the Dutch minister of agriculture and Dr. Bino assert that GMOs are possibly sustainable, Ouwehand claims the opposite. To defend her standpoint she uses a combination of an argumentation from example (GM soy) and pragmatic argumentation (see 3.4.1) to defend her standpoint that GMOs in general (including cisgenic crops) are not sustainable. To evaluate this argumentation, one must examine whether the rules for a critical discussion are observed (for an overview see Table 3.1, Section 3.2.2).
Are the standpoints of opponents accurately represented (standpoint rule): did Dr. Bino indeed use slogans such as “GMOs, the choice for sustainability” or is this a straw man? Does the argumentation conclusively substantiate these standpoints (argument scheme rule)? Is there agreement on the propositional content: does the use of GMOs indeed stimulate pesticide use as Ouwehand asserts? Is the argument scheme (argumentation from example) correctly applied? Are the critical questions pertaining to this argument scheme satisfactorily answered: does what applies to GM soy apply to all GMOs? Are there GMOs that help decrease the use of pesticides? Do GMOs indeed lead to the undesirable consequences of deforestation or an increase of the use of pesticides? Do the alleged benefits (crop security, productivity, improvement of disease prevention) outweigh the costs (deforestation, increasing use of pesticides)?

Still, it seems that Ouwehand is doing more than just arguing, i.e. “advancing a constellation of reasons the arguer can be held accountable for as justifying the acceptability of the standpoint(s) at issue” (Van Eemeren 2010: 29). She depicts the Dutch minister of agriculture as ignorant (“Apparently without being bothered by any knowledge of facts…”). And what is she doing with Dr. Bino? The contrast of representing him as “publicity agent” and an “independent scientist,” is interesting. Both categorizations are paradoxical when combined: how can Dr. Bino be a publicity agent (having an interest in selling products) and an independent scientist (meeting Merton’s ethical norm of disinterestedness) at the same time? Using the predicate of “independent scientist,” Ouwehand evokes certain associations of proper behavior for scientists (what Dr. Bino should be doing) that contrast with his actual behavior of selling products as represented by Ouwehand (what Dr. Bino is in fact doing). This reinforces the implication of a lack of credibility; since Dr. Bino is said to be talking like a salesman, people do not have to believe what he says as a scientist. I return to this instance in Section 4.4.2 on subject positioning.

This example nicely illustrates that people who are involved in (political) argumentative discourse can draw on other discursive resources than just advancing reasons to convince reasonable critics. People can do things with words. Ouwehand’s construction of Dr. Bino’s identity illustrates how discussants use language not merely to convey their message (for communicative purposes) but also to elicit certain responses from their rivals or the public (for interactional purposes).

Although deliberative democrats are well aware of this performative dimension of speech acts (cf. Fischer and Forrester 1993) in everyday political deliberations, they seek “practices in which only better arguments carry weight and in which manipulation or strategic maneuvers are minimized” (Hamlett 2003: 129). How can these strategic maneuvers be understood? As a manipulation of language that needs to be minimized?

In this chapter, I elaborate on the concept of strategic maneuvering introduced to refine the “standard” pragma-dialectical argumentation theory (as discussed in Chapter 3) so as to include the rhetorical dimension of argumentative discourse.2 Discussants do not only aim at resolving their difference of opinion. They also want their reasonable critics to accept their claims and argumentation. Selecting an appropriate argument scheme is but one strategy to be persuasive. In Section 4.2, I present a definition of the concept of strategic maneuvering and I describe its three analytical aspects indicating different strategies for persuading audiences. Again I use the debate on biotechnology in agriculture (cisgenesis) as an illustration.

According to Van Eemeren the combination of these three aspects amounts to the framing of argumentative moves. Framing can be defined as the selection of “some aspects of a perceived reality and make them more salient […] to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (Entman 1993: 52; more on framing in Section 4.2.2). As I argue, drawing on framing as a central concept within the field of discourse analysis (DA) indicates a step of including insights from sociological studies of situated language use to enrich the study of the rhetorical dimension of (argumentative) discourse. In Section 4.3, I explore the common ground further between pragma-dialectics and branches of DA that adopt a sociological perspective on language use as social practice. DA studies are useful for the study of strategic maneuvering because a) one of their shared premises is that different constructed versions of the (social) world serve rhetorical functions and b) their focus is on other discursive strategies than argumentation (in the pragma-dialectical sense) alone.

In Section 4.4, I present three forms of discursive work – identified in DA studies in Science and Technology Studies (STS) literature – which can be considered

1 The American sociologist Robert Merton (1973) formulated a set of norms (mostly abbreviated in the acronym of CUDOS) scientists have to observe: Communalism, Universalism, Disinterestedness, Organized Skepticism.

2 Van Eemeren does not provide a detailed definition of rhetoric. Following Jasinski (2001) there are innumerable meanings of rhetoric as practice (or “rhetorica usus”). I subscribe to what Jasinski calls the constructivist or constitutive perspective on rhetoric, which means that rhetoric does not refer to some sort of discourse, but instead, rhetoric is a particular quality or function of any text (the persuasive dimension of discourse).
as strategic maneuvers utilized in argumentative discourse on new science and technology: boundary work, subject positioning (or identity work) and expectations (future work). The aim of this chapter is to continue the exploration of strategic maneuvers in public discussions on new and emerging science and technology (NEST) beyond recurring argumentative patterns presented in Chapter 3 using STS literature on public controversies on NEST. In Section 4.5 address the question when these three discursive practices conflict with the rules of a reasonable discussion as elaborated in Chapter 3.

4.2 Strategic maneuvering in argumentative discourse

4.2.1 Strategic maneuvering: a definition

In A Systematic Theory of Argumentation Van Eemeren (and Grootendorst) (2004) had already alluded to the benefits of a fruitful cooperation between dialectical and rhetorical research programs of argumentation. Parallel to his own pragma-dialectical program he had developed a rhetorical version as an alternative, but equally comprehensive study of argumentation. This epistemo-rhetorical argumentation theory, grounded on an anthropological-relativistic notion of reasonableness, aims at studying the process of persuasion (as opposed to convincing) by means of an audience-oriented reconstruction (the rhetorical analysis): “what kinds of audiences have to be distinguished and which rhetorical devices work persuasively on the different audiences?” (39). The discourse or text is reconstructed as an attempt to expose rhetorical patterns.

Both theoretical positions (and their analytical, empirical and practical “estates”) are clearly demarcated in A Systematic Theory of Argumentation but they are by no means mutually exclusive. Indeed, the two versions are part of a comprehensive research program: “To make our point, we present […] the dialectical version of a research program sharply contrasted with a rhetorical version, but in practice certain elements of both programs may be combined” (ibid: 37 footnote 36). At the time of writing his systematic theory of argumentation Van Eemeren had already started a research project to incorporate the rhetorical dimension of argumentation (see Van Eemeren and Houtlosser 1999). Only in Strategic Maneuvering in Argumentative Discourse (2010) Van Eemeren explores the benefits of including the rhetorical dimension more systematically. Discussants do not only pursue the dialectical aim of reasonableness (following the procedure which is instrumental to the resolution of differences of opinion), but also the rhetorical aim of effectiveness: “to have their standpoint, supported with argumentation, accepted.” People are “also, and perhaps even primarily, interested in resolving the difference of opinion effectively in favor of their case, i.e. in agreement with their own standpoint or the position of those they represent” (Van Eemeren 2010: 39). The “argumentative predicament” discussants find themselves in comprises having to be effective while being reasonable at the same time. In their pursuit of effectiveness, not every argumentative move is allowed. Discussants have to strategically maneuver.

Van Eemeren defines maneuvering as moving about in argumentative discourse to end up in the most advantageous position in view of the particular argumentative context, using the metaphor of the maneuvering of wind-catching boats in a competition. The adjective strategic is added to denote the planned and aimed efforts to maintain the equilibrium between effectiveness and reasonableness. Thus, strategic maneuvers are contributions to the discussion which are aimed at resolving a difference of opinion while at the same time attempting to “shape one’s case to one’s own advantage” (Van Eemeren and Houtlosser 1999: 483).

What is more, strategic maneuvering is part and parcel of every discussion which means that is not a priori detrimental to a reasonable discussion. Therefore, strategic maneuvering does not necessarily need to be minimized as deliberative democrats suggest. Indeed, most of the time, arguers succeed in maintaining the delicate balance between the rhetorical and dialectical aims of argumentative discourse. Yet,

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3 Such as predominant argumentation theories that are mainly rhetorical (e.g. Perelman’s New Rhetoric and Toulmin’s The Uses of Argument) who “start from the idea that argumentation is always addressed to an audience and that the quality of argumentation depends on its acceptability to the audience” (Van Eemeren 2010: 114).

4 Van Eemeren gives preference to the notion of “effectiveness” instead of the notion of “persuasiveness”, which traditionally is used to denote the rhetorical dimension of discourse. The main difference between the two, according to Van Eemeren, is that persuasiveness is limited to “those parts of the argumentative discourse (arguments) that can be reconstructed as belonging to the argumentation stage” (Van Eemeren 2010: 39), whereas effectiveness is more comprehensive in the sense that it also encompasses the other three stages of the critical discussion (see Section 4.2.2).

5 To illustrate his point, Van Eemeren analyzes an advertisement of tobacco company Reynolds that is no longer allowed to promote smoking among non-adults in the United States. In the advertisement the tobacco company explicitly argues why young people should not smoke, using paternalising arguments with the effect to achieve the opposite: encouraging young people to start or continue smoking (Van Eemeren 2010: 20-22).
sometimes effectiveness prevails at the expense of reasonableness. In these cases, strategic maneuvering is said to derail. Derailments of strategic maneuvering occur when the rules for a critical discussion (Chapter 3) are violated. Van Eemeren distinguishes between three “inseparable aspects” of strategic maneuvering: the choice from topical potential (or topical selection for short), the appeal to (an) audience(s) or audience demand and presentational devices. “No strategic maneuvering can occur without making simultaneous choices regarding how to use the topical potential, how to meet audience demand and how to employ presentational devices” (Van Eemeren 2010: 94).

In the next subsection I examine how discussants can strategically maneuver in all four different discussion stages (Section 3.2.2). So, there are confrontational maneuvering, opening, argumentational and concluding maneuvering. For example, in addition to the dialectical aim in the confrontation stage (to achieve clarity concerning the differences of opinion and the different positions parties hold in these issues) participants will strive for an optimal definition of the difference of opinion. In each of the other discussion stages, discussants will try to find a balance between reasonableness and effectiveness. I illustrate the three aspects of strategic maneuvering using the Dutch debate on cisgenesis and Swierstra and Rip’s NEST-ethics (2007).

4.2.2 Three aspects of strategic maneuvering

The first aspect of strategic maneuvering is topical selection which is defined as “the repertoire of options for making an argumentative move that are at the arguer’s proposal in a certain case and at a particular point in the discourse” (Van Eemeren 2010: 93-93). Topical selection refers to the concept of topos (or the plural topoi) which is an ambiguous concept. It ranges from recognizable “recurrent or commonplace themes and images” (such as Brave New World or Frankenstein Food in discussions on GMOs) to “common lines of argument” or “abstract patterns of inference” (such as causality, analogy etc.) in the work of Aristotle (Jasinski 2001: 578-581). Because of its predominantly Aristotelian interpretation, topical selection is primarily associated with argumentational maneuvering: the protagonist’s choice from available argument schemes that provide an optimal defense for his standpoint. The member of parliament for example selected a complex combination of similarity (GMOs are not sustainable because GM soy is not sustainable) and pragmatic argumentation (GMOs will lead to the undesirable consequences of increase of pesticide use, deforestation etc.) to defend her standpoint that cisgenic products (which are genetically modified) are not sustainable (see 3.4.1 on pragmatic argumentation). From a rhetorical perspective, Ouwehand could have selected a different defense for her standpoint. For instance, cisgenesis is not sustainable because it defies the sustainability principles of organic agriculture (implying that only products that meet these principles can truly be called sustainable).

Topical selection is not confined to the argumentative stage, however. For instance, in the confrontation stage, a discussant can select effectively from the available issues at hand (or “topics” discussants disagree on). There are a number of controversial issues concerning cisgenesis (see Chapter 3). Are cisgenic crops sustainable? Is cisgenesis safe? Does it respect the natural order of God’s creation? Do cisgenic products offer sufficient business opportunities for Dutch small and medium enterprises (SMEs)? Ouwehand selects sustainability as the issue to disagree on in the confrontation stage whereas politicians of the liberal party select the economic benefits to argue in favor of this new technology.⁷

Discussants can also direct the course of the opening stage of the discussion using topical selection. In the opening stage the common ground is explored both procedurally and materially so as to find out whether a discussion can resolve their difference of opinion. Protagonists of new technologies (such as cisgenesis) can select two arguments which render a reasonable discussion futile. First, protagonists can use technological determinism as a rhetorical device. According to this philosophical vision on technological innovation, the possibility of social influence on scientifical and technological development is denied a priori (Swierstra and Rip 2007: 7-8). Science and technology will evolve according to their own internal logic independently from human opinions, decisions, actions and deliberations.⁸ The premise of technological

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⁶ Topoi (singular topos; locus in Latin) is an ambiguous notion, which literally means “place” or “location”. I define topos here narrowly as abstract patterns of inference or simply argument scheme which relies on the Aristotelian notion of topoi. See Jasinski 2001: 578-581.

⁷ It is worth mentioning that the Dutch minister of agriculture and proponents of cisgenesis chose sustainability as an important topic to defend this new genetic plant technology. Because of the controversial status of GMOs and the sceptic general public, it seems strategic to stress the environmental benefits of cisgenesis; see also audience demand in the next subsection.

⁸ Swierstra and Rip also discern an immanent form of technological determinism, which refers to the international (economical) competition scientists see themselves entangled in. Stopping scientific or technological activities within national borders is useless, because the technology will be developed anyway, when not in the Netherlands so it will be elsewhere.
determinism is rhetorically effective or at least persistent even if it is descriptively insufficient (Wyatt 2007)9: the European GMO resistance towards cultivation and import of GMOs has proven de facto the social influence on technological development. Nevertheless, “some actors some of the time present projects as simple and straightforward. It is necessary for them to do so in order to make things happen and to justify their actions” (172). Only its simplism can explain the persistence and the rhetorical success of this justificatory technological determinism, Wyatt argues. Also because opponents of technology frequently share this premise with their proponents, as Swierstra and Rip note, the idea of technological determinism can persist.10 In his plenary speech at the seminar on biotechnology, a director of an NGO used the metaphor of a rumbling train indicating the autonomy of technology development: “An ideological or ethical rejection will not help us very much. If only because the train is hurtling and we are at the sideline if we do not contribute to the development: “An ideological or ethical rejection will not help us very much. If only because the train is hurtling and we are at the sideline if we do not contribute to the discussion” (TK 27 428, nr. 145: 20).11

The metaphor of the train is also invoked in a second so-called meta-ethical argument (Swierstra and Rip 2007) that can be used in the opening stage of the discussion: the habituation argument. This argument also stresses the inevitability of technological development indicating that people will get accustomed to new technologies in the future even though people hold objections against them at present times. Once, people regarded the train as a threatening new technology that would kill you. Now everyone is used to the presence of trains all these objections have disappeared.

In a similar vein, Swierstra and Rip argue that technological determinism can (and perhaps must) be considered to be a rhetorical device. Whereas in a front stage performance technology enactors employ technological determinism to make public discussion unnecessary, backstage they express their hope to influence the course of things. For example, their efforts in communicating nanotechnology are aimed at preventing nanotechnology from becoming the next GM disaster.

Wyatt distinguishes between four meanings of technological determinism. The version opponents of technology adhere to, is the normative variant. This refers to the extent to which people experience a lack of agency “when confronted with new machines and new ways of doing things” (Wyatt 2007: 167).

Metaphors are a presentational device. See below.

The second aspect of strategic maneuvering is audience demand.12 In addition to its rational and its verbal character, argumentation is also a social activity, “aimed at achieving certain communicative and interactional effects on other people” (Van Eemeren 2010: 108). In order to be effective participants have to adjust to the frame of reference and the preferences of their audience at which the argumentative move is directed. This means, first, that audiences need to be identified and second that their views and preferences with which strategic maneuveres have to accord are known. Taking the frames of reference of audiences into account is complicated because of the heterogeneity of the audience: there is a multiplicity of audiences. Furthermore, sometimes argumentation is not solely aimed at convincing a direct antagonist (the primary audience) – the person or persons who have challenged a claim – but sometimes also at indirect antagonists (or secondary audiences) who witness the discussion at a larger distance (e.g. voters watching a TV debate in election times, members of political parties etc.). The claim of the politician of the Party of the Animals that GMOs lead to deforestation (bringing to mind the mediagenic images of bulldozers ruining precious rain forests) will effectively appeal to her environmentalist constituency. Peter van Dalen as member of the European Parliament for the Christian Union (CU) on the other hand, stresses CU’s advocacy in favor of cisgenesis “because it respects God’s Creation” which is important for his Christian voters (Versluis 2012: 20).

The final aspect of strategic maneuvering is the choice from available presentational devices. These are the linguistic – both semantic and syntactic – options arguers can select from to construct their speech acts and arguments effectively. An obvious example of a semantic presentational device frequently employed for argumentative purposes is the metaphor, a figure of speech based on an analogy or comparison. The public debate on cisgenesis is full of metaphors. The rumbling train is one example. Comparing plants with a box of Lego is another: “A plant is not a box of Lego, where you can take out bricks at will to build whatever you like” (Versluis 2012: 20). Sometimes, metaphors can become culturally recognizable symbols such as Frankenstein Food, a label widely circulated in the European GM controversy in the 1990s. The former Dutch minister of agriculture herself, for instance, explicitly referred to this metaphor...
in her opening speech at the seminar on socioeconomic aspects of GM crops. Not to depict GM crops as a deterrent or monstrous product because of its defiance to natural order (see Section 4.4.1 on “boundary work”), as opponents of GM crops did in the 1990s but to remind her listeners that this metaphor is a relic from past times. “Meanwhile more than a decade has passed and much has changed,” implying that GM crops are simply all around us, so the opportunity to ask ourselves whether we want this technology has passed too (TK 27 428 nr. 145: 11).

Another well known presentational device is the rhetorical question. This syntactical form of a question allows a discusssant to weaken a claim or to advance a premise indirectly. Tofik Dibi, a member of the Dutch Green Party (GroenLinks) used a rhetorical question in the parliamentary proceedings: “Why another investigation on the alleged safety of cigensesis if the eventual qualities and hence the risks are the same as in the case of transgenic crops?” (TK 27 428 nr. 142: 6). Since it is not fully externalized, this politician cannot be committed to defending his claim (“Another safety inquiry is useless”) and thus he can evade the burden of proof.

In combination these three analytical aspects of strategic maneuvering entail the selection and choices made to serve the purpose of constructing argumentative moves that bring the arguer to an advantageous position in a discussion. Van Eemeren refers to the concept of framing to indicate that strategic maneuvers make some things more salient than other things.13 “Exploiting the possibilities of presentational variation in strategic maneuvering in agreement with one’s topical choices and adjustments to audience demand boils down, in my view, to ‘framing’ one’s argumentative moves in a communicatively and interactionally functional way” (Van Eemeren 2010: 119).

His relating the concept of strategic maneuvering to the concept of framing, a “modern concept widely used in the social sciences and in discourse analysis” (Van Eemeren 2010: 126), demonstrates Van Eemeren’s orientation towards discourse analysis (DA) as a useful source to study strategic maneuvering in context.14 However, in his exposé on strategic maneuvering in general and presentational devices in particular, he mainly draws on the (classical and modern) rhetorical tradition.15 In my view, Van Eemeren’s brief theoretical elaboration on framing is a promising but only a first step to establish a more fruitful cooperation between his concept of strategic maneuvering and the empirical study of language use in DA. His reference to Erving Goffman’s Frame Analysis (1974) as his “source of inspiration” is telling because Goffman’s concept of framing in discourse analysis is but one “frame” on framing.16 Moreover, framing is only one central concept in DA (Van den Berg 2004).

In the next two sections I attempt to establish a more detailed link between

13 It is hard to find a widely accepted definition of framing (Scheufele 2008). Entman’s attempt to define framing to bring some clarification in a “fractured paradigm” is often quoted (and resonates with Van Eemeren’s description): “Framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (ibid: 52). As Ensink and Sauer (2003) argue, however, (knowledge and interactive) frames should be distinguished from perspective, which seems to be the way in which Van Eemeren seems to understand it. “Perspective,” they write, “refers to the fact that the content of a discourse necessarily is ‘displayed’ from some point of view” (2).

14 In A Systematic Theory of Argumentation, Van Eemeren had already emphasized the importance of interdisciplinary collaboration in the study of argumentation to include “the expertise of empirically minded linguists and social scientists, especially those engaged in discourse analysis and communication studies” (Van Eemeren 2004: 40-41).

15 The field of rhetoric which draws on the rich classic tradition of persuasion is useful for studying discussant’s strategic maneuvers, too. Constructions of definitions (or: definite) which discourse analysts consider to be an important discursive resource were dealt with in classic rhetorical treatises as well (Fahnstock 2009). “[S]ubdisciplines of pragmatics, discourse analysis, and sociolinguistics are all ultimately concerned with language in use” that “overlaps with the functional approach to style found in rhetoric. [...] [D]espite [the] dissimilarities [of different linguistic schools] in origin and purpose these disciplines offer insights that can add substantially to rhetorical stylistics” (Fahnstock 2011: 10).

16 It is beyond the scope of this dissertation to discuss different notions of frames and framing extensively. DeWulff et al. (2009), who use the concept of framing in conflict and negotiation studies, assert that the research of framing “represents a smorgasbord of approaches that differ conceptually, ontologically and methodologically from each other (DeWulff et al., 2009: 156).” They pose two questions to elucidate the ambiguous concept of framing. First, they identify three different categories providing answers to the question what it is that gets framed: a) issues (see Brian Wynne’s use of the concept of framing; Chapter 2), b) identities and relationships (see Section 4.4.2) and c) interaction processes. Second, it is also important to answer the question about the nature of frames. They discern between two different paradigms: an interactional paradigm (with Goffman’s symbolic interactionism as one of its roots) and a cognitive paradigm. Whereas the cognitive paradigm “focuses on surface evidence that reveals underlying structures of the participants’ cognitions”, the interactional paradigm “looks for co-constructions of issues, identities and interactions that are negotiated in the talk.”
strategic maneuvering and DA in the context of public discussions on NEST. An important reason to explore what DA has to offer the study of strategic maneuvering is that most empirical research in the field of Science and Technology Studies draws on DA. In the next section I elaborate some foundations of DA and illustrate the added value of DA for pragma-dialecticians. Drawing on a branch of critical discourse analysis, I illustrate four other discursive strategies other than advancing reasons that arguers can utilize to present their strategic maneuvers in order to be effective in public discussions. Derived from these four strategies, I discuss in Section 4.4 three discursive practices (boundary work, subject positioning and future construction) that frequently recur in public discussions on new science and technologies, described in empirical studies in STS reflecting these four discursive strategies.

### 4.3 Discourse analysis

Despite clear differences the pragma-dialectical approach to argumentation is considered “part of the study of verbal communication also known as discourse analysis” (Van Eemeren 2004: 52). The prefix “pragma-“ indicates the relationship with pragmatics as an empirical field of studying language use. Nevertheless, to consider the study of argumentation as a part of DA is not obvious. For DA is a label for many different theoretical assumptions, methodological approaches and empirical foci (Te Molder 2009; Van den Berg 2004; Whetherell 2001) and Van Eemeren does not specify what kind of DA pragma-dialectics is. Furthermore, argumentation – however defined – does not seem to be a major focus of DA studies. Several handbooks and introductions indicate that argumentation is not considered a part of DA (Schiffrin et al. 2001; Gee et al. 2012; Whetherell 2001; Jørgensen and Philips 2002) or only marginally (Van Dijk et al. 1985, 1997 and 2003; Renkema 2004).

The only explicit link I am aware of is between argumentation and critical discourse analysis (CDA). For instance, Norman Fairclough recently integrated the analysis of arguments into critical discourse analysis and political discourse analysis (Fairclough and Fairclough 2012). Furthermore, one of the very few comparisons between CDA and argumentation theory is a comparison between pragma-dialectics and Wodak’s Discourse Historical Approach (DHA) (Ihnen and Richardson 2011) that considers argumentation as one of five discursive strategies. I discuss DHA below to demonstrate what DA has to add to the empirical investigation of strategic maneuvering in interactive context. But first, I examine some foundations of sociological perspectives on DA.

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17 Whetherell (2001) discerns between six “more or less distinct discourse traditions: conversation analysis and ethnomethodology, interactional sociolinguistics and the ethnography of communication; discursive psychology; critical discourse analysis and critical linguistics; Bakhtinian research; Foucauldian research (6).

18 “culturally familiar and habitual line of argument comprised from recognizable themes, common places and tropes (doxa)” (Wetherell 1998: 400).
within different theories in discourse analysis.¹⁹

Third, discourses are functional. As people can do things with words, words can serve certain purposes. As designed constructions, language use can be varied in different contexts. The variability of versions of constructed reality allows language users to achieve particular effects. The production of discourse involves work. Because language allows for multiple versions, it “creates an argumentative and rhetorical context” (Billig 1991). The notion of rhetoric comes from ancient studies of political oratory but is has an important modern resonance. It suggests that discourse is often functional (Potter and Whetherell 1987). It is designed to be persuasive, to win hearts and minds. The study of rhetoric is, in part, the study of persuasive work and the organization of discourse to that end” (Whetherell 2001: 17). The rhetorical function of what people do with words makes DA interesting for the study of strategic maneuvering.

The variability of accounts (even within the same conversation, interview or discussion) has led discourse analysts to stress that utterances depend on the context; they are indexical. So, important questions for discourse analysts are: what is the specific function of a constructed version in a certain context? Why this version here and now?

— The discursive strategies of Discourse Historical Approach

To illustrate what DA can offer pragma-dialectics, I now more closely examine the Discourse Historical Approach (DHA) which adheres to the socio-philosophical orientation of critical discourse analysis (CDA) (Reisigl and Wodak 2001; Wodak 2001; Wodak 2009).²⁰ Of course, this selection is somewhat arbitrary, but as far as I am aware, DHA is the only approach within DA that explicitly draws on pragma-dialectics (Ihnen and Richardson 2011) because DHA considers argumentation as one of five discursive strategies. Ihnen and Richardson argue that the alleged incommensurability between DHA and pragma-dialectics which they observe in academic disputes is mistaken and undesirable, despite the evident differences between them. They discuss how the pragma-dialectical concept of critical discussion can contribute to DHA’s analysis of argumentation. Here, I make a reverse move to demonstrate how DHA’s attention towards four other strategies is useful for studying strategic maneuvering.

DHA and pragma-dialectics share a strategic perspective on discourse. A strategy is a “more or less accurate and more or less intentional plan of practices (including discursive practices) adopted to achieve a particular social, political, psychological or linguistic aim” (Reisigl and Wodak 2001: 44). In DHA five different discursive strategies are identified. DHA is interested in argumentation as discursive strategy but not exclusively or even primarily. Argumentation (as the use of topoi or argument schemes) is only one of five strategies. I discuss the other four in more detail.

The first set of strategies contains referential strategies or nomination strategies “by which social actors are constructed and represented for example, through the creation of in-groups and out-groups. This is done through a number of categorization devices, including metaphors and metonymies, and synecdoches” (Wodak 2009: 40). The last three categorization devices pertain to stylistic tropes in the long and rich
rhetorical tradition. But any categorization can be considered as a strategic device. In the context of public controversies on science and technology one stumbles upon “activists”, “scientists”, “policy makers”, “experts”, “lay persons”, “media” etc. Any categorization does rhetorical work. Calling opponents activists evokes associations of a non-deliberative or unreasonable attitude, of people who are not willing to listen. People represented as lay persons, do not have the expertise required to establish factual knowledge. Furthermore, the more or less stable cultural meanings of (social) categories also determine its demarcations: people who belong to one social group are excluded from another (see boundary work in Section 4.4.1).

Predicational strategies constitute the second cluster of strategies. “[S]ocial actors as individuals, group members or groups as a whole, are linguistically characterized through predications. Predicational strategies may, for example, be realized as evaluative attributions of negative and positive traits in the linguistic form of implicit or explicit predicates. These strategies aim at labeling social actors in a more or less positive or negative manner” (Wodak 2009: 42). Returning to the parliamentary proceeding on biotechnology at the beginning of this chapter, scientists are expected to be “independent.” Another example: two biotechnologists and proponents of cisgenesis wrote that “Greenpeace however has become a perhaps even violent group. Fundamentalism evokes negative associations immediately of a dogmatic and fights against genetically modified crops” (Jacobsen and Schouten 2009: 30). Fundamentalism evokes negative associations immediately of a dogmatic and perhaps even violent group.

Thirdly, one can concentrate on the perspectivation, framing or discourse representation “by means of which speakers express their involvement in discourse, and position their point of view in the reporting, description, narration or quotation of relevant events or utterances” (Wodak 2009: 42). It is not my aim here to discuss these three concepts at length because the differences in understanding these concepts within DA would require an inquiry of its own. I limit myself to a short exposeéon the concept of “participation framework” or “footing” which Goffman developed in order to elaborate the concept of perspective and framing. Goffman discerns between different forms of relationships that relate individuals to the discourse and which allows for a more differentiated perspective on the various participation roles a speaker (or writer) can have in a conversation (or text) etc.: animator, principal and author. The author is the originator or creator of the words. The animator is the person who produces the utterance. The principal is “someone whose position is established by the words that are spoken, someone whose beliefs have been told, someone who is committed to what the words say” (Goffman 1981: 144-145). Often, these different roles coincide, but in some occasions this is not the case. For instance, as the minister of agriculture was delivering “her” speech at the seminar on biotechnology she was the animator and the principal, but probably one of her communication officers was the author of the text. Someone quoting or paraphrasing someone else’s words is another example. As a politician of the Christian Union said in the parliamentary proceedings: “Speaking with Louise Fresco: which GMO, where [and] with what accompanying policy?” (TK 27 428 nr. 142: 3). In this case the CU politician is the animator and the “co-author” of the words since he is paraphrasing an expert – Louise Fresco – who was a key note speaker at the seminar. Who is the principal here? Who is responsible for these words? Whose beliefs are presented?

Footing can be used as a strategy to express degrees of involvement or detachment (Wodak 2009), but also as a device of “stake inoculation” (Potter 1996). For social scientists should interpret people’s discourse as attempts to discount reports and descriptions of others as a “product of stake or interest” (p. 110). Shifting in participation role from author to animator (using quotations or paraphrases), as the CU politician is doing, can be seen as a defensive rhetoric to resist the possible undermining of his statements by his political rivals or as a means to reduce accountability for utterances. Conversely, it can be regarded as an offensive rhetoric.
to render the statement authoritative because it is not the politician’s own words but those of an expert.

The fourth and last type of strategies, are “intensifying strategies on the one hand and *mitigation strategies* on the other. [...] These strategies can be an important aspect of the presentation inasmuch as they operate upon it by either sharpening it or toning it down” (Wodak 2009: 42). Intensification and mitigation can be used to qualify the epistemological status of utterances and to express different degrees of certainty (or modality; see Section 4.4.4). A discourse analysis typically concentrates on modalizing terms such as always, completely, never, somewhat, perhaps etc.24 Saying that the Dutch minister of agriculture is not “bothered by *any* knowledge of facts” for example nicely illustrates the intensifying strategy. As Potter (1996) notes, statistics and numbers can be used as well to make a strong case. In his plenary speech, professor Bino for instance put the environmental impact of using pesticides in large numbers: “1 424 000 kilos of fungicide every year” (TK 27 428 nr. 145: 21). Minister Verburg on the other hand utilized a mitigation strategy so as to prevent opponents of genetic modification to think that she is an explicit and uncritical advocate: “According to its producer [cisgenic potatoes] can generate environmental gains” (ibid: 13). The modal verb “can” expresses a certain reservation. This example also shows how Verburg chooses a footing to take more distance to the discussion on cisgenesis. She reveals the source (author) of the belief: the producer of the GM crop.

Of course, the discursive strategies of DHA are not exhaustive. First of all, DHA’s analysis of categorizations and predicates is confined to humans and social relations. The five strategies “are all involved in positive self- and negative other-presentation” (Reisigl and Wodak 2001: 44). But as the public debate on cisgenesis demonstrates, referential and predicational strategies can be extended to objects and situations as well. How should we categorize cisgenic apples and potatoes? What kind of genetically modified crops are they: are they similar to traditionally bred crops or, instead, similar to transgenically modified crops? Are they sustainable, profitable or natural or not?

Moreover, Potter (1996) for example presents a large collection of constructions of facticity which can hardly be subsumed under these five categories (e.g. creating out-there-ness using the empiricist repertoire, Potter 1996: 151; see also Section 4.4.1). My aim however was to demonstrate how a broader perspective on discourse and its rhetorical function opens up new entries for studying strategic maneuvering in context.

In the next section, I discuss three recurring discursive practices in public controversies over new science and technology which are described in STS literature: boundary work, subject positioning and the construction of futures. All three are related but cannot be completely reduced to the discursive strategies of DHA. For example, boundary work in the original meaning of Thomas Gieryn, as the attribution of selected qualities to scientific experts, can be considered as a specific nomination or predicational strategy (Section 4.4.1). But boundary work can refer to *any* demarcation between categories, be they social or not. Nomination and predicational strategies are important for the representation of identity i.e. for subject positioning (Section 4.4.2), but they also apply to futures which can be good or bad, certain or uncertain, distant or proximate etc. (Section 4.4.3).

For each strategy, I first present a short theoretical elaboration, then some empirical studies in which these concepts were used and finally some examples from the cisgenesis debate (when available). All these studies are concerned with how language is used in social interaction, even though many authors do not commit themselves explicitly to DA or do not clarify what kind of DA it is that they have done. Some of the studies are critical (comparable to CDA), others are more descriptive.

### 4.4 Discursive devices

#### 4.4.1 Boundary work

As discussed in the previous section, discourse as a situated social practice, in which identities and (social) worlds are (to a certain extent) actively constructed, involves work. So, the concept of *boundary work* refers to the work involved in constructing boundaries. Thomas Gieryn (1983) originally coined the concept of boundary work to indicate scientists’ social practice of rhetorically demarcating science from other social domains, but the concept has evolved significantly since its introduction.
Behind the scenes of… life scientists on stage
4

(Yamaguchi 2007; Bijker et al. 2009; Metze 2010). Since there are an innumerable number of demarcations that can be drawn, boundary work is a multivocal concept. If one uses the distinction – itself a boundary – between symbolic and social boundaries (Lamont and Molnar 2002), the concept of boundary work can easily be extended to all categorizations. Symbolic boundaries are “conceptual distinctions made by social actors to categorize objects, people, practices, and even time and space. They are tools by which individuals and groups struggle over and come to agree upon definitions of reality” (Lamont and Molnar 2002: 168). These categorizations are constructed and contested as well as solidified and naturalized (some more than others), which means that people can use them as strategic maneuvers in discussions.

In this subsection, I elaborate first on Gieryn’s original conception of boundary work since it is relevant in the context of public disputes over science. Subsequently I discuss instances of how boundary work is being done as described in STS literature. As this literature shows, scientists do discursive work on both sides of the boundary between science and society.

Thomas Gieryn (1983) introduced the concept of boundary work as a sociological understanding of what has come to be known as the demarcation problem within the philosophy of science. Against the essentialist tenor of carving the understanding of what has come to be known as the demarcation problem as constructed and contested as well as solidified and naturalized (some more than others), which means that people can use them as strategic maneuvers in discussions.

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25 Yamaguchi (2007), in her study on the controversy on genetically modified crops in India, proposes to also examine the boundary work of other elite actors (policy makers, industrialists, civil society etc.) within a more generalized theoretical framework of social categorization, and hence utilizing symmetry as a methodological tool. Boundary work is not something that only scientists do; it is a rhetorical strategy of other stakeholders as well. They all claimed to be the exclusive, self-appointed representatives of (the socially constructed category of) farmers, whose concerns had to be taken care for. Metze (2010) studies changes of boundary work in terms of the transcending of demarcations in dominant discourse or between (rival) discourses. Bijker et al. (2009), argue that because of his primary focus on the “contest for cognitive authority”, Gieryn “tends to emphasize processes of monopolization, expansion, exclusion and protection” (ibid: 146). In their study of the Dutch Health Council as boundary organization between science and policy, Bijker et al. observed the transgression of these boundaries in the backstage process of scientific advisory work, as to include more coordinative aspects of the interaction between science and policy institutions across these boundaries as well (see also Halfman 2003).

26 In his 1983 and 1995 texts, Gieryn distinguishes a fourth goal of monopolization, which has been left out in his 1999 book.
influence on research agendas and the use of scientific insights, they stressed that their own work in the laboratory is confined to obtaining objective facts about nature that is in no way obscured or determined by social values. Genes, they claim, are not man-made, but “are [simply] there” (286). Drawing on the notion of empiricist repertoire (Gilbert and Mulkay 1984), Kerr et al. argue that this micro-laboratory world is constructed as empiricist: “following unproblematically and inescapably from the empirical characteristics of an impersonal natural world” (Gilbert and Mulkay, 1984).27 In the interview setting, the new geneticists adopted this formal discourse, while attributing the contingent repertoire to wider society or other scientists – like eugenicists – as an explanation for their un-scientific work.

In Kerr’s critical interpretation, the “micro/macro-split” allows the geneticists to, first, discern between their own good scientific practice and an associated form of science from the past (social Darwinism, eugenics) that culturally prevails as bad science. Unlike the less ethical (or perhaps un-ethical) eugenicists (cf. Wainwright et al. 2006), the new geneticists claim not to be influenced by social preferences and political ideas of the macro-world. Second, the boundary allows them to “deflect responsibility” for the unintended consequences as a result of an unwise application of their products, Kerr et al. claim. It is part of a “rhetoric of non-responsibility,”

Without adopting this normative interpretation, this boundary work can be seen as a nomination strategy to allow the geneticists to enact a role as pure and disinterested scientist (cf. Pielke 2007 and Merton 1942) and to maintain public credibility.28 Similarly, Felt et al. (2009) identified a “repertoire of closure mechanisms” (359), i.e. discursive practices of divisive boundary-drawing, although they do not explicitly refer to the concept of boundary work in their analysis. In their understanding, the effect was that public deliberation on the social and ethical aspects of genomics research on lipid disorders was closed down. They discern two groups of mechanisms, the first of which closely relates to the construction of boundaries between facts and values. This distinction rendered issues as non-ethical: providing the right, factual information dissolved the articulated ethical issues. Furthermore, Felt et al. argue that the life scientists expanded their field of expertise, and performed as “lay sociologists” (ibid: 368) to construct “societal facts” about the cause of obesity from personal experiences, to present genome research to be the natural and inarguable solution to lipid disorders.29

The second repertoire of mechanisms they identified, consisted of “displacement strategies,” by drawing boundaries between delegated responsibilities (division of moral labor), stages of the innovation process (upstream versus downstream), and between different kinds of research (applied versus basic). In Felt et al.’s normative

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27 Mulkay and Gilbert (1984) introduced a distinction between a formal empiricist repertoire and an informal contingent repertoire to understand the variability of conflicting accounts of biochemists involved in a scientific controversy over oxidative phosphorylation. Scientists use the former to depict their actions and beliefs “following unproblematically and inescapably from the empirical characteristics of an impersonal natural world.” Backstage, however, in informal discourse among fellow researchers on the work floor, these biochemists adopted a contingent repertoire, which, by contrast, characterizes scientists actions as “activities and judgments of specific individuals acting on the basis of their personal inclinations and particular social positions” (Gilbert and Mulkay, 1984: 56-57). So, in their front stage presentation (e.g. through the use of language in their articles published in peer-review journals) scientists adopt an impersonal, neutral style to present the facts of nature as they have revealed themselves. Within the context of laboratory life, however, they showed contingency. These repertoires were also used to explain why, during the scientific controversy, opponents of their own scientific position are wrong. Whereas scientists use the empiricist repertoire to account for their own behavior, scientists belonging to the other paradigm are described in contingent terms. The question Gilbert and Mulkay raise is: why, if in the empiricist repertoire, nature speaks for itself, is this not the case for scientists making opposite scientific claims? It is important to emphasize Kerr et al.’s shifting of meaning when translating Gilbert and Mulkay’s notion of these repertoires from good and bad science to science and society. The same goes for Kevin Burchell (2007b). See par. 4.2.2.

28 Their interpretation seems to presuppose a clear set of responsibilities for genomics researchers with respect to the social implications of their scientific work, which life scientists are supposed to take. These responsibilities are far from obvious and indeed part of the (public) debate. An alternative interpretation is that life scientists construct boundaries between settled and controversial ethical issues, i.e. between issues where consensus has already been reached and issues that are still open for discussion (Firth et al. 2011) which reflect scientists’ perceptions of what issues they think they have control over. So, I would argue, boundary work is rather a reflection (instead of a deflection) of life scientists’ perception of responsibilities at best, an explanandum. Kerr et al. take the demarcation as explanans.

29 The analysts suggest this is an illegitimate expansion of expertise which reflects an imbalanced power relation between scientists and lay persons, subscribed to by both parties. Here, the authors seem to step out of their own empiricist repertoire and neutral, distanced analytic style, to do some boundary work themselves. Apparently, there exist “sociological facts” about obesity, the genomics scientists as lay sociologists do not have access to but are predetermined to be grasped only by expert sociologists (like Felt et al.). I do not claim the argumentation of the life scientists cannot be critically questioned according to pragma-dialectical norms. But, in my view, to dismiss fact claiming as “an instrument of power” employed by scientists and as an illegitimate expansion of expertise, is a normative conclusion that I cannot subscribe to.
interpretation, these displacements of ethical issues allowed the scientists to acknowledge ethical issues but to present themselves as “simply not the right addressees for ethical questions.” Delegating ethical issues to ethicists, ethics committees or regulatory frameworks (see also Kerr et al. 1997 and Firth et. al. 2011); demarcating basic and upstream science from downstream application, in order to present research activities as “purely scientific” as a result of scientific excellence and remote from any application (cf. Calvert, 2006); claiming that their research activities are conducted within the shielded space of the laboratory, safely separated from society (see Kerr’s “micro-world”). All these demarcations serve, Felt et al. claim, to position scientists “on the safe side” (364).

Whereas Kerr et al. and Felt et al. analyzed boundary work in terms of the separation of science from non-science, Brown and Michael (2001) found, in their study of the controversy over xenotransplantation (XTP) using transgenic pigs, a more complex discursive pattern, indicating both the demarcation and the transgression of the science-society boundary. Studying popular press articles on xenotransplantation (XTP), they found that promoters of this novel technology switched from a “privileged non-public-expert” discourse in the one context to a “non-expert-popular” discourse in the other. Scientists (and promoters of XTP) switched between these two repertoires, emphasizing that on scientific grounds, they are different from their (lay) audience as the only legitimate experts to assess the suitability of porcine donor hearts (demarcation). On moral grounds, however, they stress the similarity of their audience in holding the same moral views which reveals a discourse of alignment “away from antagonism toward the recruitment or enrollment of the public” (Brown and Michael: 2001: 19).

Similarly, Bloomfield and Vurdubakis (1994) argue that proponents of new genetic reproductive technologies (NRTs) seek to align with society. In order to restore the discursive demarcations (or boundary talk) of their opponents, these advocates perform “boundary repair work” (538). Drawing on the notions of rhetoric of fear and hope in the Great Embryo Debate in British parliament (Mulkay 1993), Bloomfield and Vurdubakis suggest that “Both Hope and Fear [...] tend to derive their evocative powers from the notion of boundaries as the means through which cultural categories and moral values are upheld. Boundary talk can in this sense be understood as providing a key discursive register for formulating issues pertaining to new technologies in ways that imply either threat or reassurance” (Bloomfield and Vurdubakis: 1994: 535). Opponents on the one hand attempt to represent new technologies as monstrous, defying existing moral and cultural classifications in order to invoke feelings of abhorrence. The metaphor of Frankenstein food is a well-known example. Advocates of new technologies on the other attempt to recover normality and, in doing so, these technologies must be perceived as continuous with other, already existing therapeutic technologies or “business as usual” (Swierstra and Rip 2007). To add to the complexity, agricultural biotechnologists have proven to switch between discourses of similarity and difference in different contexts (Burchell 2007a). Within the context of risks and dangers, the interviewees pointed out the similarity of GM crops and conventional breeding techniques (business as usual), whereas in the context of productivity and efficacy, GM’s superiority was emphasized (the new technology’s revolutionary aspects).

