

Scientific citizenship in a democratic society

Public Understanding of Science

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Abstract

Using the example of the sociological analysis of biological citizenship and literacy, it is argued that a merely descriptive analysis of these phenomena does not capture their distinctive normative features. While such a description realistically demonstrates how citizens respond to and are shaped by biotechnology and biomedical discourse, it provides no critique of the forces moulding the citizen-consumer. Ideas of active citizenship fuel the search for forms of public engagement in the spirit of deliberative democracy. While these attempts are guided by an important vision of policy making in democratic society, they are beset with several practical difficulties. It is argued that the discussion of deliberative practices has focused too much on direct participation of citizens in various dialogical events and its impact on policy and decision making. This approach ignores other important aspects of deliberative democratic theory, emphasizing public accountability and trustworthiness of democratic institutions.

Keywords

bioethics, biopolitics, governance of science and technology, participation in science policy, public participation, public understanding of science, scientific citizenship, scientific literacy

1. Introduction

There has not been much discussion in philosophical bioethics about what kind of role the citizens are to play in science and technology. Views that are implicit in the prevailing bioethical discourse are of a passive population that needs to be protected and/or to be utilized for social benefits (Árnason, 2009). In social science, on the other hand, there is considerable literature about active citizen participation in the shaping of public policy about science and technology (Mejlgaard and Stares, 2010). Some authors (Elam and Bertilsson, 2003) are rather cynical about dominant models of public engagement since they may reinforce existing power relations. Some of the sociological literature depicts scientific citizenship in such a way that the distinctive normative nature of citizenship is lost. A good example is Rose and Novas' (2004) analysis of "biological citizenship" which is largely framed in a discourse of production and marketing strategies. While this analysis

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is in many ways realistic, it is important to counteract it critically by a guiding vision of citizenship. This is implied in theories of deliberative democracy which have influenced several attempts to engage citizens in dialogues about public policy. Sociological studies (e.g. Irwin, 2001) have shown that these attempts meet many practical difficulties and they can also lead to premature justification of emerging technology. A neglected aspect of deliberative democratic theory in this context is its emphasis on legitimacy and accountability of public decisions. This implies that the focus needs to be more on the quality of the institutions and governance as conditions for democratic legitimacy than on active participation or pervasive public engagement.

The paper is divided into three parts. The first part is devoted to a discussion of Rose and Novas' notion of biological citizenship which exemplifies a rich sociological analysis of how developments in biotechnology are shaping contemporary citizens. Their description is critically evaluated and it is argued that it ignores a normative dimension implicit in the notions of scientific literacy and citizenship. In the second part, the main idea behind public engagement in deliberative forums is introduced and some of the main practical problems that they have encountered are described. In the third part, two theoretical objections to the deliberative project, the sceptical and the liberal, are considered. It is argued that there is a neglected aspect of deliberative democratic theory in this context which relates to public accountability rather than public participation. Finally, the example of the Icelandic health sector database project is used briefly to demonstrate how these visions of the citizen can be relevant in an actual public policy.

2. Biological citizenship and scientific literacy

The first approach to the issue of scientific citizenship represented here is a certain type of sociological analysis which takes citizenship primarily as a descriptive term covering various kinds of activity of citizens responding to available and emerging biotechnology. I choose as an example of the approach the seminal paper, "Biological Citizenship" by Nikolas Rose and Carlos Novas who demonstrate how a "new kind of biological citizenship is taking shape in the age of biomedicine, biotechnology and genomics" (Rose and Novas, 2004: 439). They show how "citizenship projects" and processes of "biological self-making" can be either individualizing or collectivizing. Such a project or process "is individualized to the extent that individuals shape their relations with themselves in terms of knowledge of their somatic individuality" (Rose and Novas, 2004: 441). The collectivizing aspect of biological citizenship is described by the authors in terms of various biosocial groupings, "collectivities formed around a biological conception of a shared identity" (Rose and Novas, 2004: 442). The analysis is intended to "encompass all those citizenship projects that have linked their conceptions of citizens to beliefs about the biological existence of human beings" (Rose and Novas, 2004: 440). Furthermore, Rose and Novas (2004: 445) talk about strategies of 'making up citizens' or "the reshaping of the way in which persons are understood by authorities". These strategies from above radically influence all citizenship projects since the political and professional discourses, or "biological and biomedical languages", that "shape citizens' self-understandings and self-techniques are disseminated through authoritative channels" (Rose and Novas, 2004: 446).

