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Responsible

Report on the analysis of theory and practice of responsible innovation in research

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Table of Contents

Executive Summary

Following DEL 5.1. that puts ethics and reflexivity on the summit of a meta-governance model, taking the best of the 5/6 keys of European Commission RRI presentation (EC-RRI), DEL 5.2. offers a contribution to this new governance framework, mainly focused on the concept of deliberation. Ten reasons ground this choice. One of them is the fact that deliberation is often mentioned as an important dimension of RRI. It is the case in the Owen, Stilgoe, Macnaghten, Gorman, Fisher, Guston (2013) proposal of *Four Dimensions of Responsible Innovation*, sometimes preferred with the 5/6[1] EC-RRI keys. Despite of the importance of deliberation in Owen *et alii* RRI framework, I have discussed in eleven points the vagueness, limits and contradictions of what they call deliberation. One of its weaknesses is that it stays at the doorstep of deliberation, promoting mainly an inclusive and plural debate, without giving answer in the way to deal with this diversity following a normative and an epistemic pluralism. The thirty years old theory of deliberative democracy (TDD) is quasi absent in the RRI research. Moreover, Owen *et alii* say that deliberation is required because RRI is a question of democracy. To be more precise with deliberation I have presented here the main lines of the TDD and a list of requirements robust enough to produce empirical original works. This theory is useful because, at its core level, we find the requirement to offer justifications in order to convince others. Moreover, it matches two other important requirements for science with society or democracy: the imperative of inclusiveness and rationality. This concern meets the debates of epistemic democracy and more practically the problem of the place of expertise in democracy. Besides that, deliberation could be matched with the precautionary principle, an important meta-principle for the European Union and for responsibility, thus RRI.

I have presented and developed the following list of requirements for the TDD[2]:

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[1] Five if governance and ethics are put together, but for me we have to distinguish two different keys.
[2] This presentation follows the methods of political theory. It does not mean that we have to find it at work in the socio-political life to prove or invalidate it. Otherwise we make a kind of Humean fallacy, deducing the "ought to be" through the "is" (what it). See Reber, 2011. We have different ways to articulate empirical and normative research. This point is crucial for the responsibility concept, mainly normative, but that needs to reach an effectiveness.

1) Expression of arguments in terms of "public good".

2) Participants should truly express their views.

3) They should respect others and listen their arguments.

4) Parties should defend their claims and logical justifications, through an exchange of information and good reasons.

5) Participants should follow the strength of the better argument in the common deliberation.

6) Egality of every participant in an open political process.

In my conclusion I have shown that RRI could conversely contribute to TDD. This line reintroduces into the debate the Aristotelian conception of deliberation, as a literary genre turn towards the future, when legal literary genre considers the past. With my different contributions to break some limitations of this democratic theory, I have taken into account the Owen *et alii* request pleading for plurality, having put clearly in a table the different elements of a normative moral pluralism under three levels. In the same way I have underlined the necessity to match ethical and political deliberation, when Owen *et alii* stay more on the political side. As I have recognized in Owen *et alii* article, the more promising element in their list is probably the *assumptions*. The need to make explicit our assumptions is part of what we have defended in GREAT project as "second order reflexivity", they are in descriptions of situations or normative propositions. Theses justifications are built through the elements of the normative moral pluralism that I have presented and by the elements of the general Toulminian scheme of argumentation.

In the GREAT project, we have already used different models of governance, giving different places and roles to the experts. With the TDD we can give a broader frame to place expertise inside a more general perspective, relevant for politics, ethics, and interdisciplinarity.

After having recognized some vagueness and confusions regarding Owen *et alii* conceptions of responsibility, I think that it is not a good way to depart from Aristotle conception of deliberation. On the contrary he could help their defence of anticipation, and the TDD to go further. Combined with moral and epistemic pluralism, this stronger deliberation makes stronger too what they call "reflexive capital". In this way this deliverable should be not only seen as a critical presentation to take seriously into account their promising proposal, but a contribution to reintroduce some parts of the TDD debates into the RRI discussion and, more over to improve the dimension they call "deliberation".

1. Introduction

In the DEL. 5.1. entitled *Analysis of Governance Theory and Practice of Responsible Innovation and Research* Robert Gianni has presented an important part of the analysis based on the 6 keys of RRI such as proposed by the European Commission (EC-RRI): Engagement, Gender, Science Education, Open Access, Ethics and Governance[3]. DEL. 5.1. has tried to take ethics (5th key) as an interesting candidate to organize the other keys in a common frame[4]. As written in the DEL 5.1. conclusion, with participation and reflexivity, ethics plays an important role in the meta-governance model. This meta-governance model is one main goal we try to find out throughout the GREAT project.

As a contribution to this new governance framework I will mainly be focused on the concept of deliberation. Different reasons ground this choice.