During the controversy over cigogenesis, similar boundaries were drawn and contested. Plant geneticists claimed the “fundamental” (Schouten et al. 2006: 750) and scientifically established boundary between transgenic and cisgenic crops (and hence a more relaxed regulatory regime for the latter). At the same time, the boundary between cigogenesis and traditionally bred plants was flexibly constructed. Whereas cigogenesis was represented as morally similar to traditional breeding processes, it was represented as technologically different (higher efficiency). These boundaries were heavily disputed. In Parliament the distinction between transgenesis and cigogenesis was represented as a “purely political and not a scientific distinction” (TK 27 428 nr. 142: 2). Others evoked a natural-unnatural distinction to accentuate the difference between cogenic and normally crossbred crops (Lammerts van Bueren et al. 2003).

To conclude, boundary work can be seen as a generalization of nominations and predications so as to include humans, objects, situations, practices etc. Many boundaries can be constructed: between science and non-science (Gieryn 1983, 1995, 1999), science and society (Kerr et al. 1997; Brown and Michael 2001), basic and applied science (Calvert 2006; Felt et al. 2009), facts and values (Felt et al. 2009), ethical and unethical science (Wainwright et al. 2006), settled and unsettled ethical issues (Firth et al. 2011), public and private (Gutmann and Thompson 2004), “purity and pollution, sanctity and profanation, normalcy and abnormality” (Bloomfield and Vurdubakis 1994: 543), natural and unnatural etc. As these studies demonstrate, for both advocates and critics boundaries are an important rhetorical resource in controversies over new science and technology. In addition, these studies show how scientists in public controversy flexibly construct the boundary between science and society in different contexts.

4.4.2 Subject positioning

The second concept which is frequently employed in discourse analytical studies of science-society interactions is subject positioning. Contrary to modern understandings of individuals as autonomous and unitary selves, subject positioning is based on the
social constructionist premise that the identity of individuals is dynamically formed and constantly reformed in social interaction, particularly in discursive practices. Subject positions are also a more dynamic alternative to the more fixed concept of (social) roles. Identities of people are fluid. There is a multiplicity of self, a variety of different and sometimes even conflicting social categories within discourses that people can use to make sense of themselves and others. Thus, people’s identities are products of prevailing discourses and subjectivity is constituted in these discourses. At the same time, people are also producers of talk. In specific contexts, people can functionally choose from this available multiplicity of subject positions to construct a particular self. In short, people can do identity work. Here, I confine myself to social identities and social selves, since I am particularly interested in how life scientists position themselves and others in public discourse (or accounts thereof). 30 First, I elaborate and illustrate some important distinctions developed in positioning theory. Then, I discuss some examples of subject positioning in discussions over new science and technology I found in STS literature.

Harré and Van Langenhove (1999) define the concept of position as “a metaphorical concept through reference to which a person’s ‘moral’ and personal attributes as a speaker are compendiously collected” (17). During the course of a discussion or conversation, one can variably position oneself or one can be positioned as for example rational or irrational, activist or diplomatic, lay person or expert. In their positioning theory, Harré and Van Langenhove present different modes of positioning. Let me return to the excerpt of the parliamentary debate at the beginning of this chapter to illustrate the most important modes.

The first relevant distinction is between tacit (or unconscious) and intentional (or conscious) positioning. The latter is a form of “strategic interaction” with people having a particular aim in mind. The politician is intentionally positioning Dr. Bino in the parliamentary proceeding on biotechnology. Comparing Dr. Bino pejoratively with a “publicity agent” can be understood as a form of offensive rhetoric (Potter 1996: 107) with the aim of undermining the facticity of Dr. Bino’s representation of GMOs as a choice for sustainability and thus of discounting the benefits of biotechnology as a personal stake.

Secondly, people can be morally positioned. A moral position refers to someone’s more or less institutional or formal role and his or her expected moral behavior. Dr Bino is morally positioned as “independent scientist.” This social category fits within Robert Merton’s ethos of science within which disinterestedness is an important norm (besides communalism, universalism and organized skepticism). The contrast between the moral position of disinterested scientist and the metaphor of publicity agent reinforces the stake Dr. Bino is attributed.

Thirdly, there are positioning of self and other which are mutually constitutive. Positioning is relational: the position of self implies the positioning of the other and vice versa. The additional effect of positioning Dr. Bino as an unreliable scientist positions the Member of Parliament as the one who debunks alleged benefits and protects citizens from an unsafe technology and rain forests from being cut.

Subject positioning has served as a discourse analytic tool in STS literature on social interactions in public deliberation settings in which social issues concerning biomedical and genomics research were discussed. Unfortunately, these studies do not provide much information about identity work of (life) scientists in public deliberation because the participants were citizens (O’Doherty and Davidson 2010) 31 or “interactional experts” (Kerr et al. 2007). 32

Although Motion and Doolin (2007) focus on the autobiographical and reflexive self-positioning, their critical discourse analysis of narrated accounts of life scientists who were confronted with activists provides a better illustration of scientists’ subject positioning (and the shifting between them). Motion and Doolin found how scientists performed identity work in their rhetorical reconstructions by demonstrating a variety of expert as well as social or public subject positions. Scientists presented

30 As Harré and Van Langenhove (1999) note, there are two kinds of identity that can be attributed to people, the self of personal identity and the self as social identity, a compendium of more or less coherent qualities or personae that are “publicly presented in the episodes of interpersonal interaction in the everyday world.” These two selves cannot be separated: “Human beings must display both a personal identity (appear as singularities) and a social identity (appear as instances of types) in order to appear fully as persons” (24).

31 O’Doherty and Davidson found that different subject positions influenced the course of deliberation on the social issues of human tissue biobanks in Canada. Participants’ expert positions (expressing their claims as universally valid) were hardly challenged, as compared to the “hedged, non-universal” claims from patient or cultural/religious subject positions (in their case indigenous Canadians).

32 Kerr et al. found that participants of three public dialogue events (a citizen’s jury, a Café Scientifique and a public meeting), shifted subject positions but their analysis is confined to the subject positions of “expert” and “lay person.” Moreover, their analysis is to a campaigner of an NGO and representatives of patient organizations. Life scientists – or “contributory experts” in terms of Collins and Evans’ (2002) typology – only played a bit part in these deliberative settings.
themselves as the only or the “real” expert who are in the position to exclusively provide “accurate and factual” knowledge to inform the general public, whereas “so-called” experts of NGOs and activist social movements only have “outdated and discredited” knowledge. Moreover, in the situation of public controversy, scientists tend to ascribe themselves attributes typical for scientists such as “rationality” and “control” when confronted with “emotive” and “unreasonable” activists.

The public part of scientists’ identity is meant to legitimize and to promote the social value of their science and to present themselves as the only legitimate spokesperson on behalf of the general public. Scientists construct activists’ naivety by depicting them as too “young […] to have experienced their friends dying of cancer” or depicting their subscribers as “well-off and middle class” (ibid: 75) who are in the luxurious position to spend their time on supporting activist protest against science and technology. In Motion and Doolin’s interpretation, (animal) activists become marginalized as radical protest groups with extreme claims and ideas that find hardly any resonance within society at large. Vice versa, scientists position themselves as the ones talking in the interest of the general public. Scientists find themselves in a “discursive struggle to establish who has the legitimate right to speak for the public, and define and determine what is in the public interest. In essence, both activists and scientists are competing for the same discursive space (ibid: 76”).

Kevin Burchell’s discourse study (2007b) of interviews with crop geneticists supplements Motion and Doolin’s conclusions. Drawing on Gilbert and Mulkay (1984), Burchell reports on the reciprocal process of positioning empiricist selves conveying the legitimacy of claims of scientists and contingent others questioning the legitimacy of claims of other social actors. Scientists tend to portray their own intentions as honorable (e.g. “I got involved in biotechnology for solving the world’s hunger”) and the objectives of others as unethical (e.g. “The Zambian dictator is prepared to let its people starve because an NGO is meddling in the politics of another country and trying to peddle their own ideology”). The discursive dualism between empiricist self and contingent other “can be related to the performative function or social intent of defending or justifying one’s own legitimate beliefs and actions, while at the same time attacking those of others with whom one disagrees” (Burchell 2007b: 160). Four categories of contingent others are derived from the interviews with GM geneticists: in addition to critical “fellow-scientists” who hold an opposite view on the risks and benefits of GM crops, there are also “the media,” “the public” and “NGOs.” The media only have an interest in “selling juicy stories”, NGOs are inclined to increasing membership and donations and the public is ignorant enough to believe their stories (cf. Cook et al. 2004).

Finally, Kitzinger and Williams (2005) analyzed national newspapers and main TV news bulletins in the UK, reporting on the stem cell debate in the UK. Opponents and proponents attempted to claim moral and expert authority on the plausibility of diverse visions of the future (see Section 4.4.3). Proponents of new reproductive technologies framed their (expert) identities as rational and realistic, while positioning opponents variably as old-fashioned or oppositely as science fictionists who overrate the possible dangers of technological innovations.

As described above, in the public debate on cisgenesis participants drew on various nomination and predicational strategies to position their antagonists and themselves for rhetorical aims. What the empirical studies on subject positioning also demonstrate, is how life scientists’ identity work indicates their operating on both sides of the science-society-boundary, as described in the previous section on boundary work. This also holds for rhetorical constructions of the future, as I discuss in the next subsection.

4.4.3 Expectations

Expectations are inextricably part of contemporary Western knowledge societies in which scientific research is stimulated for its return on investment, be it economically or socially. Moreover, the recent trend to move public engagement upstream stimulating “an accountable process of debate over […] expectations […] shaping the innovation trajectory” (Wynne 2006: 216) draws attention to the future (see Chapters 1 and 2). Researchers in the sociology of expectations have shifted the “analytical angle from looking into the future to looking at the future” (Brown et al. 2000: 4). Their main research object, therefore, is not how to predict the future as accurately as possible, but the performative force of representations of the future.35

35 Research in the dynamics of expectations indicates the variability of constructions of the future. Expectations vary over time (temporal variability). They are variably distributed over different social groups with varying distance to scientific research (socio-spatial variability). Expectations vary depending on the degree of novelty of the scientific and technological innovation (“prospecting retrospects”) and memories of past expectations are modified and rationalized in order to forget complexity and contingency (“revisionist histories and retrospecting prospects”, Brown and Michael 2003). Douglas (2005) has demonstrated how setbacks are justified rhetorically.

For a short discussion of empiricist and contingent repertoire, see footnote 19 of this chapter.

These are paraphrased quotations from Burchell 2007b.
Expectations are projections of the future to mobilize the present. Or, as Francis Collins (one of the pioneers of the Human Genome Project) quotes from Saint-Exupéry’s *The Little Prince*: “As for the future, your task is not to foresee it, but to enable it” (Collins 2010: 278).

Expectations, promises, and visions are constructed to be persuasive for a specific audience (Lucivero et al. 2011). To put it in terms of strategic maneuvering, representations of the future constitute the supply for an audience demand. This audience consists of various non-scientific actors (patient organizations, regulators, funding agencies, consumers, investors etc.) in innovation networks necessary to marshal (financial) resources that enable the fabrication of the future (Borup et al. 2006). Expectations are the flexibly interpretable binding agent of heterogeneous groups to align research agendas and collective action. Particularly scientists “wearing the entrepreneurial hat” can make strong claims about the promise of their innovation (Brown and Michael 2003: 13). The function of expectations for a broader audience (the general public) is to “legitimize, justify, back [its users’] arguments, give reasons in general” (Van Lente 1993: 187). Indeed, as the case of cisgenesis in the Netherlands demonstrates, plant scientists project several expected benefits into the future: increased crop yield, decrease of herbicide use for example.

Brown (2003) describes two key features of the dynamics of expectations. Firstly, a straightforward story line is enunciated, a normative vision of the future, in which a route is mapped out how to get there. This means that futures are imagined and that imagination is a social practice that is part and parcel in the production of science and technology (Fujimura 2003). Thus, such sociotechnical imaginaries (Kim and Jasanoff 2009) or technoscientific imaginaries (Kearnes and MacNaghten 2006) are the (provisional) results of a process of co-production defined in Chapter 2 since these imaginaries are “socially and culturally embedded assumptions that unwittingly shape future worlds and possibilities through technoscientific practice and innovation” (293)."

Secondly, promises are almost always exaggerated at the risk of generating a straightforward story line is enunciated, a normative vision of the future, in which a route is mapped out how to get there. This means that futures are imagined and that imagination is a social practice that is part and parcel in the production of science and technology (Fujimura 2003). Thus, such sociotechnical imaginaries (Kim and Jasanoff 2009) or technoscientific imaginaries (Kearnes and MacNaghten 2006) are the (provisional) results of a process of co-production defined in Chapter 2 since these imaginaries are “socially and culturally embedded assumptions that unwittingly shape future worlds and possibilities through technoscientific practice and innovation” (293)."

Secondly, promises are almost always exaggerated at the risk of generating a highly polarized and unproductive public debate on ethics. Therefore, futures are often contested. Before discussing a few empirical studies, I first elaborate Mike Michael’s (2000) rhetorical parameters of future construction, illustrated with expectations from the cisgenesis debate.

Michael (2000) explores the rhetorical function of future visions. Drawing on Billig’s rhetorical psychology (1996), Michael asserts that attitudes of people in general and attitudes towards the future in particular are to be understood as arguments against counter-claims and -positions. “[W]hen someone argues that a future is ‘distant’, there is a tacit argument against it being nearby. What is such an argument performing rhetorically?” (Michael 2000: 24). Michael identifies a (non-exhaustive) list of five dichotomous parameters by which futures are discursively constructed and provides an interpretation of their function. These parameters can be considered predicalational strategies to characterize futures for rhetorical aims.

Firstly, constructions of the future will represent a certain distance: how distant is the future from the present? Futures can be depicted as distal or proximal. Rhetorically, it serves several functions, Michael argues. “It can urge immediate action or measured consideration, it can be used to accuse actors of tactical procrastination or opportunistic band-wagoning, and it can serve in the judgment of relative efficiency or risk” (ibid: 25). In the debate on cisgenesis, proponents were implicitly accused of not taking the distant future into account: “As minister [of agriculture] but certainly as an ethical and honest person, one has the duty and the responsibility [...] to take decisions which respect and guarantee future generations, the health of citizens and the protection and [bio]diversity of the environment not only in the short term, but also in the long term” (Letter Citizens Initiative, June 8 2009).

As this example shows, there always is a particular subject presupposed in future situations, be it an individual or a group of people who experience the future. Subject is the second parameter that Michael discerns. The critical citizens made an appeal to “future generations,” whereas advocates of cisgenesis constructed futures in which collective subjects as beneficiaries are premised: in some cases a country (to master “global warming, population growth, environmental stresses, diminishing land resources associated with increased demand for quality food [...] a second green revolution is needed in India” [Jacobsen and Nataraja 2008: 1365]), and sometimes even the entire future world population (“9 billion people will have the right to balanced food. [...] New technologies can make an important contribution” [director of NGO Solidaridad, TK 27 428 nr. 145: 20]). These individual and collective subject
positions have primarily the rhetorical effect of identification but they also evoke a sense of responsibility towards these subjects.

Thirdly, Michael discerns between substantive and instrumental rationality. The latter form of rationality refers to orientations towards means in which present ends are projected onto the future. In that sense, the future is a continuation of the present. By contrast, substantive representations of the future are ends-oriented. “These accounts can be more or less utopian explorations of possible futures in which […] ‘the good life’ is examined (Michael 2000: 28).” Whereas instrumentalists can rhetorically claim “realism” (as opposed to “dreaming”), “utopians” in their turn can impute “poverty of imagination” to those oriented towards the means. The debate on cisgenesis illustrates both kinds of rationalities. Opponents of GMOs, who embrace organic farming, for example, stress that cisgenesis is merely an instrument for “symptom treatment,” whilst the real problem is lost out of sight: the “big monocultures” in intensive agricultural crop breeding (Versluis 2012: 20). Their critics on the other hand, claim that biological farming is not realistic. “The only alternative is more hunger” (De Vré, Sep 3 2012).

A fourth parameter is valency. Futures are represented as good or bad, desirable or undesirable. Thus, valency often plays an important role in pragmatic argumentation (see 3.4.1) where an action is justified (or refuted) by indicating its projected positive (or negative) future consequences. Rhetorically, advocates of certain policies or technologies tend to stress the good (higher yield, less environmental damage) and to downplay or even keep silent about the bad (deforestation, health risks) thus selecting the topics for discussion. Opponents on the other hand strategically maneuver in the opposite direction. Closely related to the parameter of valency, therefore, is modality (or degree of certainty) with which the positive or negative future is constructed. Intensifying and mitigating strategies are utilized here to exaggerate or understate future effects. The member of parliament depicts deforestation as an almost certain negative consequence of GMOs, a fact the minister of agriculture is ignorant of.

Michael thus provides a useful inventory of parameters, which amount to a set of devices used to construct futures for rhetorical purposes. Only a few empirical studies demonstrate how constructions of the future are utilized as a rhetorical resource in public debate (be it without any reference to Michael’s parameters). Parry (2009) for instance shows how scientists utilized expectations as a means to reframe the ethical debate over stem cells in the UK. The British anti-stem cell lobby almost succeeded in mobilizing public opinion to ban embryonic stem cell research (Parry 2003; in the US this anti-lobby was successful). This religiously motivated lobby reframed the “scientificized” framing of human embryos as “just a bunch of cells,” stressing the ethical status of embryos as unborn life worthy of protection. To settle the issue, some politicians suggested that scientists should confine their research to adult stem cell and cut off the path of research on embryonic stem cells. In their defense, stem cell researchers reframed the discussion “in terms of scientific progress” (100; cf. Mulkay 1993) to keep options for embryonic stem cell research open.38 Rather than blocking embryonic stem cell research because of ethical considerations, scientists argued in favor of developing both research trajectories. In the long run medical therapy will more likely and solely benefit from research on embryonic human cell tissue. Here the parameters of distance and modality do rhetorical work to indicate the usefulness of embryonic stem cells. As in the case of boundary work and subject positioning, stem cell researchers transgress the discursive boundary between science (scientific facts as settled knowledge within the stem cell research community) and society (expected production of scientific knowledge reflecting social benefits and values).

Similarly, in their analysis of the public controversy over transgenic cows in New Zealand, Bloomfield and Doolin (2010) argue that in the “struggle to represent the imagined consequences [and benefits] of technoscientific innovation” the expert versus non-expert boundary turns out to be efficacious. The imaginaries of biotechnology researchers (controlling lactose allergy, finding new therapies for multiple sclerosis, creating new businesses) were deemed more credible, plausible and legitimate than those of non-expert NGO opponents (e.g. the social movement of Mothers Against Genetic Engineering in Food and the Environment). Despite the inherent uncertainty and skepticism among fellow-scientists, the imaginaries of opponents had little influence on

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38 Mulkay writes: “(b)y their very nature, future-claims about the course of scientific research are extrapolations that go beyond the existing evidence. They have to operate by means of some kind of analogue with other areas of science and/or by reference to some implicit model of scientific progress (Mulkay, 1993: 724-725).”
the regulatory process of the research project on transgenic cows.  

Boundary work, subject positioning and representations of the future are important analytical concepts from discourse analysis for studying strategic maneuvering in the context of public disputes over science and technology. Nevertheless, I want to address a few methodological issues. Firstly, it is important to note that almost all these studies have been conducted within the context of public controversy on NEST where emotions and entrenched are dominant. Because the material was drawn from diverse empirical sources (interviews, press releases, news paper articles), from different countries, and from different controversies on NEST, translations of these findings into face-to-face upstream public deliberation deserve attention.

Secondly, many of these (critical discourse analytical) studies reflect an asymmetrical focus on discursive patterns of scientists without taking the strategic maneuvering of other social actors into account. This may produce the effect of reifying the social category of “the” scientist as “socially unreflexive” (Cook et al. 2004). This effect is increased when authors (e.g. Kerr et al. 1997; Felt et al. 2009) draw normative conclusions in their studies about science’s hegemonic exercise of power, researchers’ deflecting of (social) responsibilities and the wrongly expansion of their expertise. In my view, such a moralistic approach is empirically problematic and it needs to be justified. It is tacitly assumed that the effect of these strategic maneuvers can be objectified implying that it is the same for the multiplicity of audiences (including the analyst). It is important, however, that the concept of effect is not identified with the concept of aim (or the social analyst’s construction thereof): the rhetorical strategy may not be effective. I think additional ethnographic material is needed to investigate effects and aims. How do participants perceive the effectiveness of discussants? What is it that scientists aim for?

4.5 Conclusions

The standard pragma-dialectical argumentation theory, discussed in Chapter 3 does not take the rhetorical dimension of argumentation into account. People who are involved in a discussion are also – and perhaps first and foremost – aiming at effectiveness, at having their standpoint accepted. In this chapter, I have discussed the concept of strategic maneuvering that was introduced to include the rhetorical dimension of effectiveness into the analysis of discussions. Strategic maneuvers in the pragma-dialectical meaning are an inherent feature of every discussion. Therefore, strategic maneuvering is not detrimental to discussions and deliberations per se so it does not necessarily need to be minimized. However, it can derail when the rules for a critical discussion are violated. I will return to the problem of how to establish derailments of strategic maneuvering below.

The concept of strategic maneuvering draws attention, first, to how discussants make a selection from the topoi (available issues or argument schemes) to defend their claims (topical selection). Proponents of cisgenesis stress the desirable (expected) consequences of cisgenic crops without explicitly referring to possible side-effects. Furthermore, these crops’ contribution to sustainable agriculture is selected as the main benefits of this new technology. Thus, proponents construct a normative vision of a good future which certain publics in particular (or audiences) or the public in general perceive as plausible (audience demand). Thirdly, discussants choose a suitable presentation for their standpoints and arguments (presentational devices) to have their standpoint accepted.

Although the notion of strategic maneuvering allows for a more refined (rhetorical) analysis of argumentative discourse, it could benefit from a discourse analytic perspective on presentational devices. Particularly the main idea of discourse analysis (DA) of language users constructing different versions of reality in different contexts for rhetorical purposes makes DA an interesting empirical field for the study of strategic maneuvering. The Discourse Historical Approach (DHA) to critical discourse analysis nicely illustrates how various discursive strategies serve rhetorical functions in social interaction.

The aim of this chapter was to empirically explore strategic maneuvering in the context of public discussions on new and emerging science and technology beyond the discursive strategy of argumentation as discussed in Chapter 3. Using DHA’s theoretical elaboration of various discursive strategies – nomination strategies (categorizing objects and people), predicational strategies (characterizing them through predicates), footing (acting as author, animator or principal) and intensifying and mitigation strategies – I have investigated discursive practices as described in STS literature that can be expected in public controversies on NEST. In order to end up in an advantageous position in the discussion, i.e. to be effective in public deliberations in the discursive struggle over controversial science and technology, proponents and opponents draw on a repertoire of strategic maneuvers: boundary work or the conceptual demarcations made to categorize people (e.g. as publicity

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[39] In his typical critical way, Wynne writes: “Indeed, these claimed benefits are often asserted by scientists to be as much a part of the factual domain over which science claims sovereignty as are questions of risk” (Wynne 2003: 222).
agent, scientist, lay person or activist), objects (e.g. crops as transgenic, cisgenic or traditionally bred), practices (e.g. as basic or applied scientific research) and even social realms (e.g. as science or society); subject positioning or the nomination and predicational strategies to construct public identities of selves and others (e.g. as fundamentalist, unrealistic or myopic); and expectations or predicational strategies to represent futures (e.g. as distant, good, uncertain and rumbling).

The question, however, is when do these strategic maneuvers derail? When does the eagerness to be effective gain the upper hand at the expense of being reasonable? When do the strategic maneuvers that I have identified as frequently recurring in NEST-ethical discussions conflict with the norms of the model of critical discussion? As Van Eemeren stresses, fallacies, as derailments of strategic maneuvers often, pass unnoticed since these maneuvers “manifest themselves as strategic maneuvers that seem to comply with the critical discussion rules but in fact do not” (Van Eemeren 2010: 199). Moreover the boundaries between sound and fallacious strategic maneuvering are hard to detect since judgments on the soundness of argumentative discourse are mostly contextual judgments. The general, context-independent rules of critical discussion alone are a necessary but in many cases not sufficient conditions for determining fallacies. More specific, context-dependent criteria are needed in those cases that Van Eemeren derives from a typology of different communicative activity types (adjudication, mediation, deliberation and negotiation) each of which provide a macro-context with a particular set of more or less institutional preconditions in which the argumentation takes place. Unfortunately, Van Eemeren’s definition of the institutionalized conventions of deliberation remain rudimentary, so that these are not very helpful in identifying the maneuvers, that are not clear-cut fallacies when applying the norms of critical discussion. Unsatisfactory as it is, many shades of grey exist and it chiefly depends on the context whether speech acts are fallacious or not and many evaluations are open for discussion.

For instance, the claim of plant researchers that the boundary between trans- and cisgenic crops is “fundamental” and scientifically established can be considered as a perfectly legitimate appeal to authority: their proposition is acceptable because they are considered to be experts in the field of plant genetics. Nevertheless, since there is considerable controversy within academia as well, the certainty with which they make their claim can also be considered as an argumentum ad verecundiam, a fallacious appeal to scientific authority wrongfully referring to scientific facts. The same goes for claiming desirable consequences of a new technological innovation which can only be concluded at hindsight.

Boundary work is another example. As I have argued, any definition of reality contains demarcations and categorizations and any of these do rhetorical work. Positioning opponents of GMOs as “activists” perhaps is acceptable, but calling them members of a “fundamentalist organization” tends to be an argumentum ad hominem, a violation of the freedom rule. Equally difficult is the more subtle moral subject positioning of Dr. Bino as a scientist allegedly disguised as publicity agent who does not quite bother with the norm of disinterestedness.

Generally, these strategic maneuvers as various descriptions of reality (be it demarcations, subject positions or futures) may be constructed on the one hand to resist undermining by others (defensive rhetoric: e.g. the fundamental boundary between transgenic and cisgenic plants) or on the other to undermine alternative descriptions (offensive rhetoric: e.g. discrediting Dr. Bino’s claims on the desirable benefits of GMOs by positioning him as an interested party; Potter 1996). These discursive strategies need attention in the analysis of argumentative discourse as well as in the work of facilitators of public deliberation, firstly, because they might serve the purpose of closing down a critical discussion in the confrontation stage: claims of scientists who have a (financial) stake or people who belong to an NGOs that legitimizes violence need not be discussed at all. Secondly, because they “enter as premises into reasoning about what we should do” (Fairclough and Fairclough 2012: 86-87). As argued in Chapter 3, an important task of facilitators is to open up the propositional content of these premises for discussion. As I will demonstrate in the next chapter, representations of the future (particularly the feasibility of new technologies) turned out to be effective strategic maneuvers. Unfortunately, these maneuvers closed down the discussion at such an early stage that the moral desirability of certain futures was not critically examined.
deliberative drama after Buikhuisen...
5.1 Introduction

In the late 1970s and early 1980s a fierce (academic) controversy illustrated the taboo of predisposition to criminal behavior in the Netherlands. The controversy arose when Wouter Buikhuisen was appointed professor of criminology at the University of Leiden.\(^1\) Buikhuisen had suggested that his new research agenda was aimed at studying delinquency “in biosocial perspective,” to also include biological factors of criminal behavior. His research program was heavily criticized, within the academic community as well as in popular press. In terms of reasonableness, the discussion reached rock bottom in the leftist weekly *Vrij Nederland*, when columnist Piet Grijs strung *argumenta ad hominem* together (violating the freedom rule; see Section 3.3.2 and Table 3.1). Buikhuisen was called “a bald, impotent career scientist,” “stupid charlatan” and “the assembly point of Dutch fascism” (Cohen 2005). Worse still, others did not flinch from using *argumenta ad baculum* (argument to the cudgel): Buikhuisen’s inaugural lecture was violently disturbed and he and his family were threatened. In the end, his institute was shut down and in 1989 Buikhuisen retired, frustrated.

This controversy has become part of Dutch collective memory and it has deeply influenced the research field of criminology in the Netherlands.\(^2\) “[I]t is still impossible

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1. There is to my knowledge, no systematic historical study of this controversy. In an interview in 2009 Buikhuisen looked back at the affair: “I was terribly treated. It is almost indescribable. I was threatened with death.” (Bongers 2009). Others, who condemn these threats, argue however that Buikhuisen himself “had given cause for protest” and “current researchers on biological factors of criminal behavior seem to have, more than Buikhuisen, an eye for the contribution of other scientific disciplines” (Anon. 2000: 5). Meanwhile, Buikhuisen has been rehabilitated but not without public and political debate.

2. The media contribute to the “re-enactment” of the Buikhuisen affair (see De Haan 2009).
to bring up the relation between criminology and biology without referring to the [Buikhuisen] issue that had upset his plan for biosocial research [...] and that had lead to the early end of his career” (Anon. 2006: 6). Nevertheless, internationally “knowledge about genetics and gene environment interactions” and criminality is increasing and the “expectation is that we are only at the beginning” (ibid: 5).

As a result of these high expectations and the historical context of the Buikhuisen affair, I organized a series of three public dialogues on behavioral genomics, in close collaboration with the CSG Centre for Society and the Life Sciences (CSG) in 2008. Behavioral genomics is a field of research that tries to locate and identify specific genes or groups of genes, associated with behavioral traits (e.g. anti-social behavior, aggression, intelligence and sexual orientation) in order to understand the contribution of these genes to human behavior and to understand the interaction between genes and environment (prenatal conditions, upbringing, nutrition etc.; cf. Plomin et al. 2003). The unraveling of the Human Genome has given a new impetus to the scientific research on the biology of human behavior.

Ethicists had stressed the importance to anticipate the ethical, legal and social implications of this “complicated area of research in genetics, often controversial, occasionally explosive and with the capacity to ignite dangerous passions” (Nuffield Council on Bioethics 2002: 5) and the need for a public conversation to discuss these issues (Paren’s 2004; Paren’s et al. 2006). As a result, leading life scientists in the Dutch field of behavioral genomics were invited to the LUX Theater to engage into a dialogue with other (scientific) experts and various (invited) members of the public, “groupings of actors who are affected by the actions or events but do not have direct influence on them” (Marres 2005: 48; see Section 2.5.2). In a series of public deliberations, entitled *The Preprogrammed Human*, “life scientists and publics will collectively explore questions such as: what does behavioral genomics research yield, and for whom? What social issues does this science raise?” as the promotional text read.

These questions were to be discussed in three separate public dialogues, each of which revolved around one particular human behavioral trait or psychopathology: Attention Deficit Hyperactivity Disorder (ADHD), delinquency (in fact: psychopathologies related to delinquency, e.g. anti-social behavior), and Autism Spectrum Disorder (ASD).

Differently than expected, controversy on these issues hardly arose. Only the value of genetic tests for people with ASD was fiercely contested at the LUX. As I will demonstrate in this chapter, these discussions were hardly critical discussions on the moral desirability of the developments within behavioral genomics. Using the pragma-dialectical argumentation theory (Chapters 3 and 4), argumentative discourse is reconstructed, analyzed and evaluated in terms of strategic maneuvering. The first set of questions I address in this Chapter is: How did participants – both life scientists and publics – strategically maneuver in upstream public deliberation on behavioral genomics? What effect did these maneuvers have on the quality of these deliberations? And how could this quality be improved?

To address these questions, I present a reconstruction of the argumentative discourse of these public deliberations based on the texts of the discussions that were audio-visually recorded and transcribed *ad verbatim*. Since an analysis of argumentative discourse “is pragmatic in the sense that the discourse is viewed as essentially a contextualized exchange of speech acts” (Van Eemeren 2010: 17), the context is a valuable source for understanding and interpreting strategic maneuvers in discussions.4

Pragma-dialectics, however, only applies to first order conditions, i.e. the procedural rules to be followed to have a reasonable discussion (see Section 3.2.2). As I have argued in Chapters 2 and 3, the setting also determines the quality of the deliberation. I have elaborated Maarten Hajer’s dramaturgy of public deliberation as an instrument to analyze (Section 2.5 and 3.5) the performative effects of the

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3 We defined the public as people who might (in the future) be affected by these developments: patients diagnosed with behavioral disorders and their family; ex-convicts; (health care) professionals, such as general practitioners, psychotherapists, institution directors, psychiatrists; and people working in special education. In order to interest the public, a promotional text was distributed on digital and social media.

4 Several levels of context can be discerned. Here, I particularly mention the micro-context and the intertextual context. The former refers to those parts of the same discussion that support the analyst’s interpretation of the primary argumentative text. The transcript of the deliberations is the main empirical source, but interviews with participating life scientists after the events at the LUX were additionally used to clarify the context during the discussions. Occasionally, the video recordings turned out to be helpful in case of doubt. The intertextual context refers to “other texts or speech events with which the discourse passage or the text of speech event as a whole is somehow connected” (Van Eemeren 2010: 18). So, texts about the public deliberation on ADHD, delinquency and ASD in general or on behavioral genomics in particular as well as texts directly or indirectly referred to during the discussions were also used for the reconstruction. For example, during the deliberation on ADHD, a psychotherapist alluded to a book that had just been published. This book, and the media attention it received, was included in the analysis (see Section 5.2).
setting of the discussions at the LUX.³ “We should not merely focus on the type of arguments that are raised but include the conditions (physical, technical, theatrical) as well” (Hajer 2005: 625). Hajer introduced the concepts of scripting, staging and setting as a framework to analyze “how the design affects what is said, what can be said, and what can be said with influence” (ibid: 624). The second question of this chapter therefore reads: How does the dramaturgy of these upstream public dialogues scripted as public inquiries into the ethical and social issues concerning behavioral genomics, influence the performance of participants?

For the reconstruction of the dramaturgy of the public deliberations at the LUX, I utilize the transcripts of preparatory interviews with participating life scientists; draft documents for internal use containing concept versions of script, staging and setting; the briefings to prepare all the active (i.e. invited) participants;⁶ promotional texts; e-mail correspondence; journalistic accounts of the event published on the website; and questionnaires. Also interviews with participating life scientists to reflect on the dialogue events afterwards were used as an empirical source. Each source that supports observations is mentioned between parentheses. For example, the excerpt “the path of bio-criminology is disastrous” (Discussion) comes from the transcript of the deliberation. The interview with life scientists before and after the public dialogue will be referred to as (Interview 1) and (Interview 2) respectively. For reasons of anonymity, the names of the main characters in this analysis are fictitious.

In the next three sections, I present detailed reconstructions of both the organizational processes (the dramaturgical work behind the scenes of) and of the deliberations in terms of strategic maneuvering of each episode of The Preprogrammed Human (the discursive performance on stage). The deliberation on behavioral genomics and ADHD is analyzed in Section 5.2, the public dialogue on delinquency and ASD are presented in Section 5.3 and Section 5.4 respectively. For each case study, I first provide the reconstruction of the dramaturgical process and then I reconstruct the discursive events on stage. The analyses of the three deliberations will be presented chronologically to demonstrate how the events in one deliberation determined organizational considerations and decisions in the next.

In Section 5.5 I draw some conclusions about how appeals to scientific authority particularly with regard to the technological feasibility of future visions proved effective strategic maneuvers in the public deliberations at the LUX. Furthermore I present two strategies of critically assessing future expectations.

5.2 Discussing the effect of biological research on the medicalization of ADHD

On a cool Monday evening in June, the debating centre at the LUX in Nijmegen was crowded. The first episode of The Preprogrammed Human was sold out within days. The genetics of ADHD had mobilized a public of eighty patients, parents, general practitioners, psychologists and other professionals working in the field of Attention Deficit Hyperactivity Disorder (ADHD) as well as members of a more general public (Questionnaires and Discussion).

Perhaps the considerable media attention that a book called “The depression-epidemic” received in the week prior to the public deliberation at the LUX contributed to this high turn-out. The book was brought up during the public discussion at the LUX (see below). In some interviews in Dutch popular and medical press, the author of the book (Trudy Dehue) had drawn a parallel between ADHD and the increasing number of people actively working on their depression – using medication or doing self-help therapies (Maassen 2008; Slob 2008; Vanheste 2008).⁷ In her constructivist criticism (cf. Press 2006)⁸ Dehue argues that human behavior is increasingly put under the medical purview which turns more human behavior into disorders (denoted with labels such as ADHD as a set of symptoms): individual medical problems with material causes (genes, the brain) and solutions (mainly psychological treatments).

⁵ Van Eemeren defines these external factors as third order conditions for a critical discussion that “relate to the social circumstances in which the discussion takes place and pertain, for instance, to the power or authority relationships between the participants and to special features of the situation in which the discussion takes place (Van Eemeren and Grootendorst 2004: 189).”

⁶ In the week preceding the event, participants received a document which contained the purpose, the main characters in the play and the main questions.

⁷ In “The Depression-Epidemic”, Dehue attempts to provide a sociological explanation for why so many people in the Netherlands (and elsewhere in the Western societies) are actively working on what they call “depression,” by taking medication or doing all kinds of therapies and (alternative) treatments.

⁸ As Nancy Press (2006) argues, psychiatric disorders, such as ADHD, as classifications in the Diagnostic and Statistical Manual of Mental Disorders (DSM) are social facts, names denoting a set of criteria to determine when behavioral traits are deemed deviant. However, these disorders are wrongly represented as labels indicating medical conditions that really exist and that are the cause of the disorder.
behind the scenes of... life scientists on stage

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medication). “This biological perspective distracts the attention from circumstances [people do not necessarily have control over] as the cause [for their emotions] and [this perspective] makes us not only think of recovery in terms of own responsibility but also in terms of self-improvement” (Maassen 2008: 895).9 Dehue’s conclusion is that no biological or genetic underpinnings for these behavioral traits have been found yet and even when so, “this does not automatically mean that we are dealing with a disorder” (ibid: 894). The book sparked a controversy within the biological psychiatry community.10

John Lush, a professor of child psychiatry at a Dutch academic hospital, who had accepted our invitation to engage in dialogue with the public, had also referred to Dehue’s much discussed book during the preparatory interview. Lush, a well-known ADHD expert in the Netherlands who had just received a large research fund to investigate ADHD children, using both DNA-analysis combined with neuro-imaging techniques, expected “much discussion about ADHD as a medical condition” (Interview 1) because of a few recent articles “I assume you have read in the weekend news papers about a woman who has written a book about depression [i.e. Dehue]” (ibid) in which the biological explanation of behavioral traits was criticized.

In the first of three acts of the script of this public deliberation, the public would be offered the opportunity to articulate their “views, expectations, hopes, concerns, fears” (Discussion). Thus, an active participation of the present public was scripted. To support the staging without any distinction between active players and a passive audience, the physical setting of the LUX resembled an XLfocus group arrangement, with the invited scientist among the public.

In the second act, Lush would first respond to the contributions of the public and next, be interviewed to provide his views on the scientific state-of-the-art of behavioral genomics research on ADHD. The interview would be concluded with Lush’ addressing the main question: what does his research on the biology of ADHD yield for society? This question was intended to leave enough room for both life scientists to explain the public value of their work as well as to invite the participants to articulate and critically investigate ethical and social issues that behavioral genomics research can raise. In the third act, the floor would be opened for discussion to deliberate the issues articulated in the first round. I, as the facilitator, would utilize an interrogative question technique aimed at understanding; summarize statements; look for differences of opinions to resolve; watch the agenda and keep time.

Although I had scripted the event as public deliberation and even though I had expected controversy because of the attention of Dehue’s book, the issue of behavioral genomics was not heatedly discussed at the LUX, an observation that was subscribed to in the questionnaires. “I can still recall that Dr. Buijhuisen was victimized because he dared to suggest a link between genetic disposition and criminal behavior. Apparently, the social climate has changed so that now it is not an issue anymore,” a male psychiatry nurse described his experiences after participating in the public discussion on ADHD (Questionnaires).

A relatively large portion of the public had no intention to critically engage with science, which other people (mostly professionals in health care) regretted. Instead, these people restaged the event into an information session – or “refresher course” as someone wrote in the questionnaires – to amass knowledge from the ADHD expert Lush (Questionnaires public).11 Apparently, most parents and patients had come to the LUX for information, either for a better (self-)understanding or for empowerment – “Knowledge is power” (Discussion) – to receive the necessary (health) care for their children that was claimed to be withheld from them. Others, working professionally with ADHD, expressed their expectations (or rather hopes) about the desired outcomes of behavioral genetics research, reflecting their needs: a solution for controversial drugs (esp. Ritalin) as medical treatment of ADHD or the hope for early diagnostics since “children [with ADHD] become older and older as they come to our school, when problems have already mounted up” (Discussion) as

9 In later work Dehue (2009) claims, that medical science is mainly responsible for putting human behavior under the medical purview and for the “skyrocketing” diagnose of ADHD and intake of drugs, even with children younger than ten years of age. She identifies two disadvantages of this medicalization of ADHD. First, people might suffer because “they are not allowed to be like they are” and second, the focus of care and treatment might wrongfully on the individual patient instead of social conditions, such as “deprived neighborhoods, poor working conditions, overfull schools” (95).

10 See for example Van der Does (2009) and Dehue (2010) for her response to the contributions to the public debate.

11 As one of the questionnaires read: “In the audience, there were some people who are diagnosed with or have to deal with ADHD. I understand that they want to know all there is to know about ADHD and [that they] want to be informed about most recent developments, but the consequence was that the discussion looked like an open information evening of the prevention department of a mental health care organization” (Questionnaires ADHD).
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a health care professional in special education said.

People who actually were interested in a discussion, however, came to the LUX for consumption rather than participation (“I am more of a person who sits back instead of joining the debate,” commented a male professional in youth care in his fifties; questionnaire) or did not feel comfortable being involved in a discussion as an active participant (“A considerable amount of people will experience the idea to be addressed any time as unpleasant,” male psychologist in his thirties; questionnaire).

As a facilitator I attempted to restage the discussion into a public discussion again: “These are all positive expectations. Are there any people who think that genetics research could contribute to the other [negative] side as well?” (Discussion). It was only after this intervention, that some criticisms were expressed but no serious discussion ensued. In this analysis of argumentative discourse, I focus on the resolution of differences of opinion on the issue of medicalization that some professionals raised.

GENERAL PRACTITIONER: “I can see the advantages of this [research], [...][b]ut there is a side effect*, too. [...] I am curious about [...] what consequences we, as physicians, parents, social workers ourselves will attach to this [development].”

FACILITATOR: “Do you think that the expectations are too high?”

GENERAL PRACTITIONER: “Yes. That is part of my concern. To look at the whole social system has, I think, more added value than such a gene determination [alone] [...]. I would not want our broad systems approach to be substituted with this [gene determination].”

[...]

PSYCHOTHERAPIST: “I think it is great that science provides us with many new insights. At the same time, there lies the big danger, too. We live in a medical age in which a lot of importance is attached to scientific understanding. [...] If we adopt a medical gaze, it does not mean that it is the truth. A critical attitude towards this [is needed]. What does this genetic knowledge mean exactly? [...] There is this book that has just been published with the same purport [...]. That woman [Trudy Dehue] talks about a ‘ban on cautiousness.’ It would be a pity really if this scientific development would decrease our cautiousness [...]. If we stop looking critically at who a person is in his context and system, just as that man [the general practitioner] said. [...] As a psychotherapist I sometimes end up in a row when I refuse to put a label on [a patient]. [...] This label determines his whole identity and that is the big problem.”

[excerpt 5.1]

Here, the general practitioner and the psychotherapist use pragmatic argumentation to express their concern about “the medical gaze” as a negative consequence (“side-effect”) of behavioral genomics research. In his (cautiously) constructed future, the general practitioner is “curious” how advancing science could contribute to the medical purview and its accompanying reductionist perspective on people’s behavior. The remarks of the psychotherapist add to the issue of medicalization. As his short anecdote from his professional work demonstrates (explicating his subject position), the psychotherapist does not always agree with the people in his consulting room who frame their own behavior or that of their children as a medical condition. The label ADHD can have stigmatizing consequences, too, he suggests. Referring to the prominent motto of the “ban on cautiousness” in Dehue’s The depression-epidemic, he hints at a particular deprivation (“it would be a pity really”) due to this reductionist medical framing on human behavior. As Dehue writes, cautious people are “deprived of” their worrying (Dehue 2008: 254) since antidepressants are marketed as a remedy against worrying. From this intertextual context the psychotherapist can be said to suggest that remedying ADHD with medication such as Ritalin, deprives people of something valuable, too. As another professional expressed it at the LUX: “Let us consider ADHD as a chance. Someone with ADHD has by definition a lot of talents” (transcript).

How did Lush respond to these expectations? He did not directly respond to the negative side-effect of medicalization:

FACILITATOR: “You have heard many voices, views and opinions. What are your thoughts?”

LUSH: “I think that if one is not involved in the research, it is hard to estimate the value of genetics.”

[...]

FACILITATOR: “To what extent do the questions and remarks of the public [...].”