Let's look at an example that shows clearly how Rose and Novas (2004: 447) use the notion of citizenship. The example which is to demonstrate "self-education of active biological citizens" emphasizes how pharmaceutical companies engage in activity to educate consumers of their products. A good illustration of this is "the Prozac website" of the pharmaceutical company Eli Lilly which uses techniques "to promote a particular version of scientific or biological literacy". The example shows how marketing techniques are used to intertwine advice about caring for the self

with the marketing of the drug. In addition to taking the process of recovery more into their own hands, patients learn to ask their doctor to prescribe Prozac for symptoms of depression. After describing the example, the authors ask: "What kind of scientific literacy is being promoted here? What kinds of active biological citizens are being shaped, and to what ends?" (Rose and Novas, 2004: 448).

These are important questions which deserve a careful discussion. Rose and Novas (2004: 448) immediately provide a succinct answer: "This is the citizenship of brand culture, where trust in brands appears capable of supplanting trust in neutral scientific expertise." Furthermore, they say that "this is just one example of the way in which biovalue is supplanting public value in the biological education of citizens-consumers" (Rose and Novas, 2004: 448). The term 'biovalue' is chosen for the process in which "advances in the fields of genetics and the neurosciences, transform the potentialities embodied in life itself into a source of value creation" (Rose and Novas, 2004: 455). These values are further differentiated into three dimensions of analysis: "Along the first, we see how life is productive of economic value. Along the second, we see that the manipulation of life generates a value accorded to the enhancement of health. Along the third, we see that the production of both wealth and health is bound up with ethical values" (Rose and Novas, 2004: 455).

This value analysis is briefly fleshed out in a couple of examples. After a short description of projects of building biobanks in Sweden and Iceland, Rose and Novas (2004: 456) conclude that in those cases "the state plays an active role in transforming their citizens into a potential resource for the generation of wealth and health". In their analysis, ethical values enter through the use of bio-ethical language, for example in PR documents of a Californian biotechnology firm where it is stated that the practices and products will have "a foundation built on bioethics". Citing a chief executive officer at Genomic Health, who finds it critical "for industry to create an open dialogue with all stakeholders in order to facilitate understanding and to build trust", Rose and Novas (2004: 458) take these statements as examples of the use of ethics both as "a means of increasing the commercial value of products and a means of satisfying the values necessary to gain the trust and confidence of the citizen-consumer".

Let's take a closer look at the crucial question Rose and Novas raise about literacy in relation to their analysis of biological citizenship: What kind of scientific literacy is being promoted when a pharmaceutical company is trying to educate its consumers as the Prozac example briefly demonstrates? In order to answer that, we need to have some kind of a guiding notion of what literacy implies. In a definition of literacy that has been adopted by UNESCO (2004: 13), literacy is the "ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society".

Literacy is a contestable term and I am not choosing this definition as an authoritative standard but rather to show the rich normative implications that are built into it. The UNESCO notion of literacy implies a building up of capacities for being a citizen by enabling people to access, interpret and critically evaluate information and knowledge. Drawing upon this understanding of literacy requires that there is some evaluation of the quality of information provided and the kind of understanding that is promoted. Questions like "is the information truthful?" or "is this some kind of manipulation rather than authentic education?" are most relevant from this perspective. Misleading information does not help individuals to orient themselves in the world and propaganda undermines the ability to critically examine information and evaluate its validity.

Novas and Rose do not raise such questions in their discussion of the type of literacy promoted by Eli Lilly and they even seem out of place within their discourse. Instead of public value,

biological value is being produced in the education of citizens-consumers. Are these simply two alternative production lines in the sociological-biological construction of citizens? Granted that a certain kind of literacy is needed to appropriate brand culture, but is it “scientific literacy”? There is a need to distinguish between manipulation and understanding and to evaluate the quality of information conveyed. One could even ask: Is literacy being promoted at all in the Eli Lilly example? Aren’t individuals taking part in a process that does not “develop their knowledge and potential”, to use words from the UNESCO statement, but rather transforms them “into a potential resource for the generation of wealth and health”, as Rose and Novas put it (2004: 456).

Rose and Novas ask about citizenship: “What kinds of active biological citizens are being shaped, and to what ends?” They have provided most instructive answers to this question by showing how people are engaged in both individual and collective ‘biological self-making’. But, again, when discussing these projects as citizenship practices rather than, say, consumer manipulation, we need to have a way to differentiate between what is conducive to the ends of citizenship. Can citizenship lead to any ends or is there a limited scope within which the notion is meaningful? The notion of citizenship implies not just any activity of citizens. It refers to activities that are different from e.g. those characteristic of a colleague, a customer or a consumer (Bellamy, 2008). As a descriptive notion it explains rights and duties that citizens actually have but there are also explicitly normative positions regarding the relationship between individuals and society. In liberal theories of citizenship, the “normative core is the principle that citizens shall enjoy equal rights” (Leydet, 2006). In republican theories of citizenship, civic self-rule is emphasized: “Active participation in processes of deliberation and decision-making ensures that individuals are citizens, not subjects” (Leydet, 2006).

These classical conceptions of citizenship harbour important implications that need to be taken into account when citizenship is discussed. Most importantly, being a citizen is distinguished from being a subject. While citizenship has been analysed in terms of the conditions for political agency, the subject’s condition is primarily one of obedience to the sovereign. Rose and Novas (2004: 448) refer to this characteristic of citizenship when they write: “Citizenship, here as elsewhere is to be active” and they contrast the new biological citizenship with the “passive and compliant patienthood of a previous form of medical citizenship”. This is paradoxical because if citizenship is to be active, how can medical citizenship be characterized in terms of compliance and passivity? This wording is indeed indicative of a central position of the authors. Judging from many of their examples, biological citizenship is made manifest through some forms of subjugation. For example, “biological self-shaping” of individuals is dependent on different forms of power which direct the self-making in such a way that the citizen becomes a product of “brand culture”, “expert knowledge”, “public health measures” or the state’s creation of wealth.

There is a sense in which individual citizen formation is inevitably a form of subjugation; “socialization is individualization” as Habermas (1979: 93) puts it. But this subjugation can be described in different terms and the description by Rose and Novas is clothed in the technological language of making and being made. This dialectic is characteristic of the linguistic and social malleability of human beings. But when citizenship is described as a process of socialization it risks losing its distinctive dimensions. For instance, Bernard Crick (1998: 9) and his team in Britain argued that the aim of citizenship education is to enable pupils to become “active, informed, critical and responsive citizens”. This is sometimes referred to as “active citizenship” but the most important aspect of it in this context is the democratic vision it implies about citizens who are motivated, informed and able to critically reflect on their society and willing to participate in processes of public deliberation about matters of common interest.

This is, indeed, far from the biological citizenship which emerges from the analyses of Rose and Novas. Examples have already been cited from their text which demonstrate the passivity and subjugation involved in the production of biovalue, but the authors also discuss political participation of the citizens under the heading of a “political economy of hope”. This notion is described in terms of both activity and education: “Biological citizenship in a political economy of hope requires active political engagement – it is a matter of *becoming* political. A certain amount of education and technical administration is required in order to make one’s individual and collective voice heard” (Rose and Novas, 2004: 454, emphasis in original). The examples taken in order to flesh this out show that political activity is largely identified with activism and lobbying of patient groups for a certain cause (e.g. Huntington’s disease) related to their special problems and interests. Rose and Novas (2004: 453) describe this well when they write that there is a need to “examine the forms of citizen activism and ethical self-formation that are constitutive of a political economy of hope”. The notion of ethical self-formation squares well with identity politics which plays a significant role in citizenship theory. But ethical self-formation promoted through political activism is quite distinct from the idea of moral reflection on common interests implied in the education for citizenship. The former basically collectivizes individuals on the basis of their private interests and self-interested strategic action in order to have a political impact through force. The latter emphasizes deliberation which requires that participants assume a public standpoint from which they discuss matters of public policy. The former is built on the model of special interests power politics, the latter implies a vision of citizens who are ready to revise their preferences in light of good reasons and arguments relating to common interests.

The vision of the citizen that emerges from this analysis of biological citizenship is twofold. On the one hand, the activist citizen who is engaged in furthering the cause related to his or her medical condition; and on the other hand the citizens who are made up, for example, “as consumers of the potential range of goods which genomics has to offer” (Rose and Novas, 2004: 457). The main logic driving them is the hope “for the production of wealth and health” and the respective benefits to be reaped, whether for individuals, companies or society. Against this backdrop, ethics serves as “a means of satisfying the values necessary to gain the trust and confidence of the citizen-consumer” (Rose and Novas, 2004: 458). This picture of the citizen-consumer can hardly be associated with the vision of active citizens in a democratic society which requires a different kind of participation.

3. Scientific citizenship and deliberative forums

The preceding analysis of biological citizenship is rooted in French post-structuralism with a deep suspicion about projects to improve democracy. There is a wide theoretical gap between this Foucauldian approach and perspectives on scientific citizenship which draw upon deliberative democratic theory (Abelson et al., 2003). While forms of citizenship analysed by Novas and Rose are mostly implicit, attention is now paid to explicit attempts to involve citizens in deliberative community engagement which presuppose active and reflective citizens in the spirit of Bernard Crick’s project of citizenship education.