LUSH: “That is absolutely so.”

[excerpt 5.2]

Here, Lush performs boundary work (see Section 4.4.1). He demarcates between insiders – researchers in the field of behavioral genomics – and outsiders not involved in the research – the public. Lush does not explicitly claim expertise about the future. But he infers to a public ignorance even though the minor premise and the conclusion
of his modus ponens argument remain unexpressed.\textsuperscript{12} Outsiders, the public at the LUX, according to this argument, do not have knowledge or expertise of the (future) social benefits or the “value of behavioral genetics” (Discussion). That Lush’s remark also refers to the criticisms of the two health care professionals, was confirmed in the interview after the dialogue event: “[…] if you do not know how it works in genetics, if you are not well-informed, you can of course invent all kinds of scenarios yourself. […] [T]here are of course people who think that it [behavioral genomics research] has many consequences […] that they stigmatize people with it” (Interview 2). The expectation that more genomics research will also lead to more medicalization and stigmatization is pictured as originating from public ignorance and imagination which can be considered as an argumentum ad hominem and hence a violation of the freedom rule (see Section 3.2.2). So Lush’s strategic maneuvering derails.

Lush does not address the suggested relationship between medical science, psychiatry and medicalization. This explains why the general practitioner returned to the issue again in the discussion round, rephrasing the same concerns how the advancing knowledge in behavioral genetics might “affect the society at large, medical practice and schools” (transcript). I asked Lush to respond:

FACILITATOR: Mr. Lush, how would you respond to that? The idea that genetics contributes to the possibility of labeling too much.

LUSH: Of course, I am sensitive to the fact that scientists can collect information and that this knowledge can be used by others differently.

FACILITATOR: Who are these other people?

LUSH: That could be politicians. […] I can imagine […] that malicious insurance companies could say: “Look, if you have ADHD and you have a gene that proves you have a bad prognosis […] then we are going to look differently at [medical] treatment. Perhaps we have to invest more.” But it could also lead to nihilism […] I do not say this is a legitimate response. Statistically, I think it is nonsense but I think that we as a society – and for a moment I do not speak as a physician – have to face the possible risks that are attached to this knowledge.”

[excerpt 5.3]

In his response, Lush makes – again – a distinction. Here between the production of scientific knowledge on the one hand, and the use (or misuse) of this knowledge by other social actors (such as malicious insurance companies) on the other. First, this boundary allows Lush to acknowledge behavioral genomics information as risky (as the general practitioner indicated) while preserving the integrity of scientific researchers. Second, the subject positioning (see Section 4.4.2) of Lush – switching from physician to fellow citizen? – stresses what he and the general practitioner – “we as a society” – have in common: the risks of genetic information that both citizens are exposed to. Thus, Lush transgresses the boundary between the public and scientists (we are on the same side) that he had drawn earlier in the discussion (see Excerpt 5.2).

As argued in Chapter 2, this boundary between production and use of knowledge is problematic (Section 2.2). Nowadays, scientific knowledge is almost completely produced for its societal use. What is more, Lush justified the spending of scarce funding resources emphasizing the utility for society, such as personalized treatment and hence using pragmatic argumentation: “I think that genetics will play a role to better understand why one child can better be treated using method A and the other using method B” so as to “offer eventually, I think, more targeted treatment” and develop “new medication” (Discussion).

Furthermore, Lush adduces irrelevant argumentation here I argue (violating the relevance rule, Section 3.2.2). The fact that “malicious insurers” and “politicians” could misuse genetic information, does not address the suggested direct causal relation between the production of genetic knowledge of human behavior and the risk of medicalization.

The discussion on the issue of medicalization ended here. I directed the discussion to the issue of protection of genomic information against insurers. The general practitioner did not insist anymore and by the time I returned to the psychotherapist for his reply, it turned out that he had already left LUX, for reasons unknown.

From this reconstruction and analysis of the first episode of The Preprogrammed Human, it is fair to conclude that behavioral genomics research on ADHD was not fiercely discussed, contrary to our and John Lush’s own expectations. What effect did the strategic maneuvering of participants and the dramaturgy have on this outcome?

Firstly, most members of the public did not adopt the role of citizen critically engaging with the social and ethical implications of behavioral genomics research that was scripted in The Preprogrammed Human. A majority of the public restaged the public deliberation into a refresher course in ADHD. Apparently, they had come to the LUX to gain the latest scientific insights from a well-known expert. People who were interested in a discussion, however, refrained from an active participation. A

\[\text{\textsuperscript{12} The modus ponens argument follows the following pattern: if } p \text{, then } q; \text{ therefore } q. \text{ If I explicate the unexpressed argument, it reads: if you are not closely involved in behavioral genomics research (p) then, it is hard for you to estimate the value of behavioral genomics (q). Because you (the public) are not closely involved, it is hard to estimate the value of behavioral genomics.}\]

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bias that was included in the script can explain this hesitance. To ensure their role in framing and agenda-setting, the public was invited to start the discussion. My intervention as facilitator implied that the burden of proof rests on the public in the first instance (according to the burden of proof rule; see Section 3.2.2). When asked, the public would have to advance argumentation to defend its claims about a complex sociotechnical issue in the presence of a well-known expert, Dr. Lush.

Secondly, Lush did not really engage with the concerns of the general practitioner and the psychotherapist. Instead, he strategically maneuvered towards his goal of “highlighting the positive aspects of my research” (Interview 2). Particularly his boundary work (insiders vs. outsiders; production vs. use of scientific knowledge) was aimed at circumventing a response to the claim that biological research on human behavior might lead to medicalization and stigmatization. His strategic maneuvers even derailed, I argue since explaining public concerns as “mainly a result of a lag of information” (Interview 2) as Lush repeated in the interview afterwards, can be considered as an argumentum ad hominem. Moreover, claiming a clear boundary between knowledge use and knowledge production is logically inconsistent with his expectations in which the utility of his research is presumed.

Thirdly, the cast lacked a critic of medical science and medicalization of ADHD such as Dehue to counterbalance the expertise of Lush. Now, his sociotechnical imaginaries (see Section 4.4.3) were not investigated. Nor was the knowledge about the value of behavioral genomics. In short, there was hardly any critical discussion. As argued in Chapter 3, in a critical discussion argumentation that is advanced to provisionally defend standpoints must be confronted to a maximum of doubt. I could have helped the participants to critically discuss Lush’s pragmatic argumentation that he had used to explain the public value of behavioral genomics research on ADHD: according to Lush, his research would lead to the development of personalized treatments or new medication (desirable consequences). As the public concerns articulated in the LUX demonstrate, there was no agreement on the propositional content i.e. that medical treatment is desirable or that ADHD is a medical condition that (always) needs to be medically treated in the first place (ADHD as a normal variation in human behavior). Furthermore, the justificatory force was not examined since critical questions pertaining to pragmatic argumentation (see Section 3.4.1) were not addressed. Are new medication and more personalized treatment feasible? Are there better alternatives? According to the medicalization critique, interventions in the social conditions are as effective (and necessary) as medication. What are the negative side-effects (e.g. medicalization, harm due to long term medication use) and do they outweigh the benefits?

5.3 Assessing constructed futures of neurobiology on delinquency

Because biocriminality had proven to be a very controversial issue in the Netherlands, I expected a more lively discussion in the second edition of The Preprogrammed Human. However, my experiences during the ADHD deliberation resulted in some dramaturgical changes in order to stage the deliberative event as a critical public assessment of ethical issues of this field of research. First, as part of the new script, the cast was extended (cf. Hajer 2005). Similar to the public dialogue on ADHD, a representative of the life sciences was asked to engage in public dialogue: Roger Lamb. Lamb is the medical director of a Dutch academic centre for child and youth psychiatry and professor in forensic youth psychiatry, with research interests in delinquency at risk groups and neurobiological aspects of criminal behavior. This time, however, new actors would be introduced on stage. Two correctional psychologists (one working with adolescents in a juvenile detention centre, one with adults in penitentiary), a psychiatrist working in a detention hospital (a so-called TBS-clinic), an ex-convict now working as a youth worker, and a member of Parliament were invited as members of the affected public and instructed and prepared as “catalyst” (briefing) to increase active public participation.

Furthermore, two critics of (neuro)biological research on delinquency were added to the list of characters, to stimulate deliberation. The first critic was an expert in behavioral science, Dr. Martin Lobb, who had expressed his concerns in his inaugural speech about the current domination of biologically oriented research and its possible bias at the expense of his own behavioral sciences field. The second critic was Harry Tubb, a science writer and journalist of a Dutch national newspaper who had written on the Buikhuisen controversy. He had argued that the objections against Buikhuisen are, while neurobiology and psychiatry are making progress, perhaps a more topical issue than ever.

The second dramaturgical change was the re-scripting of the deliberation as a critical public investigation of the sociotechnical imaginaries of Lamb’s scientific field. Behind the scenes of and prior to the deliberative event on stage, Lamb’s future visions were investigated. Even though participants in the LUX would still be invited to articulate their own issues, the organizers intended to anticipate ethical issues and to set the agenda.

As Lamb explained in the preparatory interview, brain imaging and genomics techniques promise to contribute to actuarial criminology, a recent trend in the research on criminal behavior which focuses on the statistical risk factors and the assessment of criminal behavior instead of its cause(s) (Harcourt 2007). Lamb underlined the novelty of neurobiological risk assessment tools that promise to more
accurately detect people at risk of behavior or psychopathology related to criminality (anti-social behavior, impulsiveness etc.) than current “classical,” “limited” and “subjective” (Interview 1) risk assessment instruments – questionnaires and lists to be scored by a medical expert or physician.13, 14 “We want, of course, an assessment of ‘is that person a risk for the future?’ That knowledge is of course of social importance” (Interview 1). “Can we find a gene combination which indicates that someone belongs to that group [of people] with higher impulsiveness, [to such an extent that] we have to take care of?” The same applies to neuroimaging (ibid.).” Thus, Lamb claims the potential future utility of neurobiological research, using pragmatic argumentation (see Section 3.4.1) indicating the benefits for society: a more accurate risk assessment of criminal behavior (desirable consequence).

Because of our experiences with Lush who had not engaged in the ADHD deliberation with the possible negative consequences of the use of the knowledge he is helping to produce (esp. medicalization), I subsequently probed Lamb’s position on the moral desirability of improved risk assessment tools. First, Lamb was asked what he thinks it will mean for the treatment of and detention regimes for convicted criminals, if these improved (neuro)biological risk assessment tools are used in the future? Will people at risk receive (obligatory) medical treatment? Will they be held into custody preventively etc.? Second, the issue of preventive criminology was discussed: would it be possible to assess the risk of criminal behavior even before people have committed a crime?

Lamb acknowledged the first issue, but as a scientist he did not want to take an explicit stance on these issues. “I hold a personal view. [...] But [...] then I do not speak as a scientist. [...] I do not want to use my research to spread a political message [about how to implement this knowledge]” (Interview 1). About the second issue – preventive criminology – he was explicit: this is scientifically not feasible and morally undesirable. “That is not the research we want to do” (Interview 1).

Even though he abstained from making his position public, the investigation of both issues was scripted in a new attempt to elicit Lamb’s personal opinion on stage. “The idea is to discuss two fictitious cases. An offender who [...] has already committed a brutal lust murder. During his/her imprisonment, the science of biological factors of criminal behavior advances. What does this knowledge mean for the treatment of this person? The second case is a preventive case [...] Is it desirable to screen DNA of ‘petty thieves’ who are obligated to give a sample of their DNA for more serious offences?” (briefing for participants).

In the first act, the invited members of the public, the two critics and the politician would be asked to give their opinion on the scientific developments in the field of the biology of criminality by means of a short, closed question: “Do you see the advantage of behavioral genetics research on delinquency for society?” (hand-outs). In the second act, Lamb would be interviewed, to provide information on the scientific state-of-the-art about neurobiological and particularly genetic research. At the end of the interview, he would be asked to take his position on the first issue of risky detainees, to allocate the burden of proof to him. Then, the floor would be opened for discussion in the third act. Compared to the ADHD deliberation, the physical setting of the second edition of The Preprogrammed Human underwent no significant modifications.

In the first act, quite some skepticism was articulated. A correctional psychologist said that if the discussion would evolve towards a “mono-causal explanation for criminal behavior”, “they will find me on their way” (Discussion). The TBS-psychiatrist was skeptical about when his practice would benefit from genetic research: “it is all about redeeming a promise (ibid.).” The professor in behavioral sciences, Martin Lobb, said that “molecular genetics will [...] teach us particularly how important the environment is in influencing [human] behavior.” The science writer Harry Tubb was most skeptical. He stated that the “path of bio-criminology is disastrous” (ibid.). But after the second act (the interview) and some skirmishes early in the third act (the discussion), the controversy faded.

In the reconstruction of this second deliberation I describe how issues of moral desirability of more accurate (neurobiological) risk assessment tools were taken off the agenda as a result of Lamb’s strategic maneuvers in the interview (second act) and in a fierce but short debate between him and the science writer (third act). First, I analyze the interview and then the deliberation in more detail.

In his first response to (and perhaps because of) these criticisms, Lamb warned against high expectations. At the LUX, Lamb said that “(...) neurobiology will never
tell us who someone is and what someone is going to do; it depends on other factors as well, such as social environment, but perhaps it can help us to make some better predictions. Better than [the predictions] we do now” (Discussion). However: “In this respect [risk assessment], we are actually not so far. [...] Not as far as is written in newspapers” (ibid.).

He acknowledged that some of his respected fellow researchers are co-responsible for raising expectations in the media. As an example, he referred to a newspaper interview in the week prior to the public deliberation at the LUX. There, the well-known criminologist Adrian Raine had claimed that “In practice, this means that we can say to parents: ‘We have administered social, biological and genetic tests to your child and we can say with ninety percent certainty that if no action is taken, he will grow up to be a violent criminal (Van Hintum November 8 2008).” In Lamb’s scientific opinion, these claims are “nonsense” and “talking rubbish” (Discussion). In fact, he explained that the predictive power of risk assessment instruments at this moment is still very low and that “modesty” (ibid.) is appropriate.

Here, Lamb enacts his part as a scientist on stage, positioning himself (Section 4.4.2) as an expert capable of assessing the quality and feasibility of scientific results. Furthermore, he indirectly constructs an identity of a responsible and modest scientist vis-à-vis his colleague Adrian Raine, mitigating (or even contradicting) Raine’s expectations who wrongfully suggests the prediction of criminal behavior using several predictive tools. As a response, I attempted to probe Lamb on his own position on the feasibility of neurobiological assessment instruments (instead of merely refuting Raine’s) and to imagine possible effects in order to address the issue of their moral desirability.

**FACILITATOR:** “But that means I might possibly lose the right to...that I will be forced to be administered a genetic test, or [then] a susceptibility will be established and then I will be released and then it will be determined for instance where I will live, or not?”

**LAMB:** “That is not something to ask me. I think that society has to say what they want to do with such things. The same as with these risk assessment tools [in the current public debate].”

**FACILITATOR:** “But it cannot be ruled out that your research will in the end lead to this?”

**LAMB:** “That interpretation is possible, and as I have already said, I can see the danger of that. [...] You will always talk about chances, chances are big or small. What the interpretation will be, is in other people’s hands. I am willing to discuss that of course, [...] but I think it concerns society as a whole. [...] What are we going to do with risk assessment tools?”

**FACILITATOR:** “But you say that there has to be a concrete result of that [kind of] research. [...] What are the typically possible increased risk factors, impulsivity, you name them. You say that there is a genetic factor, isn’t it?”

**LAMB:** “A genetic correlation has been established, yes.”

**FACILITATOR:** “How high are these risks then? What are the rates?”

**LAMB:** “[...] The problem is, we are not that far at the moment. [...] And the question is whether it is going to happen ever at all, because our genome is immense and immensely diverse.”

[excerpt 5.4]

As John Lush did in the ADHD deliberation (previous section), Lamb is performing boundary work here as well, demarcating between science as knowledge **producer** and society as knowledge **user**. As a **scientist**, he is able to communicate the scientific facts about genomic risk factors but he is not in the position to address the issue of how the scientific knowledge is used. Society is to decide. Although he says he holds a **personal** view he is willing to discuss, close examination of the transcript demonstrates that Lamb never expressed it at all.16 I consider this boundary work as a form of confrontational strategic maneuvering (see Section 4.2) that allows him to abstain from publicly taking a position on this controversial issue and to remove the burden of proof when challenged. However, as argued in the previous section, presuming a sharp distinction between fact and value is problematic, if not untenable.

Furthermore, using Michael’s rhetorical parameters (Section 4.4.3), Lamb can be said to have constructed a distal or even implausible future. Practical neurobiological applications – valid risk assessment tools – are remote, perhaps even unfeasible (“whether it is going to happen ever at all”) because of the human genome’s complexity. The effect was that I stopped interrogating Lamb: what is the urgency or use of deliberating ethical issues publicly of technologies that are probably unfeasible? To mark the passage to the discussion round (act three) I returned to the science writer who in the confrontation stage had claimed that Lamb’s research “follows a disastrous path.” I discuss the strategic maneuvers in the discussion that ensued.

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16 During the interview afterwards, I confronted Lamb with it, using the transcript to substantiate my observation. Lamb’s response was: “Well, you should have fished it [his position] out of me, then” (Interview 2).
And you say that scientists in the field suggest that? Short response, Mr. Lamb.

Does Mr. Tubb make a logical error and when so, what is it? Using the facet of the trope of rhetorical question, Lamb implies a categorical question: “it can and will be misused to hold people preventively into custody when a genetic profile indicates a high risk. Tubb had warranted this claim earlier by arguing that the research would be locked up in advance, before they have actually done anything.”

Excerpt 5.5

Tubb challenges the feasibility of neurobiological research in general, using the rhetorical trope of conciliatio. Conciliatio is a strategic maneuver in which an arguer uses a proposition the opponent is explicitly committed to in order to support his or her own position (Van Eemeren 2010: 207). Tubb explicitly uses Lamb’s assertion (“just as Lamb holds”) about the small contribution of neurobiological factors resulted from research until now to draw the conclusion that interest in this field of research is incomprehensible. Using the trope of rhetorical question, Tubb implies biological research on criminal behavior will never be useful.

He also challenges the moral desirability of preventive applications of this scientific knowledge. The science writer constructs a negative (parameter of valency) and most certain (parameter of modality) future consequence of neurobiological knowledge production (see Michael 2000 and Section 4.4.3), again using a rhetorical question: it can and will be misused to hold people preventively into custody when a genetic profile indicates a high risk. Tubb had warranted this claim earlier by arguing that preventive refinement contradicts an important fundamental principle of criminal law: one can only be guilty of a crime one has committed.

Here, Tubb constructs a logically inconsistent future (and hence, his argumentation derailed) since his moral concern is based on rather optimistic estimates of future risk rates, whereas a minute earlier he had denied the feasibility of neurobiological research altogether. Still, it is important to analyze Tubb’s argument to understand Lamb’s response.

Excerpt 5.6

FACILITATOR: Do [Mr. Tubb] make a logical error and when so, what is it?

LAMB: Yes, that logical error is, first, that he assumes that we will screen people in advance and put them in prison before they have done anything, and that is absolutely not the direction we should take. We [researchers]

look at is there a chance of recidivism and can we help, and is there a contribution of neurobiology possible [...]? The other thing is scientific, to make assumptions about variance in advance. How can he say something about variance before we have even conducted the research?" [excerpt 5.6]

Even though Lamb had repeatedly stressed not to overestimate the significance of scientific results or to overstate the expectations of neurobiological research, here he defends the feasibility of his research adducing the inherent uncertainty of scientific research itself as an argument. Making an appeal to the fundamental academic value of autonomy, Lamb had already concluded that his “research cannot be banned” (Discussion) arguing that “scientific research cannot be conducted because people know in advance that it will not produce any results” (ibid.). “History will decide whether we have made a contribution” (ibid.).

Lamb performs a delicate balancing act at the LUX: using mitigation strategies to tone down high expectations that raise complicated ethical issues while at the same time using science’s unpredictability to foil arguments about the a priori uselessness of scientific research. However, his defense derails. Lamb violates the standpoint rule (Section 3.2.2) since the claim that is his research should be banned is wrongfully attributed to the science writer who had asserted that “scientists should take responsibility” (Excerpt 5.5).

Moreover, Lamb subscribes to the undesirability of preventive custody by simply making a moral appeal (“we should not go in that direction”) and explaining what contrary direction researchers are in fact going. Taking this explanation for granted, I asked Tubb to explain the origin of his future scenario: “Mr. Lamb also said [that] it can be ruled out that we are going to use the research for that purpose [preventively, before someone has committed a crime]. Where did you get this idea?”

TUBB: He himself refers to Adrian Raine [and his statements in the newspaper interview] and Raine said something similar in De Volkskrant [Dutch national newspaper] ten years ago, that now we are not [yet] able to do it, but if you pick six-year-olds then you are actually already too late, you will have to do it [screening for risks for criminal behavior] on two-year-olds. [...] [W]hat I said [earlier during the deliberation], it is a false presumption, it is pretended that much is possible and I would not want to have a society in which children at the age of two are screened for possible delinquency. I fully disagree with that! [...]
LAMB: [...] I agree with that, that I am equally concerned about this interpretation as well. I oppose to that just as much, but still think it would be a shame when, because of that, the value, or the potential value, [...] of this kind of research will be undone. [excerpt 5.7]

My intervention reveals a change in perspective or footing (Section 4.3). Whereas earlier Tubb seemed the author of the future of preventive screening (Excerpt 5.5), convinced as he perhaps was that such sociotechnical imaginaries were representative for the field of criminology, now it turns out he is the animator of Adrian Raine’s imaginaries. Now, Tubb is calling them into question (“it is pretended that much is possible”). It is reasonable to presume that Lamb has succeeded in persuading (or reassuring) Tubb of the implausibility of Adrian Raine’s expectations. Although no conclusion was drawn explicitly, a critical discussion between the child psychiatrist and the science writer is not useful because there is no difference of opinion anymore. Both men agree on the unfeasibility and the undesirability of preventive screening of people (particularly young children) at risk for criminal behavior (as Raine suggests).

Behavioral sciences Dr. Martin Lobb subscribed to this conclusion. “Currently, it is sexier to provide a biological explanation for criminal behavior than a sociological one. [...] That’s why these kinds of statements, that are completely wrong, like Rain, those are picked up by journalists, because that is interesting and that is what people want to hear. Then, you can organize a debate” (Discussion). No one else challenged the opinion of these three men and other issues were discussed, such as storage and misuse of DNA in forensic biobanks.

From the reconstruction of the argumentative discourse of the second episode of The Preprogrammed Human, it can be concluded that there was indeed some controversy, but it was limited to issues of scientific and technological feasibility of expectations. However, there was hardly a critical discussion about the moral desirability of risk assessment tools for people at risk for criminal behavior despite the dramaturgical work behind the scenes (extending the cast, priming the invited public, investigating Lamb’s sociotechnical imaginaries). How can this be explained? Mainly, because of Lamb’s effective strategic maneuvering, I argue.

Reflecting on the events at the LUX afterwards, Lamb said he had been aiming at increasing public understanding so that people would think “‘Now I understand what the value [of this research] is’ [...] and ‘why we should not oppose it by definition’” (Interview2). This aim, anticipating public opposition, must be understood in the historical context of the Buikhuizen controversy. In the preparatory interview he had already alluded to the role of scientists such as himself to participate in public dialogue, to communicate the significance of their research findings without exaggeration. “Otherwise, other people with simplistic ideas will start the discussion. [...] They will only harm our research discipline” (Interview 1). On stage at the LUX, Lamb indeed embodied the role as scientist. Firstly, Lamb simply did not take a position on the matter (just as in the preparatory interview). He argued that he is not in the position to address the issue. He was performing ethical boundary work, demarcating his responsibilities as a scientist: producing facts, in this case risk numbers.

Secondly, Lamb succeeded in acting as a more credible scientific expert of technological feasibility than Raine and Tubb. What makes Lamb’s (modest) assessment of the future more plausible than Raine’s, who can be considered a respected expert as well? “[M]odesty (as an admission of contingency and uncertainty) has become a major rhetorical tool” (Michael 2000: 31). Using the rhetorical parameters of valency and distance (Section 4.4.3), Lamb toned down Raine’s high expectations, constructing them as morally problematic and therefore distal (“we are not that far”) if not implausible. “Great distance of a future bad facilitates a relaxed set of responses” (Michael 2000: 24). This was the case in the second edition of The Preprogrammed Human. Why discuss the moral desirability of scientific developments in behavioral genomics or preventive neurobiological screening tools in particular that are technologically unfeasible? The urgency of the issue decreased, which explains that the criticisms fell silent after the first round.

Thus, Lamb morally positioned himself as sound scientist indirectly by constructing Raine’s identity as a fellow researcher exaggerating the social meaning of his findings. Indeed, Lamb was perceived at the LUX as a sound scientist, indicating the shortcomings of neurobiological research. As a philosophy student observed during the discussion: “I think that his gentleman [Lamb] does fantastic work and I think it is unpleasant that he is critically treated, while this man considers research ethics of paramount importance. This man is far too intelligent to stigmatize people” (Discussion). The questionnaires, distributed afterwards, confirm this perception. Tubb himself declared afterwards, that he thinks Lamb is an “interesting and balanced man” (Questionnaires participants).

At the same time, Lamb had to defend neurobiological research against Tubb’s claim that it is useless, because it is unproductive. Here, he argued that only “autonomy has resulted in scientific progress” (Discussion) and that furthermore, scientific endeavor is fundamentally uncertain. So, no one can a priori ban scientific research. However, there is a logical inconsistency in Lamb’s argumentation and hence, his argumentation derails (violating the validity rule; see 3.2.2). He switches modality: if the future is inherently uncertain, as Lamb argued, how can he be so sure
about the unfeasibility of Raine’s future scenario?

Because Lamb was considered as a more authoritative expert on technological feasibility, the deliberation was suboptimal. The moral desirability of (Lamb’s own) sociotechnical imaginaries was not critically assessed because scientific developments were treated as unfeasible. But, as Lamb himself argued, the future is uncertain. Even though the experts at the LUX, who happened to be cast for this deliberation, agree on the unfeasibility, the literature demonstrates that others anticipate technological applications. Professionals in the legal system – probation officers, social workers and solicitors – suggested that “calculations of genetic susceptibility to aggressiveness could be integrated with other indicators used to identify risky individuals and to plan and manage interventions” (Pieri and Levitt 2008). Others expect a shift towards “more predictive and preventive criminology” (Schmer 2006) or “identification of, and preventive intervention upon, aggressive, risky or monstrous anti-citizens” (Rose 2000). Lamb himself had said in the preparatory interview that “it is already the case that in the United States neuro-imaging is admitted as evidence in lawsuits” (Interview 1).

Expectations do something (Section 4.4.3): attract attention from the media, but also from policy makers and funders. Therefore, Raine’s sociotechnical imaginaries need critical reflection, I argue. Here, the critical questions of pragmatic argumentation can be applied again. Is risk assessment necessary? What are unintended consequences of preventive criminology? Stigmatization, increasing health care costs because of false-positives (Brom and Van Keulen 2009; Schmer 2006)? Do these impacts outweigh the benefits? These issues remained unaddressed since Raine’s future scenario was considered as unfeasible. And what about Lamb’s own future expectations? Due to Lamb’s (derailing) strategic maneuvers, his imaginaries were not discussed. But how (un)feasible are his own expectations? On what grounds did he claim that neurobiological research will contribute to a more accurate risk assessments in the preparatory interview? If Raine’s prediction rates are too optimistic, what are more realistic ones? Aren’t lower rates ethically even more problematic? These issues were not discussed.

5.4 Challenging the moral desirability of genetic tests for ASD using technological feasibility

FACILITATOR: “Mr Gibbs, when I was at your office a while ago, […] we thought: ‘Magnificent debate.’ And now it is slipping away […]. What is it we need to discuss in terms of what is technically feasible and what not? […] We were discussing genetic tests [for Autism Spectrum Disorders] weren’t we? Or did I misunderstand then?”

[excerpt 5.8]

Indeed a few weeks earlier, William Gibbs, the life scientist participating in the third edition of the Preprogrammed Human, had elaborated his sociotechnical imaginaries in his office. Dr. Gibbs, directing the genetics research of the child and adolescent psychiatry department at a Dutch academic hospital, told me that genetic tests are feasible in the near future, enabling early diagnostics – at least for some variants of autism with a large genetic risk.17 Gibbs’ belief was based on new scientific findings of the Autism Genome Project (AGP) Consortium, in which his group was participating. The AGP had recently published in *Nature Genetics* in which new genetic biomarkers – so-called Copy Number Variants or CNVs – for autism were described (Szatmari et al. 2007).

Based on Gibbs’ articulate imaginaries we expected a “magnificent debate.” In the Netherlands, genetic testing had been controversial in the 1980s (Van El et al. 2007). Particularly, prenatal genetic testing and screening had sparked a lot of public debate. Genetic testing for incurable behavioral disorders such as ASD would raise ethical issues, as was demonstrated during an online discussion organized by the Center for Society and the Life Sciences on a parenting web forum (Jeucken and Radstake 2008; Radstake et al. 2009).

Gibbs, who had also participated in the online dialogue, anticipated controversy at the LUX about his claims, too. “In general, people have doubts about genetics research. I think because they do not know the ins and outs. That raises suspicion. So I think people will probably pay more attention to the risks of genetics research.

Gibbs indicated that, besides genetic testing for drugs metabolism and disorders associated with autism (fragile X syndrome, tuberous sclerosis), “what will come in the near future is an extension of diagnostics. So you will say we know that an amount of smaller abnormalities indicate an increased risk. You can produce a test kit out of that. […] Then you say: ‘If you hand in your blood, then we can produce a percentage’. That is, what I think is coming, in the next two or three years” (Interview 1).
and less to the potential benefits” (Interview 1). Therefore, Gibbs perceived his role as an expert responsible for informing the public about developments that are “inescapable” (ibid). Providing information will increase public acceptance for this new technology that people will eventually get used to.18

Gibbs’ prediction proved to be correct. A reconstruction of the complete argumentation structure of the deliberation indicates that genetic testing of autism was contested from various ethical perspectives. However, a scientific controversy about the technological feasibility of genetic tests for ASD arose on stage and dominated the discussion. Particularly, the expert dispute on the technical specifications of genetic tests (esp. their predictive value) framed the discussion on moral desirability. The controversy was confusing (see Excerpt 5.8); it sidelined non-expert participants and it closed down the discussion, as I demonstrate. More importantly, my interventions as facilitator contributed considerably to this particular framing. Before I analyze the strategic maneuvers in this expert dispute in detail, however, I first elaborate on the modifications of the dramaturgical setting.

First, a new character in the play was introduced. A social scientist of the Centre for Society and the Life Sciences (CSG), involved in a project aimed at increasing the participation of psychiatric patients in the scientific research on their behavioral disorders, would enact the role of commentator. She would observe the deliberation from the sideline and be asked to stimulate discussion when needed. For the rest, the scheme of the cast of the second edition of The Preprogrammed Human was copied. Besides geneticist Gibbs and representatives of the affected public (parents and professionals), two experts of ASD outside the field of (behavioral) genomics completed the cast, both well-known in their field.19 One expert was Roger Roote, professor in child psychiatry, chair of a Dutch association for psychiatry and director of the local centre of expertise that operates at the interface of care practice and scientific research. The other expert was Dr. Matilda Cutts, scientific researcher, therapist, instructor and author of many publications about ASD.

Their presence affected the dramaturgical setting: the physical setting was reconsidered as a result of the huge public interest in attending the deliberative event. As questionnaires demonstrated, the presence of Roote and Cutts as national stars in the field of ASD had drawn a large audience. To provide seats for almost 250 people, a stand was used which differed from our initial staging. Now, a stage separated active players (the panel) from the audience. Still, an active public involvement was intended. However, the setting affected the public recognition of the contribution from the audience.20 Moreover, a large majority of the audience was out of reach for the microphone.

Third, the deliberative event was re-scripted, too. We had experienced in the previous episode that Roger Lamb’s representation of sociotechnical imaginaries on stage differed from those constructed offstage: in public he had mitigated the high expectations of fellow researchers. Therefore, the interview on stage was substituted for vignettes: short sketches that give a trenchant impression about the future vision of our participating life scientist. Designed as a qualitative research technique we used vignettes because its context “provides respondents with an opportunity to discuss issues arising from the story from a non-personal and therefore less-threatening perspective” (Hughes 1998: 383). In vignettes, perceptions, beliefs, attitudes and opinions are separated from the people who have them. Gibbs would not be recognized as the author of the imaginaries. The first of two vignettes to be discussed, read:

“Mrs. Jansen recently gave birth to a bouncing boy. The midwife performed a heel prick on the eighth day of the young boy’s life. The blood of the

18 “When people look suspiciously at a topic, it is mostly because they do not know the ins and outs. There are so many examples that demonstrate this. The train…the first train in the Netherlands, that story you must be familiar with. The cows are dying, perilous, that train drove 40 km/hr, aren’t you going to die? That sort of considerations are caused by a lack of knowledge and understanding. And now, everybody thinks it is normal because it is widely accepted, you just know how it works. Therefore, you have to inform people” (Interview 1). Here, we recognize a mixture of recurring arguments, described in the previous chapter (see Section 4.2.2). Gibbs associates a habituation argument (Swierstra and Rip 2007) with an information-deficit thinking: if I provide the proper information, people will get used to genetic tests.

19 We invited three parents of children diagnosed with ASD, a member of the board of directors of a large health care institution for ASD patients, a professional working in a child health care center (CHCC) specialized in early diagnostics of ASD and a project leader of the National Network Autism (LNA), an organization devoted to education and ASD.

20 As some one wrote on the LUX blog afterwards: “All in all a disappointing debate. Too much attention for the audience, too little for the expert panel” (LUX forum, 17 December 2008, 11:26 am).
new born collected with the heel prick was screened for autism. The test result shows that the son of Mrs. Jansen has indeed a susceptibility to autism. What is the consequence of this test result?" (briefing).

This was a concise reproduction of Gibbs’ sociotechnical imaginaries. Besides the technological feasibility of genetic tests, we also used the preparatory interview to investigate his ideas about the societal usability – how tests for ASD would be integrated in current medical practice – and the moral desirability of such a practice (Lucivero et al. 2011). Gibbs endorsed our suggestion of integrating these genetic tests in the Dutch neonatal screening program. Thus, children and parents would optimally benefit from genetic tests. As the other two genetic researchers did, Gibbs substantiated his claims on the moral desirability of genetic testing using pragmatic argumentation (Section 3.4.1): developing tests and using them in the neonatal screening program will enable early diagnosis of autism (desirable effect X), which will prevent frustrations among parents as well as harm for their children (desirable consequence X, and X), since at present autism is often diagnosed at a relatively late age (social need).

The vignettes would be discussed in act 2 and act 3. In the first of four acts, however, opinions would be polled about the main proposition of Gibbs’ moral argument: “The early as possible diagnosis of autism is necessary to prevent harm. Only genetic tests enable this early diagnosis” (Discussion). The analysis of the online dialogue on the parenting website proved this claim was controversial. The proposition would first be presented to the public and only later, the panel would be asked to respond, because invited participants had dominated the previous deliberation on delinquency. The organizers intended to increase public participation. In the final act, participants would reflect on how “these social issues affect the organization of genetics research on autism” (briefing).

Indeed, in the first act the propositional content, particularly its evaluative element, i.e. the desirability of an early diagnosis of ASD implicated in Gibbs’ argument, proved controversial among the public. A young man, diagnosed with ASD at eight years of age, for instance endorsed Gibbs’ reasoning: “My parents have trained my social skills since I was young. My guess is that if my parents had started earlier, this [training] would have been even better” (Discussion). However, a mother questioned the desirability of a very early diagnosis. She said an ASD diagnosis is “rather crude” (ibid.). Autism is a spectrum disorder, she argued. Even if your condition is manageable, you receive the label ASD. The sooner the diagnoses, the sooner people will experience its harms. The justificatory force of Gibbs’ pragmatic argumentation was challenged as well. A professional was concerned that more testing would lead to more early autism diagnosis, which would prevent frustrations among parents as well as harm for their children (desirable consequence X, and X), since at present autism is often diagnosed at a relatively late age (social need).

The second vignette described the prenatal situation of clinical genetics practice for genetic counseling on carrier status and reproduction. The last situation was not a topic of the preparatory interview, but we estimated that prenatal use of genetic tests would spark debate, too. In this chapter, I only focus on the first vignette, since this case stimulated enough discussion for almost the entire evening (although the discussion about prenatal use lurked).

Gibbs did not seem determined about this idea of social usability. Our impression was that Gibbs did not have very articulate ideas about how to integrate genetic tests for autism in medical practice. We had to make some suggestions, one of which was integration of the tests into the heel pricking screening.

FACILITATOR: “[H]ow would the practice of testing look like, [the practice of] this early diagnosis? Does it mean, that everyone at the child health care…”

GIBBS: “That is a good question…that is a good question…”

FACILITATOR: “[…] Next [we] will sequence one’s DNA for a thousand dollars and then we know.”

GIBBS: “Yeah. […] then it is like the heel prick…”

FACILITATOR: “Would you want that? Because you say…”

GIBBS: “Yes. Because I think that is beneficial. I think that it will limit harm.” (Interview 1).

From an ethical point of view, genetic testing in neonatal screening is not a very realistic option, since autism is a condition that cannot be prevented or cured. It makes more sense to use genetic testing in prenatal diagnostics or screening, which was the topic of our second vignette.
to an undesirable side-effect: “even more over-diagnosis” (ibid).

Moreover, this health care professional was the first one to raise the issue of (technological) feasibility of genetic tests for autism. Particularly, he questioned their predictive value. It was I who selected the feasibility issue for discussion in the panel soon after the professional’s response. After asking the parents as the potential end users of neonatal genetic testing whether they had preferred an early as possible diagnose, I investigated the differences of opinion about the feasibility issue within the panel: “Who of the people who sit here [in the panel] has doubts about such a genetic test: ‘Well, it does not mean quite so much’?” (Discussion). Roote immediately seized the opportunity to enact his role as scientific expert.

**ROYOTHE**: The tricky thing with genetics is, I think, that no single genetic marker can be [uniquely] identified in all people with autism. It means that you will probably find all kinds of susceptibilities. But if you and I subject ourselves to a genetic test, we can be utterly miserable because you and I have all kinds of flaws in our DNA we do not have the slightest idea of. [...] The ethical question is: Do you want to know? [...] Children of people with Huntington’s disease can do a genetic test to find out if they have it [the mutation] or not. Generally, they do not want to know. Because, what is the use of knowing that? You know that one of your parents has suffered from a terrible dementia, you have a chance of one out of two that you will develop it, too. Do you have to think at fifteen: Oh my God, I have only fifteen years left?” [...] 

**FACILITATOR**: Do you believe that this will eventually be possible?“

**ROYO**: Well, I don’t think I will witness it, but look, it is of course a kind of brave new world, that at a certain time all genetic risks can be determined. [But] it is not like blue and brown eyes. I mean, that is not how the heredity of autism works. You do not know what will happen in life.”

[excerpt 5.9]

Using the parameters of valency and distance (see Section 4.4.3), Roote constructs a distant future for genetic tests for autism (“I don’t think I will witness it”) that he evaluates as bad. He draws on the familiar dystopian cultural symbol of Aldous Huxley’s *A Brave New World* as a rhetorical device to show that he is not supportive of the new developments in genetics research. Indeed, he claims that genetic tests are unethical, using an argument from consequence challenging the justificatory force of Gibbs’ pragmatic argumentation: information about genetic risks will cause unnecessary worry (an undesirable consequence) for conditions and diseases that perhaps will not ever develop. “You do not want to know” is the answer to his rhetorical question, indicating that the possible benefits of an early diagnose can never outweigh the negative side-effect of worrying. Roote substantiates his claim using an argument by analogy, for the case of Huntington’s disease had demonstrated that people do not need or want genetic testing. Roote’s comparison falls short and hence his argument by analogy is derailing because Huntington’s disease is a hereditary disease that is almost fully penetrant whereas Roote’s claim was that people can only have a genetic risk for ASD. Nevertheless, the professor is taking the technological specifications of genetic tests (low predictive value) as a premise in his argumentation that genetic tests for ASD are morally undesirable. It demonstrates how the issue of moral desirability is inextricably related to the issue of technological feasibility.

Taking the scientific authority of Roote seriously, I attempted to elucidate the feasibility issue:

**FACILITATOR**: “Mr Gibbs, [...]What is it we need to discuss in terms of what is technically feasible and what not? [...] We were discussing genetic tests [for Autism Spectrum Disorders] weren’t we? Or did I misunderstand then?” [see Excerpt 5.8]

**GIBBS**: “About these genetic tests, I am convinced [...] that there are a few genetic variants that are strongly predictive for an ASD diagnose and these are not only the [...] gentle but functional forms of autism, but these are the people...whose children will probably be severely disabled early on, who will be institutionalized for the largest part, and from a young age, you must have the courage to think about that. I will be honest about it, [...] I have not made up my mind about the ethical issue, that is a very complex matter, certainly in the prenatal case, but those [tests] are simply on their way.

[T]en years ago [...] we thought there in terms of risk genes. And we actually overlooked the small chromosomal variants that give a high risk. Well, that has only been acknowledged since 2007. That has been replicated three times now, in *Nature Genetics, Science*. Anyway, I realize that [information] is so new, that the discussion here, that people here in fact, still use the old model of polygenetic abnormalities. But that just is not the case.”

[excerpt 5.10]

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24 Gibbs criticized this analogy with Huntington’s disease. Contrary to the inescapable, incurable and lethal symptoms of this monogenetic disease, Gibbs believes, interventions in the daily environment could alleviate the symptoms of autism.
Here, Gibbs uses two different strategies to decide the issue about technological feasibility in his favor. He employs technological determinism as a rhetorical device (Section 4.2.2) to stress that “a few genetic variants are strongly predictive”: “Those tests are simply on their way.” This sounds like a prophecy: the deliberation at the LUX will not stop these highly predictive tests from being developed, so their consequences have to be dealt with. So, society has to dare to think about these consequences, Gibbs argues.

Furthermore, Gibbs is performing boundary work. Without publicly offending his scientific colleague (using the impersonal “people here”), he demarcates those who use “the old model of polygenetic abnormalities” (Roote and others) and geneticists (like Gibbs himself) who perfectly keep up the leading scientific literature (Nature Genetics, Science) on the subject. Thus, he is attempting to establish exclusive expertise. Yet, these argumentative moves did not help Gibbs to position himself as the only credible expert, as I argue below.

Realizing that this scientific controversy on stage was hard to conclude, I proposed to pass over the dispute and to invite Gibbs, the professor and the other participants, who were sidelined in this technical issue, to imagine a world in which Gibbs’ scientific claims are facts to discuss its moral desirability. “Wait a second. I really want the case [described in the vignette] to be discussed. [...] Let us assume that we live in a world in which uncommon and serious kinds of autism are screened” (Discussion). Still, the controversy persisted. It shifted somewhat. According to Roote, having a high risk for symptoms.

Moreover, the argumentative context of the discussion shows that the perceived low-predictive value was an important reason. As a health-care professional phrased it: “As I understand [Roote], even if you talk about severe variants of ASD, it does not mean it will develop. [...] What information is it you provide for parents, then? A severe variant, but you know nothing. That seems terrible to me” (Discussion).

The questionnaires distributed afterwards confirm this observation. Almost half of the respondents’ perceptions on technological feasibility contrast sharply with Gibbs’ expectations. “If there is any discovery at all, it is too complex to do something with it” (Questionnaires), a health care professional replied. For some participants, the controversy on stage had particularly a confusing effect. A 29 year old psychologist wrote: “To me it is not clear what we know and what we do not know about the genetics of autism” (ibid.). Or the discussion affected their sense of urgency. A young psychiatrist stated that scientific research is still in its early stages and therefore that “there hardly needs to be discussion about it” (ibid.).

Gibbs himself who had stated before that he had “not made up his mind about the ethical issue” (Discussion 0h43m; see Excerpt 5.10) yet, later seemed to have made a decision about this “dilemma” all of a sudden: “I do not think that I am a proponent for [genetic testing] in the neonatal screening” (Discussion 1h08m). Of course, it is unlikely that the low predictive value was convincing for him, so there must have been other reasons.

A consensus about the undesirability of integrating genetic testing in the neonatal screening program became apparent. I decided to conclude the discussion with vignette #1: “Then I can just ask who does not [agree], but that is a bit hard I think” (Discussion). This conclusion was premature, however. First of all, two parents in the panel still were in favor of this scenario, as our analysis of the argumentative text indicates. Furthermore, as he reported in the interview afterwards, Gibbs was unhappy about this apparent consensus that was “produced” (Interview 2). At the LUX, the predictive value of chromosomal abnormalities (CNVs) and “general risk factors” were wrongfully “mixed up” (ibid.).