In their paper “Deliberating about Bioethics”, Gutmann and Thompson (1997: 39) distinguish between the main social purposes served by deliberation in democracy. The first two of these purposes imply crucial aspects for democratic biopolitics and scientific citizenship: “to promote the legitimacy of collective decisions” and “to encourage public-spirited perspectives on public issues”. It is hoped that when citizens authentically engage in conversations about matters of common concern, they are likely to adopt a public standpoint, to broaden their perspective, and be willing to revise their individual preferences in the light of information and arguments. This makes

real deliberation very different from all kinds of strategic interaction which people use in order to further their special interests. "When citizens bargain and negotiate, they may learn how better to get what they want. But when they deliberate, they can expand their knowledge, including their self-understanding as well as their collective understanding of what will best serve their fellow citizens" (Gutmann and Thompson, 1997: 40).

In recent years, many kinds of deliberative events have been planned in order to engage citizens in relation to policy making in the area of biotechnology. The following is a typical description of an attempt to engage citizens in deliberation concerning a genome research project (Hicks et al., 2008: 2):

Based on theories of deliberative democracy, our research group sought to engage community members in open dialogue. The approach assumes that once informed and provided with an opportunity for deliberation, non-expert members of the public are fully capable of reflecting on highly complex, technical issues. Participants work to understand each other and determine areas of agreement and disagreement; they both form and test their judgments within the collective discussion. ... Our goal was not to correct a knowledge deficit, but to enable authentic deliberation and trade-offs among competing values. What risks will the public accept in order to gain the benefits of genomic research?

This concise statement portrays well the intention of public engagement approaches in the spirit of deliberative democracy. There are many practical obstacles that such attempts are bound to meet, but I will concentrate on three critical questions about this approach that have been posed in the sociological literature on the subject. The first question regards how issues are to be framed for public debate. Inevitably, there is some kind of "pre-framing" of the agenda which may restrict the possibilities for participants to discuss matters "within their own terms of reference and frameworks" (Irwin, 2001: 9). There is always a selection of the information provided and in how it is presented to the public. Felt et al. (2009) have shown, for example, that there are major difficulties with involving lay people in ethical discussions about basic science "upstream" even though more basic value questions and more crucial questions for policy making could be addressed at that level. This is because "only applications are perceived as relevant for ethical considerations. ... Thus ethics is pushed downstream, to a moment when concrete applications can be discussed" (Felt et al., 2009: 365). In order to counter this trend, the authors suggest that the imagination of the participants about the impact of science and innovation upon society be harnessed. In this way, the ethical discourse could move beyond a narrow focus on protection from risk and discrimination towards broader questions of what kind of society we want to live in (Felt et al., 2009: 356).

Another important question that has been raised concerning the implementation of the deliberative idea of public engagement and consultation concerns its institutional context. What are the appropriate forums and public spaces for deliberative participation that are conducive to a dialogue which is framed in terms of the participants' concerns? It has been argued (Bickerstaff et al., 2010: 490) that "in often subtle ways the cultural norms of an institution play out in the framing and enactment of dialogue". According to these authors, this cannot be dealt with as an organizational or a procedural question as such because it is rooted both in "conceptualization of the expert-lay (science-society) relationship" (Bickerstaff et al., 2010: 491) and in the corresponding institutional culture and ways of working. Institutional cultures are largely characterized by "long-standing and fundamentally hierarchical models of engagement" which resist initiatives to introduce "more radical and egalitarian modes of scientific citizenship" (Bickerstaff et al., 2010: 490).

The hierarchical models of engagement referred to are versions of "the deficit model" (Durant, 1999: 314), according to which knowledgeable experts are to educate lay people about science and

technology. The alternative democratic model seeks to establish a relationship of equality between scientists and non-scientists and “emphasizes dialogue between scientists and non-scientists” (Durant, 1999: 315). It has to be asked in this context in what sense a relationship of equality can be established between these partners. Gadamer (1975: 92) argues that by authentically engaging in a conversation or deliberation the partners ‘forget’ themselves and become occupied with the subject matter of the dialogue. Such participation in dialogue does not result in equality in the sense that all viewpoints are given equal weight. To the contrary, listening to and recognizing another point of view implies “that one has to concede the possibility of superior knowledge and insight to someone else” (Warnke, 1987: 135). This attitude is a manifestation of humility which is the mother of true knowledge. To refer to a paradoxical point made by Hicks et al. (2008) above, an authentic deliberation will thus inevitably “correct a knowledge deficit”.

This understanding of dialogue erases a clear demarcation line between public participation and public competence. The latter has been associated with the deficit model of knowledge while the former is related to dialogue: “Whereas the competence approach is primarily concerned with one-way translation and dissemination from science to passive citizens, the participatory approach is experimenting with new formats that involve direct interaction, dialogue and participation in two-way communication” (Mejlgaard and Stares, 2010: 546). These authors and others (Bauer et al., 2007) have sensibly argued that a proper understanding of scientific citizenship needs to integrate both dimensions. The dialogue serves the function both of conveying the concerns and values of the public and of building up competencies and skills which enable citizens “to navigate effectively and define their role within the system” of the knowledge society (Mejlgaard and Stares, 2010: 547).

Thirdly, it needs to be asked whether public deliberations do inform and affect government policy. This is an empirical question which needs to be answered through case studies. The conclusion of one such study (Hagendijk and Irwin, 2006) is that while talk about deliberative practices has become commonplace in most European countries, the application of deliberative democratic theory is quite constrained and has a long way to go. Instead of being an alternative mode of governance, Hagendijk and Irwin (2006: 182) conclude that in practice deliberation is mixed with other types of governance. Moreover, they write (2006: 183) “we have seen that these experiments tend in practice to be partial and limited in scope ... They often represent isolated and insulated attempts to respond to public unrest. As such, they can resemble little more than an extension of corporatist modes of governance, without recognizing the wider challenges of deliberative democracy.”

Studies have also been done on dialogue events that are not intended to influence policy. It has been argued (Davies et al., 2009: 347) that since such non-policy dialogue events are less likely to suffer from the constraints of authority and a hidden agenda, they could be “far more effective in changing the culture of science to become more personally relevant and democratically accountable than through public participation in policy.” The authors admit, however, that often non-policy dialogue events do not meet this ideal and much more research is needed to show what actually takes place within dialogue events of this kind. The same could be said about policy oriented dialogue events. Hagendijk and Irwin (2006: 182) conclude their study by noting that “the European rhetoric of ‘innovation through deliberation’ needs careful scrutiny. Tough questions need to be asked, raising fundamental issues for the governance of science”.

4. Participation and democratic accountability

The preceding discussion entails valuable criticism of deliberative practices and shows the complexities and obstacles to be dealt with in relation to their implementation, but it need not contradict any of the theoretical tenets of the deliberative vision of the scientific citizen. To the contrary, the

criticism is immanent in the sense that it asks whether the “mechanisms of public deliberation” (Irwin, 2001: 2) are able to keep the promises implied in the slogans of public engagement and empowerment or whether they serve other purposes. The democratic vision of the deliberative approach is not rejected, but is constructively criticized from a practical point of view, for example by arguing that “it is necessary to adopt a flexible and situationally appropriate approach” (Irwin, 2001: 16) rather than a one-size-fits-all model of deliberative practices.

There are other types of criticism, however, that are properly described as objections to the idea of citizenship in the spirit of deliberative democratic theory. I will briefly consider two of them: the sceptical and the liberal objections. Under the heading of the sceptical objection, I classify those who doubt the intrinsic value of public deliberation. From this perspective, deliberation is seen as an attempt to make the public more docile and trusting in public policy or corporate undertaking. Elam and Bertilsson (2003: 241), for example, speak cynically about deliberation in attempts to increase public understanding of science: “New deliberative forums are being designed as opportunities for science and the public to spend quality time together.” Drawing upon Mouffe’s criticism of deliberative democracy, Elam and Bertilsson (2003: 244) argue that the emphasis on reaching a consensus would greatly reduce “the available space for expression of dissent in innovation processes” and will in fact reinforce existing power relations. This leads to an activist idea of scientific citizenship where other modes of communication than rational deliberation are used in order to create “legitimate forms of public confrontation with science and technology outside the deliberative process” (Elam and Bertilsson, 2003: 245).

The emphasis on consensus in deliberative democratic theory is overrated in this criticism. The main idea is to aim for a consensus about the legitimacy of decisions or outcomes, even though substantial disagreements remain (Gutmann and Thompson, 1997). Ideas of deliberative democracy can also be used critically against every real consensus that has been reached, for example in deliberative exercises that have been conducted, without taking all viewpoints fairly into account and without giving the participants “the opportunity to challenge the information presented” (Abelson et al., 2003: 244). Elam and Bertilsson (2003: 245) use “a classic example” about the AIDS activists who were “largely excluded from decision-making processes deciding their fate”, as a criticism of deliberative democracy. But it could be argued that this example shows to the contrary the importance of the demand to include everyone affected by a decision or a policy in the decision-making process. From a deliberative democracy viewpoint, the activists were justified in using strategic means and bargaining in order to gain access to the decision-making and funding bodies setting priorities for AIDS research.