It can be concluded that the controversy about the technological feasibility or specifications directed the discussion on the moral desirability of genetic tests for ASD. If the predictive value of these tests is indeed low, as Roote asserted contrary to Gibbs’ expectations, then the conclusion that these tests are undesirable is understandable. As normative screening criteria stipulate, the moral desirability of screening technologies depends on their validity (Gezondheidsraad 2008: 58).

What made Roote the more credible expert at the LUX despite Gibbs’ strategic maneuvers to claim expertise (technological determinism and his subtle boundary work)? Roote is an authoritative and well-known expert in the field of ASD, an
influential administrator in several professional bodies. As the director of the local centre of expertise on ASD, Roote was the star in a home match, addressing people by name (“But Kees Kamp in the room here knows that we sometimes diagnose people of my age with autism” (Interview1)). The very reason many people had come to LUX was because Roote was one of the speakers. The cast therefore has affected “what can be said with influence” (Hajer 2005: 624).

Furthermore, the professor was probably more successful in adjusting to the audience’s frame of reference of ASD (audience demand; see Section 4.2.2): “Children who are at high risk of developing ASD, still do have a reasonable chance of becoming a ‘gifted engineer at Philips’” (see Excerpt 5.11). When Roote had declared his sympathy with young people with an ASD diagnosis, he earned much applause: “Our society is not worth a straw when we say: ‘We only want perfect people who do not need extra support’” (Discussion). Gibbs criticized the professor’s framing of autistic patients as people who still have a reasonable chance to succeed in the interview afterwards. “[T]here is brutal genetics, too. If you have this [gene] defect, you just have bad luck. In that situation, you have an IQ of 50 or less. […] These are all children who are just chronically hospitalized. […] I think that if you as a parent have a severely mentally handicapped and withdrawn child, you would have entered that discussion of ‘Is this what I really wanted?’” (Interview2)

Therefore, Gibbs preferred “a continuation of the discussion,” because “[t]he question should actually be, if I have a [genetic] test now which produces a very reliable result, which let me say differentiates with a 99 percent certainty between having an autism spectrum disorder or not, what would you do then?” (ibid.) Indeed, this question was not critically discussed at the LUX. Because most people relied on Roote’s expertise, the critical discussion of Gibbs’ pragmatic argumentation stopped after Roote successfully challenged the feasibility of genetic tests. Most people believed Gibbs could not answer the feasibility question satisfactorily. So, challenging the feasibility of new technologies is an effective strategic maneuver because moral desirability cannot be separated from technological feasibility. However, there is no reason to think that Gibbs’ expectations are implausible, even though he failed to provide sufficient warrant for his claim (as the burden of proof rule prescribes). It is not unimaginable that Roote’s claim will turn out to be wrong.²⁶

Now, the investigation of Gibb’s pragmatic argumentation was not confronted to a maximum of doubt. First, the propositional content implicated in Gibbs’ argument (the desirability of an early diagnosis of ASD) was not properly discussed, whereas the analysis of the complete argumentative text indicates that people disagreed over this content. Whereas two fathers supported the benefits of early diagnostics, a mother had doubts about the quality of bonding between parent and autistic child: “When your child is labeled as autistic so soon after birth, I wonder if parents can look at their child in an unprejudiced manner. You will always be interpreting its behavior in terms of autism” (Discussion). The other expert, Matilda Cutts, opposed the framing of autism as a “disorder,” caused by “static genetic defects” (Discussion). She criticized the need to diagnose autism as a “medical condition” (ibid).

In addition, other critical questions to determine the justificatory force of Gibbs’ argumentation – necessary-means question, best-means question and side effect questions (see Section 3.4.1) – were not critically discussed. These issues were only touched upon, partly due to my interventions as a facilitator.²⁷

²⁵ In the preparatory interview, Gibbs had already alluded to what he perceived as a widespread misconception of autism. “There has of course been this film Rain Man, that is what autism is for the average Dutch citizen. […] That does not reflect reality” (Interview1).

²⁶ Since Dr. Roote and Gibbs are entangled in a mixed difference of opinion, Roote also has an obligation to defend his claim (see Section 3.2.2). According to Gibbs, Dr. Roote has “a bit of a knowledge problem” (Interview 2).

²⁷ The issue of feasibility of tests as being “non-permissible” (see Ihnen-Jory 2011: 152) was also raised: integrating autism as a medical condition to be detected in the neonatal screening program would not meet the normative screening criterion of benefit. As the Dutch Health Council writes this criterion for (genetic) screening reads: “It must be clearly established that early detection of the illness(es) or condition(s) […] in question can lead to a significant reduction in the burden of disease in the target group in question” (Gezondheidsraad 2008: 58).
Both experts had doubts about the necessity of genetic tests and asserted that the available and widely used questionnaires (such as the Early Screening of Autistic Traits, or ESAT) are better alternatives because genetic tests only establish a genetic cause but provide no clues for treatment. Other participants indicated some negative side-effects of genetic testing: an early genetic diagnose would raise false hope about the treatability of autism; genetic testing would increase the risk of over-diagnosis.
5.5 Conclusions

In this chapter, I have investigated a) strategic maneuvering and b) dramaturgical effects in three public deliberations on the ethical and social implications of behavioral genomics, using argumentative texts and additional empirical sources (different contexts and addition ethnographic data).\textsuperscript{28} Firstly, I elaborate on how participants have strategically maneuvered and the effect thereof on the quality of the deliberation. In this conclusion section I discuss how the quality of these upstream public dialogues could be improved. Secondly, I discuss how the dramaturgical setting affected “what could be said, what could not be said and what could be said with influence” (Hajer 2005).

As the analysis of argumentative discourse demonstrates, futures were contested at the LUX. Participants of these public deliberations were involved in a “struggle to represent the imagined consequences of technoscientific innovation and to render dominant their particular view of the future” (Bloomfield and Doolin 2010: 59). Life scientists mainly select pragmatic argumentation as a topos of consequentialist reasoning (see Section 3.4.1 and 4.2.2 on topical selection) to be effective in this struggle about the moral desirability of behavioral genomics research. Pragmatic argumentation reflects a public reason because it is used to indicate the beneficial social consequences of their scientific activities: personalized treatment, better risk assessments or early diagnosis of ASD. However, these arguments were not confronted with a maximum of doubt. Neither the propositional content or the justificatory force were systematically examined. This means that mostly the public deliberations at the LUX were not critical discussions. Critical questions belonging to pragmatic argumentation were only partly discussed at best, mostly (but not exclusively) due to (sometimes derailing) strategic maneuvering of participating life scientists identified in Chapter 4. Some of these strategic maneuvers closed down discussions on the moral (un)desirability of behavioral genomics research.

First, boundary work was performed. The demarcation between insiders (scientists contributing to behavioral genomics research) and outsiders (the public) allowed John Lush to depict the future unintended consequences health care professionals articulated as “invented” and hence, unrealistic. Similarly, the boundary between the production of factual scientific knowledge and its socially determined use proved an effective strategic maneuver in the confrontation stage to abstain from taking a position in ethical issues.

Secondly, participating scientists carefully constructed their public identities (subject positioning) in different contexts as insider or fellow citizen (ADHD), modest and sound scientist (delinquency), scientific expert involved in the state-of-art research on genetic markers on autism (Gibbs) or as the socially committed child psychiatrist who is advocating the social support of young people with ASD (Roote).

Thirdly, representations of the future determined the course of the deliberations. Futures were constructed as distal, bad, desirable, uncertain, or impossible. However, appeals to scientific authority about the technological feasibility proved to be an effective strategic maneuver. Because the feasibility question is the first in the logical order of critical questions, questioning technological feasibility successfully means that other critical questions (necessary-means, best-means and side-effect questions) do not have to be discussed. John Lush’s future visions were not critically questioned. Adrian Raine’s sociotechnical imaginaries about predictive criminology for instance are “not as far as written in newspapers” so that difficult ethical questions remained unaddressed. Similarly, claims were made about the low predictive value of future genetic tests for autism so that other issues were not discussed. But assessing the truth of expectations is impossible, since “whether or not they [expectations] are true can only be assessed in hindsight – if ever (Lucivero et al 2011: 132).” In such cases, appeals to authority derail (argumentum ad verecundiam) violating the argument scheme rule. Instead of performing a “reality check” (Nordmann and Rip 2009), it is only possible to publicly check the plausibility of expectations.

However, one must not overstate the seriousness of the violations of the discussion rules. As the empirical material presented in this chapter demonstrates (e.g. comparing testing for Huntington’s disease with testing for autism), such a violation is easily made, mostly unwittingly for sure or as a result of “indolence or sloppiness”(Van Eemeren 2010: 197). The aim of this chapter is not to point an accusing finger at life scientists (or other participants) as soon as the quality of their

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28 Even though the concept of strategic maneuvering emerged to be a powerful analytical concept to reconstruct, analyze and evaluate argumentative discourse, this case study also shows that additional (ethnographic) data are essential for a maximally argumentative interpretation (see Section 3.5). Firstly, including texts which are (explicitly) referred to in the discourse – the inter-textual context – enrich interpretation and analysis. In the delinquency deliberation for instance, Adrian Raine turned out to be an “inter-textual discussion partner.” Secondly, ethnographic data on stage as well as back stage from video-recordings, interviews and questionnaires complement the analysis. These data provide a) context of how to interpret statements (John Lush’ boundary between insiders and outsiders); b) knowledge about what participants were aiming for; how participating life scientists managed their impression (Lamb’s toning down of expectations; see Chapter 1); how to determine the effect of particular strategic maneuvers (Dr. Roote’s claim on technological feasibility) or how participants experienced the outcome of the deliberation (Gibbs’ discontent with the produced consensus).
argumentation is questionable. Claims about quality are in fact debatable themselves. Nor do I want to suggest that argumentative moves were meant to obstruct a reasonable discussion intentionally. So what I do not claim is that every participating scientist committed an *argumentum ad verecundiam*. As I have indicated in this chapter, expertise about the future was mainly attributed to scientists as their visions remained unchallenged. My point rather is that, particularly when these visions are contested, a critical investigation increases the dialectical quality of the discussion.

One strategy of checking the plausibility of expectations can be derived from the pragma-dialectical evaluation of argumentations from expert opinion using a set of critical questions experts must answer satisfactorily (Wagemans 2011). Perhaps the “field question” (Is the expert an expert in the field of expertise, in this case genetics?) and the “expertise question” (How credible is the expert as a source?) are not very useful. As social studies of sciences have demonstrated, the boundaries of fields of expertise are socially constructed (Gieryn 1995, 1999) and credibility is gained in social interaction as the public dialogues at the LUX demonstrated. The “back-up evidence question” and the “consistency question,” however can be used to interrogate expertise both off-stage and on-stage: Is the expert able to provide evidence for his claim? Is the expert’s claim consistent with other experts’ assertions? And perhaps a “certainty question” can be added (cf. Weiber 1995): what is the amount of uncertainty attached to this claim?29 These critical questions can work as tools to critically assess expectations. With respect to technological feasibility, the consultation of a number of different experts, an analysis of the context in which claims are made and a lab study are helpful. An analysis of fictive scripts casts light on how technologies are envisioned to function in social practices (social usability). And finally “[b]y making explicit which values and moral justifications are embedded in expectations” (Lucivero et al. 2011: 140) and using NEST-ethics, differences of opinion about the moral desirability can be anticipated. As argued in Chapter 3, NEST-ethics and the set of critical questions (stock topics) both provide a heuristic to anticipate moral argumentation (not only consequentialist, but also deontological, good life ethics etc.). In the next chapter I describe how these two strategies were used as dramaturgical work behind the scenes. I present a critical vision assessment of omics profiling for common diseases (Chapter 6), particularly an assessment of the moral argumentation. The critical questions constitute a heuristic to find relevant information and expertise for a well-informed discussion.

The second question I have addressed in this chapter read: How does the dramaturgy of these upstream public dialogues, influence the performance of participants? The reconstruction provides some clues that scripting, staging and setting affected the deliberations at the LUX. Firstly, the script – the selection of “characters in the play” and “cues for appropriate behavior” (Hajer 2005: 631) – affected the performances of participants. The public in the ADHD deliberation who were staged as active participants did not automatically adopt the role of critical citizen. The script of the ADHD deliberation for instance allowed a majority of the public to re-stage the interaction and turn the public investigation of sociotechnical imaginaries into a “refresher course.” Most other people were hesitant to participate in a discussion in the public sphere not least because of a bias that lurked in the script. In an attempt to involve the public in the setting of the agenda of issues, the burden of proof was allocated to the public who were asked to provide reasons for the undesirability of behavioral genomics research. In the ASD deliberation on the other hand, the presence of two national scientific celebrities induced a change in physical setting which prevented a large part of the public from participating. Furthermore, Dr. Roote was “the star” whose authority and fame influenced the course of the discussion.

Secondly, the staging – “the deliberate organization of an interaction” (ibid.) – in the delinquency deliberation failed. Because of Roger Lamb’s modest representations of the future, hardly any interaction between him as protagonist and the two critics as antagonists occurred. The public setting presumably has affected Lamb’s public presentation of expectations. The interview scripted as the very beginning of the interaction, proved to be a problematic staging technique to elicit advocacy, particularly within the historical context of the Buikhuisen affair. This means the considerable influence organizers and facilitators of upstream public deliberation have on the performance of participants as they define the “cues for appropriate behavior” (Hajer 2005: 631).

However, for a more profound analysis of the dramaturgical effects the empirical data of this case study, particularly the questionnaires, provided insufficient information for investigating specifically how participants experienced the dramaturgical interventions. In Chapter 6, I provide in more detailed description of a more empirically informed analysis of the effect on the dramaturgical considerations of a public dialogue event on omics profiling for common diseases.
6

BACKSTAGE OF...
THE DRAMATURGY
OF DELIBERATING
FUTURE HEALTH
CARE FOR DIABETES
UPSTREAM
CHAPTER 6

Backstage of...
The dramaturgy of deliberating future health care for diabetes upstream

6.1 Introduction

"Revolution in personalized medicine: First-ever integrative ‘omics’ profile lets scientist discover, track his diabetes onset."1 Thus read the headline of a press release from Stanford University on March 15, 2012. The report announces a publication in scientific magazine *Cell* (Chen et al. 2012). In that article, the Stanford Genetics researchers present the so-called “integrative Personalized Omics Profile,” or iPOP. The iPOP is a genetic risk profile derived from the personal genome, supplemented with recurring measurements of RNA, metabolites and proteins from the blood of a healthy test subject: the head of the Stanford Genetics Department himself, Michael Snyder. Snyder having his DNA completely sequenced multiple times and letting it be searched for genetic susceptibility for various diseases and disorders without a medical cause was not new (cf. Ashley et al. 2010).2 What was new was that he had his blood tested twenty times over a 14-month period for the presence of all sorts of other biomolecules. In the article, the researchers claim that an iPOP, if measured over a longer period of time for one test subject (n=1, longitudinal research) can give relevant information about the state of health of an individual.

The test subject proved, for example, to have a genetic predisposition for cardiovascular diseases and type 2 diabetes. A risk of cardiovascular diseases was to be expected on the basis of his family’s medical history, but a predisposition to diabetes was not. Other risk factors (obesity, too little exercise etc.) were not present either. During the longitudinal tests, the researchers measured the blood glucose levels in the healthy state, but also when the test subject was ill. His glucose levels rose significantly after he contracted a viral infection. However, these levels remained

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2 To get an insight into margins of errors, three sequencing machines that are by now commonly used in genome sequencing were employed.
much higher than is normal after the subject’s body had successfully eliminated the virus. This leads the researchers to conclude that they witnessed the onset of type 2 diabetes in real-time. The glucose levels only decreased as a result of an intervention: the test subject adapted his diet and started exercising more.

As such, the creation of iPOPs would enable finding diseases like diabetes at such an early stage (predict) that symptoms of the disease could be reversed long before complications occur (prevent). “The researchers say that Snyder’s diabetes is but one of myriad problems the iPOP can identify and predict, and that such dynamic monitoring will soon become commonplace” (Conger March 15 2012).

It is hard not to be enthusiastic after reading the press release. The public is, after all, made witness to nothing less than a scientific breakthrough, a historic moment, “an important milestone in the realization of the promise of truly personalized medicine” (ibid.). The reader sees, furthermore, that money invested in medical research was usefully spent: on prevention of an extensive health problem “that affects millions of Americans.” The press release contains countless maneuvers to persuade the reader of the prospect of personalized medicine or P4 medicine (for a more extensive explanation of this concept, see Section 6.2).

This incident and the study as they were described in the press release formed the immediate cause for an upstream public deliberation event in at the LUX that was titled An iPOP for everyone? Is preventing diabetes better than curing it? In a publicly accessible setting, a panel of members of the public, life scientists and experts on public health and diabetes were to deliberate on the desirability issues concerning the (preventive) care for diabetes.3

This deliberative event formed the case study that I describe as a diptych in this chapter and the next. In Chapter 7 I analyze the strategic maneuvers of the participants on stage during the public deliberation, whether or not as a response to my interventions as the facilitator. This chapter, on the other hand, is also a detailed description of the preparatory work for the public deliberation event (Section 6.3.4). In Section 6.4 I conclude that a) the dramaturgical work mainly consists of making trade-offs between deliberative and participative quality criteria and b) that public deliberation events are experimental in nature with unforeseen effects.

Section 6.2 is a short introduction into the concept of P4 medicine and health. Section 6.3 contains the reconstruction of the dramaturgical process of the upstream public deliberation event on P4 medicine and diabetes. First, I describe the work of framing the public issue (Section 6.3.1). Second, I discuss the selection of relevant participants and the contingent process of forum formation (Section 6.3.2). In the next section, I particularly focus on the investigation of expectations (Section 6.3.3) as was reported to all participants prior to the public deliberation. Since expectations are part and parcel of the discourse in NEST-ethical discussions, exploring the socio-technical imaginaries of P4 medicine and health was considered to be a prerequisite for discussants to perform as deliberating citizens. Finally, I discuss issues of scripting, staging and setting of the public deliberation event (Section 6.3.4). In Section 6.4 I conclude that a) the dramaturgical work mainly consists of making trade-offs between deliberative and participative quality criteria and b) that public deliberation events are experimental in nature with unforeseen effects.

6.2 What is P4 medicine and health?

The authors of the article in Cell see in the iPOP, and in the “high-throughput technologies and computational frameworks [that] enable the examination of biological systems in unprecedented detail,” a new and important instrument that contributes to “significant advances in personalized and precision medicine” (Chen and Snyder 2012: 73). In this section I want to consider the definition of the concept of personalized medicine since this term has various meanings. I am using the term as it was defined in the 2012 report by the European Science Foundation (ESF) that was published as Personalized Medicine for the European Citizen (ESF 2012),

3 In chapters 6 and 7 and will simply speak of ‘diabetes’ rather than ‘type 2 diabetes’ from this moment onwards. The distinction, however, is crucial, given the differences in genetics between type 2 diabetes, type 1 diabetes and, for example, MODY (Maturity-Onset Diabetes of the Young). Type 2 diabetes is by far the most common, but it is far less heavily genetically predetermined than type 1 and MODY are.
Personalized medicine can be broadly described as a customisation of healthcare that accommodates individual differences as far as possible at all stages in the process, from prevention, through diagnosis and treatment, to post-treatment follow-up (ESF 2012: 13). Defined as such, personalized medicine is broader than terms like genomic medicine or precision medicine (also used by Chen and Snyder), which both do contain a significant portion, but fail to really articulate the broader vision. Genomic medicine, for example, wrongfully suggests that information about the genome alone is sufficient for the customisation of healthcare. Moreover, genomic medicine could be wrongfully associated with the image of personalized medicine, now that the notion that genomics has failed to deliver on its promises is spreading (ESF 2012: 14; in Section 6.3.1 I offer a more expansive discussion of the technological feasibility of applications of whole genome sequencing in health care).

According to the ESF report, “the future of medicine might best be considered [...] as proactive P4 medicine” (ibid: 14). The concept of P4 medicine is attributed to Leroy Hood (see e.g. Hood et al. 2012; Hood and Flores 2012), an American biologist who tries to apply insights from systems biology to medicine. Systems biology is the coordinating (holistic) view on the biology of humans and their health. It integrates the knowledge of multiple different “omics” disciplines within the life sciences that each have a specific level in biology as their object of study: the complete individual DNA and the genes of humans (genomics), RNA-molecules that come into being as a result of the process of transcription (transcriptomics), produced proteins (proteomics) or products of the metabolism and metabolites like glucose (metabolomics). The presence of, the quantity (or concentration) of, or a change in the chemical composition of all these molecular biomarkers may be timely indicators of an aberrant process that denotes the development of a disease.

The term P4 medicine refers to four Ps: Predictive, Preventive, Personalized and Participatory. This form of health management is about a) the identification of actionable genetic variants (with the aid of whole genome sequencing) and the divergent or changing values of measured biomolecules (in comparison to previous measurements conducted on the same individual) that, respectively, predict a risk of, or indicate the early onset of certain diseases (predictive); b) the early detection of pathological processes so that they can be reversed or even prevented before severe complications arise, as with diabetes, with the aid of measures such as medication and lifestyle interventions (preventive); c) the customization of prevention, diagnosis and treatment to the specific biology of the individual (personalized) and d) the active contribution of proactive patients and health care consumers to their own health management and to scientific research by making their data available (participatory).

In Section 6.3.3 I will further explicate the promises that surround P4 medicine and health. In the next paragraph, I will describe how the iPOP as future technology was made the subject of a public dialogue.

6.3 The dramaturgical work behind the scenes at the LUX

6.3.1 Identification of an issue: why P4 medicine here and now?

A public deliberation is useful only when a) an actual difference of opinions exists, b) when the right people engage in debating each other, and c) when the plausibility of expectations concerning the feasibility of the new technology is recognized. Before P4 medicine was chosen as a suitable issue, I conducted an extensive preliminary investigation, which I will describe in this paragraph.

The germ for beginning the preparations of the public deliberation about iPOPs and P4 medicine and health was the publication of the report Het ‘duizend dollar genoom,’ een ethische verkenning (The ‘thousand dollar genome,’ an ethical exploration) by the Dutch Health Council (Gezondheidsraad or GR) (Dondorp and De Wert 2010). The report is an exploration of the ethical, legal and social issues (ELSI) incited by the development of whole genome sequencing, the technical possibility to sequence the complete hereditary material of an individual “to deliver prevention, diagnostic testing and treatment to individual patients (personalized medicine)” for an affordable fee, i.e. thousand dollars or less (Dondorp and De Wert 2010: 13). In the preface to the report, the urgency of a broad social discussion is stressed, because “we are at the threshold of a development that is in many ways uncertain, but that has potentially major consequences for healthcare as well as society as a whole” (ibid: 4). As an organizer of public deliberation, I seized this call for further investigation. After all, I had observed in the report a difference of opinion: as opposed to the advocates of these technoscientific developments (as represented in the report, at least), the ethicists feel that a “positive balance of advantages and disadvantages” is out of the question for the time being, so that “a reliable offering within public health care is out of the question anyhow” (ibid: 31). At the same time, the report gave me two tasks to face. First, how do I delimit the issue, and second, how to determine the plausibility of these future expectations? I discuss the demarcation of the problem first.

4 For reasons of consistency of the American spelling used in this dissertation, I have adapted the title of the ESF report.

5 It is unclear to me why they themselves hold on to the term personalized medicine.
The plethora of questions articulated in the report prompted me to make choices for a suitable delineation. In this case, the technology of whole genome sequencing determines the scale and scope of the issue. The screening of the complete personal genome of individuals complicates a clear focus more than, say, the issue of specific genetic testing for autism (as was discussed in the previous chapter) or other diseases, disorders or defects. The authors of the report do, after all, discern several divergent ethical fields that each evoke their own questions. I decided to further investigate the genome-wide screening of healthy people with no medical reason in order to predict as many common diseases as possible.6.7 The screening of healthy people and the impact of genomics on health care is, after all, a pre-eminently public matter since it potentially affects (and mobilizes) a wide public (cf. Pröpper and Witteveen 1995). Moreover, some of the other issues were already extensively looked after (for example: informed consent and reporting unsolicited findings in whole genome diagnostics of people with rare (mono-)genetic disorders, cf. Rigter et al. 2013).

6 This choice was at the expense of matters like genome-wide diagnostics, genome-wide prenatal screening or pre-implantation genetic screening, which all have bearing on diseases and disorders with a much stronger genetic factor than common diseases. Genome-wide diagnostics – and exome sequencing – is already a standing practice in the Netherlands. It is about the merging of a diagnostic and a scientific practice, aimed, in first instance, at identifying a (mono)genetic cause for a disease or a congenital defect (e.g. mental retardation), but in second instance – if none of the established genetic causes were found – aimed at finding new genetic causes by systematically scanning the whole genome (or exome). In this case, it often concerns monogenetic diseases and disorders that are largely incurable. It is also expected that prenatal screenings (during the pregnancy) and pre-implantation genetic screenings of embryos after IVF treatments will be limited to severe, heavily genetically determined and untreatable disorders. As yet, there is little reason to assume that prospective parents would opt for abortion if a heightened risk for diabetes is detected in the unborn child. Incidentally, another matter the authors observe is genetic carrier screening for untreatable disorders. As yet, there is little reason to assume that prospective parents would opt for abortion if a heightened risk for diabetes is detected in the unborn child. Incidentally, another matter the authors observe is genetic carrier screening for diseases such as sickle-cell disease, so that couples of which both partners have taken a carrier screening before their intended pregnancy know in advance what their odds are for having a child with a hereditary disease.

7 Initially, the choice of focusing the debate exclusively on the screening of adults or on the screening of newborn children as well (for example during the neonatal heel prick screening) remained open. See 6.3.2 under “social usability” for an elucidation of the choice for the screening of adults only.

8 See Becker et al. 2011 for a description “Common disorders have a multifactorial etiology: they are caused by several genes and environmental factors, involving gene-gene and/or gene-environment interactions” (56).

9 In the aspiration of a wide social debate as advocated by Dondorp and De Wert, a public deliberation cannot be restricted to a single common disease. However, a broad approach was not performable within this research project. All the same, if it had been, I would still have chosen to have multiple deliberations, with each focusing on a single common disease, i.e. beside type 2 diabetes, on cardiovascular disorders, cancer etc. The choice for diabetes was more or less made by chance: the Dutch Diabetes Fund had recently started a poster campaign with the ambitious slogan “A future without diabetes. Let’s do this. Support research.” Nevertheless, the observed drastic increase in the number of diabetics and the scope of this disease do meet the first of Wilson and Jungner’s screening criteria: it concerns an important health problem that every Western citizen has a chance of getting. Moreover, it is a recognizable disease to many people.

10 Because of this framing, issues as a result of cumulative effects stay out of the picture, even though those could play a significant part in the future (Horstman and De Vries 2007).
al. 2011). Why organize a dialogue about predictive technologies while the scientific community itself has severe doubts about their feasibility?

This changed when I was made aware of the article in Cell. The study in Cell indicated that in principle, omics profiling provides valuable new information about the health situation of individuals. Second, the authors of this study acknowledged the limited value of genetic information for the prediction of common complex diseases.11 But most importantly, TNO, an independent Dutch research organization that works for the Dutch government, the SME sector, large companies and NGOs in order to develop “knowledge for practical application,” had started to participate in social experiments or field labs (“proeftuinen”) aimed at the early diagnosis and prevention of diabetes and the provision of personalized lifestyle advices.12 What is more, TNO had prominently adopted Hood’s P4 medicine as a paradigm for future health care in general and of diabetes in particular. In a report, TNO anticipates new medical technologies for the prevention of diabetes (Wevers and Gijsbers 2013). So, new networks built around the promises of personalized medicine were emerging and considerable amounts of research funds had already been invested to stimulate these scientific developments. This indicates that within these networks, these sociotechnical imaginaries revolving around predictive and preventive health care are not considered to be “too futuristic.”

In short, the transition to P4 medicine and health with the aid of iPOPs proved a suitable issue: a current but still young development in the life sciences that is receiving financial investments and that evokes ethical questions. The selected framing – genome-wide screening of healthy people for type 2 diabetes as part of an iPOP – made the organization of the dialogue more manageable, because it defines the public explicitly. Who should actually participate in such a dialogue?

### 6.3.2 Casting the characters in the play

As described in Chapter 2, an important element in scripting a public deliberation setting is to determine the characters in the play (Hajer 2005: 631). Which people are suitable for the cast? Which life scientists who work as authorities on the systems biology of health? Who belongs to the public? And who has relevant expertise? In this section I will discuss the formation of the panel, a mini-public (Fung 2003) which was to publicly deliberate the issues (see Section 6.3.4 on staging). I elaborate on the selection of life scientists, next the identification of members of the public, as “implicated in” the issue of P4 medicine (Marres 2005: 48) and finally various experts from outside the community of life scientists. I looked for a professional organization that was active in the field of diabetes care as a partner, in order to be able to make use of their networks and communication channels (also for subsequent publicity campaigns).13 My assumption was that the public would sooner recognize the relevance of a dialogue if it was co-organized by an organization with which they were familiar.

In Chapter 5, I demonstrated the significance of the participation of delegates of the scientific community who consider the feasibility of future technologies as plausible and who are willing to publicly perform as advocates of these new technological innovations. Dr. Lamb, for instance, employed several strategic maneuvers in order to refrain from advancing a standpoint on the moral desirability of improved risk assessment tools for criminals and citizens based on biological indicators. He drew an ethical boundary between his responsibilities as a scientific researcher and the responsibilities of society that has to make a final decision about the usefulness of such risk assessment tools. Thus, the aim of upstream public deliberation – to ask scientists to publicly justify their decisions on the course of scientific research programs – was hard to accomplish.

I wanted to have four participating life scientists, in order to not just give a broader representation to science, but also to publicly expose possible differences of opinions within the scientific community. The report of the Health Council provided little indication to find proponents of this new technology. The only explicit source that the ethical exploration itself offers is Francis Collins (2010a), the author of...
popular science book about “DNA and the Revolution in Personalized Medicine,” as its subtitle reads. The only explicit mention of Collins was in the inaugural lecture of a professor in clinical genetics who was also a board member of the Dutch Association of Clinical Genetics (Vereniging Klinische Genetica Nederland) whom I sent an invitation. Other invitations I sent out to researchers who a) were mentioned by people in my own network who overlooked the field of (genetics) research into common diseases, b) who came up in an extensive search on the Internet, or c) who were in the network of the Dutch Diabetes Federation (NDF), that agreed to collaborate in this deliberative project.

Some life scientists who were invited really wanted to come, but had to give priority to other planned activities on the proposed dates. Others did not deem themselves suitable discussion partners and had to be persuaded. With varying success. I did, for example, send an invitation to a principal investigator of a public-private partnership project that is aimed at finding new biomarkers of type 2 diabetes. His expertise made him a very relevant speaker. In his own opinion, being an “expert in the field of the molecular mechanism of the development of diabetes” was exactly what made him unsuitable, given his “limited understanding of the discussion at issue.” He did express his willingness to give me the names of “researchers who are far better than I to participate in the discussion” as a “project leader of a big project concerning the prevention of diabetes” (e-mail correspondence). A second attempt in which I emphasized his expertise and his function as a project leader (which he himself acknowledged) once more came to nothing.

In the end, three life scientists committed: 1) the previously mentioned clinical geneticist and board member of the Dutch Association Clinical Genetics; 2) an innovation director of life sciences at TNO; and 3) the program manager of a consortium that experiments with whole genome sequencing in diagnostics. The last mentioned also blogs about new technological developments; his blogs (sometimes) appear in Dutch newspapers and newsmagazines.

For the invitation of members of the public, “called into being” (Marres 2005: 55) by the issue, public groups were identified from an analysis of the promises surrounding P4 medicine, which I will describe in greater detail later on (Section 6.3.3). These promises do, after all, imply an audience. As Michael (2000) states, a subject who will experience this (favorable) future is often presupposed in these expectations for the future (26-7). In the case of P4 medicine, this does not simply concern an individual subject: the health care consumer who can live healthier. Hood and Flores (2012) assert that the transition to P4 medicine stems from the needs (“push”) of a collective of articulate and “newly activated and networked patients and consumers,” who “are beginning to push for a health care that is adapted to their own particular circumstances” (619). In addition to this, other collective subjects are constructed: risk groups that can be reached sooner and better, citizens who need to pay less for health insurance so that health care will remain affordable for future generations as well, and people in Developing Countries who share in the benefits. On the other hand, individual health care consumers are expected, as citizens, to take responsibility of their own health and to place their biological information at the disposal of science through a large infrastructure for the exchange and storage of big data. Apart from individualizing – in the sense that each individual gets customized medical treatments and advice – the technology of the iPOP, then, is also collectivizing (cf. Dijstelbloem and Klaassen 2008). This makes P4 medicine a public issue. Who wants this change in health care? Who will have to deal with its consequences?

It is typical for P4 technologies such as iPOPs that, besides diabetes patients and risk groups (such as obese individuals), they open up new public groups: still-healthy (and young) citizens, articulate health care consumers or pre-patients who want to actively monitor their health for risks without displaying symptoms. I chose not to have a random sample of Dutch citizens (as is customary in, for example, consensus conferences). Instead I approached not just patients and people at risk, but four active members of local political youth organizations who each represented a major Dutch political party, thus covering a significant share of the political spectrum: the socialist party (Socialistische Partij, SP), the labor party (Partij van de Arbeid, PvdA), the progressive party (D66) and the conservative party (VVD). These people are all young and as such have little to do with diseases; they are articulate, as is evident from their political interests; they belong to the future generation that would benefit from these developments; and they represent different political movements. Another important public group that might have to face the consequences is the group of health care professionals (nurses, general practitioners and internists). A new way of working will, after all, be expected of them, a way that is aimed more at health monitoring.

The third group of panelists – beside life scientists and members of the public – were people with relevant expertise other than the expertise of life scientists and the expertise through personal experience that I assumed the public groups to have. What kind of expertise is relevant? Who knows the practice, the prevention
of, and the research of diabetes well? Who will be using the technology? I further invited: a) a manager working at a local public health institute (GGD) whose primary public assignment is organizing disease prevention, b) the head of research of the Diabetes Fund, the largest private fund that finances the research of diabetes, c) the director of the NDF, d) an ethicist specialized in the medical-ethical questions around prevention, e) a philosopher specialized in issues around public health, f) a professor in diabetology (who is also an internist), and g) a sales manager of medical equipment for diabetes patients (glucose meters, etcetera).

The amount of control the dialogue organizer has on the eventual composition of the panel turned out to be limited. Many invitees gave precedence to other (daily) activities. Negotiations with the collaborating partner also partially determined who did and who did not receive an invitation to the panel. The NDF insisted, for example, that “official representation of the [diabetes] patient is a must,” while I considered their suggested candidates (an ex-parliamentarian, for example) to be too administrative. To me, direct personal experience as a diabetes patient or risk group was important. In addition, not everyone identified with the role that was allotted to them in the cover letter that was sent along with their invitation. In the invitation, they were initially addressed “as opinion leaders.” After a considerable number of negative responses, many people indicated, upon further inquiry, that they considered themselves to be too ill-informed of the technoscientific developments. The place of action – a city in the east of the Netherlands – proved to be of importance for many participants (this was a reason to invite local political youths): after a series of cancellations from people all over the country, the NDF and I successfully aimed at people from the Nijmegen area. The panel members also proved to be, without exception, well-educated.

After all panel members had confirmed their attendance, the phase of substantive preparations began. To that end, I carried out an assessment of the expectations for the future regarding P4 medicine, which I will discuss in the next paragraph.

6.3.3 Assessing future visions of P4 Medicine

As was discussed in Chapter 4 (Section 4.4.3), the sociology of expectations focuses on the performative function of expectations. Expectations are strategic maneuvers, often projections of a morally desirable future that are discursively presented with the rhetorical goal of persuading a (possibly critical) audience (audience demand). Advocates of new science and technology use expectations as a rhetorical device for arousing interest sponsors and for anticipating public discomfort. Expectations do, in short, belong to the standard repertoire of public performances of scientists. As the dramaturgist of this public deliberation, I considered a critical analysis and assessment of the sociotechnical imaginaries around P4 medicine and health necessary for two reasons. Firstly, a vision assessment is a helpful tool to broaden public deliberation as I indicated in the conclusion section of Chapter 5 (see Section 5.5). Consulting literature in which these imaginaries are elaborated helps anticipating the public issues at stake instead of merely responding to the issues that are articulated ad hoc.

As the analysis of the public deliberations on behavioral genomics showed, there was plenty of reason to suggest that the imaginaries of participating life scientists could be more critically discussed. Secondly, the events described in Chapter 5 demonstrated that members of the public do not automatically adopt the role of deliberative citizen. Instead, they refrained from participating in the public sphere or they adopted a more passive role of recipient of state-of-the art information. To prepare all panelists for their deliberative performance the results of my vision assessment were reported to all participants in the week before the deliberative event at the LUX (see Figure 6.1). The report (see Appendix E) was meant to be an understandable, accurate and as complete as possible introduction to P4 medicine and the main ethical issues concerning the moral desirability of systems biology approaches to health care to warrant an equal point of departure for all panelists.

For the analysis I made use of the patterns of moral argumentation (NEST-ethics, Swierstra and Rip 2007), various parameters (Michael 2000), and the three types of closely related rhetorical claims made in expectations for the future: technological feasibility, social usability, and moral desirability (Lucivero et al. 2011; see Section 4.3.3).

Apart from official publications (popular science books, academic orations, reports, trend analyses, but also scientific publications), I also conducted a number of backstage interviews about constructed futures with various experts, including some who were not directly involved with the life sciences. These interviews were compared to the publications (cf. Lucivero et al. 2011).

For the interviews, five life scientists were interviewed. Some of the interviewed experts were to participate in the discussion, others were not. Three of them were participating panelists, one was a principal author of the paper on iPOP in Cell and one was a principal investigator of a research project aimed at developing molecular technologies for the early identification of people at risk and a personalized prevention and therapy program for diabetes in a Dutch public-private research consortium for translational medicine. Furthermore, the ethicist (see panel) and a philosopher of public health with a background in science and technology studies, the professor of diabetology (see panel) and two other panelists were interviewed: the director of NDF and a diabetes patient who had been active as a representative in a diabetes patient organization, the Dutch Diabetes Association (DVN).

Important questions were: how do the interviewees look upon the future
of P4 medicine? Which issues are identified? More specifically, I examined how representations of futures are articulated frontstage, and how those representations differ from the constructions that were made by the (participating) life scientists in the backstage interviews. Which issues do they expect the public will articulate? Which moral issues do they identify themselves (see Appendix D)?

Emphasis was laid on moral argumentation and a critical analysis thereof (see moral desirability).

To contrast the findings of these preparatory interviews with participating life scientists with their actual performance on stage, I present the results of these interviews backstage in Chapter 7.

To contrast the findings of these preparatory interviews with participating life scientists with their actual performance on stage, I present the results of these interviews backstage in Chapter 7.

The two life scientists who participated in the end were questioned more extensively in an interview that took place after the deliberation. Of the other 15 panel members, 13 filled in the questionnaire. One panel member refused to fill in the questionnaire because it was not anonymous. The fifteenth panel member did not fill in the questionnaire.

The manager of the local public health institute (GGD) described the report as “absolutely not neutral” in the questionnaire. See also footnote no. 23 in this chapter for his response to the information and scenario on stage.
will be difficult to dismiss as too futuristic, since various networks are already forming around these promises. On the other hand, challenging technological feasibility can be a very effective strategic maneuver on stage without risking derailment because of the elusive character of future expectations, as demonstrated in the autism deliberation (Section 5.4). Challenging technological feasibility renders the other critical questions and hence, a critical discussion on moral desirability redundant. Why discuss moral issues of technologies that will not materialize in the first place? How plausible did participants believe P4 medicine to be?

According to the literature, the expectations with respect to technological feasibility of personalized medicine or P4 medicine are high. The question is not if iPOPs will materialize, but when. Their advocates construct an optimistic future. The future of P4 medicine is certain, near (“In 10 years we see every consumer of healthcare surrounded by a virtual cloud of billions of data points,” Hood and Flores 2012: 614), it is rapidly developing (“The way we understand and treat disease is changing rapidly,” ESF 2012) and revolutionary (“Advances in the ability to perform large-scale genetic and molecular profiling are expected to overcome the limitations [of current medicine] by addressing individualized differences in diagnosis and treatment in unprecedented detail,” Chen and Snyder 2012: 73). Some figures in these documents are used strategically to demonstrate the gradual progress “from bench to bedside” (see ESF 2012: 24; see Figure 6.2).

Nevertheless, the literature also explicitly mentions concerns, limitations and challenges (Chen and Snyder 2012; ESF 2012; Hood and Flores 2012; NHGRI 2011). Those challenges are often of a social and organizational nature (e.g. whether or not health care professionals and consumers have sufficient knowledge), but there are still uncertainties on a technical level as well, especially concerning the processing power, suitable bioinformatic calculation models for analysis, and the integration of different types of data. But the purport in the literature is that these technical challenges can be overcome. In the end: “the era of personalized precision medicine is about to emerge” (Chen and Snyder 2012: 79).

The interviews demonstrated a more nuanced vision of the future. The diabetologist was skeptical: “Valeriya Lyssenko [a Russian researcher] has managed to put all those genetic traits, those risks that are determined, into a model and she has checked whether or not those can predict a risk of diabetes. And that turns out to be really disappointing” (Preparatory interviews). He questioned the usefulness of...
having a public deliberation in this early a stage.¹⁹

One out of the three participating life scientists emphasized, conversely, that the scientific developments should be a reason to organize a dialogue at this early stage. “I feel that we [as scientists, as doctors] are indeed working on a development which people should already be thinking about. Not because we have direct applications for it or because we can directly... Well, work on the improvement of health care. But because we are presently working on technologies which will enable decisions about that within, well, five or ten years” (Preparatory interviews)

Nevertheless, the life scientists had divergent opinions about the technological feasibility of iPOPs. Two of them were cautious. The PI: “I think that there is too much emphasis on the biological risk factors at the moment. Because, if you’re being honest, the research into genetic variations in relation to the development of diabetes that has been done so far has yielded awfully few results. Looking at our own research one actually sees that the biological risk factors that emerge are really not all that surprising at all” (Preparatory interviews). Even so, he stressed, “This technology should absolutely be developed.”

The clinical geneticist indicated that she had readjusted her views of the future as she had articulated them in her oration a year earlier. Then, she told her audience that “by sequencing hundreds of thousands, maybe even millions of genomes, we are going to find genetic variations which individually, or in combination with a small number of other variations, are strongly decisive in the development of common diseases such as diabetes, rheumatism, and asthma.”²⁰ Now she sees “the period in which that [the charting of genetic variations] will happen, […] as much, much longer, and I even think ‘if it will happen at all’” (Preparatory interviews).

The interview with the diabetologist I asked: “How useful, in your opinion, would it be to organize such a dialogue?” Diabetologist: “Well, I strongly doubt it [will be useful]. Yes, I strongly doubt it.” Me: “And do we set too much store by such a publication, for example? Or do we risk...?” Diabetologist: “Yes, I think so.” I also asked the diabetologist what, then, were his reasons for participating in the dialogue. To that he answered: “There needs to be someone there who has the proper expertise. Otherwise it will become a dialogue about an abstract subject, with no people present who have the relevant know-how. If it takes place in the Nijmegen area, I feel like I should be that person. Or at least, I am one of the people in the area who could be that person. So that’s it.” Me: “And then you will say: ‘Well, people, I am skeptical about all these possibilities,’ and then we can all go for a cup of coffee?” Diabetologist: “Yes... Well, if you put it like that…. If you would have asked me: ‘Is this a good idea? Would you want to organize an afternoon like that?’ I would not have done it.”

In short: opinions about the feasibility of P4, medicine differed (in particular with regard to the P’s of prediction and prevention), as is the case in all scientific and technological development. Nevertheless, this information from the interviews was helpful. First of all, the expectations of P4 medicine and health are plausible to a considerable part of the life scientific community, although concerns exist. Second, it was possible to prepare a possible intervention in case someone would close the discussion claiming that iPOPs for preventive use are not technologically feasible. I would be able to appeal to the asking of critical questions: what is your opinion based on? And: does a consensus exist about this in the scientific community? The preliminary investigation provided me with a negative answer to the last question, which would make it easier for me as the facilitator not to get stuck in issues about feasibility. To further decrease that risk, I invited the panel members to consider the technological feasibility of iPOPs a given, with the aid of a scenario. For that matter, the technological feasibility proved not to be an issue during the deliberation. The preparation might have had a significant role in that, although this cannot be proved with empirical material.

Social usability

Sociotechnical imaginaries were also examined for social usability. What social practices are envisioned in which iPOPs are supposed to be functioning? As was argued in Chapter 2 (Section 2.2), technologies are inextricably linked to social practices. How technologies are used in practice partially determines the ethical questions they can evoke (see Horstman and De Vries 2007).

To get a sense of what experiencing the repeated testing of molecular biomarkers might be like for research subjects, and how the device might possibly be used in the future, I interviewed a principal author of the Cell article. Although he indicated that “a lot of devotion is needed” of the research subject for him/her to give even more blood during viral infections, he did indicate that the lab setting that was used cannot be compared to the way in which the measurements will eventually be conducted in the future. “But as it [the iPOP technology] gets further, it will become more streamlined, take shorter time, and a lot less [bodily] material. Less stressful, and in the end it might be just a tabletop thing. Or just a wristband that the patient is wearing. That’s how I view it.” (Preparatory interviews) He could not be much clearer in his description of the practice around these technologies.

This kind of detailed information about the practices in which P4 technologies are to be used was also lacking in the literature. There is quite a lot of attention for the (rational) social organization that is required for a successful implementation of P4 technologies: health literacy, stimulating interdisciplinary work, harmonization of protocols for data collection and handling (ESF report), new interpretation of...
Behind the scenes of… life scientists on stage

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tasks (from clinical geneticist to wellness coach; Hood and Flores 2012). Hood and Flores (2012) are an exception, even though the practices they envision remain very sketchy and contradictory. On the one hand, they envision “clinical institutions” where consumers can monitor and improve their health with the aid of “wellness coaches and genetic counselors,” who provide actionable information “largely through digitally linked social networks, the most important of which will be family networks.” This information comes from personal genome sequencing which has to be iterated regularly and preferably compared with the genome sequence of family members (family sequencing). On the other hand “P4 medicine will not be confined to clinics and hospitals. It will be practiced in the home” (Hood and Flores: 614).

Important questions about the context of application are not addressed, however. Will people be able to order their iPOP profiles from commercial providers off the Internet, in the same way we are now able to order direct-to-consumer genetic tests? Or will the risk profiles only be used in certified public health facilities because they are viewed as medical proceedings? Will there be portable devices that can be taken everywhere, such as a glucose meter for diabetes patients that implies a certain home use? At what age is a personal genome sequence made? How will the family be involved when “family sequencing” (Hood and Flores 2012) is recommended for optimal measurement results? Will common disease risk identification become a part of neonatal screening (Idenburg et al. 2012; Collins 2010)? However, this type of expectation is poorly articulated, both in the literature and during the interviews.

In order to provide more detailed information about a possible future, a more elaborate sociotechnical imaginary or scenario of a preventive outpatient clinic (in Dutch, the “preventiepoli”) was developed (Appendix C), drawn from several scenario studies (esp. Van Rijswoud et al. 2008). The scenario sketches a possible future in with civil society (patient organizations and insurance companies) take initiative in founding preventive polyclinics which are accessible to anyone who wants to preventively manage their health, and which are a facility for general practitioners to intervene more pointedly in the lifestyles of risk groups. The government stimulates this technologically supported practice because it considers it an ally in its goal of health care improvement.

The scenario served multiple purposes. First, this image of the future presumed that a number of decisions were already made, in order to be able to give focus and direction to the deliberation. The technological feasibility of iPOPs, for example, was taken as a given. The scenario also explained why, in an earlier stage, the political decision was made to waive doing the screening for genetic risks as early as the neonatal heel prick. In this manner, as I had learned from previous experience, I could prevent the discussion from switching too quickly to the more loaded ethical theme of the screening of children (about which the report by the liberal VVD was positive; see De Haan et al. 2010).21

Secondly, the goal was to anticipate the future sociotechnical developments, the accompanying ethical dilemmas (see “moral desirability” below), the political decisions to be taken about it, and the arguments that might play a role in the deliberation. How will (health care) insurance companies handle their knowledge of the health conditions of individual citizens? In the scenario it is suggested that health insurance companies will offer basic policies at attractive prices to people who have low risk profiles. Will such a premium differentiation undermine the solidarity in the health care system? This was one of the issues that was articulated in the discussion with the panel (see Chapter 7). Another issue was the accessibility of this technology (together with the related justice arguments): the iPOP will not completely be made a part of the free market, but will instead function as an integral element of public health care. “In this way, it is also easier to guarantee equal access to these facilities” (Appendix C).

The panel members received the scenario a few days ahead of the deliberation. The attached script (see 6.3.4) read that “the short sketch of the future [is] the starting point of the conversation: what does this vision of the future of preventive or P4 Health and Care evoke in you?” (Script panel members; see Appendix F). Gauging the effect of the scenario is not easy. The questionnaires do show that panel members were ambivalent about the scenario. First of all, I noticed that five of the participants had no comments (the only question that had this low a response). Out of the panel members who did fill something in (8 in total) about half considered the scenario “too abstract,” unhelpful (“I was not really aided by it”), ineffective (“the contents produced little result”) or incomprehensible (“Many [of us] did not

21 One of the participants a sales manager of medical equipment, for example, referred to a possible future practice of screening young children during the debate: SALES MANAGER: “When it concerns the premature revelation of [health] information, I think that it is at least also very important to guide the people, in how to deal with that. And for an adult, you could do that, but when a child gets all kinds of information after a heel prick, the parents have all that information, and should that be passed on to the child later on, or shouldn’t it?” ME: “[...] But that is based on the assumption that [a] heel prick screening would be conducted. I understand you would find that objectionable?” SALES MANAGER: “Yes.” ME: “Yes. Okay. I am just going to put that between brackets, because with the scenario we are trying to see what happens when you have got this from a mature age onwards” (Discussion).
understand it"). The ethicist indicated after the deliberation that the scenario had a “social” framing and that it was based on an “abstract individual,” as a result of which it lacked the imagination to see how the technological developments “might changes the lives” of “actual persons” (Discussion).

Others, on the other hand, thought the scenario was “fine,” “a convenient, pleasant way to think about the future.” The GGD manager indeed thought that the scenario was a “story that was lousy with presuppositions” (Discussion), but also that it was helpful in “seeing a wider perspective” (questionnaire panel members). This man, by the way, kept seeing me as the author of the scenario, in spite of my chosen footing.22 The audience largely shared the panel members’ views on the scenario.

Nevertheless, four panel members explicitly based their first contributions to the dialogue on the scenario, which indicates that they used the scenario in their preparations. Some participants also pointed out to their opponents that they were to stick to the scenario.23 One of the observers, conversely, doubted the impact of the scenario. In his opinion, the impact could have been magnified had there been not just one, but multiple scenarios, so that contrasts become larger and “choices become clearer” (observations Observer A). “Now you [as the organizer of the dialogue], had already made a number of choices, more or less implicitly” (ibid.) I made this choice to make sure that within a limited time frame at least one scenario could be profoundly discussed.

—— Moral desirability

As was argued in Chapter 4, in their expectations of the future, the advocates of new technologies appeal to the moral desirability to thus construe a good future (Michael’s parameter of valency). They paint a normative vision on a future reality, or even use a “rhetoric of hope” that, according to Mulkay (1993), is an “idealized vision of the relationship between science and society which enables its users to project an indefinite range of science-based technologies into a radically simplified future” (728). As preparation for the public deliberation, I have analyzed the moral argumentation used in the future imaginaries of P4 medicine advocates, and reported the results of this analysis to the participants. I have, furthermore, made a number of unexpressed premises explicit. Using the NEST-ethics (see Chapter 3) in the future imaginaries themselves, I also used bio-ethical literature and interviews to find answers to a series of critical questions.24

Analysis shows that the sociotechnical imaginaries and moral justifications for P4 Medicine are strongly liberally inspired. Firstly, the advocates of using the iPOP as P4 technology stress the fourth P of participatory, which means that health care consumers will be (even more) in charge of their own health. Using the argumentation outline of deontological argumentation (see Section 3.4.2), the advocates thus find the iPOP worth the effort of developing, because it does justice to the autonomy principle, an important moral principle in medical ethics which expresses that individuals should be as capable as possible to shape and direct their own lives according to their own moral standards.

Although Leroy Hood never uses the concept of autonomy, his vision of the future implies it. He describes the rousing self-awareness of ever more articulate “activated and networked consumers [who] are beginning to push for a healthcare that is adapted to their own particular circumstances, including their individual genome […] and dynamic measurements such as from blood” (the iPOP) and who “are beginning to demand that science-based healthcare address their need for assistance in managing...”

22 The manager of the public health institute (GGD) persistently referred to me as the author of the scenario. During the debate, I made an attempt to negotiate the footing: MANAGER: “When I look at your story, at what you put there, I notice you are really mostly talking about health care. While, when you are talking about diabetes and about obesity, you will also have to be like ‘How will we do this, as a society?’” ME: “I have to have something about... I have heard you say ‘your story’ a couple of times now. I have tried, of course...” MANAGER: “No, I understand. No, but still...” ME: “Before I become the only one here to defend what will happen” (Discussion).

23 Chair of the local youth liberal party: “But I think we now have to look: how will this scenario work in society as we now know it? And in society as we now know it, the scenario will not work, because way more people than we would want will get access to that information” (Discussion).

24 In the report I omitted the word “critical” to prevent advocates of P4 Medicine to perceive me as biased.
their own health” (Hood and Flores 2012: 619). The current, reactive health care system is more of a “disease management industry,” while the needs of health care consumers are specifically made up of managing their own health.

The concept of autonomy is a complex philosophical concept with a rich history and many different meanings, as also became apparent during the dialogue at the LUX (see Chapter 7). The implicated autonomy principle strongly resembles that of J.S. Mill, which strongly influenced the liberal body of thought: autonomy as freedom of choice. Here, autonomy is, in first instance, a negative ideal of freedom; a “free of.” The iPOP firstly supplies the knowledge the individual needs to no longer let the diseases that hinder him determine his fate. But more than that, the iPOP enables the individual to proactively make his own choices about his health, and to no longer be dependent on what he is told by doctors, the experts who populate the reactive health care system, as a “passive recipient of expert advice” (Hood and Flores 2012: 619).

Secondly, the sociotechnical imaginaries of P4 medicine and the iPOP commonly bear witness to a technologically instrumental rationality (Michael 200: 27-9) which is often interpreted as a liberal vision of technology (Zwart 2011; Feenberg 1999): a technology like omics profiling is seen as a neutral instrument in reaching positive goals: prevention or early diagnosis of lifestyle disorders (like diabetes), the prevention of the burden of diseases, shortly, an “improvement of the health care quality as it is experienced by the patient” (Weyers and Gijsbers 2013: 17). Advocates of P4 medicine therefore also use a consequentialist argumentation, in the form of pragmatic argumentation (Section 3.4.1). In their papers, they point out the desirable consequences, the benefits of the developments in systems biology and the life sciences.

As such, P4 health and care is also an instrument for pushing back the cost of health care, which is tightly connected to another value that is typical of liberalism: one’s own responsibility. “We wanted to show that technological breakthroughs leave a large and increasingly large mark on health care. […] But above all, with that we also want to stress the normative aspect which such a health care of the future contributes to a participation society, which enables individuals to take responsibility of their own health and of social participation” (Wevers and Gijsbers 2013: 87).

Citizens are expected to take responsibility in staying healthy and the iPOP technology will help them with that. Because, although freedom of choice is a fundamentally liberal principle, this freedom applies only as long as it does not impair the freedom of others (impairment principle). This would, for example, be the case if collective health care costs were to needlessly rise because someone did not grasp the possibility to gather information about his health in an early stage, thus later having higher costs for his disease or disorder. “If someone did not want certain predispositions to be examined, and this leads to higher costs for society as a whole […] he should in all reasonableness be confronted with his choice. This can be done by partially or entirely recouping the costs from him, or by raising his health care insurance premium” (De Haan et al. 2010: 45).

Hood en Flores furthermore stress the positive effects of this revamped health care on economic development and industriousness. Thanks to digitalization and the decrease of health care costs, even the developing nations can profit from these scientific and technological developments (Hood and Flores 2012: 621).

At the same time, an inconsistency lurks in Hood and Flores’ plea. On one hand, they create a need: “Activated and networked consumers are beginning to push […] for new ways in which to engage with our science-based healthcare system to maintain wellness and achieve life goals as well as treating disease” (Hood and Flores 2012: 619). On the other hand, they see education for “consumers, patients, physicians and members of the broader medical community” as an enormous and necessary challenge, because “[m]any individuals will initially want to remain ‘old-fashioned patients’ letting the doctor tell them what is best” (ibid: 620-1). As it turns out, the autonomous and articulate health care consumer belongs to a vanguard of sorts, but does not speak on behalf of everyone.

See Section 7.3 for a more elaborate discussion of the concept of autonomy.

25 The publications diverge between themselves. While Hood and Flores see reducing the costs of health care as an important promise, the ESF report is more cautious about this. “A realistic expectation could thus be cost containment rather than reduction” (ESF 2012: 18-19).

26 Incidentally, I would like to immediately remove the notion that the TNO report only represents a liberal discourse. It is a nuanced piece and not, like the report of De Haan et al. 2010 a document intended to think through the ethical issues that stem from new scientific developments from a liberal perspective. This shows, for example, in the following extract: “Restructuring unhealthy behavior to healthy behavior is, however, difficult, and it requires skillful handling and support. […] When candy bars are attractively displayed near every cash register and when each train station and gas station has a wide variety of (unhealthy) foods on offer, the will power of the individual is taxed to the extreme. […] [H]ow much paternalism […] of the government is justified in the aim of the desired behavior of citizens, in this case the prevention of public enemy number 1, obesity (which is a well-known and important risk factor for type 2 diabetes). At first instance, technological solutions appear to be of secondary importance here. Rather, it is about social innovation” (Wevers and Gijsbers 2013: 28).
Then, I studied which other NEST-ethical issues could be anticipated. Which rights would possibly be at issue? What are the unintended consequences? Will everyone profit from this technology in equal measure? And if not, how will the difference be justified? I used the stock topics derived in Chapter 3 to systematically investigate potential NEST-ethical issues (see Table 3.2). The amount of attention for these issues highly varies. Francis Collins uses a “rhetoric of hope” in his book and seems to pay little thought to the ethical, legal and social issues to which he was initially so dedicated (cf. Zwart 2011b). The liberal biomedical ethics from the report by the Teldersstichting and “the hyperliberal utopia” from Hood’s publications about P4 show a great “convergence” (Zwart 2011a).

De Haan et al. (2010) do, after all, mainly (or even only) stress the protection of the rights of the individual in their liberal vision, as do Hood and Flores (2012): the privacy of and control of personal details (this is, by the way, an issue that is widely recognized). Although sharing “anonymized patient data” is essential, this information cannot get in the hands of insurance companies or employers: “Laws must be enacted to protect the individual against the exploitation of their medical data by other elements of society such as employers or Insurance companies” (Hood and Flores 2012: 618-9).

To Dondorp and De Wert’s concerns about the right of not-knowing (2010), De Haan et al. (2010) answer that the right of not-knowing is not important to liberals in the end: “If treatment in a late stage is significantly more expensive, the person does not have the right of not-knowing. In many cases, liberals do not acknowledge the right of not-knowing (De Haan et al. 2010: 41-4).”

Unintended consequences do not appear in the liberal and scientific visions. The authors of the ESF report, which was realized in close collaboration with ELSA-researchers, and the authors of the TNO report do observe these consequences, even if they are not systematically studied like in other consulted bio-ethical literature and in the interviews. The reports do, for example, envision a continuing trend of medicalization, just like a panel of citizens (Stol and Nelis 2009) and the interviewed ethicist did. First of all, a systems biological view puts the cause of the disease in the individual biological condition of the (pre)patient. Other, often social factors, which are specifically important in causing disorders like diabetes, may be neglected. In his interview, the ethicist mentioned yet another side of medicalization: the ever expanding medical view on aspects of daily life and the increasing knowledge of our own health – aided by technologies like the iPOP – leads to a situation in which people begin to consider their health “a shaky balance that is always in danger” (Preparatory interviews).

Others mentioned added unjust reassurance and unnecessary concern as unintended consequences (Dondorp and De Wert 2010), also for family members who share the hereditary material at least in part (cf. Haga 2009). A culture of victim blaming and the decrease of solidarity as a result of an increasing emphasis on the individual responsibility for health might also come into being (ESF report). Yet others articulate an issue of justice: do iPOPs not lead to (larger) socioeconomic health differences as a result of differences in education (and health illiteracy) and access to and use of ICT-applications like smartphones (ESF 2012; Wevers and Gijsbers 2013; Van Rijswoud et al. 2008)?

Zwart writes in his critique of Collins’ book: “I take it as rather symptomatic for the approach adopted by the author that, instead of using the June 2000 press conference as his point of departure, as is done in previous publications, Collins now prefers the ‘science-only’ celebration that took place one month earlier. This is symptomatic of the fact that the book conveys a ‘science-only’, technology-driven vision of future developments. The various pitfalls and concerns involved in personalised medicine and human genome sequencing are more or less delisted from the agenda, in order to clear the way, as it were, for the potential benefits as envisioned from the point of view of pure science. From a bioethical and societal perspective, the book represents a remarkable relapse into a science-only, pre-HGP approach to science” (Zwart 2011: 90).

The fourth condition is that participation in screening must be based on an informed, well considered choice (informed consent). Even if taking the time for routine, extensive multidisciplinary counseling is a realistic option, obtaining anything beyond a form of generic consent appears unfeasible. [...] The question is whether this is enough to allow a considered choice to be made about the offer to analyze the personal genome. The “right to not know” in particular will be difficult to shape in this context” (Dondorp and De Wert 2010: 51).

During the debate itself, two liberals - the chairperson of the young liberals and the co-author of the report - came to be diametrically opposed to each other about this issue, which shows that the liberal body of thought is open to multiple interpretations. See Section 7.3 for a more elaborate discussion of this difference of opinion.
In the report I sent to the panel members, I listed the expected advantages and disadvantages in order to facilitate critical questions during the deliberation. I also pointed them to questioning the propositional content of the expectations: do the technological developments in fact lead to the expected advantages and disadvantages? "Does P4 Health and Care really deliver a reduction of health care costs? Are people not psychologically able enough to handle new information about their health?" (report panel; see Appendix E).

Apart from an overview of desirability issues, I made explicit a number of unexpressed premises that are incorporated in these representations of the future. The visions of the future around P4 medicine imply, after all, a liberal image of man as an autonomous health care consumer who can decide in freedom how he/she wants to manage his/her health, using the increasing medical knowledge that originates from an enormous data explosion.32 "One big revolution in medicine is that we will create massive amounts of digital data for the 'quantified self' of each individual that will transform our ability to monitor and optimize our own wellness" (Hood and Flores 2012: 616).

These unexpressed premises were made explicit and questioned in the information for the panel members. Do people even want to take responsibility of their health in the way that Michael Snyder did? Are they able to do so? Do they accept the responsibility of making their biological information available? Do suitable lifestyle interventions which deliver health improvement even exist (report panel)?

A few days ahead of the public deliberation (see Figure 6.1) the panel members received a script (Appendix F), a document with instructions and a timeline of events they could expect to happen during the deliberation. The instructions contained "cues for appropriate behavior" for the characters in the play (Hajer 2005: 631). The dialogue is a "critical exploration of the issues surrounding the potential future broad application of systems biological technologies (like iPOPs in the preventive) health care of diabetes. The aim of the informative text is to enlighten you all as well as participants to really consider which issues they thought were worth discussing. Discussions about the statements or the articulated issues would not be allowed in this stage, to prevent the deliberation from starting off too arbitrarily. The inventory round also had to promote equal participation: everyone should get an equal chance to have their say. Thus, I wanted to prevent the bias that the public deliberation on ADHD had characterized (see Section 5.2).

The two life scientists were to begin the inventory. The goal was to position them as advocates of P4 medicine and to allocate the burden of proof to them in accordance with the basic assumptions of upstream public engagement. The deliberative interaction was scripted since the behavioral genetics case demonstrated that the visions of the life scientists were not critically discussed. In the preparatory conversations they had, after all, presented themselves as clear advocates of these technological developments (see Section 7.2).

I also had the statements that were made in the inventory round projected on a screen. This served multiple purposes. It was to slow down the discussion, so people could really let the statements of the others get through to them. It would also offer an overview for the panel and for the audience.

After the inventory, a prioritization was to follow. I wanted to give the panel members themselves control over and responsibility for the agenda. I suggested we would discuss the most controversial issue first. To that end, I would ask people to raise their hand if they agreed with the proposition or statement, for example "iPOP technology leads to more autonomy among health care consumers." The issue that raised the most divergent opinions, would be the first to come up for discussion in the deliberation. A supporter of the statement would be asked to give arguments to support his or her point of view. Then, I would ask an opponent to substantiate why he or she disagreed with the statement. Then the floor would be open to all. The deliberation session would have an intermission as well. Not just for the participants, but also to give me, as the facilitator, the opportunity to analyze the discussion together with a colleague and, if necessary, give it a new direction.

Apart from the script, the staging and setting also play an important role in the dramaturgy of public deliberation. I will discuss these in the final subsection.

32 “The ‘data explosion’ requires that new analytic tools be created for capturing, validating, storing, mining, integrating and finally modeling all of these biological data sets – thus helping to convert them into knowledge,” (Hood and Flores 2012: 616).
6.3.4 Staging and setting

The public deliberation would take place at a day and time that deviated from other public discussions organized at the LUX: a Friday afternoon, from 1 until 5 pm. This would give us more time for a profound deliberation than the usual Monday or Tuesday night. The past had shown that the audience certainly considered these nights, long working days notwithstanding, suitable for participation in or attendance of a public deliberation. The choice for the Friday afternoon broke this expectation, but was in a sense also obvious: for part-time workers, it is the most-used day off. A dialogue in the free weekend would, furthermore, ask for too much commitment.

From the earliest moments in the preparations of the public deliberation onwards I chose for a clear staging: the life scientists, audience and experts in the panel would “chiefly be active participants” in the dialogue (set-up dialogue 5 April 2013). To nevertheless answer the principle of publicity, an important normative principle in the theory of deliberative democracy (Section 2.3.2.) the deliberation would take place in a public setting to be “freely accessible to anyone” (ibid.). For that reason LUX, a recognizable public theater, was chosen. As such, the panel discussion got a public gallery. An extensive publicity campaign was to fill this gallery. This staging with a clear “distinction between active players and (presumably passive) audiences” (Hajer 2005: 631) thus created a clear division of labor, which I considered necessary due to the extensive preparations and the size of the panel.

The only room that was available on the day of the deliberation – a theater with a level floor – allowed me to accentuate this division of functions between the observing audience and the actors. The lighting plan would also support the staging, by putting the stage and the panelists in the spotlight, and by obscuring the audience. Even the presence of a camera was an influence on the staging. On one hand, the extra light that was needed to guarantee video recordings for the study partially negated the lighting plan. On the other hand, the camera increased the distance between spectators in the auditorium and panel members on stage, because, as the observer noticed, the audience took their seats behind the camera (observations Observer B).

Everyone on stage got their own headset microphones. Not just for their audibility for the audience and for the recordings, but also to give each panel member an equal chance of participation, and to allow the discussion to run a “natural” course (interruptions included). The volume of my own microphone had to allow me, as the facilitator, to be heard louder than everyone else, in case multiple people would start to talk at the same time. This technology did cause a trade-off between the participants’ freedom of movement on stage and their audibility. To adapt a speaker’s volume on the spot, if necessary, the technician had to know directly, at all times, who was speaking and which slide to move on the mixing panel. To that end, everyone got a fixed position on the stage. Having the participants demonstrate their differences in opinion by moving around the stage (something I considered during the preparation) no longer was a possibility.

Thus, the panel members would sit on chairs in a semicircle on the stage. This was to allow them to make eye contact with whomever they ended up debating, without having to turn their backs on the audience. The benefit of fixed seats was that everyone could be given a name tag, so that the audience could immediately tell who was talking.

In the run-up to the deliberation date, this staging came to be called into question. The overview of the sold tickets and the reservations (and the names of the visitors), generated by the automatic ticket module on the LUX website to monitor the expected audience attendance, revealed names of people who might just as well have been panel members themselves. The division of panel members on the stage and an onlooking audience proved artificial. For that reason, I decided to allow for contributions from the audience at fixed moments during the deliberation.

Furthermore, the audience had to be provided with information, because it could not be ruled out beforehand that they would be too little in the know about the theme. The audience had to catch up on iPOP, P4 medicine and health, and the problems it was to solve, in a relatively short amount of time (ten minutes). To ensure neutrality here as well, I made a presentation in the form of a video with a voice-over, in order to prevent the audience and panel members from considering me the author of the presented sociotechnical imaginaries. The video ended with the scenario, the starting point of the discussion.

Eight out of thirteen panel members supported the choice for this staging. “Why invite a panel if you are not distinguishing between panel and audience?” One of the diabetes patients did remark that such a division is only possible as long as “the audience is not more knowledgeable than the panel.” Others thought it was “a pity” that the audience had little opportunity to participate, or saw the staging as “artificial,” “considering the disappointing number of visitors. Especially in this setting it would be interesting to offer the stage up as a platform for the audience, and approach the panel members as experts on the matter,” wrote one of the young politicians.

The audience had varying opinions as well. Some had expected more room to contribute because that had been “announced,” or thought the scant contributions of the audience “unpleasant.” Others were used to “little interaction between panel and audience.” A 60 year-old woman who described herself as a “citizen who is generally interested in technological developments” felt that “the debates [at the LUX] are too tightly organized at present.” Yet another group of audience members...
of different norms and criteria for input (inclusiveness, independence and early involvement) and throughput legitimacy (dialectical quality of the deliberation), as discussed in Chapter 2 (esp. Section 2.4.1). The dramaturgical work consists of making trade-offs between these criteria repeatedly, which affects what can and cannot be said as well as how participants evaluate the quality of deliberation.

The first preparatory phase concerns finding a relevant and urgent issue that has the power to mobilize an audience. A current technoscientific development that is sufficiently plausible. One that will potentially have huge consequences is morally uncertain and potentially controversial, but that is in an early enough stage to still be influenced. Although I considered the iPOP and P4 medicine and health such a development, others considered them too premature. Despite the eventual rather low public attendance, the issue mobilized a broad and diverse panel.

The delineation of the issue was also deemed important for the engagement of the implicated public. At the same time, the framing determines what will not be discussed. Yes to moral desirability, no to implementation. Yes to personal genome screening of common diseases, no to pre-implantation genetic screening. Yes to adults, no to children (as in the scenario). Yes to diabetes, no to cardiovascular diseases and, therefore, no to the cumulative effects of P4 medicine. Nevertheless, the focus made the issue maneuverable enough to start a targeted search for a collaboration partner and a public.

The composition of the cast displays internal tensions. Firstly, the organizer has only a limited measure of control on who does and does not participate. The panel is the result of a contingent process that depends on negotiations with the speakers and the collaboration partner, the geographical location, and unexpected events (e.g. illness). Secondly, the choice for an orderly mini-public for active participation and high deliberative quality is at odds with inclusiveness and participation. The inclusiveness proved to be at issue, since the panel members (as well as the audience) were primarily well-educated; a lesser educated public was excluded. The participation decreased because it was decided that there would be a clear staging of the panel as active players on the stage on one hand and a passive public in the auditorium on the other hand. The opinions of the public about this staging reflect this trade-off. Some mourned the lack of interaction, while others appreciated the orderly course and the profound conversation.

The preparation of the contents strengthened this chosen strategy. Extensively informing the mini-public beforehand gave them an intrinsic head start, which did not stimulate the participation of the audience. Even so, the passive audience was a necessary prerequisite for realizing a public setting and answering the principle of publicity. The preparation of the contents did, however, induce further compromises. I carried out a discourse analysis of the expectations for the future and the (moral)

6.4 Conclusions

Maarten Hajer (2005) asked for people to take notice of the performative character of public deliberation. By viewing deliberation as staged performances, a new perspective is given on the quality of deliberative processes. It is not only about the argumentation that is used, but also about the conditions within which these discursive actions take place. How does the design of the setting affect “what is said, what can be said, and what can be said with influence?” (p. 624). In short, Hajer asks for attention for the dramaturgy of public deliberation. In this chapter, I have put the dramaturgical work done back stage to design an upstream public deliberation event on NEST centre stage.

The first part of the work behind the scenes consisted of a critical assessment of the sociotechnical imaginaries of P4 medicine and iPOP technology. As argued in Chapter 5, such an assessment is an important tool for facilitators of upstream public deliberation on NEST to anticipate claims about technological feasibility, social usability and moral desirability of new technologies. From the discursive analysis it can be concluded that the moral argumentation of advocates of P4 medicine coincides with a minimally liberal bio-ethics (with its emphasis on the autonomy principle and its instrumentalist tendency). In Chapter 7 I will demonstrate how this liberal idea of future health care was contested from a more social perspective.

The focus of this chapter, however, was the ethnographical reconstruction of the practice of organizing public deliberation about new science and technology. This ethnography reveals the dramaturgical dimension of the work behind the scenes: the scripting, staging and setting of a deliberative drama. I consider it as a study in empirical philosophy (cf. Mol 2000) that has an “ethnographic interest in practice” to uncover “the practical entanglement of abstract concepts” which “shows how such entanglement produces specific effects” (Bruun Jensen 2005: 222).

In the above-mentioned description it becomes clear that the dramaturgical work for upstream public deliberation is a practical entanglement in the execution
lines of reasoning, not just to provide the panel members in advance with a shared starting point, but also to increase the dialect quality of the deliberation: to make tacit premises explicit, to ask critical questions, and to explore all NEST-ethical issues. At the same time, every intrinsic intervention increases the risk of losing independence. The authorship of the scenario that “was lousy with presuppositions,” for example, was attributed to me, despite the carefully chosen footing of the written information and availability of all read sources (transparency and resource accessibility). The disputable presuppositions were specifically needed for the discussion.

Even the technology that was used mediated the performance of the participants. The research setting interfered with the discussion setting because the camera increased the audience’s distance from the panel. The microphones that were needed to get audio recordings made it impossible to move freely around on stage.

In Chapter 2 I wrote that public deliberation sessions are experiments with unexpected effects (see Section 2.5.1). An ethnography of the dramaturgical work underlines the experimental character and displays the divided views on quality. It furthermore casts a light on the countless choices, compromises and tensions in the practice of the organization of a dialogue, which remain mostly invisible in the theoretical and conceptual work of deliberative democracy. An understanding of the “normative surfeit” (Zuiderent 2007) of this practice is essential for the sensitization of dialogue organizers and participants to improve, respectively, their dramaturgy and performance.
managing impressions with strategic maneuvering in public deliberation on P4 medicine
7.1 Introduction

A Friday afternoon in October, a few minutes before 1 p.m., debating center LUX: Room 6 most closely resembles a television studio, right before a broadcast. On the non-elevated floor there are a mixing console and a jumble of cables. A sound technician turns switches while his colleague sticks a theater microphone to the cheek of a man who is wearing a suit and striking green pointed shoes. “Can you say something, so we can get the right volume?” On the big screen on the rear wall, a wandering camera image appears. One by one, the people on stage who have already been outfitted with microphones appear, magnified on the enormous screen, chatting easily. Then, people start shuffling into the room, a bit ill at ease. They pause for a moment and ponder the situation. Then, they pick a seat behind the camera that is positioned prominently in the middle of the stands. Their chairs offer a view on the big screen that shows the words: “An iPOP for everyone? Is preventing diabetes better than curing it?” They see how the people on the floor are slowly starting to occupy the seats on the first few rows. Seventeen chairs remain unoccupied on stage, set up in the shape of a crescent. The white color of chair backs lights up bright orange in the shine of the theater lights. Only when a man walks onto the stage and his amplified voice fills the room, the conversations in the room fall silent. “Ladies and gentleman, I bid you a warm welcome at the LUX. [...] My name is KD. I am the facilitator of – I can call it that – an experiment. At least, this is the first time I am putting this many people on a stage. [...] If you were to summarize the theme in one question, or in a number of short, concise questions, then today’s discussion is about: Will new technologies change the looming trend of ever more diabetics in the Netherlands? And what is responsible application of those technologies? [...] Today we try to critically explore the promise that lies in the term “P4 medicine,” or P4 medicine. [...] To see what those promises entail, and to [...] explore
Behind the scenes of… life scientists on stage

The scene that was described above marks the transition from the last preparations backstage – such as sticking on theater microphones – to the public performance front stage, which starts with the announcement of the facilitator of the public discussion that is about to start. In the previous chapter, I have discussed the dramaturgical work that was carried out behind the scenes for setting up a critical public deliberation about the desirability of the Integrative Personalized Omics Profile (iPOP). In this chapter, I will analyze the discursive effects on the deliberation as a result of the interventions that were, a) part of the preparatory dramaturgical work off-stage and, and b) part of the work as facilitator during the public deliberation on stage.

As was discussed in Chapter 6, the first backstage intervention was an extensive vision assessment to investigate the plausibility of three interrelated types of claims about the future. I deemed such a vision assessment an important strategy to a) investigate the plausibility of claims about the technological feasibility (specifically the unfeasibility) of new technologies that could make a critical discussion about moral desirability issues impossible from the very start (as turned out to be the case with the public discussions about behavioral genetics; see Chapter 5); b) identify possible contexts of use or implementation (social usability) which partially define which desirability issues are relevant; c) systematically map the moral justifications (moral desirability) in the sociotechnical imaginaries surrounding P4 medicine (Type 2 Diabetes in particular), using the stock topics (NEST-ethics and critical questions) that were discussed in Chapter 3, in order to be able to subject these visions to a critical public investigation: making the unexpressed premises explicit, identifying the propositional content of claims, and formulating critical questions in anticipation of possible public issues (see Section 6.3.3).

This vision assessment demonstrated that the moral arguments of advocates of this new technology are grafted onto a liberal bio-ethic. On one hand, advocates of P4 medicine strongly emphasize autonomy as a central medical-ethical value. On the other hand, they apply an instrumental rationality in which technologies like the iPOP are envisioned as neutral instruments to realize desirable goals (consequences) – (altering the course of increasing collective health care expenses, increasing individual health, etc.). In preparation for the public deliberation, all members of the mini-public were sent the results of the vision assessment beforehand, together with all sources used, to give them the opportunity to make their own analysis (transparency criterion).

The second important backstage intervention concerned a modification of the script. Specific attention was paid, for example, to casting, to the selection of characters in the play. Chapter 5 demonstrated the importance of the cast life scientists’ willingness to adopt their roles as advocates publicly. In extensive preliminary interviews with the invited life scientists, I investigated how their personal views on the future related to the sociotechnical imaginaries that surround P4 medicine. In addition to that, it was made explicit in the script that the participating scientists would clearly be staged as advocates during the first round of deliberation – the inventory of issues. By inviting them to articulate their views on the moral desirability of P4, I tried to allocate the burden of proof to the scientists. The goal of the dialogue was, after all, to critically question their visions and the accompanying arguments.

In this chapter, I present a discursive analysis of the strategic maneuvers of the participants in this upstream public deliberation session about the moral desirability of P4 technologies that I staged as a dramaturgist and guided as a facilitator. As in Chapter 5, I will focus on interactions in which the participating scientists were involved. I do, however, approach the analysis of the selected fragments symmetrically.

When necessary for an optimal reconstruction of the argumentative discourse, I have also put the (philosophical) content of the discussion within a broader philosophical or social context. A discursive reconstruction of the deliberation shows that the liberally oriented sociotechnical imaginaries were criticized from a social perspective, just like in the philosophical and ethical literature. My analysis does indeed show that critics put the liberal perspective – with its emphasis on autonomy for the individual and instrumental rationality – up for discussion by drawing attention to solidarity and justice.

Finally, I use ethnographic methods (participant observation and interviews) to write a “thick description” of the deliberative events at the LUX. In conversations after the discussion, I examined a selection of video fragments with the participating scientists. This gave me additional information about the goals they pursued, the roles they played, etc. All names of the participants are invented. Their background is stated between parentheses each time, so the reader is clear on which social role the speaker personifies.

1 In order to maintain readability, I have often omitted quotation marks – even when what I write is often based on statements made in the conversations beforehand and afterwards.
In Section 7.2, I analyze how the participating life scientists, cast because of their advocacy, maneuvered strategically to position themselves differently when they were staged as advocates. The discursive analysis shows how the scientists constructed a certain identity (subject positioning; see Secion 4.4.2) that differed from the intentions that were expressed backstage.

In Sections 7.3 and 7.4 I analyze the strategic maneuvers in the discussions about the liberal moral reasoning that underlies the sociotechnical imaginaries of P4 medicine. In Section 7.3 I discuss the argumentative discourse in the discussion about the autonomy principle, while I analyze the argumentation about unintended consequences or side effects in Section 7.4. Here, too, the interviews with life scientist offer insights into the disparities between their front stage performance and their off stage behavior.

In the conclusion (Section 7.5), I argue that the life scientists used impression management as a theatrical technique to be effective in the deliberation (Hilgartner 2000; see Chapter 1). They tried to regulate the others’ perceptions of themselves and of P4 medicine without derailing (i.e. violating the dialectical rules of a critical discussion; see Section 3.2.2). The analysis also shows that the constructed public identity of the scientists is not static, but that it changes during the discussion under the influence of the situated interaction. Finally, I draw conclusions about what the strategic communication of the scientists does to the quality of public deliberation.

### 7.2 Staging the advocate

The starting point for the public deliberation about the iPOP was to let advocates of these new developments in science and technology explain the benefits in a public setting. The underlying thought was to allocate the burden of proof of explaining the desirability of a transition to P4 medicine to life scientists who are involved in realizing these sociotechnical imaginaries, or who at least implicitly endorse them. In Chapter 5, I already observed a bias in the public discussion about ADHD: the public was asked what they considered undesirable about the developments in behavioral genetics, which was a possible reason for a reserved attitude of the public (see Section 5.2). This bias fits what some commentators have called the dominant liberal discourse of science and technology developments (Swierstra and Te Molder 2012). At the center of this liberal discourse is the no-harm principle: as long as a new technology is not expected to do any obvious damage (hard impacts), technology developers do not have to publicly give a full explanation on the soft impacts (see Section 2.2).

In accordance with the ideas of upstream public engagement (see Chapters 1 and 2), the script of the public deliberation at the LUX tried to break away from this discourse. According to the script, life scientists who work on these new technological developments would be staged as advocates who would explain which benefits they expected from P4 medicine. They would also be the first to speak in the inventory round. As was described in the previous chapter, all panel members were instructed to articulate no more than one issue that relates to something they find desirable or undesirable about this new technological development (see Section 6.3.3). In contrast to the other participants, the life scientists were not given the choice to explain what they found desirable or undesirable about this transition. They were only asked to name a benefit.

In this section I contrast the presentations of the two life scientists in the private sphere of the preparatory interviews I had with them, with their public performances at the LUX in reaction to this staging as advocates, and my interventions as a facilitator. First, I will present the empirical material from the preliminary interviews. Then I will analyze their public performances in terms of strategic maneuvering, using the additional ethnographic material from the interviews afterwards to identify their rhetorical goals. I will do so for both life scientists individually.

Innovation director Davies had positioned himself as a socially responsible advocate of P4 medicine in the preliminary interview. He spoke about “we at TNO,” people who see it as their responsibility to contribute to solutions for social problems. Not standing in an ivory tower, but being led by society, tuning in to the government, to companies, but to the public as well. For, as a scientist, it is very easy to find solutions no one wants. Take the surgery robot. Costs three million euros. Every hospital wants one, but it hardly offers any improvements. The risk of a “technology push” is present for P4 medicine and for the iPOP as well. “Look, we’ve got a nice new gadget that can measure yet another thing.” “Technicians expect a lot from P4 and the iPOP,” but do the people want this technological transition? Scientist should be open to that question. So Davies had seized the invitation to the dialogue as a means to show his responsiveness to the public’s needs. He feels, after all, that society makes these choices.

Davies does, for that matter, anticipate that many people will be open to this technology and that they will embrace this transition. Personally, he is convinced that
P4 medicine will benefit. His advocacy was most strongly expressed in a technological imperative: "I think we are morally obliged [to use it] it, as a society" (Interview 1 Davies)... To diminish the burden of illness, to restructure health care costs, to increase citizen participation in society and in the process of labor. These are the benefits described in the TNO report Davies wants to propagate at the LUX (Wevers and Gijsbers 2012). “[In LUX] I would like to contribute to creating a picture of the areas in which it can be beneficial.” However, this is how Davies responded during the inventory round at the LUX:

ME: “I would like to start with Mr. Davies. [...] TNO has embraced this concept, so I thought: ‘It should not be hard for you to mention the most important desirable thing that makes this a good development.’”
DAVIES: “Yes, I see. Still, I wanted to mention an undesirable side.”
ME: “Gosh, instant rebellion.”
DAVIES: “Because the fact that we have embraced it of course does not mean that we see very many possibilities here, as TNO. We did not invent the concept, of course, but we have only adopted it from the United States and [we] advocate it in the Netherlands. But what we do fear is that there is going to be an enormous technology push. When you see all [the tests] that Mr. Snyder has performed on himself, [...] what he learns from that is enormous. But he could have simply [...] just measured his blood glucose and then he could have reached the same effects. So the question is whether you actively need the whole array of possibilities. So [...] we feel that implementing [current possibilities] is at least as important, so that the patient and the human really benefit. And what is also important: all knowledge that is gathered should be usable. Knowing without being able to take action... The technology push, then, should not just be us throwing ever more knowledge into the ether. People should be able to use it.”
ME: “So, no technology push? That is an undesirable thing?”
DAVIES: “Yes.”
ME: “But I’m sure you could mention something which makes you say: ‘Well, this is a good development after all.’ TNO did not endorse it for no reason.”
DAVIES: “The fact that we diagnose many diseases on the basis of symptoms right now and not [...] on basis of the underlying biology offers many opportunities to offer people more focused prevention, but also to take therapeutic action. So more knowledge can lead to better results and hopefully to lower costs, provided you know what to do.”
ME: “Health gains.”
DAVIES: “Yes.”
ME: “And I heard you mention a [second benefit], too: lower costs.”
DAVIES: “Ideally, yes.”
ME: “Ideally, but do you believe in it? Is it really that, ‘Yes, I do believe that it will eventually enable lower costs in health care?’”
DAVIES: “Yes, I do believe in that, but not if you set unleash everything on everything.”
[excerpt 7.1]

As facilitator, I try to stage Davies as an advocate (“it should not be difficult for you to mention something desirable”). But he does not take up his role as an advocate. He is the first speaker and he does not yet know the positions of the others. Furthermore, he wants to prevent being seen as a “geek” (Interview 2). The night before the deliberation, Davies had once more read all articles in the information package that was sent to all panel members in preparation. Mike Snyder’s article (Chen and Snyder 2012) had made him think: “It is very overblown” (Interview 2). An exaggeration of the expectations will only hurt the matter. People give up when there’s overpromising. So he tempers the expectations (mitigation strategies; see Section 4.3).

First of all, he “rebels” against the ‘facilitator’s instructions. Davies first wants to mention something undesirable, to “indicate that you’ve considered both sides” (Interview 2). Furthermore, he changes the footing to somewhat dissociate himself from the future visions of P4 (see Section 4.3). Davies makes it clear that TNO is not the author of these imaginaries, but at most the animator (“We did not invent the term, of course”). He also puts his own role (“only adopted it from the US”) and agency (“what we do fear is that there is going to be a technology push”) in perspective. Davies further distances himself from technician Snyder by doubting the need for the iPOP. Snyder could have just used a glucose meter, couldn’t he? And what is the use of measuring just to measure (“throwing ever more knowledge into the ether”), without the ability to use that knowledge?

In the end, an intervention by the facilitator is necessary to make Davies designate two desirable consequences of P4 using pragmatic argumentation: P4 technologies such as the iPOP will lead to a more focused prevention and treatment, and to lower health care costs.

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3 In a certain sense, this technological imperative is the positively phrased version of a claim that is often heard in NEST-ethical discussions: “It would be unethical to not develop this technology.”
Stokes also presented himself as a different character on stage than he did in the preliminary interview. During the interview, Stokes had unequivocally positioned himself as an advocate of new technologies in the life sciences. “I am very much in favor of actually using this kind of [technology]” (Interview 1). He endorses the subject category of missionary that I used to summarize his position. Stokes wants to persuade people to use new technologies – such as personal genome sequencing and the iPOP. He considers the deliberation successful “if there is even one person who asks about getting themselves screened [after the discussion at the LUX]. At the DNA, RNA, whatever level, I mean. And it would really be great if that person, or someone else, would actually do it. So they’d send their saliva or blood in for an analysis, simply because they want to know more [about their health]” (Interview 1).