The sceptical objection is clearly akin to the biological citizenship argument of Rose and Novas. The lure of this argument is that in a world of power play and conflict it is in many ways realistic while deliberative democratic ideas can appear naïve (Hagendijk and Irwin, 2006: 169). A fundamental flaw of this approach, however, is that it confuses descriptions of actual policies with the rightful basis of action or public legitimacy which requires that “courses of action are chosen because they are based on reasons which all could accept” (Held, 2006: 245). This idea can be manipulated like any other but it provides an important vision of policy making in democratic society which the sceptical view loses sight of. A valuable reminder of the sceptical view, however, is that deliberative events can become diplomatic ways to ensure a more docile population through managed consultation. This is particularly dangerous when “promissory science” (Hedgecoe, 2004: 17), which citizens have no experience of but which raises their hopes, is being introduced. This can lead to a premature justification of a policy with unforeseen social consequences.

The liberal criticism of the deliberative vision of the citizen concerns the demands placed on citizens in liberal democratic society. To hold this objection one need not doubt the intrinsic value

of deliberation but rather emphasize other values that are more important to protect people's basic interests. From an individualist liberal viewpoint, the citizens should not be bothered with demands for collective deliberation on public policy. They should be able to enjoy the privacy of their personal life and have freedom from politics. This squares well with the prevailing view towards citizens that is implicit in bioethical discourse (Árnason, 2009) where the main purpose is to protect the personal domain of the individual from illegitimate intrusion. This protection makes it possible to reap the benefits from advances in biotechnology and genetic research without interference from the citizens.

The protection view and the benefit view are important, but a public policy about biotechnology which is guided exclusively by these views provides no democratic resistance to the passive formation of the biological citizen as analysed by Rose and Novas. The deliberative vision of the scientific citizen does not violate the right to privacy and freedom from politics, but it emphasizes the fact that in democratic society every citizen is partially responsible for public policy. It is a duty of democratic politicians to conduct politics in such a way that the citizens are well informed and otherwise enabled to assume their responsibilities as democratic citizens which in turn should affect political decisions. It could still be said that many citizens are not interested in being informed and responsible and their choices in that regard will be respected. Nevertheless, it is quite compatible with liberal politics to emphasize citizenship education that motivates citizens to think about common concerns and develop the skills of reasoning and mentality of respect which is crucial for deliberative democratic practices.

This deliberative view implies a vision of the citizen which is markedly different from the protection and the benefit views and can complement them by taking into account the capacities or moral powers that are needed for active and reflective participation in democratic society. As we have seen from the previous discussion, the main emphasis in the application of deliberative democracy has been on "direct discussion and engagement" (Irwin, 2001: 16), and the weaknesses of the approach are related to how difficult it is to successfully implement the idea. If carefully used, however, the guiding vision of scientific citizenship can resist the passive making of the biological citizen and even compensate for the loss of public value in that process.

It is interesting to see how the discussion of deliberative practices tends to focus almost exclusively on direct participation of citizens in various dialogical events and its impact on policy and decision making. However, other crucial aspects of deliberative democracy have been neglected in this discussion and need to be drawn upon in order to strengthen the vision of scientific citizenship. Judging from Habermas' analysis of three models of democracy (1998: 248–249, emphasis in original), direct participation is the main characteristic of the republican view on democracy but not of discourse theory:

Discourse theory has the success of deliberative politics depend not on a collectively acting citizenry but on the institutionalization of the corresponding procedures and conditions of communication. ... Discourse theory works ... with the *higher-level intersubjectivity* of communication processes that flow through both the parliamentary bodies and the informal networks of the public sphere. Within and outside the parliamentary complex, these subjectless forms of communication constitute arenas in which a more or less rational opinion- and will-formation can take place.

The key notion here is "rational opinion- and will-formation". The distinctive feature of deliberative democratic theory is its emphasis on the quality of arguments and reasons used to justify policy and that validity of these reasons needs to be tested in communication that is free from deception and coercion. Recall that according to Gutmann and Thompson (1997: 39) the first

social purpose “served by deliberation in democracy” is promoting the democratic legitimacy of political decisions. Chambers (2003: 308) even sees accountability rather than consent as “the conceptual core of legitimacy”. From this perspective, the way in which public policy is explained and justified to the citizens is essential and the activity of the legislators and policy makers comes into focus. “Deliberative democratic theory critically investigates the quality, substance, and rationality of the arguments and reasons brought to defend policy and law” (Chambers, 2003: 309). This requires a scrutiny of working procedures and modes of reasoning in politics and public administration as well as of the ways in which information is presented and made accessible to the public, e.g. in the media. Public accountability implies that policy can be justified to all that it affects and that they can accept its legitimacy.