At the same time, Stokes portrays himself as a member of the scientific community who are constructing a very probable, nearby and beneficial future (see Section 4.4.3). “We scientists, we doctors” are working “on technologies that will enable a decision about [health improvement] within five or ten years.” The function he envisions for the discussion at the LUX is to prepare the public for these technological developments. Hence his message: “And what’s specifically going to happen, and that is probably going to be my standpoint in the discussion, is that we have to be able to deal with more uncertainty instead of less uncertainty” (Interview 1).

As opposed to clinical genetics, new tests – such as the iPOP – won’t give any “black or white answers,” no clear results. This drawback does not, however, outweigh the great advantage of having more autonomy than before in making decisions about your own health. “Where we’re heading […] is a place where everyone […] has the autonomy or the right to […] check and govern their own health […]. That is where these instruments help, and not to give more black or white answers” (ibid.).

ME: “Mr. Stokes. [You are] employed at Centre X. With you, I also thought: ‘You are probably able to mention a desirable thing.’ […]”

STOKES: “Yes, we do a lot of work with reading DNA. Specifically the DNA of patients who come to us […] on a clinical indication. And that is still the line of action in the current health care system. I agree with the desirability of adding some more molecular measurements to that. I think I see this as a desirable development. One thing that is very important to me, I think, or for us, is that an awareness will develop that the iPOPs, the sequencers and the other variations you mentioned, will not necessarily lead to a clear-cut answer. They will not necessarily lead to more certainty, but they will lead to a kind of autonomy in decisions you might take on the basis of certain insecurities.”

ME: “Okay, so I’m hearing two things. On the one hand, there’s more insecurity. Is that something…”

STOKES: “At least, there’s more information that is not necessarily more certain.”

ME: “Not necessarily more certain. And that is something that makes you say: ‘Yes, this is a good thing?’”

STOKES: “I think so. Because you make decisions….”

RILEY (philosopher): “And yet there’ll be more autonomy?”

ME: “Okay. Let’s first try to gather […]. So there will be more uncertainty, but this enables people, at the same time, to take more autonomy about their health. I do understand that correctly, right? Okay.”

Although I try to stage Stokes as an advocate as well, he mainly positions himself “as a technician,” a role he says he had already chosen for himself ahead of the discussion at the LUX (Interview 2). The divide between active members of the mini-public and the audience as part of the dialogue’s staging had further amplified that perception of his role: “The panel members sit there [on stage] as experts. […] [T]he public, the audience, would like to hear from the experts how it works or what is going on.” (ibid.).

As an expert, Stokes immediately wants to adjust a public perception of the new biomedical technologies in the public discussion: “One thing that is very important to me, I think, or for us, is that an awareness will develop that the iPOPs […] will not necessarily lead to a clear-cut answer.” Who are the “us” he is referring to? And why is it so important to speak for this “us” instead of for “me” (he does, after all, correct himself)? Stokes considers it important to emphasize that this statement is not his personal opinion, “not something I’ve thought up on the spot” (Interview 2). No, Stokes speaks for a collective of eight Dutch clinical-genetic centers with scientists, clinical geneticists, lab specialists, and bio information scientists. In this manner, he tries to give his statement the status of an expert opinion that represents a wide scientific consensus in this field. This makes it difficult for others (outsiders) to deny it. The use of “us” suggests a group of experts that is marked off from other groups (boundary work; see Section 4.4.1).

Why is it so important that people come to realize this? Stokes immediately tries to refute an important premise that is presupposed by critics in discussion about new P4 technologies. “The ‘measuring means knowing’ adage is rather dominant. […] The assumption in all discussions about this [ethical issues], whether it concerns health insurance companies or the government or politics or whoever will use it [biomedical information], is that it is indeed a sort of, well, absolute certainty. And that is “where [the debate] fails” (Interview 2). When privacy was mentioned as an issue later on in the discussion, Stokes posited that statement (see Section 7.4).

Despite the emphasis Stokes puts on this message, he also appeals to
the autonomy principle as an argument to indicate that these technological developments are desirable. This directly incites a discussion. Before Stokes even gets to finish his sentence, Riley (philosopher) reacts. He mutters, “And yet there'll be more autonomy?” frowns his brow to express his incomprehension, and shakes his head (video). I nip that discussion in the bud.4 I want to follow the script and take inventory first, and I summarize Stokes’ position once more. His most important argument was given.

This analysis shows that both scientists constructed a different identity in public than in the preliminary interviews, even though (or perhaps because?) they were staged as advocates. They used different strategic maneuvers to reach that goal. Davies positioned himself intentionally (see Section 4.4.2) as a nuanced scientist who is able to indicate the undesirable sides of this technological development, in order to distance himself from “geeks” (boundary work). In this way, Davies attempted to prevent a public resistance against the overblown sociotechnical imaginaries of P4 as envisioned by Snyder et al. Only after an intervention of the facilitator was Davies willing to substantiate what he thinks is desirable about the transition towards P4 medicine.

Davies’ performance had several effects. McCann (health care professional) thought he was “far more nuanced than the panel chairman tried to depict him” (survey panel). Someone in the audience wrote that “he didn’t let himself be tricked into making statements” (survey audience). On others, Davies made a different impression. “Surprisingly enough, he was not able to substantiate TNO’s choice to invest in this” (survey audience). The philosopher in the panel called him “rather ambiguous”, and felt that he “sometimes almost sounded like he was against it” (survey panel). In hindsight, Davies himself feels that he “tried to be a bit too nuanced” in his attempt to cast off his role as an advocate (Interview 2).

Stokes had considered his role in advance and decided to take the role of expert. This subject position was decidedly different from the missionary [he was] backstage. By appealing to a collective “us,” he constructs his identity as an expert in a field that is marked off from outsiders who hold a dubious premise in discussions about social issues concerning NEST in the life sciences. Both the public and the other panel members recognized Stokes’ positioning as an expert, although that was appreciated in various ways. A panel member: “He took the right position as a scientist” (survey panel). Someone in the audience considered his contribution “useful background information” (survey audience). Others considered his contribution as a “real techie”, on the other hand, “mediocre” and “a bit (exaggerated?) in the ‘I am a neutral scientist’-role and ‘it is up to politics/society to decide’” (Survey audience).

Some even thought that “industry and bioscience lacked” from the panel (Ibid.). These reactions show that the clear staging as an advocate did not work out for everyone. The reserved attitudes of Davies and Stokes furthermore incited the advocacy of fellow scientist Nick Havers, who responded to criticism about these technological developments from the audience (see Section 7.4).

Nevertheless, my interventions led to the achievement of the inventory round’s primary goal: the gathering of the arguments the life scientists use defend the moral desirability of these new technological developments. These arguments were to be critically examined in the deliberation phase.

### 7.3 Discussing autonomy

During his contribution to the inventory round, Stokes appealed to the autonomy principle to defend the desirability of the developments in P4 medicine. His reasoning resonates with the sociotechnical imaginaries of P4 medicine that emphasize that the iPOP is an instrument that enables individual health care consumers to be in charge of their own health (more) (see Section 6.3.3: moral desirability). Stokes selected the deontological topos of the autonomy principle to argue for the desirability of the developments in P4 medicine (Excerpt 7.2). As was described in Section 4.2.2, the topical selection in the argumentation phase includes the choice for the argumentation scheme or topoi that discussants consider most effective in supporting their point of view. Since autonomy is a central value in medical ethics, the choice for this topoi is obvious: more personal direction would obviously be appealing to people (audience demand). Stoke’s topical selection did indeed quickly strike a sympathetic note with other members of the panel. Boles (diabetes patient) echoed for example “that it means you can take the reins, that you can manage your own health”, and “that you can take responsibility for your own health” (Discussion). Briggs (science communicator and co-author of a liberalist ethical exploration) said “it was enormously welcome” that the “autonomy and own responsibility of citizens” would be increased if the iPOP “would deliver practical medical information to which you can adapt your health and your lifestyle” (Discussion).

Yet, from the first discussion round onwards, opinions about Stokes’ standpoint and argumentation differed. As was mentioned before, Riley (philosopher) immediately responded to his statements with a rhetorical question (“And yet there’ll
be more autonomy?" Excerpt 7.2). When the issues from the first discussion round were prioritized (see Section 6.3.4 about script), the autonomy issue proved most debatable. While both life scientists (Davies and Stokes), both diabetes patients, the general practitioner, and two out of three liberals had raised their hands to indicate that they agreed with the statement that the iPOP technologies would increase autonomy, the others were less certain (video).

In this section, I zoom in on the discussion about autonomy. Not so much because this issue proved most controversial, but to demonstrate how life scientist Stokes reacted when his own chosen topos was brought up for discussion. I will first briefly elaborate the concept of autonomy with the aid of philosophical literature. The context of philosophical literature and the analysis of the autonomy principle allow me to make explicit the unexpressed premises (indicated with Roman numerals i, ii, iii, etc.) that are necessary for making a reconstruction of the argumentative discourse that is as complete as possible. First, it will become clear how the different speech acts of the panel members can be interpreted as contributions to the discussion about autonomy, and how the opinions about autonomy differed. Second, I can demonstrate that my interventions as facilitator offered Stokes enough space to develop an evasive discussion strategy without derailing.

Autonomy is a complex philosophical concept with many different meanings (Arpaly 2003), as became apparent during the public deliberation at the LUX (see below). According to a well-known definition, people are autonomous “when their decisions and actions are their own; when they are self-determining” (Dworkin 1988: 13). Autonomy as self-determination can be characterized as the capacity to act or to live according to one’s own values, principles and rules.

According to Barnhill and King (2013), this notion of autonomy requires, first of all, a form of liberty: it requires that you have (treatment) options to choose freely from (i) and that nothing or no one external forces or limits you to choose between these options (ii). Secondly, it is presumed that you are able to get access to information that provides you with insights in your (health) condition (iii), and that you want to have access to this information (iv). Indeed, within the context of predictive genetic testing, some autonomy protagonists place a lot of emphasis on the right to know and the right to (health) information: this information may not be withheld from people. In this approach, the acquisition of more information (of any kind) is simply equated with increasing autonomy (v) without further problematizing the nature of the information, an assumption philosopher Riley immediately called into question. Hildt (2009) calls this a “narrow conception of autonomy”, an approach that tends to “uncritically broaden the use of genetic tests” (151). As Boles (diabetic) already announced in the inventory round: “I want to know everything” (Discussion).

Secondly, Barnhill and King deem a certain level of understanding of this information necessary: you have to be able to understand the significance this information has in your life (vi) and you have to be able to comprehend what the consequences of your choice are (vii). Thirdly, the autonomy principle presumes a (psychological) capacity: that, subsequently, you are able to make a well-considered decision in accordance with your own values, and that you also do what you have decided, without being impeded or limited (by, for example, an addiction, social values, or influences from your environment) (viii). This description of the autonomy principle still leaves room to decide to not use the information about your (future) health state, while the sociotechnical imaginaries of P4 presume that the rational individual always use the test results for their health management (ix).

Autonomy as described above, then, denotes a quality of individuals, one which they have to a larger or smaller extent, based on how many of these conditions have been fulfilled. In liberal ethics, it is often presumed that people do actively possess this quality to an adequate extent (as long as they are free to choose, and possess sufficient correct information). In the liberally oriented sociotechnical imaginaries of P4 medicine, then, many of the above-mentioned assumptions are (tacitly) endorsed (see Section 6.3.3; see also info report Appendix E). But “the view that people are...
always autonomous should be considered a descriptive statement that is debatable” (Ten Have et al. 2009: 81). Critics of this liberal autonomy principle have, after all, pointed out that people are to some extent socially and culturally determined and. Furthermore people who have a chronic illness (such as diabetes) cannot always demonstrate autonomy.

Autonomy as a demonstrable quality (descriptive) should, however, be distinguished from autonomy as a value (normative) to be pursued. Autonomy as a value does, after all, express the desirability of people forming their own lives according to their own values. The assumption that more autonomy is always desirable (x) cannot, however, always be assumed. Since an individual cannot not decide, “an autonomous individual […] is constantly working on self-determination: he constantly has to choose whether or not to do something” (Ten Have et al. 2009: 81). Deciding about everything is unfeasible. Furthermore, medical ethics has other important values, besides autonomy, which sometimes need to be balanced against each other.

With this short philosophical survey, I can make evident how the panel members in their various contributions to the deliberation at the LUX cast doubt on the propositional content of the aforementioned presuppositions of the liberal notion of autonomy. Hudd (research director of a patient organization), for example, called the availability of suitable treatment options into question (premise i), something he would repeat during the deliberation round. “All initiatives for being able to measure more, should go together with more developments to actually be able to do something with that data. And in that sense, [there is] a long road ahead. […] Then you get the very undesirable situation in which you do know that something is wrong, but you are unable to do anything about it” (Discussion).

According to Hirst (board member obesity association), premises vi and vii are problematic. “For a number of people, monitoring their own health will be feasible, but by now, research has shown on all fronts that there is a very large group of people who find that difficult or who are not capable of doing so.” Mr. Kidd (general practitioner) complements her argument. People cannot or will not deal with their health care problems (premise iv). “I am a General Practitioner and as such, I see highly overweight people on a daily basis, [who are] from lower social classes as well. People who are very hard to reach. They come to me during my office hours for other things, but this is one thing you can never really discuss properly. And how can you persuade those people to lose weight?”

Dr. Goldberg (diabetologist) doubts whether people possess enough psychological capacity, and draws a parallel to smoking (premise viii). “My mother had diabetes, so I have a higher risk of getting it as well. […] But does that really mean I will drastically change my behavior? So: does it help when you know something? And I think we see that every day, with smoking. No matter what is written on a pack, people do not change their behavior. So if you have a nice iPOP but are unable to adjust your behavior accordingly, it will be a lot more complicated.”

Others think that new, widely accepted social norms to monitor your health will do the exact opposite and limit the freedom of individuals (premise ii). Sands (young liberal politician), for example, did call into question Stokes’ argumentation. Is the autonomy principle really unambiguously applicable to the situation (see Section 3.4.2 on deontological argumentation)? Does the right to autonomy not also mean that you have a right of not-knowing, and that you have the right not to use the information (premise ix)? She hinted at an imposed duty to know for everyone, by making an analogy with people in the Netherlands who do not participate in the vaccination program for religious reasons: “Here in the Netherlands, you can choose, for example, to not have your children vaccinated. And we say of those people in the “black stockings-area” [geographical area of mainly protestant Christians]: they don’t let their children be inoculated. They are in general reviled. Will that not be the same for the iPOP in the future? If you don’t get an iPOP made, will you be doing wrong?”

Foster (diabetes patient) talked about the “pressure in your life” when “you don’t live according to the new rules that are necessary with this affliction.”

In the discussion round, the differences of opinion were further explored. Despite the aforementioned objections, patient Boles emphasized the narrow perspective on autonomy by an appeal to the right to information (cf. Hildt 2009). “I would really like to have the right to do things myself. So that is that freedom of choice. […] It won’t surprise you that I am a proponent of the right to self-determination, but I just feel that I have the right to know, and I also feel that I have the right to use it. […] So, that autonomy. I just want to be in charge myself” (Discussion). She equates an increasing amount of information with increasing autonomy (premise v). And she sees autonomy as freedom of choice.

This provokes another reaction from philosopher Riley. He explicitly positions himself as a philosopher (“As a philosopher I am required to say something about that, I think”), who sees it as his role to put the autonomy principle itself up for discussion. He criticizes this narrow “neoliberal” view of autonomy as freedom of
choice as a not really political autonomy (voice), since health care consumers have had little say in what health care products are offered. “You can only choose from what is on offer. And that is what we call autonomy? That is very, very narrow.” Furthermore, he emphasizes that autonomy as a value should not be overestimated (premise \( x \)). People’s happiness does not automatically increase with every new choice, as he substantiates with an argumentation by analogy: “As if our autonomy has increased now we can choose between very many different electricity companies and mobile phone providers. Well, I don’t know if anyone is really happy about that, but I rarely meet [those] people anyway.” 8

As an ethicist, Webber also emphasizes the important of “clarifying the understanding of autonomy.” He makes a distinction between autonomy as freedom of choice and autonomy as self-control (“to have the control to direct your own life”). The ethicist assumes an intermediate position by endorsing philosopher Riley’s criticism on autonomy as freedom of choice, while also acknowledging that the iPOP could increase the self-control of people. Could, because “for very many people [this technology] will really not [offer] that [self-control]. You are only offering more information, more uncertainty.” According to Webber, not everyone will benefit from this new technology in equal measure, something which he finds, as he indicated earlier on in the discussion, unjust. I will discuss the justice issue more extensively in Section 7.4. Webber also brings the relationship between more (and more uncertain) information and more autonomy of the narrow conception up for discussion (premise \( v \)). “And then one really has to wonder if you could state in general terms [that] ‘this technology stimulates autonomy as [self]control.’”

In short: for many of the unexpressed premises of autonomy as a quality people have, the propositional content was disputed. Others asked critical questions which undermined the justificatory force of Stokes’ chosen topos. Does more unclear information not lead to less autonomy? Does autonomy not presuppose the right to not-knowing? Stokes still had not come into the discussion. With an intervention, I tried to make him choose a position in the ongoing discussion.

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8 One could wonder to what extent the analogy between an energy providers and the making of health care choices applies (and, so, if Riley’s argumentation derails). As life scientist Davies later remarked in his interview after the debate, he feels that many people are willing to pore over information once it concerns something as important as their health, in order to make an autonomous choice on that basis.
for its intended users. The experiment shows, after all, that the scientists find it hard to interpret their own uncertain test results. With this, Stokes compromises to premise viii: that people actually do what they have decided. At the same time, Stokes seems to put forward a habituation argument (see also Section 4.2.2.). His remark does come across as cautious ("We have not quite solved that yet"), but since he does not revoke his earlier advocacy, in my opinion Stokes aims to assert that more uncertainty is simply inevitable, which health care consumers will just have to get used to. So, although Stokes does not directly respond to the discussion about autonomy, he does seem to posit the habituation argument as a "standard answer that closes down the discussion before it even begins" (Swierstra et al. 2005).

Hence, I try to move Stokes to take a position in the discussion a second time. To no avail. He starts an interview with diabetes patient Boles to find out what kinds of health information she would like to receive. After that, the discussion takes a turn, and Stokes does not engage in the discussion about autonomy anymore.

This analysis demonstrates, first of all, that the moral argumentation of life scientist Stokes that was expressed in the inventory round was critically discussed. The propositional content of many unexpressed premises, for example, proved unacceptable to some of the panel members. Furthermore, a number of critical questions were asked. Stokes, however, did not answer this doubt and these critical questions. This excerpt demonstrates that he chose an evasive or reserved discussion strategy, that he felt suited his chosen role as an expert. According to Stokes, experts often take position as technicians – especially as a technician – it is not very useful to enter into an extensive discussion about issues that do no match their own expertise, which obfuscates the debate (Interview 2). Moreover, Stokes generally considers the dilemmas in ethical discussions as theoretical issues that cannot easily be substantiated in practice. "As far as I am concerned – especially as a technician – it is not very useful to enter into an extensive yes-no [discussion] about it" (Interview 2). That is striking. Although Stokes himself mentions a moral argument to support the benefits of P4 medicine, he suddenly performs ethical boundary work (see Section 4.4.1) here: he does consider it to be not his responsibility to participate in the discussion about these ethical questions. Neither does he give the impression that he is examining the articulated objections. He simply lets the matter drop. This is hardly consistent with his earlier advocacy during the preliminary interview and – to a lesser extent – on stage at the LUX.

Finally, my analysis demonstrates that my intervention was unsuccessful. Although I wanted Stokes to take position in the ongoing philosophical discussion, my intervention offered Stokes too much room to continue playing the role of expert.

### 7.4 Discussing side-effects

The script of the deliberation included a break (see Section 6.3.4). The break was mostly intended for me to be able to direct the course of the discussion. Before the break, the discussion about autonomy had eventually moved to the issue of whether or not health care consumers want the information this technology produces (see premise iv). This difference of opinion dissolved as soon as life scientist Davies suggested a liberal solution with an appeal to autonomy. Everyone should be free to decide if they want to gather health information for prevention, a point of view that would repeat after the break. With a colleague who was observing, I decided to direct the discussion toward the expected social side effects or costs of the iPOP. Similar issues had already been articulated in the inventory round. Webber (ethicist), for example, had articulated the issue of a just distribution of benefits. And King (young social-democratic politician) called attention to the effect of P4 medicine on solidarity within the health insurance system. King feared that P4 technologies will hold people ever more responsible for their own health, even when they cannot always control it themselves.

**KING:** "I find that another of those [undesirable] developments [...]. It's like 'yes, you've got this disease, but didn't you know you'd get it beforehand? It's your own fault. We as a society won't help you. You are responsible. You are autonomous.' That is an element of the discussion that I find underexposed, and that is something I do fear." [excerpt 7.4]

The two diabetes patients had divergent opinions about this. Although both supported having as much health information as possible, Foster (the other diabetes patient) responded to diabetes patient Boles who "on behalf of the group I guess I'm representing" said she wanted to know everything about herself. Foster called attention to "a large group of people who simply do not want to know that they have diabetes now. And if they have diabetes, they really don't want anything else happening with it. They cannot bear it."

**Davies:** "One person [...] will go wild with all available options, and another will completely trust his doctor. Perfect" (Discussion).

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9 "What you do generally see – that's why I used the anecdote – what you do generally see is that people adapt their opinion, their point of view, their actions, their theoretical actions as soon as it concerns themselves. And scientists are still thinking too little about 'What would it be like if I got this conclusion?'" (Interview 2).

10 Davies: "One person [...] will go wild with all available options, and another will completely trust his doctor. Perfect" (Discussion).
These issues had, however, not been critically discussed yet. Right before the break, philosopher Riley had yet again called attention to them in reaction to Briggs (science communicator and liberal), who had after all used the topos of something that could be called the Luddite argument to position critics as anti-technology, like the Luddites. Briggs: “Is that almost a nostalgic longing for a kind of pre-technology era? [...] The problem with this discussion is of course that, to some extent, we don’t know what this new technology will yield. But if it will really give us tangible health improvement, yes, then I can only be in favor.” To which philosopher Riley immediately replied: “Then the question still stands: who gets it, who doesn’t, and at what cost?”

In the last minutes of the break, I spoke to Webber and King to ask them to state their objections once more. Immediately after the deliberation continued, I prefaced my intervention to the public with a short elucidation. Since the iPOP individualizes the risk of diabetes (assuming the cause in the biology and the individual lifestyles of people), as Webber had already argued, the discussion may have been framed in terms of the consequences for individual health care consumers. I alluded to the possibility that some social issues were kept out of the discussion, since I suspected that the panel mainly consisted of highly educated people for whom being willing and able to use this technology is no issue. Then, I invited the ethicist and the young social-democratic politician to elucidate their views about the social costs once more.

In this section, I will analyze how life scientist Davies maneuvered strategically in the discussion about unjust social-economical health differences. Ethicist Webber expects that an increase in these differences will be an undesirable consequence of using the iPOP. In my analysis, I limit myself to Davies’ performance since he actively participated in the discussion, while Stokes hardly took part in these discussions. The presented reconstruction and an analysis of Webber’s argumentation show that Davies strategically chose from the topics Webber raised in order to position himself as an advocate on stage at the LUX (topical selection), while he left other topics that he had commented on off stage unmentioned.

WEBBER: “What I mentioned early on [in the discussion] is something that has two sides. Not that that is a reason not to want this technology, by the way. Or to consider it undesirable. I just think that it does have a problematic aspect that should be duly considered. [...] Important factors that cause diseases [are] socially determined. [They are] also connected with lifestyle, but lifestyle cannot be separated from the way in which children, but adults as well, are formed by the environment in which they live. The moment you individualize [health] problems [in terms of] ‘your omics,’ you will often take no notice of other [social] factors. There is one group that specifically suffers from this [...] This is the same group that also suffers most from the social factors of unhealthiness, and this is often the lower socio-economic class. This group is at a double disadvantage when we really focus on this technology, because as soon as you put this technology at the center of [...] a whole prevention program, I very well know who will use it most. Who can use it most. Those will be highly educated people, and they are the exact opposite group. So you could say: as soon as you consider the health differences between different groups in society, the social-economic health differences, as a social problem... the problem of justice. This really is about equal chances of a good life. Yes, then we’ve got a double problem. Because we aren’t paying attention, or less attention, to the factors that should be center stage, and the interventions that we’re bringing into society mostly help... groups that are better off to begin with. [This will] only reinforce the health differences.”

[excerpt 7.5]

Webber puts the use of the iPOP in a social perspective. He puts Davies’ pragmatic argumentation – that the iPOP will lead to the desirable consequence of health benefits (Excerpt 7.1) – up for discussion. Figure 7.1 represents the argumentation structure of the sub-discussion between Webber and Davies (see below). It demonstrates Webber’s topical selection in the confrontation stage of the sub-discussion: the issues that he chooses to bring up for discussion.

Webber (obviously) does not question the desirability of a lower disease burden for chronic illnesses such as diabetes. He had, however, cast doubt on the general validity of the propositional content that P4 and the iPOP will lead to health benefits for everyone (see previous section; see Inter-subjective Identification Procedure in Figure 7.1). Not, incidentally, that he considered the iPOP as a whole undesirable.

He doubts the justificatory force of Davies’ pragmatic argumentation even more (see Inter-subjective Testing Procedure in Figure 7.1). I interpret some of Webber’s statements in this fragment as a sign that he finds that Davies has no satisfactory answer to some of the three sets of critical questions required for pragmatic
Discussing the propositional content

1 We should stimulate the development of P4 technologies

1.2 P4 technologies lead to a lower health care costs

1.1 P4 technologies lead to a lower disease burden of diabetes

(1.2.1) Lower health care costs are desirable

(1.1.1) Lower disease burden is desirable

Testing the justificatory force

- critical question I: feasibility question – Are P4 technologies feasible?

No, P4 technologies are not feasible

(2) Yes, P4 technologies are feasible

- critical question II: necessary means question – Are there any other means to achieve the same results?

No, only P4 technologies can achieve these results

Yes, there are other means to achieve these results

- critical question III: best means question – Are P4 technologies, on balance, the best means to achieve these results?

No, P4 technologies are not the best means

Yes, P4 technologies are the best means

Figure 7.1  Schematic representation of argumentation structure, sub-discussion on Davies’ pragmatic argumentation

<table>
<thead>
<tr>
<th>Discussing the propositional content</th>
<th>1 We should stimulate the development of P4 technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 P4 technologies lead to a lower health care costs</td>
<td>1 No, not for everybody</td>
</tr>
<tr>
<td>1.1 P4 technologies lead to a lower disease burden of diabetes</td>
<td>Yes, they do</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Testing the justificatory force</th>
<th>1 No, P4 technologies are not feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Yes, P4 technologies are feasible</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>- critical question II: necessary means question – Are there any other means to achieve the same results?</th>
<th>No, only P4 technologies can achieve these results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, there are other means to achieve these results</td>
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</table>

<table>
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<tr>
<th>- critical question III: best means question – Are P4 technologies, on balance, the best means to achieve these results?</th>
<th>No, P4 technologies are not the best means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, P4 technologies are the best means</td>
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</table>

4.1 If you put P4 technologies at the center of a prevention program, they lead to increasing health differences

4.1.1 Everyone should have an equal right to a healthy life

4.1.2 Medicalization leads to increasing health differences

4.1.1.1 Increasing health differences are not desirable

4.1.2.1 Under the medical purview, social factors are ignored

4.1.2.2 People from lower socio-economic classes are less inclined or able to use P4 technologies

- critical question IV: side-effect question 1 – Do P4 technologies have undesirable side-effects?

Yes...

No...

- critical question V: side-effect question 2 – Do the desirable effects outweigh the undesirable side-effects?

No...

Yes...

Davies’ pragmatic argumentation is not successful

Davies’ pragmatic argumentation is successful

Dr. Davies’ statements
Dr. Webber’s statements
Critical discussed questions
Critical undisputed questions
Alternative discussion moves
Unexpressed premises or standpoints

Figure 7.1  Schematic representation of argumentation structure, sub-discussion on Davies’ pragmatic argumentation
argumentation. As was described in Section 3.4.1, pragmatic argumentation is a topos to justify (or reject) an action by pointing out its desirable (or undesirable) consequences.

The first critical question is the (technological) feasibility question. Webber does not choose feasibility as an issue to demonstrate the untenability of Davies’ argument, which indicates that he does not question the technological possibility of the iPOP. As reported, the scenario posited the iPOP as a given. The prepared intervention of the facilitator to prevent the discussion from falling into feasibility issues (see Chapter 5) proved unnecessary.

Webber does suggest that the necessary means question should be answered negatively: aside from P4 medicine and the iPOP, the risks of obesity and type 2 diabetes can be dealt with in other ways. People from lower socio-economic groups are, after all, more at risk for diabetes because of their unhealthy diets and habits, and the excessive offer of fattening foods in their social environments, claims Webber.

This implies that adjusting this fattening or obesogenic environment (for example: fewer or no unhealthy foods in schools, supermarkets, etc., a tax on fat and sugars) is an important condition for health benefits for this group (Statement 3.1 in Figure 7.1). “This is the same group that also suffers most from the social factors of unhealthy eating.”

Reasoned this way, advocates of P4 medicine do not have a satisfactory answer to the best means question either. Is a wide deployment of the iPOP as a means of preventing diabetes (and other diseases of civilization) really the best solution to the problem, considering its social costs (best means question)? Since the P4 is not an indispensable measure in the prevention of diabetes, Davies (and other advocates who point out the desirable consequences) should demonstrate that it is the best measure, i.e. the measure that has most advantages to compensate for its possible disadvantages. Webber identifies such a disadvantage (social cost) of P4 medicine: (even) larger socio-economic health differences (standpoint).

He defends the evaluative proposition of this standpoint (“Larger health differences are undesirable”) by appealing to the justice principle. Everyone should have an equal chance to a good or healthy life (Statement 4.1.1.1 in Figure 7.1). Then, he argues for the causal proposition (“P4 leads to larger health differences”) with a complex or multiple argument (Van Eemeren et al. 2002). First, Webber refers to medicalization as a cause of increasing health differences. According to the medicalization criticism, we lose sight of the social factors of a problem because the complaint is seen as a medical problem in the individual (cf. Ten Have et al. 2009: 104). Under the medical purview, your own biological vulnerability and character are the main determining factors in your risk for obesity and diabetes (Statement 4.1.2.1 in Figure 7.1). An adjustment of the living environment as a solution gets forgotten as a result of medicalization, when “you put the iPOP at the center of a full prevention program” (Statement 4.1 in Figure 7.1).

Second, the undesirable consequence of increasing socio-economic health differences occurs as a result of the selective use of the iPOP technology. Thus, Webber involves the user context in his argumentation. Webber expects that exactly the group of people which benefits from an adjustment in their living environments (the lower socio-economic classes) will be less inclined to use the iPOP or less capable of using the iPOP (Statement 4.1.2.2 in Figure 7.1). Webber does not explicitly comment on whether or not the undesirable consequence of the growing health differences outweigh the advantages. His remark that it is “no reason not to want this technology”, suggests that it does not.

The discussion that follows is mostly about the best means to tackle the problem of lifestyles that are at risk of diabetes. Baron (young liberal politician) defends the iPOP technology and is convinced that “explaining [the knowledge] in simple terms” can remedy the unintended effect. McCann (GGD) appeals to his experience as a professional (“I work with this on a daily basis”) to claim that good, comprehensible information on its own does not work. You have to make it easy for people to make the right choice by changing the alluring environment (“Because the temptations there [in the supermarkets], they are enormous, aren’t they?”). He finds the adjustment of a fattening life environment necessary. Philosopher Riley adds another argument to the question of whether or not the iPOP is the best intervention. Most likely not, he answers, because “it would not surprise me if it was much more effective to shape the environment differently.” An environment that is lighter on sugar and fat and that invites more physical exercise. Not just because there’s a more equal chance to a good life (Webber’s justice argument), but because it attains more effects.

At this point, Davies has not entered the discussion. I ask him to respond. When I asked him in the preliminary interview which ethical questions he expected the audience to articulate, Davies had, after all, personally identified with the problem of increasing socio-economic health differences. He said he was shocked when he recently heard of the existing difference in life expectancy between people with higher and lower educations. P4 technologies contribute to these differences, Davies feels, because he expects that low-skilled people will not be interested in the iPOP, or that they will not want to know their personal profiles. He told me he was afraid it would become a “white, highly educated, luxury thing to intervene in your health” (Interview 1). Although he interprets the cause somewhat differently from Webber (the lack of interest or the fear of knowing versus not being capable), in his preliminary interview he did take a standpoint that was similar to Webber’s:
that there is an “increasing gap between haves and have-nots” (Interview 1). In LUX, however, he takes a different position.

ME: “But Mr. Davies, if I may ask: What is your standpoint in this discussion? Because there is something being said about the functioning of this kind of technology [referring to the unintended consequences].”

DAVIES: “It is not without reason that TNO has a whole bunch of social scientists who are engaged in the design of cities, and the optimal ways of doing that. [...] I think we are [again] making a false contrast. The government should indeed be making choices about how to arrange society, but the knowledge we have about the individual’s biology and environment should not be neglected [...] A society that is not obesogenic, yes, I don’t think anyone can be against that, but at the same time, you can still say ‘an iPOP approach can offer benefits.’ So I think it is a bit of a false contrast.”

McCANN: “But I think we all agree with that. In that sense, I think we all agree with that, with taking a broad approach. And then the issue lies more with: where does the money go?”

[excerpt 7.6]

In the public sphere of LUX, Davies does not openly take the position that he expects the iPOP to contribute to increasing health differences, as he did in the preliminary interview. He does not respond to Webber’s statement that especially poorly educated people are less inclined to use the technology (Statement 4.1.2.2 in Figure 7.1). Neither does he confirm nor deny that they are less capable of doing so (ibid.). He does not want to position himself as a concerned citizen, but as an advocate of P4 medicine “in order to not present the technology too negatively” (Interview 2). Because of that, he focuses his topical selection on the premises he can ward off. He does not select any of the other topics. This strategy allows him to, first of all, dispute the ethicist’s suggestion and the philosopher’s statement that environmental changes would be a better solution – either more just, or more effective – by...
“role as a proponent did not appear clearly. But that did not really seem to be [his] intent. Maybe there were not enough proponents present in the end, and these two [Davies and Stokes] covered themselves because of that?” (Survey audience).

The contribution Davies’ fellow scientist Nigel Havers made from the audience near the end of the deliberation indicates this as well. Havers felt, after all, that his fellow scientists on stage should have taken a stronger position as advocates. “I had expected more of them, honestly” (Interview Havers). As some panel members mainly emphasized the disadvantages of these technological developments, Havers decided to engage in the deliberation from the audience. To conclude this section, I will briefly analyze Havers’ contribution to the discussion in terms of strategic maneuvering. He made a historical analogy that enabled him to address the hotly discussed issue of privacy.

Havers, a colleague of Davies at TNO who was recently appointed professor of personalized health at a Dutch university hospital, was able to follow the whole discussion as a member of the audience. He came to LUX to get a sense of how citizens look at the new iPOP technology. He himself felt that the article by Chen et al. in Cell was very important. “A game changer” (Interview Havers). He noticed that the members of the panel who are not closely involved in the technological developments primarily perceive this innovation as as potentially harmful. Havers even found two of the young politicians (Sands and Baron) annoying. He thought their contributions were one-sided. “When you look at an issue, [...] you have to consider both its positive and its negative aspects. [...] I did not hear them saying: ‘Yes, but it could be beneficial as well.’ [...] Sometimes there were irrational comments like: ‘Yes, but my employer can find out about this. You make agreements about that, and you can decently protect those [rights], as is currently happening with every patient. And I thought that was very unfair, and no one commented on that’” (Interview Havers).

With that, Havers appeals to the critics’ reasonableness. He expects a form of compliance from his fellow discussants – something that Gutmann and Thompson call the deliberative virtue of civic magnanimity: the acknowledgement of the value in your opponent’s statements (see Gutmann and Thompson 1996; see Section 2.3.2).

When I ask the audience for their last responses at the end of the deliberation, Havers is among the people who raise their hands immediately. With an analogy, Havers attempts to stimulate the young politicians’ imagination to envision the usefulness of the iPOP, without directly challenging their views.

According to Havers, the discussion about the detrimental side effects has diverted our attention from the true intentions of the makers of the iPOP. Havers wants to “simplify” the discussion. To that purpose, he selects the analogy as argumentation scheme (topical selection). He compares the iPOP with GPS route planning software.

On one hand, Havers underscores the useful function of both instruments: directing people to their destination. For the GPS route planning software, the travel destination is a geographical spot (Paris), for the iPOP it is health. On the other hand, the comparison is mainly intended to refute certain of the critics’ counter-arguments. The historical analogy with the GPS route planning software is intended, first of all, to demonstrate that the articulated fear of privacy violations is unfounded (“that is all nonsense”) because this fear proved unfounded with the GPS route planning software twenty years ago. In his reflection on his contribution after the deliberation, Havers uses the habituation argument (see Section 4.2.2) to emphasize that people will eventually get used to the iPOP, just as they did with the GPS route planning software. “In ten years, everyone will use it on their smartphones and no one will be questioning these things” (Interview Havers).

Secondly, Havers also addresses the issue of an unfair distribution in his analogy. He does not, however, express moral judgments about the differences between people who do not have a GPS route planning software and other people who have a luxury version. In—contrast to the fear of privacy violations, Havers does not consider Webber’s claims about an unjust distribution of benefits nonsensical (and, therefore, he does not call them such), as it turned out in the interview after the discussion. “It
can reflect inequality. That is true” (Interview Havers). Havers presents the inequality as a given (“There is an inequality there”), as something that we have to accept.

Leaving aside the question of whether or not an analogy between the GPS route planning software and the iPOP holds true, the analogy proves to be an instrument for topical selection. With his comparison, Havers does address certain topics (privacy, equal distribution of benefits), while he leaves other articulated issues undiscussed. He does not, for example, comment on issues like the increasing responsibility for one’s own health, as was mentioned by young politician King (see Excerpt 7.4), or the provisional shortage of fitting treatments, as Hudd (research director patients’ advocate association) stated (see Section 7.3). At the same time, off stage, Havers admits he finds these objections convincing. “I had never realized that before, but the idea of ‘it’s your own fault that’s going to happen, of course” and “I would like to avoid falling ill, yes [...] That’s an important bottleneck. [...] You do have to know what you can do to prevent that health risk. And there’s a big flaw, there” (Interview Havers).

Havers’ comparison only addresses those counter-arguments which, in his opinion, paint too negative an image of this future technology. Furthermore, this strategic maneuver enables him to defend P4 technologies without publicly acknowledging the negative side effects (increased personal responsibility) or uncertain assumptions (personalized treatment). After my interview with Havers – after I had already turned off the recorder– I asked him to reflect on his views about the image of non-reflective scientists who support new technologies uncritically. Havers: “On the outside, that perception is rather correct. When you are enthusiastic about something, you emphasize the advantages, not the disadvantages. [...] You just don’t do that. When you subsequently ask the individual scientists, they will mention the disadvantages” (notes interview Havers).

7.5 Conclusions

The deliberative quality of this dialogue has considerably improved compared to the discussions about behavioral genetics. As was concluded in Chapter 5, two issues undermined the deliberative quality of those discussions. First of all, the burden of proof was allocated to the public instead of to the participating scientists as a result of a bias in the script (the ADHD discussion) and strategic maneuvers (not publicly taking position; the delinquency discussion). In Section 7.2 I argued that this allocation of the burden of proof fits into a dominant liberal discourse assigning a large measure of autonomy to science and technology developers. The advocates of upstream public engagement feel, however, that enactors do need to account for the so-called soft impacts that, after all, do frequently lead to public controversies. Therefore, the explicit objective was to critically and publicly examine the moral argumentation of life scientists who support new developments in medical technology and/or help develop these. Although Davies and Stokes no longer presented themselves as convinced advocates, my interventions prompted both life scientists to articulate their most important moral argumentation about the desirability of P4 medicine. I will discuss this more extensively later.

Secondly, it turned out that issues about moral desirability, as far as they were articulated, were not critically discussed (confronted with a maximum of doubt) in the discussions about behavioral genetics. I have characterized all three discussions about behavioral genetics as a “struggle to represent the imagined consequences of technoscientific innovation and to render dominant their particular view of the future” (Bloomfield and Doolin 2010: 59). The expected undesirable consequences of these developments were not deemed feasible. To put it differently: the constructed future imaginaries of critics proved less plausible or even implausible whereas the future imaginaries concerning technological feasibility of scientists were deemed most plausible. Due to the scientific expertise that was ascribed to them, they had an advantage in this struggle about presented futures.

The elaborate argumentative reconstruction of the deliberation at the LUX demonstrates that the argumentation the life scientists advanced to defend the moral desirability of P4 medicine was at the forefront of the discussion. Moreover, their reasons were critically discussed. I first reconstructed the argumentative discourse by making its unexpressed premises explicit with the aid of a short discussion of the philosophical literature on autonomy. Subsequently, I demonstrated that doubt was cast on the (partially unexpressed) propositional content of the premises of Stokes’ autonomy. This topos was also critically questioned. The same goes for Davies’ pragmatic argumentation. Are P4 technologies really the best way of solving the social problem of an ever-increasing number of diabetes patients? At what social cost? And do the benefits outweigh these costs? Even though the differences of opinion have not been solved and no consensus has been reached, the validity of the arguments used has been tested. The differences of opinion have also become a lot more clear, which is also an important goal of public deliberation (see Section 2.3.2).

I also demonstrated that as a facilitator, you can successfully intervene during the deliberation. My interventions, first of all, contributed to both life scientist being staged as advocates. With his mitigation strategies, Dr. Davies initially positioned himself as a self-critical scientist emphasizing the dangers of P4 developments (“technology push”). But I continued to ask him about his views on its desirability. Furthermore, I asked both life scientists to react to the discussion as it had unfolded. When the discussion about autonomy was heading for the familiar liberal solution...
Behind the scenes of... life scientists on stage

Subject positioning proved to be the salient strategic maneuver. As was described in Chapter 4, subject positioning refers to how people shape their social identity in interactions with others, as a compendium of personae which are “publicly presented in the episodes of interpersonal interaction in the everyday world” (Harré and Langenhove 1999: 24; see Section 4.3.2). Stokes, for example, positioned himself mainly as a technician who adopted a rather unresponsive attitude in the philosophical discussion about autonomy in the deliberation, by not picking from the topics that were made available to him in the discussion situation (topical selection). According to him, he did so in order not to obfuscate the discussion., In the interview afterwards he constructed a demarcation between issues in which, in his role as an expert, he does not have a responsibility of responding, and issues in which he does have to respond (boundary work). My intervention that was intended to make him take position in the philosophical discussion allowed Stokes to remain reserved.

As opposed to Stokes’, Davies’ social identity evolved during the discussion. Initially, he positioned himself as a socially responsible scientist who is capable of naming the undesirable aspects of technology developments, dissociating himself from the inventors of the iPOP by choosing suitable strategic maneuvers (footing, mitigation strategies and boundary work) to achieve his rhetorical objective. Although an intervention that was intended to nevertheless stage him as an advocate was successful, an intervention lacked when Davies defended P4 medicine in the discussion about social side effects without publicly sharing his personal convictions. In this case, too, topical selection proved to be an effective strategy to get the maximum defense of the technology in without either giving up his personal convictions to the audience, or disavowing them. This strategy also respected the dialectical conditions for a reasonable discussion. Only when his performance on stage was compared to the preparatory interview in the analysis after the discussion, it became evident how Davies’ public identity at the LUX differed from his more personal identity off stage. The same goes for Davies’ colleague Nick Havers, who chose the topos of the analogy with the main intention of refuting the most important arguments of the critics without openly having to acknowledge the points of criticism he agreed with, as became clear in his interview after the discussion.

These contrasts between their off stage identities and the identities the life scientists constructed on stage indicate that they used the theatrical technique of stage management or impression management: disclosing controlled information about themselves, they attempted to create a public identity that matched the image they wanted others to have of them (see Introduction and Hilgartner 2000). As advocates, both Davies and Havers made the most of the room the discussion occasionally offered to refute some issues, while leaving the issues that they (later) admitted they could agree with undiscussed. And also Stokes presented himself differently in his role as a technician than as the missionary of new medical technology he had intended himself to be before the public deliberation.

Although topical selection is a discussion strategy that tallies with reasonableness, this debating strategy can be criticized on the basis of the framework of the deliberative virtues of civic integrity and civic magnanimity, as defined by Gutmann and Thompson (see Section 2.3.2). According to Gutmann and Thompson, participants in a public deliberation have to develop these character traits in order to be able to discuss a moral disagreement in a reasonable manner (principle of accommodation). One of the three aspects of civic integrity is displaying a consistency of speech. An important aspect of civic magnanimity is sincerity and the pursuit of an economy of moral disagreement. The latter means that participants in the deliberation should strive to “minimize rejection of the position they oppose” (Gutmann and Thompson 1996: 85), and that they should also openly indicate the matters they do not disagree with.

How can this deliberative behavior be interpreted? It is possible that an instrumental view on technology incites a defensive attitude in the life scientists. Based on a fundamentally optimistic attitude towards NEST, they consider new technologies mainly as good instruments in themselves, losing sight of unintended consequences. This would explain scientists’ discussion strategy to refute as much criticism as possible.

The dramaturgical setting may have partially determined the strategic behavior of the life scientists here. The evasive discussion behavior of Stokes was possibly reinforced by the informal dramaturgical setting of LUX. Participation in the deliberation was, after all, voluntary, it was an one-off event without outcome (in the form of a report or a tangible decision) enforced. There is not much at stake at the LUX. Unless you, as a life scientist, decide for yourself to shape your scientific
practice differently because the deliberation gave you new insights, the conversation will have little concrete influence on the research practice.

Furthermore, the critical discussion was mainly focused on spotlighting differences in opinion. During the inventory round, many panel members chose an issue that indicated why they considered P4 medicine to be undesirable. As Lucivero et al (2011) wrote, the claims on [moral] desirability [of NEST] often display a conservative stance towards the future. When new technological developments mostly evoke criticism, the inclination to defend yourself or, possibly, to withdraw from the discussion, increases.
concluding remarks
8.1 Introduction

“The official from the State Department of Environmental Protection [DEP] locked the door to the [...] building and the five of us walked together out into the parking lot. After almost three and one-half hours of heated discussions with citizens in the meeting room, the fresh, cool air of the night was reinvigorating. I was thinking to myself, I’m glad that’s over with! when the DEP official aggressively said, ‘[…] The participation project was a complete failure. […]’ Between the lines I thought I heard him say, ‘Thanks for nothing.’

[…] In the van on the drive home we analyzed the event and looked for mistakes. We looked for people to blame. On the outset, there was plenty of blame to go around. If only the moderator had controlled the discussion a bit differently. If only that member of the research team did not argue with the expert. If only the state official had not given such a one-sided and lengthy presentation. If only we had pushed harder to have citizens from outside communities present. If only we had known about that other landfill siting debacle from last year. If only the citizens had been a little more patient, a little more open, and a little less hostile!” (Webler 1995: 35-6).

This ethnographic account of the world behind the scenes of a public participation event beautifully describes the struggle that facilitators of public deliberation can sometimes experience. To me, as a professional facilitator of public dialogue, Thomas Webler’s personal revelations are very recognizable despite the differences between discussions on waste disposal that Webler describes and upstream public deliberation on the moral desirability of new and emerging life sciences and biotechnologies that I have been studying. Indeed, my colleagues and I have often talked over the events of public discussions, fully frustrated, right after our performances on stage.

But, as Webler rightly observes, before moderators, citizens, experts or others can be blamed, a mistake has to be identified. What is it that went wrong? As with Webler and his colleagues, the frustration and struggle I have experienced every once in a while were an important incentive to investigate the practice of facilitating
public deliberation. Weber et al. have developed a “yardstick” to evaluate the “right discourse in citizen participation” (ibid: 35). Although their reference to Habermas’ discourse ethics suggests differently, I demonstrated in Chapter 2 that in their approach the throughput quality of public deliberation still remains out of the picture: in the end, their rich framework has too little to offer for facilitators to evaluate the quality of argumentation and to direct public discussions towards deliberation.

Therefore in this dissertation, I have investigated the following main question: How to facilitate quality face-to-face upstream public deliberation between life scientists and citizens on the ethical issues emerging from the new life sciences and biotechnologies? As I demonstrated in the Introduction of this book, this question has become most relevant because upstream public deliberation has by now gained considerable ground in the European science policy, as appears from the Horizon2020 framework. At the same time, the quality of the outcome of public dialogue depends largely on what actually happens during the deliberation.

In this conclusion section, it is time to consider what we can learn from the events during the upstream public deliberation sessions at the LUX. What my analyses discussed in Chapters 5, 6 and 7, demonstrate is that deliberation does not occur automatically. This observation will hardly come as a surprise for we all know out of our own experiences how difficult it can be to remain reasonable in discussions. As Weber says, “[n]othing that happened during the meeting was so unusual” (Weber 1995: 36). Even though empirical research (by argumentation researchers) shows that we subscribe to the normative framework of a reasonable discussion (cf. Van Eemeren et al. 2009), in the heat of the moment we do not always act as reasonable critics who demonstrate the deliberative virtue of magnanimity. We do not always assess the position of the ones we disagree with, distancing ourselves from our own. It is not uncommon that we push the boundaries of a reasonable discussion in order to be effective. “[P]eople are also, and perhaps even primarily, interested in resolving the difference of opinion effectively in favor of their case, i.e. in agreement with their own standpoint or the position of those they represent” (Van Eemeren 2010: 39). Sometimes our argumentation even derails. Even though the performances of life scientists were looked at through a magnifying glass in this study, of course they do not belong to the rare species of strategically maneuvering people.

Psychologists have described and theoretically accounted for the mechanisms of several cognitive biases and logical errors humans are frequently entangled in. Apparently, we are not always the rational and clear thinkers whom deliberative democrats theoretically assume we are, as most of them are undoubtedly willing to admit. People are inclined to interpret the world as it confirms them in their own right (confirmation bias). They brilliantly invent reasons to let their ideas tally with the outside world again in their strive towards inner harmony (cognitive dissonance reduction). Or they tend to just think what the majority thinks (bandwagon effect, group think or herd behavior).

However, this does not mean that we are completely at the mercy of our irrational psyche. Nor that Van Eemeren’s rules of a critical discussion are less correct or valuable. It does mean, however, that discussions can greatly benefit from the help of well-trained facilitators who stimulate critical thinking to become truly deliberative. These are facilitators who know how to apply the pragma-dialectical discussion rules in various contexts; who recognize recurring strategic maneuvers as expressions of persuasive rhetoric participants of deliberation employ to close down the discussion; who observe what character the actors in the play construct; who are – following Maarten Hajer – in their role as dramaturgist also aware that the deliberative setting that is staged, affects “what is said, what can be said and what can be said with influence” (Hajer 2005: 624).

In these concluding remarks, I pass the most salient findings of this study in review. Firstly, I discuss in what ways the taxonomy of critical questions or stock topics that I have derived from pragma-dialectics and NEST-ethics is a helpful tool to confront the argumentations in discussions on the moral desirability of NEST with a maximum of doubt and to intervene in the discussion on site (Section 8.2). Next, I turn to the performative dimension of public deliberation. I discuss the staging techniques facilitators can utilize to counterbalance the theatrical techniques of persuasive rhetoric (particularly the construction of futures) and impression management (controlling the information in their public presentation) life scientists used to pre-empt discussion (Section 8.3). Then, I discuss how the public sphere itself, the fact that participants deliberate publicly, affects their very performance and what dramaturgical interventions can prevent plebiscitory reason which reflects the harmful effect of publicity (Section 8.4). Finally, I will conclude with some general remarks about future research and the necessity for training programs to professionalize facilitators of upstream public deliberation (Section 8.5).

8.2 Stock topics and deliberative quality

Facilitators whose ambition it is to facilitate quality upstream public engagement on the moral desirability of NEST first need a conception of deliberative quality. According to deliberative democrats, the quality of decisions on public moral issues depends on a legitimate decision-making process based on mutually justifiable reasons. In the context of NEST, this means that those involved in the process of
directing techno-scientific innovation trajectories (in the life sciences) owe affected publics justifications for their science policy. As a result, deliberation is all about the reasonableness of the process of argumentation. And the task of deliberative democrats is to “critically investigate the quality, substance and rationality” of these reasons and justifications (Chambers 2003: 309).

Because deliberative democracy theory does not provide a detailed theory of how to assess or evaluate the discursive quality of argumentation that facilitators of upstream public deliberation can use to direct discussions towards deliberation, I developed a theoretical conception of deliberative quality. This conception had to a) enable a reconstruction, analysis and evaluation of argumentative discourse, particularly in the context of new and emerging science and technology and b) allow facilitators to intervene in face-to-face public deliberation on NEST.

For that purpose I used the pragma-dialectical argumentation theory. In Chapter 3 I elaborated the pragma-dialectical model of critical discussion which provides a code of conduct for reasonably resolving a difference of opinion (see Table 3.1). When it comes to determining the quality of reasons, the argument scheme rule is at the heart of this normative framework. This rule stipulates that “a standpoint may not be regarded as conclusively defended if the defense does not take place by means of an appropriate argument scheme that is correctly applied” (Van Eemeren et al 2002: 183). This can only be the case when the protagonist has satisfactorily answered a set of critical questions pertaining to the argument scheme that is applied. Drawing on Swierstra and Rip’s NEST-ethics, which describes recurring argumentation patterns in NEST-ethical debates, I have derived sets of critical questions discussants need to satisfactorily answer in the context of discussions on the moral desirability of NEST. Together, these critical questions constitute a set of stock topics: “a taxonomy, a system of classifying the kinds of questions that can be at issue in a [NEST-ethical] controversy” (Jasinski 2001: 528).

This taxonomy of stock topics has proven to be a helpful tool in three respects. Firstly, the taxonomy can serve as a diagnostic tool for assessing the quality of a certain public deliberation. In Chapter 5 I have used the tool to evaluate three face-to-face upstream public deliberation sessions on behavioral genetics at a Dutch debating center (LUX). I concluded that in neither of these public discussions were the claims of life scientists critically discussed, since their argumentation was not confronted with a maximum of doubt. Most of the stock topics were not addressed. According to the literature reviewed afterwards, however, several critical questions could have been posed. At the LUX these questions were not satisfactorily answered, but they were in the first place, never raised.

Secondly, the taxonomy is useful as a heuristic tool for systematically investigating, mapping and thus anticipating NEST-ethical issues as part of a critical vision assessment of new technologies. In Chapter 6, I described how I performed such a vision assessment as part of the preparatory work for an upstream public deliberation session on new and emerging biomedical technologies (esp. Integrative Personalized Omics Profile, or iPOP). An extensive argumentative reconstruction and analysis, including the explication of unexpressed premises, constituted the main source of information for a report sent out to the panelists to prepare them for the discussion.

Thirdly, the stock topics are an important intervention tool for facilitators to direct the deliberative discourse on stage to improve its quality real time. As I have discussed in Chapter 7 critical questions helped to open up the discussion again. When the discussion about whether and how new biomedical technologies will contribute to the good life was closed down with an appeal to the principle of autonomy (“Since we will not be able to resolve our difference of opinion on this issue, people should be able to decide according to their own moral beliefs”), one of the critical questions pertaining to pragmatic argumentation opened up a critical discussion on unintended consequences and (in)justice that had not yet been systematically addressed.

The pragma-dialectical model of critical discussion and the taxonomy of critical questions are also effective intervention tools when a deliberative session is spread out over a few meetings. Then, there is sufficient time for a meticulous reconstruction, analysis and assessment of the argumentative discourse of one session that can serve as an input for the next.

### 8.3 Directing deliberative performances

The pragma-dialectical argumentation theory provides a normative framework for resolving differences of opinion in a reasonable manner. Similarly, deliberative democrats prescribe deliberative behavior in terms of civic virtues. Together, the pragma-dialectical code of conduct and these virtues constitute a set of constraints for an appropriate deliberative interaction. However, in the unruly deliberative reality on the ground discussants do not only behave as virtuous and reasonable agents. They also attempt to make maximal use of the room that these deliberative constraints offer to pursue the aim of effectiveness: having others to accept their standpoints. Drawing on the dramaturgical perspective in the social sciences, I have indicated that participants in public deliberation can be considered as public performers or actors who employ a variety of theatrical techniques to be effective in trying “to manage and turn in their ‘best performance’, appropriate to their individual (or institutional) goals” (Harvey 2009: 150).

One of these theatrical techniques is persuasive rhetoric (cf. Hilgartner 2000).
Pragma-dialecticians acknowledge that discussants also pursue rhetorical aims apart from resolving a difference of opinion. To make room for this rhetorical dimension, Van Eemeren introduced the concept of strategic maneuvering. This concept amounts to the delicate balancing act of discussants being effective (the rhetorical dimension of argumentative discourse) while also remaining reasonable (the dialectical dimension). Drawing on Discourse Analysis – and particularly Discourse Historical Approach (DHA) – I demonstrated in Chapter 4 that discussants dispose of more discursive strategies than using topoi or argument schemes in order to be effective. Language or discourse does not neutrally reflect reality. Instead, it is a form of social action: people can do things with words to be persuasive.

In the case studies presented in Chapters 5, 6 and 7, I also studied how life scientists strategically maneuvered in upstream public deliberation on NEST-ethical issues and how these strategic maneuvers relate to the pragma-dialectical norms of critical discussion. One effective strategic maneuver that I have identified is the construction of futures. At the LUX, all kinds of futures were constructed: distal, bad, uncertain, beneficial to individuals, unlikely etc. Particularly the expectations concerning the technological feasibility of new and emerging life sciences and (biomedical) technologies proved effective in discussions on the moral desirability of NEST. Some represented the futures of critics who anticipated undesirable consequences of new technological developments as unfeasible. Others constructed a future with new technologies (e.g. genetic tests for autism) as implausible. In both cases, the effect was that difficult issues concerning the moral desirability of NEST were not discussed.

In this struggle to construct plausible expectations, expertise about the future was claimed by or ascribed to a particular group of people. These appeals to authority with regard to the technological feasibility can be considered as derailments (argumentum ad verecundiam). Only time will learn which socio-technical imaginaries will materialize. From the pragma-dialectical perspective on this kind of argumentation, discussants appealing to scientific expertise about techno-scientific futures – “This future is (un)feasible, because (I belong to the selected group of) experts (who) say so” – cannot satisfactorily answer a set of critical questions. Is the expert able to provide evidence for his claim about the future? Is his claim consistent with other experts’ assertions? How much certainty can be attached to this claim? As I demonstrated in Chapter 6, these critical questions are powerful tools for facilitators to anticipate discussions on technological feasibility and intervene in them if necessary.

Another theatrical technique is impression management. From the dramaturgical perspective, participants of public deliberation manage their public presentation: people present themselves to the public in such a way that they are perceived as they prefer, distinguishing between their “self” that remains hidden from the public view and their public identity or “persona.” To identify the dramatic personae of life scientists participating in upstream public engagement on NEST, using the pragma-dialectical argumentation theory is not sufficient. Argumentation theory focuses after all on the positions people express in their speech acts, on what is, directly or indirectly, said (or written; see Van Eemeren and Grootendorst 2004). Impression management is also about what people do not express front stage. To investigate how life scientists manage their impressions I additionally performed participant observation.

In accordance with the concept of subject positioning, which presupposes a multitude of different identities in different social situations, participants of the upstream public deliberations at the LUX positioned themselves and (implicitly) others variously as: modest, sound, concerned fellow citizen, expert, spokesperson, responsible innovator, illiterate, techie or geek. From these various subject positions, one can conclude that there is not a single role that life scientists adopt when they participate in upstream public deliberation. In fact, their public identities can even change during a single deliberative session.

Two public identities dominated the discussions at the LUX: the pure scientist (or technician) and the issue advocate (cf. Pielke 2007). Life scientists presenting themselves as pure scientist chose to refrain from publicly advancing their standpoint on the moral desirability of NEST. Others, on the other hand, presented themselves as issue advocates. However, sometimes life scientists demonstrated public reluctance to express their advocacy they had expressed privately. They presented themselves as modest or occasionally even as anti. As I described in Chapter 5 for example, the professor in forensic youth psychiatry (Dr. Lamb) warned against the high expectations of his academic colleagues (such as Adrian Raine). In the end Dr. Lamb even refrained from publicly advancing a standpoint on the moral desirability of improved risk assessment tools for criminals and citizens based on biological indicators. Perhaps this is understandable in view of the fierce Buikhuisen controversy in the Netherlands, but it complicated the discussion considerably.

These performances by pure scientist and the reserve to act as issue advocate are in contrast with the literature on the sociology of expectations where it is claimed that promises and expectations tend to be exaggerated, particularly in early stages of technological innovation. Perhaps there is a cultural explanation for this reserve among Dutch life scientists because of a consensus-based, social policy making culture, often referred to as the polder model. What is more, these constructions of public identities as pure and modest scientists serve as immunization strategies, aimed at pre-empting critical discussions on moral desirability of NEST.
As a facilitator it is important to be aware of these strategies and to stage them as they present themselves behind the scenes, as I did with Dr. Davies in the public dialogue on P4 medicine (see Chapter 7). Whereas Dr. Davies presented himself as an issue advocate behind the scenes, on stage he initially distanced himself from the new technology, anticipating the possible public resistance towards the exaggerated expectations of P4 supporters. He even seemed to present himself as a critic or opponent, choosing a footing as animator instead of author of the imaginaries of P4 medicine and referring to these technological developments in terms of being “ovrun in this tsunami of new technologies.” Having learned from the events in the deliberation on behavioral genetics and delinquency, I managed to elicit Dr. Davies’ argumentation expressing why he thinks developing P4 medicine is a good idea.

This intervention would have impossible without a preparatory interview. The impression management thus illustrates the importance of these interviews where people feel comfortable and confident to express how they (really) think about particular issues in a relatively private environment.

8.4 The detrimental effects of publicity

As I described in the introduction section of this dissertation, some commentators have argued that the organization of upstream public deliberation itself has contributed to the public uneasiness with new and emerging science and technology. Therefore, I decided to include the effects of the organizational process on the quality of deliberation into my analysis. For this purpose, I borrowed the dramaturgical concepts of scripting, staging and setting as Maarten Hajer has introduced. Besides the theatrical techniques discussed in the previous section, the second aspect of the performative dimension of public dialogue is the effect of the dramaturgy on the performances of participants.

In the previous chapters I showed for instance how the casting of characters in the play (as part of the scripting of public deliberation) influenced whose expertise is considered as more credible (see Section 5.4). I also demonstrated how the script of the public discussion on behavioral genetics and ADHD was biased (see Section 5.2). Furthermore, the staging between active panelists and passive audience proved to have an effect on the role perception of one of the panelists (see Section 7.4). And even the technologies recording the discourse (microphones and video cameras) that were part of the laboratory setting turned out to be – putting it in terms of Actor Network Theory (ANT) – actants mediating the deliberation.

But what affected the deliberation perhaps most significantly is the public sphere itself. The public indicated that speaking in public discouraged them to actively participate in the discussion on the behavioral genetics of ADHD. Furthermore, the observations described in the previous section corroborates the claim that publicity can have harmful effects on the quality of deliberation, as Simone Chambers has argued (Chambers 2004).

Publicity is one of the three main procedural principles deliberative democracy theory hinges on (see Section 2.2). Deliberative democrats argue that the openness of the public sphere has salutary effects on public reason. Theoretically, it has a positive effect on the quality of reasoning since in public people are urged to carefully think over one’s position, to anticipate possible criticisms and to take other people’s view into account. Furthermore, publicity stimulates public reason because in pluralist societies, people are committed to arguing in favor of the general interest instead of their own, private needs and concerns. Nevertheless, publicity can also have a detrimental effect on the quality of reasoning in reality (Chambers, 2004). In those cases, public reason turns to plebiscitory reason: even if people argue in favor of the res publica, the quality of the argumentation lags behind. “The public nature of the debate forces speakers to make general appeals, but there is little or no critical accountability to ensure that those appeals are well reasoned” (Chambers 2004: 398).

Two of the strategies that characterize plebiscitory reason are more or less recognizable in the public performances of life scientists at the LUX. The first strategy is that public speakers say what people want to hear, a form of shallow reason or pandering, as Chambers describes this strategy pejoratively. Dr. Davies for instance anticipated public criticism towards the overblown future visions regarding P4 medicine. That he was the first person to publicly express his views on the topic reinforced his mitigation strategies to tone down his future visions. In public, he articulated his concern that P4 medicine would possibly result in a technology push, while behind the scenes he said that he would enact the role of advocate to persuade the public of the benefits of a transition towards P4 medicine.

The second strategy is image-maintaining. Publicly, speakers might not “want to ‘look’ weak by changing their mind and so are resistant to good argument” (ibid. 399). They do not want to lose face. The analysis of the deliberation on the iPOP at the LUX demonstrated that both Dr. Davies and Dr. Havers had difficulties to publicly agree with some arguments of their opponents. Dr. Davies did not publicly show his personal beliefs concerning the possibly increasing inequalities in health as a result of the use of P4 technologies, while Dr. Havers did not openly acknowledge the points of criticism of opponents he agreed with. “You simply do not do that,” Dr. Havers said.

Again, this illustrates how important it is to a) critically examine the argumentation used in public deliberation mobilizing critical questions (to discourage pandering) and
b) to investigate the opinions of participants of public deliberation using preparatory interviews (to catch sight of instances of image-maintaining). Most of all, facilitators have an important role to play in stimulating deliberative courage: that it is okay for participants to publicly change your mind and admitting that things are perhaps a bit different than initially thought.

8.5 Final remarks

My findings have demonstrated the value of qualitative research to cast light on the discursive as well as the performative dimensions of the throughput processes of public deliberation. Facilitating public deliberation is not only about applying the right democratic input criteria. The application of criteria is only to a certain extent helpful in the organizational process because concrete designs appear to reflect particular trade-offs between these criteria (see Section 6.4). As political scientist Ryfe writes: “Deliberative democrats mistakenly adopt an ‘if we build it they will come’ mentality. If we infuse a context with the right procedures and [if we] organize an encounter to conform to the right norms then deliberation ought to take place” (Ryfe 2005: 63; italics KD).

The pragma-dialectical argumentation theory (combined with NEST-ethics and discourse analytical studies of controversies in new science and technology) has proven to be a useful tool for facilitators to realize and improve reasonableness in upstream public deliberation on NEST. Similarly, the dramaturgical perspective is valuable to sensitize social scientists as well as facilitators for the social dynamics during upstream public deliberation on NEST. More research on the argumentative discourse in public discussions on NEST will yield additional recurring strategic maneuvers than I have identified. Furthermore, new sets of critical questions can be developed to confront argumentation with a maximum of doubt. More social scientific research aimed at studying the social interaction during public deliberation will also reveal more features of the performative dimension of deliberation. I am also strongly in favor of broadening the scope of research. In this study, the focus was on participating life scientists. I think it would be valuable as well to closely investigate the roles of other important groups of participants in upstream public deliberation as well, for instance the role of ethicists who are frequently staged as experts in ethics.

Ideally, the findings from this study and future research projects will be used to professionalize facilitators of upstream public deliberation on NEST. My experience as a facilitator is that intervening in the discourse is quite difficult in the chaotic, spontaneous and dynamic course of events that follow each other at a fast pace. It is for good reason that I needed a complete reconstruction afterwards to analyze the argumentative discourse. Therefore, it is important for professional facilitators to be trained in recognizing argumentative discourse in NEST-ethical discussions. Since deliberation is regarded as an important democratic condition among theorists in the field of deliberative democracy, facilitation is a large responsibility that can only be left to professionals. Perhaps, technology assessment institutes – such as the Rathenau Institute in the Netherlands – can play an active role here to develop intense training programs to instruct and train professional facilitators. Making use of video recordings of deliberative settings, argumentative discourse can be reconstructed, analyzed and evaluated and the social interaction can be analyzed.

Of course, the frustration that Webler describes and that I am now familiar with will not disappear completely. Deliberation will to a certain degree always remain an utopia. At the same time, this is what makes this profession attractive and tempting. Never a dull moment...
references


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Behind the Scenes of... Life Scientists on Stage

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QUESTIONNAIRE PUBLIC: AN iPOP FOR EVERYONE?
Table A.1 Collected data in case studies

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| 1 Not all the preparatory interviews with invited speakers by telephone were recorded and hence not used as research data. | 2 These interviews were held among international researchers working in the field of P4 to investigate expectations and sociotechnical imaginaries of P4 Medicine. | 3 These interviewees were selected based on their answers in the questionnaires. Members of the public were able to indicate their willingness to be interviewed.
APPENDIX B

Questionnaire: The preprogrammed human

What is your gender?
- Female
- Male

What is your age?
- 15 – 24
- 25 – 39
- 40 – 60
- Older than 60

How are you related to the issue of ADHD (more than one possibility)?
- Patient
- Parent of a child with ADHD
- Professional in education
- Professional in youth care
- Psychologist
- Psychiatrist
- Psychotherapist
- Genomics researcher
- Behavioral scientist
- Other

What was the reason for you to visit this public discussion?

Did you acquire new information?
- Yes
- No

If so, what information?

Did the public discussion meet your expectations?
- Yes
- No

If so, what? If not, why so?

What did you think of the facilitator?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the setting?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the interaction?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the interview with prof. John Lush?
- Good
- Fair
- Moderate
- Inadequate

What did you learn from this public discussion?

Did the public discussion meet your expectations?
- Yes
- No

If so, what? If not, why so?

What did you think of the facilitator?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the setting?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the interaction?
- Good
- Fair
- Moderate
- Inadequate

What did you think of the interview with prof. John Lush?
- Good
- Fair
- Moderate
- Inadequate

What did you learn from this public discussion?

Did the public discussion meet your expectations?
- Yes
- No

If so, what? If not, why so?

What did you think of the facilitator?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the setting?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the interaction?
- Good
- Fair
- Moderate
- Inadequate

What did you think of the interview with prof. John Lush?
- Good
- Fair
- Moderate
- Inadequate

What did you learn from this public discussion?

Did the public discussion meet your expectations?
- Yes
- No

If so, what? If not, why so?

What did you think of the facilitator?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the setting?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the interaction?
- Good
- Fair
- Moderate
- Inadequate

What did you think of the interview with prof. John Lush?
- Good
- Fair
- Moderate
- Inadequate

What did you learn from this public discussion?

Did the public discussion meet your expectations?
- Yes
- No

If so, what? If not, why so?

What did you think of the facilitator?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the setting?
- Good
- Fair
- Moderate
- Inadequate

Remarks

What did you think of the interaction?
- Good
- Fair
- Moderate
- Inadequate

What did you think of the interview with prof. John Lush?
- Good
- Fair
- Moderate
- Inadequate
What did you think of the contribution of prof. John Lush?
☐ Good  ☐ Fair  ☐ Moderate  ☐ Inadequate
Remarks  ..........

What did you think of the quality of the discussion?
☐ Good  ☐ Fair  ☐ Moderate  ☐ Inadequate
Remarks  ..........

What should have been done differently (e.g. break, duration etc.)?
 ..........

Final remarks  ..........

Do you want to be kept informed about the next public discussions “The Preprogrammed Human”?
☐ Yes  ☐ No

Can we call for a more detailed discussion?
☐ Yes  ☐ No

If so, how and when can we get in touch?  ..........

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**APPENDIX C**

**Scenario public deliberation on iPOPs**

**The preventive outpatient clinic (for Diabetes)**

Scenario “An iPOP for everyone”1

International life sciences research keeps yielding an increasing amount of results. In recent years, international research consortia and companies have invested considerable amounts of money in systems biology studies of common diseases such as Type 2 Diabetes. The aim of this research is to find new entries to treatment, but above all, early detection and prevention. In the footsteps of the first scientific publication about iPOPs in leading magazine Cell’s March 2012 issue2, affordable and validated methods have become available for sequencing the complete human hereditary material and for determining which omics profiles signify diseases in a “molecular” stadium.

Insurance companies, patient organizations such as the Diabetesvereniging Nederland (DVN, Dutch Diabetes Organization), hospitals and health centers have seized on the growing interest in individual disease prevention by founding so-called preventive outpatient clinics. In this way, the patient organizations present themselves not just as representatives of their own constituent patient groups, but also as advocates who look after the interests of health care consumers and citizens who want to stay in good health. Insurance companies also want to answer the growing interest in the (commercial) offer of this type of test among the more ‘risk aware’ consumers. The insurance companies do not want to give the wrong impression, and they let it be known that they take no interest in the results of medical tests and profiles. They trust the individual responsibility of the insured; that they, in case of a less favorable result, will take their own actions to ensure improvement. It

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1 Largely based on Genetica, genomics en gezondheidszorg (Van Rijswoud e.a. 2008), supplemented by interviews with experts.

2 Chen et al. 2012.
is solely about customer relations, and about answering the government’s demand for stimuli in prevention.

Depending on the type of insurance a person has, the patient will pay for the costs. Some insurance companies put this type of prevention in their supplemental options, and mostly stimulate the free lifestyle changes. On top of that, a number of insurance companies try to lure customers with a differentiation in premium, in which the basic insurance is offered with extra beneficial conditions to individuals with a low risk profile.

The Dutch ministry of health, welfare and sport stimulates these developments. Confronted with high health care costs, the ministry has increased its focus on three goals over the past few years. The so-called Triple Aims are a) to improve healthy behavior (in which individuals’ own responsibility for their own health will be addressed in increasing measure), b) specific health improvement for risk groups and c) decreasing collective health care costs. Spearheads of the government’s preventive policy are, among others, obesity and Type 2 Diabetes. In recent years most efforts were aimed at education and stimulating measures, but these policies have so far shown little effect. Due to the alarming increase of obesity and Type 2 Diabetes (at ever younger ages), the government decides to stimulate the development of prevention clinics. An implementation that is controlled as much as possible in public health care is to be preferred, in the minister’s opinion, over an uncontrolled market development in which commercial parties offer preventive screenings. In this way, it is also easier to guarantee equal access to these facilities.

In the past, the government decided to forego systematic screenings of children for their genetic disposition towards obesity and diabetes (as was suggested by the medical field) for ethical reasons. The fact that parents would receive information about their child’s health was considered too much of an infringement of the child’s right to decide later on what it does and does not want to know. Parliamentary questions asked by the liberal political party VVD did not manage to sway the minister’s opinion. Although every parent is free to abstain from genetic screening in the neonatal heel prick, this implementation was seen as too proactive. Furthermore, doctors raised the objection that the difference between life threatening but treatable diseases (such as PKU) and chronic diseases like Diabetes would become too complex for parents. The government does, however, think that the time of casual information and general measures has passed. General practitioners are urged to play an active role in talking to parents in a more direct manner about their responsibilities, and regional health services agree to approach parents and children more as individuals when it comes to child health care.

Apart from a place where general practitioners can be actively approached, the outpatient clinic for prevention is also a place where risk aware health care consumers can take responsibility for their own health. In this clinic, doctors and health coaches attend, educate and give out personalized lifestyle advice to patients and clients. Every adult can, for example, access their electronic patient file at the outpatient clinic and have it periodically screened for possible variants of which the medical meaning has recently been determined. To increase the possible impact of the genetic data, clients are also advised to convince their direct relatives to have their DNA sequenced. Beside genetic information, the outpatient clinics offer the opportunity for regular health checks. In case it turns out that the client has a genetic risk for Type 2 Diabetes, (future) patients have the option to procure a glucose meter so they can monitor their own blood sugar levels. So-called lab-on-a-chip technologies enable clients to simply take a drop of blood from the fingertip and measure countless molecular biomarkers that indicate the early development of Diabetes (and other diseases). The test results are also sent to the attending doctor or health coach. Requisite for participation is that patients and clients make their data available for scientific research. In so-called digital communities, patients and clients can share their experiences with other patients and clients, in the Netherlands and in the rest of the world.

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3 Innoveren voor gezondheid, TNO Zeist, 2013.
4 Diagnose Diabetes 2025, Virusscenario.
6 Gen-ethische Grensverkenningen, Teldersstichting, Den Haag, 2010
7 Hood and Flores 2012.
8 Ibid.
9 Ibid.
10 Innoveren voor Gezondheid, TNO Zeist, 2013.
Appendix D

Interview guide Mr. Davies

1 In advance

Direct cause
The article by Chen et al. (2012) in *Cell*, in which they introduce the concept of the iPOP and present the results of an experiment that had Stanford-researcher Michael Snyder go into a number of systems-biological readings over the course of 14 months: first a complete DNA sequence, then, based on that, regularly scheduled test panels to trace biomarkers that might indicate the presence of Type 2 Diabetes (and other (multifactorial) diseases).

Indirect cause
The developments in the field of P4 Medicine (specifically the “predictive” and “preventive” aspects) and the research in the field of life sciences about multifactorial (and) common diseases (like Type 2 Diabetes).

Main question for the public dialogue (for now; depends on where the focus lies in the preliminary talks): Can a wide application of iPOPs in (public) health care contribute to a responsible preventive care of Type 2 Diabetes?

2 Interview questions

Introduction
- Who is Mr. Davies? What does he do for TNO (specifically concerning P4 Medicine and Diabetes)?

Questions about participation
- What is your reason/are your reasons for participating in this public dialogue?
- Why is it good to have this public dialogue?
- When would you consider this public dialogue a success?
- What function does this public dialogue serve, in your opinion?
- Which topics need to be discussed in this dialogue, in your opinion?

Questions about expectations
- What are your expectations concerning the future (uses of) the knowledge in the life sciences for preventive and predictive medicine?
- Why is the research in the life sciences that concerns multifactorial diseases (especially Type 2 Diabetes) valuable in relation to preventive and predictive medicine?
- What are your expectations regarding the “technological feasibility” of iPOPs (in particular, and the knowledge of the life sciences and its applications in general, to the care for Diabetes)? What will be possible? Under which technological conditions (specifications)?
- What are your expectations regarding the “social usability” of iPOPs (or other future applications)?
- What would make iPOPs (un)desirable? To which need do they cater? Who has this need, and how do you know?
- What do you think of the promises that are being made about P4 Medicine, NextGen Sequencing, iPOPS, etcetera (Francis Collins, Leroy Hood, Rui Chen/Michael Snyder)?
- Which (ethical) issues are prompted by iPOPs or might in the future be prompted by iPOPs?
Introduction

Below you can read the (provisional) results of the preliminary investigation for the public deliberation. This information was gathered in interviews and by doing desk research. I talked to experts (in ethics, the sociology of scientific knowledge, diabetology), researchers in the field of life sciences, and stakeholders (Dutch Diabetes Federation – NDF – and the Diabetes Association Netherlands). I have studied reports, scientific publications and opinion articles (you will find a list of references below; all sources are also made available to you in the Dropbox folder).

I have attempted to present the contents of the information accurately and clearly, without oversupplying you. For the sake of openness, all references are also made available to you in the Dropbox folder.

For questions, remarks, corrections and additions, you can contact Koen Dortmans (contact information in the email).

Goal of the public deliberation

In the first public deliberation at the LUX (with a possible continuation on Dutch Diabetes Day 2014 - in March), the issue of P4 Medicine (and the iPOP as technology within the subject) will be explored. The word “issue” presupposes that there are uncertainties and differences of opinion. The preliminary investigation demonstrates that these uncertainties and differences of opinion do exist. The goal, given these insecurities (is P4 technologically feasible, what does the health care consumer feel about P4 Medicine, etcetera), is to examine these differences of opinion. To get the deliberation process about the pros and cons of P4Medicine started, this piece was written. It is an attempt to offer information about what P4 Medicine is, and which questions a transition to P4 Medicine in health care can incite. The goal has been to be as complete as possible, but some questions and issues must surely have been overlooked. These can of course be addressed during the deliberation.

Appendix E

Report vision assessment panelists public deliberation on iPOPs

Information in preparation of the Public Deliberation “An iPOP for everyone. Is preventing diabetes better than curing it?”

What is P4 Medicine?

The concept of P4 Medicine is attributed to Leroy Hood, an American biologist who makes many efforts in the area of systems biology in health care. Systems biology is a coordinating (holistic) view on the biology of humans and their health. It integrates various disciplines in the life sciences which commonly end in -omic and which each have a specific level of the biology of humans (DNA, cell, organ) as their object of study. Genomics is the field that studies the complete individual DNA and the genes of humans (and other living organisms). In transcriptomics, RNA molecules which come into being as a result of the process of transcription are studied, while in proteomics the produced proteins and in metabolomics the metabolites (products of the metabolism such as glucose) are studied. Elaborating the details of life sciences leads me to far afield. It is most important to know that the presence of, a change in, the amount of (or concentration of), or the chemical composition of all this molecular material might be early indications of divergent processes, which possibly indicate the early development of a disease. As such, all these sectors combined yield important information about the (non-)functioning of the organism, and because of that, about the illness and health of humans.

In March 2012, a number of researchers published a study in scientific magazine Cell (Chen et al. 2012), in which they made a so-called integrative Personalized Omics Profile (iPOP) of a human subject. The subject did not just have his full DNA-material mapped (this process is also called sequencing), but other matters were also observed on a molecular level. Thus, it turned out that the subject had a genetic predisposition for type 2 diabetes (a number of genes that, when combined, increase the risk of getting diabetes). The history of disease in his family formed no cause to think that this person would have a predisposition for diabetes (whereas the DNA analysis did indicate the risk of heart disease that ran in his family).

In an interview with Rui Chen, the first author of the article, he elucidated that the study was a “proof of principle”, a manner of demonstrating that an iPOP could yield valuable information in the very early detection of diseases. As such, the iPOP forms an important prelude to “precision medicine” or “P4 Medicine”, write Chen and the subject in an opinion piece (Snyder and Chen 2012). This form of proactive medicine (or health management), they write, is the expected new pattern that health care will follow. According to them, this proactive form of medicine has a number of advantages over the (current) limited reactive medicine, which is primarily based on diagnosing and treating diseases after symptoms have occurred. The existing, reactive health care “generally neglects preclinical pathophenotypes or risk factors; it generally disregards the underlying mechanisms of the symptoms; the disease
descriptions are often quite broad so that they may actually include multiple diseases with shared symptoms; the reductionist approach to identify therapeutic targets in traditional medicine may over-simplify the complex nature of most diseases,” they write (p. 73).

The alternative, then, is a proactive form of medicine: P4 Medicine. This term refers to the four P’s. It is:

**Predictive**
According to Leroy Hood, this is about completely mapping the individual DNA (DNA sequence) and about other tests that enable an assessment of various health risks. Hood estimates that this will happen for every individual within ten years (Hood and Flores 2012). Even better, he argues, would be to sequence whole families so that even more precise determinations become possible. It is about the identification of “actionable genetic variants”: variations in the hereditary material which indicate an increased risk of the development of a disease, which can be countered (by being actionable). In this manner, the subject in the iPOP study came to find out that he had an increased genetic risk of getting diabetes, a disorder which also further developed (during the study) after the subject contracted a virus (his blood sugar levels remained elevated after the virus). With more exercise and an adapted diet, the test subject managed to normalize his blood sugar levels, thus avoiding early-onset diabetes. Since the amount of knowledge about this type of risk factors grows rapidly, these risk assessments should be repeated every year, claims Hood. Moreover, the blood (the “window for assessing health and disease”) will be periodically (Hood mentions a two year-term) examined for all kinds of biomolecules that indicate diseases in their early stages (for example, the detection of proteins in the blood in organs which are the first signs of a disease). These measurements will make it possible to compare the person to him or herself: the previously measured health states will form the basis from which to determine whether or not there are deviations in a newer, later state (a so-called longitudinal n=1 measurement, like the subject from the Cell study underwent). All data will be stored and will – anonymously – be made available in databases which scientists elsewhere will have at their disposal in order to gather knowledge about the diseases and health of individuals.

**Preventive**
More knowledge about the early signals of disease and health will make the prevention of diseases or the occurrence of complications a possibility, as a result of which the disease burden will either not occur, or remain manageable. This can be done, the researchers of the Cell article write, by means of a lifestyle transformation (more exercising, eating fewer high-fat and high-calorie foods, quitting smoking, etcetera).

Another option is the prescription of preventive drugs which are specifically attuned to the individual (Hood and Flores 2012). Hood expects that the management of health will, in this way, mostly come to take place outside of clinics and hospitals. Perhaps special centers in which professionals counsel individuals in managing their health will come into existence (see “How can P4 technologies be used in practice?” below).

**Personalized**
Since every individual is (genetically) unique (even monozygotic twins do not have the exact same DNA material), the individual is compared to him or herself every time. As such, it is individually determined for each person which values are divergent in their specific case, and which interventions or treatments are suitable. Hood stresses the potential of the immensely large new data source, if each individual would constantly make their measured values available (on the condition that these data are anonymized and used responsibly). Hood expects that people will be willing to do this (as long as their privacy is warranted by legislation), in order to improve the health of their children and grandchildren (he assumes that there will be solidarity between generations).

**Participatory**
The success of P4 Medicine depends to a large extent on the contributions of active patients and consumers. The participation contains two elements. Firstly, Hood determines that patients have become critical health care consumers who no longer “are passive recipients of the advice of expert advice”, but who are active, and who do not just ask for a more effective health care, but who also contribute to the transition towards a proactive health care (by, for example, making their health data available). “Today’s educated consumers are increasingly conscious of this fact and are beginning to demand that science-based healthcare address their need for assistance in managing their own health,” writes Hood. (p. 619). Secondly, the participation of health care consumers and patients consists of making their data available for scientific research in large databases. In the TNO report *Innovating for Health* (“Innoveren voor gezondheid” 2013) the authors write that people “are responsible for making the enormous amount of data that becomes possible through personalized diagnosis available and for sharing it” (p. 60).

A market of new machines, technologies and appliances will, according to Hood, follow to aid health care consumers in supplying information about the state of their health. He also anticipates that the management of health will become a social activity. All kinds of new digital platforms, social networks and mobile applications will make it possible for people to communicate with each other about their lifestyles,
and to stimulate each other to change those lifestyles (for example to prevent Type 2 Diabetes).

**Which problem(s) will P4 Medicine (or P4 Health and Care) solve?**

The TNO report offers an extensive analysis of the current state of affairs of Dutch society and medicine. The costs of health care keep rising disproportionately. On top of that, chronic diseases (such as diabetes) occur ever more often. According to *Diagnosis Diabetes 2025* (Idenburg et al. 2012) over 1.4 million people will have been diagnosed with diabetes by 2025 (p. 10). Citizens have a personal responsibility to stay healthy and thus to contribute to the cost problem in that way, the authors of the TNO report state. These developments induce a new understanding of health: “the ability to adapt and self manage.” How will people be able to participate, notwithstanding their limitations? (“Participation society,” King Willem Alexander’s new buzzword.)

Given this situation, a so-called Triple Aim was formulated:

- Improvement of health care quality as experienced by the patient
- Improvement of the health/vitality of a defined population/specific target group
- Decrease of the costs per capita (or, at least, a check on the costs)

According to the authors of the TNO report, a transition to P4 Medicine would be the select route towards reaching these goals. This analysis takes the quality of health care and the control over health care costs as a point of departure. But when one also reads the prospect by Hood and Flores, it is hard to avoid the impression that P4 Medicine also serves an economic goal: P4 Medicine will then contribute to increasing economic growth through health care innovations and is, as such, important for the knowledge economy.

**What is the technological feasibility of P4 Medicine?**

Technological innovation, and especially “rolling it out” on a large scale, is an obstinate and, in part, social process (social factors determine the success of innovations to a large extent). The expectations about what is technologically feasible, as described in the studied sources and sounded out in the interviews, vary considerably. Just like with gene therapy before, expectations of what is possible and what is desirable are closely interwoven. Some find that previous biological research has yielded little result, and feel that it will be extremely complicated (and even see this as a reason to not yet organize a public deliberation). Leroy Hood, on the other hand, anticipates the technological feasibility (and its practical applications) shortly (within 10 years). The TNO report also speaks of “fundamental breakthroughs in genomics and biotechnology.” Some claim that this technology will come no matter what, that it cannot be stopped.

**How can P4 Medicine technologies be used in practice?**

On the one hand, there is a market-oriented solution in which everyone who wants to do so can pay for the technologies themselves (whether this is reimbursed by insurance companies or not) to better manage their health (see Hood and Flores 2012). On the other hand, there is a government-directed solution, in which a (more or less) active government tries to reach as many people as possible with screening programs (see, for example, the “Virus scenario” in *Diagnosis Diabetes 2025* (Idenburg et al. 2012)). Or a compromise in which an observant general practitioner fulfills an important function. As the authors of *Genetics, Genomics, and Health Care* (Van Rijnsdour et al. 2008) argue, each scenario comes with its own dilemmas.

**How desirable is P4 Medicine?**

The opinions about the desirability of P4 Medicine vary quite considerably as well. Some people are reserved or even skeptical. Its enthusiasts, on the other hand, focus their attention on the desirable consequences that investing in further scientific research and technology development will have. Hood and Flores in particular focus primarily on the benefits. The TNO report is more nuanced. P4 Health and Care (the term they use) is “a beautiful vision of the future.” “But many ethical and social questions, and question about health care policy, science policy and technology policy are still open” (p. 74). The mentioned (expected) advantages and disadvantages are listed below.