These aspects of accountability can be regarded as necessary conditions for informed public opinion and deliberation about public policy. The other main form that the promotion of democratic legitimacy of political decisions can take is to create deliberative forums designed to enhance and facilitate public deliberation about the issues for public policy. This aspect of participation as a feature of deliberative democracy should not, however, be overestimated and certainly not be confused with direct participatory democracy. In the latter the primary emphasis is on widening the scope and increasing the amount of issues about which citizens can have a direct say. In deliberative democracy, on the other hand, the main rationale behind the deliberative forum is to facilitate better informed and more reasonable decisions. The results of deliberative forums feed into policy decisions by informing policy makers about the arguments, viewpoints and concerns of the citizens.

One way to put this point is to say that scientific citizenship requires good governance which, as Davies and Wolf-Phillips (2006: 59) argue, “requires a change not so much in getting the public to set the research priorities but in the organizational structures and models on which the ways of working are based”. This implies that the way to restore public trust in science is to establish trustworthy institutions and practices. By removing the primary emphasis from participation to accountability, the focus is partly moved from the competencies and literacy of each individual to the “collective literacy” (Roth and Lee, 2002) of a community in which science is being taught, applied and criticized.

5. The example of Iceland

In 1998, the research company, deCODE genetics, announced a plan to construct a central population database where health care information about Icelandic citizens could be cross-referenced with genealogical and genetic information. After a high court ruling concerning flaws in privacy protection, the project was aborted (Árnason, 2010). With good co-operation with the Icelandic public, deCODE genetics managed to build a large population database as a resource for its research on various diseases.

The Icelandic database project is one of the examples that Rose and Novas take to demonstrate how the Icelandic citizenry is being transformed for the creation of biovalue. This is in many ways an interesting example from the viewpoint of citizenship because of the strong willingness of the Icelandic people to participate in the project. Polls repeatedly showed overwhelming public support for the project which was heavily criticized by the Icelandic professional community and many local and international experts who argued that the policies of presumed consent and privacy violated major principles of research ethics (Pálsson and Rabinow, 2004: 98). While critics approached the issue from a protective position – emphasizing the rights of participants to privacy, self-determination, non-discrimination and protection from harm – the general public adopted a benefit position held by spokesmen of the company and the majority of politicians. This included

both the economic benefits associated with employment opportunities for scientists and the medical benefits that would be reaped from the project. In the language of Rose and Novas (2004: 455, 456), most Icelandic citizens seem to have gone willingly and even enthusiastically into “the service of biovalue”, hoping or even convinced that the project would generate both “wealth and health”.

The question must be asked whether it is misleading to say that the Icelanders who did not opt out of the intended database were voluntary collaborators in the project. Is it more correct to say, as do Rose and Novas (2004: 455), that their vitality was transformed “into a standing reserve for the creation of biovalue”? This should not be regarded as an either–or issue. It is essential to the analysis of Rose and Novas that there is an interplay between the voluntary enthusiasm of the citizens and the transforming forces of biopolitics and biocapital. The vitality of individuals is harnessed for the production of biovalue. It is crucial to this dialectic that there is no coercion or order from above; instead there is an appeal to “civic virtues” (Pálsson and Rabinow, 2004) and even obligations to contribute to a project which could benefit the sick and the disabled. This is analysed by Rose and Novas (2004: 442) as “a moral economy of hope, in which ignorance, resignation and hopelessness in the face of the future is deprecated. This is simultaneously an economy in the more traditional sense, for the hope for the innovation that will treat or cure stimulates the circuits of investment and the creation of biovalue”.

From the viewpoint of deliberative democracy and scientific citizenship, several questions need to be raised regarding public accountability and citizens’ participation in this example. As for the former, it is essential to investigate “the quality, substance, and rationality of the arguments and reasons brought to defend the policy and law” (Chambers, 2003: 309) relating to the Icelandic health sector database project. It has been argued (Árnason and Árnason, 2004) that politicians failed in publicly articulating, explaining and justifying the policy regarding the database project. A major question concerns the benefits which a project of this kind can be expected to engender. Strong statements, by both scientists and politicians, were made about the potentials of genetics for health care (Hakonarson et al., 2003). It is of the nature of a “promissory science” (Hedgecoe, 2004: 17) that the possible benefits and the social harms are intertwined and the “economy of hope” is nourished by focusing on the promises of benefits (Árnason, 2011).