**Which (expected) advantages does P4 Medicine have (to which positive or desirable consequences)?**

- Prevention, early (or earlier) diagnosis, and a (more) effective treatment of diseases for individual health care consumers and specific target groups.
- A vital society with citizens who are able to develop themselves and contribute to productivity.
- Lower collective costs for health care (with an eventual export to developing countries so they can profit as well; see Hood and Flores 2012).
- Economic growth through technological innovations (“economic opportunities”).
- P4 Medicine gives people more autonomy: more authority over their data, more control over their health and a more equal relationship to their doctors or health care managers.
Which (expected) disadvantages will the transition to P4 Medicine have?

- P4 Health and Care could result in (more excessive) medicalization, in two definitions of the word: a) too many aspects of daily life will partially or entirely become about health and disease (at the expense of other values), b) emphasis will be put on disease as an individual problem, which will cause other (primarily social and environmental factors) to be relatively underexposed.
- The already present (socioeconomic) health differences might be magnified, since especially (highly) educated people will find their way to these technologies.
- How will the right of not-knowing be guaranteed (see, for example, Dondorp and De Wert 2010)?
- If people know their risk of contracting a disease or disorder (like diabetes), it might cause a psychological burden for them.
- Privacy and access to this immense quantity of data might be liable to suffer.
- Empirical philosopher Annemarie Mol (2000) argues that appliances such as the glucose meter (and, similarly, a lab-on-chip which enables the study of a large number of proteins that might indicate disease through a simple prick in the fingertip; Hood and Flores 2012) do not only register a value, but do something as well.

What is required for a successful transition to P4 Medicine?
The success of a transition to P4 Medicine is based on a number of prerequisites, most of which are social factors. A number of important ones have been listed:
- An individual who does not just want to be active and participative about his or her health, but who is also willing and able to take on the (shared) responsibility for his or her health.
- An individual who furthermore understands how things work, has discipline, and possesses the knowledge and skills to take action.
- Active participation of the individual (or the individual health care consumer) in scientific research by (willing to be) making their data available.
- There are successful interventions to achieve lifestyle adaptations and health gains exercise programs, medication, etcetera). A certain expectation (or, in terms of the health care market: a demand): that people in this way are willing to (continuously) engage with their health.
- Harmonization of systems and collaborating scientists (to store all different methodologies and research data and to save them in order to be able to compare them).
- New relations between scientists, doctors, health care professionals, patients and consumers.

A number of questions
The issue P4 Medicine does in fact raise a number of questions that can be explored during the public deliberation. As a first step, a number of these are listed here:
- Are the aforementioned advantages and disadvantages realistic? Does P4 medicine really deliver a reduction of health care costs? Are people not psychologically able enough to handle new information about their health?
- Is P4 medicine the best solution to the problem? What, in reality, is the problem that needs to be solved? What are the alternatives and what are their advantages and disadvantages?
- Are the assumptions that are made true: do people feel the need to be preventive?
- What will this technological innovation ask of patients, health care providers, citizens, the health care system, and society?

During the public deliberation, we will explore these questions (among other questions, some of which will be put on the agenda by you).
APPENDIX F

Script of public deliberation on iPOPs


Goal
A critical exploration of the issues emerging from the potential future application of systems biological technologies (like iPOPs) in the (preventive) health care of diabetes. The aim of the report of the vision assessment [Appendix B] was to inform you in advance about the issue as well as possible. The short sketch of the future (the other attachment in the mail that contains this script [Appendix C]) is the starting point of the conversation: what issues does this vision of the future of preventive or P4 Health and Care raise according to you?

The idea is to first collect these issues (without discussion), and then to discuss them in order of priority. On which topics do opinions differ and what does the difference of opinion consist of? This approach is intended to collect as many issues as possible and to further examine the most important ones first. The proposal is that we end with making an inventory of issues that can be discussed in a possible future follow-up deliberation (for example during the National Diabetes Day in March 2014).

The discussion will primarily take place among the panel members on stage. Although the members of the audience will mostly have the role of observers, they can participate at fixed moments.

Participants
[...]

Schedule
12:00 PM Arrival panel members, short introductions, tuning the microphones
12:50 PM Arrival audience
01:00 PM A welcome by panel chairman Koen Dortmans
The theme will be briefly introduced, the intention and schedule are briefly discussed
01:10 PM Short presentation (on film): introduction to the issue, ending with a short sketch of the future (the other attachment in the mail that accompanies this script)
01:20 PM The panel members are introduced briefly (by name and occupation only) by the panel chairman and are asked to take their seats on the stage
01:30 PM Inventory of the panel members’ issues
02:00 PM Discussion round 1: discussion based on the prioritized list of issues
03:00 PM Intermission
03:20 PM Discussion round 2: continuation of the discussion
04:45 PM Conclusion: which issues deserve further discussion?
05:00 PM End of the deliberation
APPENDIX G

Questionnaire Panelists: An iPOP for everyone?

What is your name? ................
What is your level of education? ............
What was the reason for you to visit this public discussion? ............
What did you learn from this public dialogue? ............
Did you revise your opinion (compared to your opinion before the dialogue)?
☐ Yes
☐ No
If so, how? If not, why not? ............
What were your intentions c.q. what is it you wanted to do during the dialogue? ............
Did the public discussion meet your expectations?
☐ Yes
☐ No
If so, what? If not, why so? ............
What did you think of the quality of the information you received to prepare yourself (e.g. neutrality, intelligibility, completeness etc.)? ............
Did you use the information that was disseminated before the dialogue?
☐ Yes
☐ No
If so, what? If not, why so? ............
What do you think of the recording of the panelists’ statements in terms of “desirable” and “undesirable” issues? ............
What do you think of the future scenario that was used? ............
What did you think of the composition of the panel (e.g. size, who was absent, who was redundant etc.)? ............
What did you think of the interaction within the panel (e.g. respectful, dominant, fair etc.)? ............
What did you think of the contribution of Dr. Stokes? ............
What did you think of the contribution of Dr. Davies? ............
Who do you think was persuasive? ............
What did you think of the facilitation of the dialogue (e.g. too much/too little guidance; on/off topic; promoting participation; neutrality; framing; depth etc.)? ............
What did you think of the setting (staging, attributes, microphones etc.)? ............
The dialogue was in the public sphere. Did this affect your contribution in any way?
☐ Yes
☐ No
If so, how? ............
The organizers chose to differentiate between an active panel discussion and a more passive audience. What do you think of that? ............
Do you think you had enough expertise to equally engage into the discussion? Please explain (what kind of expertise did you use, what expertise lacked etc.). ............
What additional comments do you have? ............
Appendix H

Questionnaire Public: An iPOP for everyone?

What is your gender?
- Female
- Male

What is your age? 

What is your level of education? 

How are you related to the issue of “new technologies in diabetes health care” (more than one possibility)?
- Patient
- Care professional
- Working at the Diabetes Association
- Working at the Diabetes Federation
- Working at the Diabetes Fund
- Working at a company (e.g. developing new biomedical technologies)
- Citizen, interested in the social issues concerning new technological developments
- Studying the social, legal and ethical aspects of life sciences
- Working at TNO on the development of new biomedical technologies
- Working at a Dutch university on the development of new biomedical technologies
- Working at a Dutch university in the field of life sciences
- Other 

What was the reason for you to visit this public discussion? 

What did you learn from this public dialogue? 

Did the public discussion meet your expectations?
- Yes
- No
  If so, what? If not, why so? 

What did you think of the composition of the panel (e.g. size, who was absent, who was redundant etc.)? 

What did you think of the interaction within the panel (e.g. respectful, dominant, fair etc.)? 

What did you think of the contribution of Dr. Stokes? 

What did you think of the contribution of Dr. Davies? 

Who do you think was persuasive? 

What did you think of the facilitation of the dialogue (e.g. too much/too little guidance; on/off topic; promoting participation; neutrality; framing; depth etc.)? 

What did you think of the setting (staging, attributes, microphones etc.)? 

The dialogue was in the public sphere. Did this affect your contribution in any way?
- Yes
- No
  If so, how? 

The organizers chose to differentiate between an active panel discussion and a more passive audience. What do you think of that? 

What do you think of the recording of the panelists’ statements in terms of “desirable” and “undesirable” issues? 

What do you think of the future scenario that was used? 

What additional comments do you have?
summary
“Citizens will participate in decisions on academic research.” Thus read the headline on the front page of a national Dutch newspaper on 25 November 2014. The article highlights one of the spearheads of the new science policy as presented by the Dutch Ministry of Education, Culture and Science. This new policy fits a broader trend within European science policy to engage the public with decisions on science and technology. Public engagement with science and technology is considered to be a necessary condition to achieve either instrumental ends (restoring public trust, increasing public acceptance) or substantive ends (improving the quality of health care) or simply the right thing to do from a normative and democratic perspective. However, simply increasing public participation is not the means to achieve these ends, as Chapter 1 of this dissertation demonstrates. Several lessons about the process of PEST have been drawn from past experiences.

First, the discussion of public issues was narrowly framed in terms of the (un)desirable impacts of new science and technology. But public engagement also has to address a wider spectrum of issues concerning the moral desirability of purposes, needs and expected benefits of new and emerging science and technology (or NEST) as imagined or envisioned by scientists and technology developers. Secondly, it is important to involve the public as early as possible to anticipate potential benefits and harms of NEST; to openly discuss the research priorities that are set; and to assess the moral visions that drive scientific developments. In this way the contribution of participants can have an impact on technoscientific innovation trajectories. In short, public engagement has to move upstream. Thirdly, public engagement with science also needs a deliberative turn. According to deliberative democrats, decisions on public moral issues (e.g. emerging from new science and technology) are only legitimate when they are the result of a quality discussion where individual views and perspectives are justified with good reasons that are acceptable to the people who think differently. Finally, how public engagement is organized can contribute considerably to the public uneasiness with new science and technology. Facilitators wrongfully assume that correctly following protocols and guidelines for implementing public engagement methodologies (such as consensus conferences) automatically generates a legitimate outcome, thus neglecting the influence of the facilitation process itself on the outcome and quality of the deliberation.

Public engagement has by now become a popular topic of academic analysis and evaluation. However, the problem is that scholars in the fields of Science and
Technology Studies (STS) and political sciences have paid scant attention to the deliberative process itself and the effects of facilitation on this process and its quality. On the one hand, evaluative research in STS is mainly concerned with providing normative conceptual frameworks for assessing the conditions of a valuable outcome of public engagement instead of assessing deliberation in action. On the other hand, the few studies that are focused on the deliberative process do not take the effect of settings on this process systematically into account.

This dissertation on the contrary investigates both deliberation in action and the effect of settings on public dialogue. Both are crucial for the quality of facilitating upstream deliberation on the moral desirability of new and emerging life sciences and biotechnologies. The life sciences – the broad field of science that involve the scientific study of living organisms such as microorganisms, plants, animals, and human beings on a molecular level (DNA, RNA etc.) – have proven to be a research field that has sparked public controversy time and again (think of Dolly the Sheep, Bull Herman and genetically modified crops). As its title suggests, I compare public engagement with theater. This metaphor allows me to spotlight, firstly, engagement as public performance, i.e. the front stage performances of life scientists enacting public engagement as well as the interventions of facilitators directing the discussion process towards deliberation and, secondly, the dramaturgy of public engagement, i.e. the back stage process of how professional organizers of public engagement set the scenes of public deliberation in their role of dramaturgist.

The metaphor of the theater also connects the two theoretical frameworks used in this study. In dramaturgical analysis in social sciences interaction among people – such as deliberating ethical issues of NEST – is studied in terms of public performances. Drawing on the work of social scientist Erving Goffman and STS scholar Stephen Hilgartner, this book is particularly focused on the theatrical techniques persuasive rhetoric and impression management life scientists who participate in public engagement with science, are expected to employ in upstream public deliberation. How do life scientists’ rhetorically perform in upstream public deliberation NEST-ethical issues? How do these performances relate to norms of a good discussion? How does the presentation of these life scientists on stage differ from their back stage presentation?

The second theoretical framework draws a parallel between the process of facilitating public deliberation and dramaturgy, the process of scripting, staging and physical setting behind the scenes that affects the performances on stage and the quality of the discussion. How does the dramaturgy of upstream public deliberation affect the performances of participants and the quality of deliberation?

In Chapter 2 a discursive as well as a performative perspective on the quality of deliberation are developed that are both crucial in the off stage work of organizing public dialogue as well as the work of facilitating dialogue on stage.

To develop the discursive perspective, the implicit link between STS literature on upstream public engagement and the conception of deliberative democracy of Gutmann and Thompson is explicated. Drawing on their theory, its central principle of reciprocity – amounting to a process of seeking mutually justifiable reasons – indicates a first direction for developing a conception of discursive quality: the quality of argumentation advanced to defend particular (science) policy. An important aspect of the work of facilitators of upstream public deliberation then is to critically investigate the quality of the reasons advanced to defend science policy, i.e. the input and direction of innovation trajectories. Therefore, the first research focus of this study is to develop a theoretical concept of argumentative quality which enables a reconstruction, analysis and evaluation of argumentative discourse, particularly in the context of new and emerging science and technology and which allows facilitators to intervene in face-to-face public deliberation on NEST.

Drawing on Actor Network Theory (esp. the work of Gomart and Hajer), a performative perspective on quality public deliberation is developed. Methodologies or “technologies of community” used for facilitating upstream public deliberation on NEST (such as consensus conferences etc.) are not neutral instruments that produce an unbiased representation of consensus. Just like other technologies, these methodologies affect the outcome. The second research aim of this dissertation is to investigate the dramaturgical work implied in and its effects on public deliberation on NEST. For this purpose, the dramaturgical concepts of scripting, staging and setting are introduced that form a framework to analyze how the work behind the scenes affects the public deliberation process.

In Chapter 3, a notion of argumentative quality of public discussions over new and emerging science and technology (NEST) is developed on the basis of the so-called pragma-dialectical argumentation theory. What does a good discussion entail? According to pragma-dialectics reasonableness is the main quality criterion. Quality then refers to a formal procedure that reasonable discussants agree to observe in order to resolve their difference of opinion by systematically testing standpoints (and their argumentative defense) for their acceptability. Within this formal procedure, I particularly focus on the elements for analyzing and assessing the quality of argumentation as a product (how a conclusion can be inferred from its premises). Pragma-dialecticians define three procedures that are important for systematically confronting argumentation as product with a “maximum of doubt.” Firstly, it is important to explicate unexpressed premises that remain implicit largely
The pragma-dialectical procedure of reasonable discussion is applied to ethical argumentation patterns within the context of public discussions on NEST, as described in the literature. As an illustration I use the Dutch public and political debate on cisgenesis, a technique to modify crops developed as an answer to the public unease with genetic modification. From this particular case, a comprehensive set of critical questions is developed that together form the stock topics to be addressed in NEST-ethical discussions.

Apart from the dialectical aim of resolving their difference of opinion following the procedure of reasonable discussion, discussants also – or perhaps first and foremost – want to be rhetorically effective: to have others accept their claims and argumentation. In Chapter 4 the concept of strategic maneuvering is elaborated, that pragma-dialecticians introduced to refine and extend their argumentation theory so as to include the rhetorical dimension of argumentative discourse. Strategic maneuvering is defined as keeping the delicate balance between the rhetorical aim for effectiveness in argumentative discourse and the dialectical aim of maintaining reasonableness. When argumentation violates the pragma-dialectical procedure of critical discussion, i.e. when discussants pursue effectiveness at the expense of reasonableness, their strategic maneuvering is derailing.

The concept of strategic maneuvering draws attention, first, to how discussants make a selection from the available issues or argument schemes to defend their claims (topical selection); secondly, how standpoints and arguments correspond to what particular publics (or audiences) or the public in general perceive as plausible (audience demand); thirdly, how discussants choose a suitable presentation (presentational devices) to have their standpoint accepted.

The concept of strategic maneuvering is used in this study to analyze the persuasive rhetoric that both advocates and opponents of NEST employ as theatrical technique to be effective in public discussions on new science and technology. Since pragma-dialectics is not specifically concerned with public discussions on NEST, scientific literature is reviewed that has discursive strategies used in NEST-ethical discussions as its focus. Methodologically, these studies use discourse analysis which is, as will be argued, useful because of it is focused on a) the rhetorical function of constructed versions of the (social) world and b) other discursive strategies than argumentation (in the pragma-dialectical sense) alone.

The literature review demonstrates that both proponents and opponents draw on a repertoire of strategic maneuvers in order to be effective in public deliberations on controversial science and technology: boundary work or conceptual demarcations between science and non-science, science and society, basic and applied science, facts and values, ethical and unethical science, settled and unsettled ethical issues, natural and unnatural etc.; subject positioning to construct public identities of selves and others as e.g fundamentalist, unrealistic or myopic; and expectations to represent futures as e.g. distant, good, uncertain and rumbling.

The dramaturgical perspective on public deliberation, with its concepts of scripting, staging and setting (Chapter 2), combined with the concept of strategic maneuvering and its derailments with respect to the pragma-dialectical rules of reasonable discussion applied to public discussion on NEST-ethical issues (developed in Chapter 3 and 4) constitute the analytical framework to describe, reconstruct, analyze and assess face-to-face upstream public deliberation events on the moral desirability of new and emerging life sciences and biotechnologies. In Chapter 5 a series of three deliberative events on behavioral genomics is analyzed. How do participants of these public discussions strategically maneuver, how do these maneuvers affect the quality of the deliberation and how does the dramaturgy of these upstream public dialogues scripted as public inquiries into the ethical and social issues concerning behavioral genomics, influence the performance of participants?

Life scientists mainly select pragmatic argumentation to be effective in this struggle about the moral desirability of behavioral genomics research. Pragmatic argumentation is an argument scheme used to justify the desirability of a certain action to indicate the desirable consequences this action entails. This argumentation reflects a public reason because it indicates the beneficial social consequences. However, their argumentation were not confronted with a maximum of doubt, i.e. not critically tested, because, firstly, the burden of proof was allocated to the public. Participating life scientists staged as advocates of NEST, publicly presented themselves as sound and modest professionals toning down future expectations regarding their behavioral genomics research. The public on the other hand – staged for communicative efficiency reasons. Secondly, the explicated propositional content of every individual statement must be acceptable. If not, the protagonist needs to advance argumentation in a sub-discussion to defend this claim. Thirdly, the justificatory force of every argumentation needs to be critically tested. The critical testing procedure is successfully completed when protagonists, defending a claim by advancing argumentation, have satisfactorily answered all critical questions, pertaining to a correctly applied argument scheme. These critical questions are first and foremost a measure for deliberative quality (diagnostic tool). But these questions also constitute a heuristic in order to fulfill another quality aspect of deliberation: inclusiveness (heuristic tool). What are the issues to be addressed? Furthermore, these critical questions are an important intervention tool for facilitators, responsible for leading the critical testing procedure, to direct the deliberative discourse on stage to improve its quality real time.
as participants critically assessing the new science and technology – rather adopted a role of a health care consumer merely interested in being informed about the state-of-the-art in behavioral genomics. What is more, a bias that lurked in the script reinforced the public’s hesitance to participate in a discussion in the public sphere: the attempt to involve the public in the setting of the agenda of issues, the burden of proof was allocated to them instead of to the participating scientists. This reflects a dominant liberal discourse assigning a large measure of autonomy to science and technology developers.

Secondly, some strategic maneuvers proved effective in closing down discussion on the moral desirability of behavioral genomics research. Demarcating between insiders (scientists contributing to behavioral genomics research) and outsiders (the public/society) and between the production of factual scientific knowledge and its socially determined use (boundary work) as well as appeals to scientific authority about the technological feasibility rendered the constructed future imaginaries of critics less plausible or even implausible. Due to the scientific expertise ascribed to them, the life scientists had an advantage in this struggle about presented futures. When futures are represented as unfeasible, the moral desirability of these futures need not be discussed.

Chapter 6 is a detailed description of the dramaturgical work performed behind the scenes of an upstream public deliberation event on new knowledge and technologies in another field within the life sciences: P4 medicine and particularly, the moral desirability of integrative personalized omics profiles or iPOPs in the preventive care for type 2 diabetes.

Firstly, the chapter includes the description of the discursive work of a critical vision assessment to prevent the pitfalls diagnosed in Chapter 5. Based on interviews and literature review, the technological feasibility of sociotechnical imaginaries concerning P4 Medicine are mapped and critically assessed using a set of critical questions experts must answer satisfactorily derived from the pragma-dialectical evaluation of arguments from expert opinion. Furthermore, an analysis of how P4-technologies are envisioned to function in social practices (social usability) informed the development of a future scenario that was the point of departure of the public discussion. In addition the argumentation advocates advance to defend the moral desirability of P4 Medicine and iPOPs is systematically and critically assessed using the stock topics derived in Chapter 3 as a heuristic tool to make explicit which values and moral justifications are embedded in expectations and to anticipate moral desirability issues.

Secondly, the thick description of the dramaturgical work behind the scenes demonstrates how the framing of the issue; the provision of information; the contingent process of casting participants; and the distinction between an actively deliberating mini-public and a more passive audience considerably affected the performance of participants. Thus, the ethnography casts a light on the practical entanglements facilitators of upstream public deliberation face: the tradeoffs as a result of the application of abstract normative criterions concerning input legitimacy (inclusiveness, independence and early involvement) and throughput legitimacy (dialectical quality of the deliberation) of public participation. It is argued that an understanding of the “normative surplus” of this practice with its countless choices, compromises and tensions in the practice of the organization of a dialogue, is essential for the sensitization facilitators to improve their work as dramaturgists of public deliberation.

Chapter 7 turns the spotlight to the staged performances of life scientists participating in the public deliberation on the moral desirability of iPOP-technologies. An elaborate argumentative reconstruction of the deliberation demonstrates that, partly due to the facilitator’s successful discursive interventions, firstly, the burden of proof was allocated to the advocates and, secondly, how their deontological and consequentialist topos, reflecting a liberal biotechieses, were critically questioned. Although no consensus was reached, differences of opinion about the moral desirability of P4 Medicine have become clearer, which is also an important aim of public deliberation.

However, the analysis of the strategic maneuvering also shows that all three participating life scientists employed the theatrical technique of impression management to position themselves as advocates on stage without having to publicly divulge their personal convictions that prove to correspond to the views of their opponents backstage. Although the dialectical dimension of a reasonable discussion was respected, their impression management does not fully accord with the deliberative virtue of civic magnanimity. According to this principle, discussants should strive to “minimize rejection of the position they oppose” and that means they should also openly indicate the matters they do not disagree with.

In addition, it is argued that the informal dramaturgical setting and the voluntary participation in the deliberation with no enforced outcome together with the instrumental view on technology are possible explanation for the life scientists’ strategic discussion behavior. For the fundamentally optimistic attitude towards NEST that is implied in the sociotechnical imaginaries of P4 Medicine might reinforce the often conservative stance towards a technological future.
samenvatting
“Burgers gaan meebeslissen over onderzoek,” zo kopte dagblad NRC op 25 november 2014. Daarmee belichtte de krant het nieuwe initiatief van de Nederlandse minister van onderwijs om een dialoog te starten tussen wetenschap en maatschappij om zo tot een Nationale Wetenschapsagenda te komen. De minister sluit daarmee aan bij een brede Europese ontwikkeling in het wetenschapsbeleid om het publiek te betrekken bij beslissingen over wetenschap en techniek (in de literatuur aangeduid met het Engelstalige begrip *public engagement with science and technology*; hierna kortweg en oververtaald *public engagement* genoemd). De dialoog tussen wetenschappelijke onderzoekers en de maatschappij wordt beschouwd als een noodzakelijke voorwaarde voor het bereiken van instrumentele doelen (bijv. herstel van publiek vertrouwen, vergroten van publieke acceptatie) of substantiële doelen (bijv. verbetering van de kwaliteit van zorg) of simpelweg het juiste om te doen vanuit normatief en democratisch oogpunt. Het simpelweg vergroten van publieksparticipatie is echter niet zonder meer de oplossing gebleken om deze doelen te bereiken, zo laat Hoofdstuk 1 uit dit proefschrift zien. Uit het verleden is lering getrokken uit het proces rond *public engagement*.

Ten eerste werd het onderwerp van discussie van publieke kwesties beperkt tot de (on)wenselijke gevolgen van nieuwe wetenschap en technologie. Maar *public engagement* moet ook een breder spectrum van kwesties aansnijden betreffende de morele wenselijkheid van de doelen, behoeften en verwachte voordelen van nieuwe en opkomende wetenschap en technologie (in de literatuur aangeduid als *new and emerging science and technology*, afgekort tot NEST). Ten tweede is het belangrijk om het publiek zo vroeg mogelijk te betrekken om zo te kunnen anticiperen op eventuele voordelen en risico’s van NEST. Bovendien kunnen zo de gekozen onderzoeksprioriteiten openlijk besproken worden en de normatief geladen toekomstvisies van wetenschappelijke ontwikkelingen beoordeeld worden. Alleen zo kan de bijdrage van deelnemers aan het publieke debat impact hebben op wetenschapsgedreven innovatietrajecten. De publieksdialoog moet kortom stroomopwaarts (of *upstream*) plaatsvinden. Ten derde heeft *public engagement* een deliberatieve wending nodig. Volgens deliberatieve democraten zijn besluiten over publieke morele kwesties (zoals opgeroepen door nieuwe wetenschap en technologie) alleen legitiem als ze voortkomen uit een kwalitatieve discussie waar individuele perspectieven gerechtvaardigd worden met goede argumenten die ook acceptabel zijn voor de mensen die anders tegen de kwestie aankijken. Tenslotte
blijkt de manier waarop public engagement wordt georganiseerd het publieke onbehagen ten aanzien van nieuwe wetenschap en technologie aanzienlijk te kunnen vergroten. Organisatoren van public engagement (of facilitators) nemen soms ten onrechte aan dat implementeren van public engagement methoden (zoals consensus conferenties) automatisch leiden tot een legitieme uitkomst. Zij zien dan echter de invloed over het hoofd van het facilitatieproces zelf op de uitkomst en de kwaliteit van de deliberatie.

Public engagement is inmiddels een populair onderwerp is geworden van academische studie. Het probleem is echter dat onderzoekers in wetenschap- en technologiestudies (in het Engels aangeduid met Science and Technology Studies, of STS) en in de politieke wetenschappen maar weinig aandacht besteed hebben aan het deliberatieve proces zelf en de effecten van het facilitatieproces op de kwaliteit ervan. Aan de ene kant heeft onderzoek binnen STS vooral betrekking op het definiëren van normatieve conceptuele kaders voor het evalueren van de voorwaarden van een waardevolle uitkomst van public engagement. Binnen deze kaders is echter geen plaats voor het beoordelen van deliberatieve actie. Aan de andere kant nemen de weinige studies die het deliberatieve proces wel als focus hebben het effect van de setting op dit proces niet systematisch in ogenschouw.

Dit proefschrift onderzoekt juist deliberatie in actie en het effect van settings op de kwaliteit van publieksdialoog. Beide zijn een cruciaal onderdeel van het faciliteren van kwalitativedeliberatie over de wenselijkheid van nieuwe en opkomende levenswetenschappen en biotechnologieën. De levenswetenschappen – het brede wetenschappelijke veld dat de studie van levende organismen zoals micro-organismen, planten, dieren en mensen veelal op een moleculaire basis (DNA, RNA etc.) omvat – is een onderzochtsveld gebleken dat keer op keer publieke controverse heeft losgemaakt (denk aan Dolly het schaap, stier Herman of genetisch gemodificeerde gewassen).

Zoals de titel van dit boek aangeeft, vergelijkt ik public engagement met theater. De theatermetafoor maakt het mogelijk enerzijds om zowel de publieke optredens van levenswetenschappers als de interventies van facilitators gericht op het realiseren van deliberatie te belichten. Anderzijds brengt deze metafoor het proces van professionele organisatoren van public engagement in hun rol achter de schermen voor het voetlicht.

De theatermetafoor verbindt tevens de twee gebruikte theoretische kaders die in deze studie worden gebruikt. In dramaturgische analyse binnen de sociale wetenschappen wordt interactie tussen mensen – zoals het delibereren over ethische kwesties opgeroepen door nieuwe wetenschap en technologie – bestudeerd in termen van publieke performances. Voortbouwend op het werk van socioloog Erving Goffman en de STS-er Stephen Hilgartner, richt dit boek zich specifiek op retorische overtuiingskracht en de management van impressies die levenswetenschappers naar verwachting zullen als theatrale technieken aanwenden tijdens hun deelname aan upstream publieke deliberatie. Hoe geven levenswetenschappers hun optreden aan upstream publieke deliberatie over NEST-ethische kwesties retorisch vorm? Voldoen deze performances aan de eisen van een goede discussie? In welke mate verschilt hun presentatie op het podium van hun voorkomen achter de schermen?

Het tweede theoretische kader trekt een parallel tussen het facilitatieproces en dramaturgie, het proces van het schrijven van een script en het in scene zetten van een theaterlijke interactie (de mis-en-scène) achter de schermen dat de kwaliteit van de discussie en de optredens op het podium beïnvloedt. Op welke manier beïnvloedt de dramaturgie van upstream publieke deliberatie de optredens van deelnemers en de kwaliteit van de deliberatie?

In Hoofdstuk 2 worden een zogenoemd discursief en een performatief perspectief op de kwaliteit van deliberatie ontwikkeld die respectievelijk hun licht laten schijnen op het facilitatieproces op het podium en op het organisatiewerk achter de schermen.

Voor het ontwikkelen van dit discursieve perspectief, wordt eerst de impliciete verwantschap van het concept public engagement met theater besproken. Het proces van facilitatie kan worden geverifieerd in termen van kwalitatieve outcomes die betrekking hebben op de kwaliteit van de discussie en de optredens op het podium. De kwaliteit van de outcomes is echter aan de hand van het thema van wetenschap en technologie en het klimaat van een wetenschapsbeleid. Dit perspectief wordt vervolgens ingesleurd in de context van de discursieve kwaliteit van public engagement (hoofdstuk 3).

In Hoofdstuk 3 wordt de kwaliteit van de outcomes in een discursieve perspectief onderzocht. Deze kwaliteit is het effect van de setting op het facilitatieproces, het proces van het schrijven van een script en het in scene zetten van een theaterlijke interactie. Het effect van de setting op het facilitatieproces, het proces van het schrijven van een script en het in scene zetten van een theaterlijke interactie is echter niet systematisch onderzocht in het standaardwerk over wetenschap en technologie. Deze kwaliteit van de outcomes is de oorzaak van het effect van de setting op het facilitatieproces, het proces van het schrijven van een script en het in scene zetten van een theaterlijke interactie. De kwaliteit van de outcomes is echter niet systematisch onderzocht in het standaardwerk over wetenschap en technologie.
te bereiken, worden de dramaturgische begrippen script, mis-en-scène en setting geïntroduceerd die samen een kader vormen om het werk achter de schermen van het publieke deliberatierproces te analyseren.

In Hoofdstuk 3 wordt een begrip van argumentatieve kwaliteit van publieksdiscussies over NEST ontwikkeld gebaseerd op de zogenoemde pragma-dialectische argumentatietheorie. Wat betekent een goede discussie eigenlijk? Volgens pragma-dialectici vormt redelijkheid het belangrijkste criterium. Kwaliteit verwijst naar een formele procedure die redelijke discussianten stilzwijgend respecteren om hun meningsverschil op te lossen door systematisch de aanvaardbaarheid van hun standpunten (en hun argumentatie) te testen. Binnen deze formele procedure zoom ik in het bijzonder in op de elementen voor het analyseren en evalueren van de kwaliteit van het product van argumentatie (hoe een conclusie logisch voortkomt uit zijn premissen). Pragma-dialectici definiëren drie procedures die noodzakelijk zijn voor het systematisch onderwerpen van argumentatie aan optimale twijfel. Ten eerste is het belangrijk om de onuitgesproken vooronderstellingen die veelal impliciet blijven vanwege efficiënte communicatie te expliciteren. Ten tweede moet de inhoud van iedere afzonderlijke uitspraak aanvaarbaar zijn. Mocht dat niet het geval zijn, dan moet de protagonist in een sub-discussie argumentatie aanvoeren om deze uitspraak te verdedigen. Ten derde moet de argumentatie kritisch getest worden. De kritische testprocedure is pas helemaal afgerond wanneer protagonisten een set van kritische vragen op bevredigende wijze heeft beantwoord die horen bij het correct toegepaste argumentatieschema. Deze kritische vragen zijn eerst en vooral een maat voor de deliberatieve kwaliteit en vormen zo een diagnostisch gereedschap. Maar deze vragen zijn ook een heuristisch middel om te voldoen aan een andere belangrijk kwaliteitenkriteria van deliberatie: inclusiviteit. Wat zijn de kwesties die ter sprake moeten komen? Tenslotte vormen de kritische vragen een belangrijk gereedschap voor facilitators, die verantwoordelijkheid dragen voor de uitvoering van de kritische testprocedure, om de deliberatie op het podium te verbeteren.

De pragma-dialectische procedure wordt toegepast op de ethische argumentatietoppen binnen de context van publieksdiscussies over NEST, zoals beschreven in de literatuur. Bij wijze van illustratie pas ik het theoretische kader toe op het publieke en politieke debat in Nederland over cisgenese, een methode om gewassen te modificeren als antwoord op de maatschappelijke onvrede over genetische modificatie. Uit deze casus, wordt een omvattende lijst van kritische vragen afgeleid die samen de stock topics vormen die in NEST-ethische discussie ter sprake gebracht moeten worden.

Behalve het dialectische doel om een verschil van mening op te lossen door het volgen van de procedure van een redelijke discussie, proberen deelnemers aan een discussie misschien zelfs wel in de eerste plaats om retorisch doelmatig te zijn: om anderen hun claims en argumentatie te laten accepteren. In Hoofdstuk 4 wordt het begrip strategisch manoeuvreren uiteengezet, dat pragma-dialectici introduceren om hun argumentatietheorie te verfijnen zodat ook de retorische dimensie van argumentatie in de analyse meegenomen kan worden. Strategisch manoeuvreren wordt gedefinieerd als het bewaren van het delicate evenwicht tussen het retorische doel van effectiviteit en het dialectische doel om redelijk te blijven. Als argumentatie in strijd is met de pragma-dialectische procedure van kritische discussie, oftewel als deelnemers aan een discussie doelmatigheid nastreven ten koste van redelijkheid, dan kan gezegd worden dat hun strategisch manoeuvreren ontspoort.

Het concept strategisch manoeuvreren werpt ten eerste een licht op hoe deelnemers aan een discussie een keuze maken uit beschikbare geschilpunten en argumentatieschema’s om hun standpunten te onderbouwen (in de literatuur aangeduid als topical selection); ten tweede op hoe standpunten en argumenten afgestemd zijn op wat specifieke publiekgroepen of het algemene publiek plausibel vinden (aangeduid als audience demand); en ten derde op hoe discoursedelnemers een geschikte presentatie kiezen (aangeduid als presentational devices) om hun standpunt geaccepteerd te krijgen.

Het begrip strategisch manoeuvreren wordt in deze studie gebruikt voor de analyse van de persuevier retoriek die zowel voor- als tegenstanders van nieuwe wetenschap en technologie bezitten als theatrale techniek om effectief te zijn in publieke debatten. Omdat pragma-dialectici zich niet specifiek bezig hebben gehouden met publieksdiscussies over NEST, is wetenschappelijke literatuur onderzocht die zich concentreert op discursieve strategieën in NEST-ethische discussies. Methodologisch gezien, maken deze studies gebruik van discourse-analyse dat, zoals beargumenteerd wordt, bruikbaar is omdat het aandacht heeft voor a) de retorische functie van de verschillende versies om de (sociale) wereld te construeren en b) voor andere discursieve strategieën dan argumentatie zoals pragma-dialectici dat definiëren.

De literatuurstudie maakt duidelijk dat zowel voor- als tegenstanders de beschikking hebben over een repertoire aan strategische manoeuvres om effectief te zijn in publieke deliberaties over controversiële wetenschap en technologie: a) grenzenwerk dat gedefinieerd kan worden als het conceptueel onderscheiden van wetenschap en niet-wetenschap, van wetenschap en samenleving, van fundamenteel en toegepast onderzoek, van feiten en waarden, van moreel aanvaardbare en moreel onaanvaardbare wetenschappelijk onderzoek, van beschekte en controversiële kwesties, van natuurlijk en onnatuurlijk etc.; b) identiteitswerk, oftewel het construeren van publieke identiteiten van zichzelf en anderen als bijvoorbeeld
fundamentalistisch, onrealistisch, kortzichtig; c) toekomstwerk, oftewel het representeren van toekomsten als ververwijderd, goed, onzeker, of impactvol.

Het dramaturgische perspectief op publieksdeliberatie, met de begrippen script, mis-en-scène en setting (Hoofdstuk 2) en het begrip strategisch manoeuvreren (en het ontsporen daarvan) toegepast op NEST-ethische discussies (ontwikkeld in Hoofdstuk 3 en 4) vormen samen het analytische kader om face-to-face upstream publieksdeliberatie over de morele wenselijkheid van nieuwe levenswetenschappen en biotechnologieën te beschrijven, te reconstrueren, analyseren en te evalueren.

In Hoofdstuk 5 wordt een reeks van drie publieke discussie over gedragsgenetica geanalyseerd. Hoe manueuvreren de deelnemers aan deze discussies strategisch? Welke invloed hebben deze manueuvres op de kwaliteit van van de deliberatie? En wat is de invloed van de dramaturgie van deze upstream publieksdialogen, gescrispt als publieke onderzoeken naar de ethische en maatschappelijk kwesties met betrekking tot de genomics van menselijk gedrag, op het optreden van de deelnemers?

Levenswetenschappers kozen in deze discussies veelal voor pragmatische argumentatie, een redeneerpatroon om de wenselijkheid van een handeling te rechtvaardigen door te wijzen op wenselijke gevolgen van dat handelen. Deze argumentatie weerspiegelt een publieke rede omdat het wijst op de voordelige van wetenschappelijke kennis en het productie rede omdat het wijst op de voordelige van wetenschappelijke kennis en het

als hun appel op wetenschappelijke autoriteit met betrekking tot de technologische haalbaarheid die de toekomstvisies van critici minder geloofwaardig of zelfs ongeloofwaardig maakten. Als gevolg van de wetenschappelijke expertise die hen werd toegeschreven, hadden de levenswetenschappers duidelijk een voordeel in de twist over de verschillende toekomstvisies. En als een toekomst als onhaalbaar wordt geregresenteerd, is een discussie over de morele wenselijkheid van zo’n toekomstbeeld onnodig.

Hoofdstuk 6 bevat een gedetailleerde beschrijving van het dramaturgische werk uitgevoerd achter de schermen van een upstream publieksdeliberatie over nieuwe kennis en nieuwe technologieën in een andere veld binnen de levenswetenschappen: P4 gezondheid en zorg (in het Engels aangeduid als P4 Medicine) en meer in het bijzonder, de morele wenselijkheid van integratieve personalisated omics profielen (afgekort tot iPOPs) voor de preventie van diabetes type 2.

Het hoofdstuk beschrijft ten eerste het discursieve werk van een kritische beoordeling van de toekomstvisies teneinde de valkuilen beschreven in Hoofdstuk 5 te voorkomen. Gebruikmakend van interviews en een literatuurstudie, worden de technologische haalbaarheid van sociotechnische toekomstvisies rond P4 Medicine in kaart gebracht en vervolgens beoordeeld door gebruik te maken van een reeks kritische vragen die wetenschappers bevredigend moeten beantwoorden. Deze kritische vragen zijn afgeleid in Hoofdstuk 3 als een heuristisch middel om de waarden en morele rechtvaardigingen te expliciteren die in deze toekomstvisies besloten liggen. Dit instrument kon de facilitator tevens gebruiken om te anticiperen op controversiële kwesties rond morele wenselijkheid.

Hoofdstuk 6 is ten tweede een etnografische beschrijving van het dramaturgische werk achter de schermen: hetframendekwetse;hetverschafvaninformatie aan de deelnemers; het contingentie proces van het uitnodigen en vastleggen van deelnemers; en de besluiten rond de mis-en-scène die alle een effect te hebben op de optredens van de deelnemers. Deze ethnografie werpt aldus een licht op de praktische verwikkelingen waar facilitators van upstream publieksdeliberatie in verzeild kunnen raken: de keuzes die zij moeten maken als gevolg van het toepassen van abstracte normatieve criteria die publieksparticipatie legitiem zouden maken (inclusiviteit,
Hoofdstuk 6 werkt het argument uit dat een diepgaand begrip van deze normatieve overdaad van de praktijk van het organiseren van publieksdialoog met zijn ontelbare keuzes, compromissen en spanningen onontbeerlijk is om organisatoren gevoelig te maken zodat ze zo hun werk als dramaturgen van publieksdeliberatie kunnen verbeteren.

Hoofdstuk 7 richt het toneellicht wederom op de optredens op de bühne waar levenswetenschappers deelnemen aan de publieke deliberatie over de morele wenselijkheid van iPOP-technologieën. Een uitgebreide argumentatieve reconstructie van de deliberatie maakt duidelijk dat – deels dankzij de succesvolle discursive interventies van de facilitator – ten eerste de bewijslast duidelijk bij de pleitbezorgers van NEST kwam te liggen en ten tweede dat hun argumentatie – die een liberale bio-ethiek weerspiegelen – kritisch is getest. Hoewel geen consensus werd bereikt onder de deelnemers, zijn de verschillen van mening over de morele wenselijkheid van P4 Medicine duidelijker geworden, hetgeen ook een duidelijk doel is van publieke deliberatie.

De analyse van het strategisch manoeuvreren maakt echter ook duidelijk dat alle deelnemende levenswetenschappers gebruik maakten van de theatrale techniek van impressiemanagement. Ze konden zich publiekelijk presenteren als pleitbezorgers van deze nieuwe technologieën aan het publiek prijs te hoeven geven dat hun persoonlijke overtuigingen achter de schermen wel degelijk overeenkomen met critici. Ook al werden de dialectische regels van de kritische discussie gerespecteerd, hun impressiemanagement staat op gespannen voet met de deliberatieve deugd van grootmoedigheid. Deze burgerschapsdeugd schrijft voor dat deelnemers aan een discussie ernaar moeten streven om de positie van tegenstanders of andersdenkend zo min mogelijk af te wijzen. Dat betekent dat het ook belangrijk is om openlijk toe te geven waar je het met je tegenstanders over eens bent.

Tot slot wordt beargumenteerd dat de informele dramaturgische setting en de vrijwillige deelname aan de deliberatie die geen concrete uitkomst verlangde samen met een instrumentele kijk op technologie een mogelijke verklaring kunnen zijn voor het strategische discussiegedrag van levenswetenschappers. De fundamenteel optimistische attitude tegenover nieuwe technologieën die in de sociotechnische toekomstvisies van P4 Medicine besloten liggen zou immers wel eens de toch al zo vaak getoonde conservatieve houding tegenover toekomstige technologieën kunnen versterken.
LIST OF PUBLICATIONS

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2013

2009

Popular publications (selection)

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2012
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- “Genetische modificatie voor een duurzame voedselproductie” (“Genetic modification for a sustainable food production”), interview with Gerda Verburg, minister of agriculture (together with Frans van Dam), Lev Magazine, May, 2010

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2006
- “Democratiseer de wetenschap” (“Democratise science!”, interview with Helga Novotny, chair European Research Advisory Board), De Helling, June, 2006.
Koen Dortmans saw the first light of day on April 6 1975 at a pig farm in the small village of Someren in the province of Brabant in the Netherlands. In 1987 he went to St. Willibrord grammar school in Deurne, receiving the benefits of incessant social-democratic policy efforts to elevate the poorly educated peat farmers of the Peel. After receiving his VWO diploma he started his twelve years of academic wanderings that guided him to Enschede (University of Twente, mechanical engineering), Nijmegen (Radboud University, physics and philosophy) and Berlin (Free University of Berlin, philosophy). His thesis on the concept of causality in modern physics in the work of Ernst Cassirer was rewarded with a Master of Arts degree in 2005.

His work as a professional facilitator of public dialogue on controversial social issues at the LUX (Nijmegen) that he had started several years before graduation, turned out to be the entry into a continuation of his academic career as a PhD candidate at the Department of Philosophy and Science Studies at the Faculty of Science of Radboud University Nijmegen.

In 2014 he continued his career as a lecturer of professional development and ethics and as a study career coach at the Institute Applied Sciences of HAN University of Applied Sciences, lecturing ethics to junior lab professionals and training them reflection and effective communication skills. In 2015 he also started as a lecturer of ethics and philosophy at the Institute of Social Work at the same educational institution. Very recently he started as a program manager of Field Lab Thermion that connects small business, health care professionals and consumers for testing new technologies in primary health care. He combines his management tasks with a role of researcher at the Center of Expertise Public Affairs at HAN, working on participatory evaluation of new technologies in health care.