The evaluation of the benefits of such a project is very complex and it is difficult to frame these issues in a social debate. It is a cheap way of justifying a new genetic research project to ask in a deliberative forum: “What risks will the public accept in order to gain the benefits of genomic research?” (Hicks et al., 2008: 2). Nevertheless, there is all the more reason to look for ways to increase the likelihood of understanding and sensible decisions among both the public and policy makers. From the deliberative viewpoint, it is most important to improve governance by evaluating “the institutions, forums, venues, and public spaces available for deliberative justification and accountability” (Chambers, 2003: 309). Iceland is very weak in this regard. Unlike other Nordic countries, Iceland has no national ethical council that has the task of raising public debate about bioethical developments and policy. Such institutions have the general aim of respecting the principles of scientific practice and moral conduct rather than serving the political authorities or the private sector. Deliberations in trustworthy bodies can both provide conditions for informed public debate and further democratic accountability.

Another indication of democratic weakness in Iceland is the media. It has been shown (Hjörleifsson, 2008) that with the exception of the population database project, human genetic research and its potential effect on health and society has not been much discussed. Hjörleifsson (2008: 75) is especially critical of the Icelandic media coverage which “has been framed in such a way that highly relevant questions are left unattended”. The study (Hjörleifsson et al., 2008)

demonstrates that news briefs from deCODE about their successes were uncritically taken up by the media which even leaves out the company's own reservations. In this way, scientific and health care benefits of the research are treated as being beyond reasonable doubt, while uncertainty about financial issues is predominant.

Furthermore, it is especially significant from both the perspective of deliberative democratic theory and the sceptical standpoint that the only community meetings held in order to discuss the population database project were organized by the genetic research company. These meetings were usually held in local health care centres and were conducted by spokesmen of the company gathering public support for the database project.

All of this can be used to substantiate the statement of Rose and Novas (2004: 455) that Icelandic citizens were "a standing reserve for the creation of biovalue". Icelandic society provides very little democratic resistance to the transforming powers of private companies, be they in the banking or the health sector. As a consequence, the Icelandic population is most vulnerable to the moulding forces of the economy and biology and the vitality of the citizens is easily harnessed for the promise of creating health and wealth. According to the analysis of Rose and Novas, this makes the Icelanders a good example of biological citizenship. From the viewpoint of deliberative democratic theory, on the other hand, it shows a lack of both the major background conditions that enable people to exercise the capacities essential for scientific citizenship and the institutions necessary for public accountability.

6. Conclusion

The analysis of scientific citizenship in this paper has drawn upon two perspectives that have very different intellectual roots and create diverse positions and theoretical tensions which will not be reconciled. Nevertheless, the post-Foucauldian perspective and the deliberative democratic perspective can potentially serve a complementary function in research of public engagement. The former is radically suspicious about ameliorative projects of democracy based on active citizen engagements and demonstrates how such projects are linked to the constitution of the subjects as vehicles of biopower. This view can be easily substantiated with empirical examples which show how people take part in the economy of hope engendered by the promissory science of genetics. As such it serves as a constant reminder of the processes of social engineering at work in democratic society, even in the name of public engagement and consultation. This can be lost sight of in naïve versions of deliberative democratic exercises. However, the sceptical view lacks a vision of the scientific citizen which provides democratic resistance to the passive formation of the consumer-citizen. The tools for this are not found only in the various forms of direct public engagement but also and more importantly in the aspect of deliberative democratic theory which emphasizes public accountability and democratic legitimacy of policies. From this perspective, the focus is turned towards the institutions that are the venues of democratic decision making and to a critical investigation of the practices of accountability and justification.

In effect this invites a twofold critical approach to the evaluation of biopolitics and the forms of scientific citizenship they imply. On the one hand, analysis of the strategies at work in the constitution and self-making of the biological citizen along the lines suggested by Rose and Novas. Their analysis shows us how the actual processes of citizen making are functioning and these dynamics can in the long run undermine the basic structure of liberal democratic society. On the other hand, a critical analysis of the arguments and reasons used to justify biopolitical projects is needed. Deliberative democratic theory provides a normative and emancipatory vision of the scientific citizen whose powers are harnessed in the public interest rather than merely for the creation of health

and wealth. These two approaches are not to be reconciled, partly because their value consists in the tension between them and the mutual critical resistance that they provide to one-sided analyses of complex phenomena.

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