First of all, deliberation is often mentioned as an important dimension of RRI. The Owen, Stilgoe, Macnaghten, Gorman, Fisher, Guston (2013) proposal of *Four Dimensions*[5] *of Responsible Innovation* (pp. 38-39), has been often quoted in the RRI researcher community[6], sometimes preferred, or at least made equivalent with the 6 keys of the EC-RRI presentation. Despite of the importance of deliberation in Owen *et alii* RRI framework we will see and discuss the vagueness of what they call deliberation.

Secondly, if deliberation is welcome in the RRI researcher community, quite no mention has been made by these analysts of the famous theory of deliberative democracy (TDD). Therefore I aim at introducing in the RRI research domain the main lines of this theory, with some of its turns, open questions and even limitations.

Thirdly, the TDD has the advantage to have produced a big amount of theoretical *AND* practical works, qualitative and quantitative. This combination of approaches is echoing with the setting up of GREAT project, designed as an interdisciplinary work. In this way DEL 5.2.

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[3] https://ec.europa.eu/research/swafs/pdf/pub_public_engagement/responsible-research-and-innovation-leaflet_en.pdf
[4] For a very detailed and convincing presentation see Gianni 2016.
[5] They speak of « commitment » as well. *Ibid.*, p. 38.
[6] Even in the GREAT project in some of the empirical research and the work on guidelines.

can offer an original contribution to fill the gap between normative theories and deliberative practises (GREAT DOW, 2015, p. 17), and besides that RRI practises.

Fourthly, TDD could be a relevant governance model putting together the six EC-RRI keys.

Fifthly, TDD is one of the more prominent theory in political theory, and more precisely democratic theories. Thus, it could not only meet some challenges for *Sciences with and for society (SWAFS)* programme, but European building project as well. Indeed, at the core level of the TDD we find the requirement to offer justifications in order to convince others, they are individuals, bodies, groups or institutions. This practise of justification aiming at convincing others is an everyday practise among the 28 EU countries community, which have to select common practises on the European level, coming with different experiences and modes to solve the same problems.

Sixthly, TDD matches two other important requirements for science with society or democracy: the imperative of inclusiveness and rationality. This concern meets the debates of epistemic democracy and more practically the problem of the place of expertise in democracy. This issue is of particular importance in European building, in general and not only in the European Research Area.

Seventhly, deliberation could be matched with the precautionary principle. This important meta-principle for the European Union could be understood as a possible candidate to complete RRI or to reframe it, taking seriously into account the epistemic and normative problems of RRI.

Eighthly, responsibility - and with it, RRI research – can offer conversely a great contribution to the TDD.

Ninthly, TDD is convergent with what we have proposed in GREAT project as "second order reflexivity". The TDD justification requirement calls for reflexivity[7].

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[7] In this document we will not make any difference between reflectivity and reflexivity (see footnote 12).

Tenthly, with the TDD we will be able to reintroduce all the elements of our different analytical grids, alongside the journey of this project. It will be partly the purpose of DEL 5.3. to achieve this task.

All these ten reasons to convey TDD could be treated in different sub-parties. Nevertheless, I have decided to pack them inside the four parts below. I will present into details the Owen *et alii* conception of deliberation, one of the four dimensions of their framework for RRI. I will make 11 remarks and critics. I will then present the theory of deliberative democracy (3) and some of its definitions. Then, I will give examples of empirical research based on this theory (4) and propose a list of requirements for this theory. Section 5 will discuss some open questions, limitations and ways to solve them: kind of arguments and components, deliberation between ethics and politics, the articulation between moral pluralism and interdisciplinarity. The conclusion will present what responsibility can offer conversely to deliberation.

2. What Deliberation in RRI[8]?

In GREAT DEL 2.2., we have already noticed the importance and in the same time the limitations of the book edited by Richard Owen *et alii*, *Responsible Innovation. Managing the Responsible Emergence of Science and Innovation in Society*. Our main focuses were their conceptions of responsibility, the ways they treat the problem of the interpretation of norms in contexts, and their implicit mode of governance.

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[8] In their book, Owen *et alii* speak most of the time about responsible innovation only. Nevertheless, their examples take often into account responsible research (i.e. the case of Francis Crick and James Watson working in Cavendish Laboratory in Cambridge University, p. 45).

2.1. Deliberation as one of the four Dimensions of responsible Innovation

In this section I will read their famous presentation of four dimensions of RI and have a close analysis of their understanding of deliberation. I will propose a more in-depth analysis of their second chapter: *A framework for Responsible Innovation*. The authors are prominent in the field of RRI not only in Europe but in the US too. One of them, Richard Owen, has been appointed to be evaluator of the first group of four RRI projects, and GREAT project among them. He has been generous enough to recognize the theoretical inputs coming from the GREAT project.

Besides that, it is precisely this chapter that proposes to summarize RRI under four "dimensions of Responsible Innovation" (p. 38), that is often mentioned in several RRI researcher works. Some of GREAT empirical works were more based on their four RRI dimensions than on the larger analytical grid (DEL 2.2. and DEL 2.3.).

If we read this chapter carefully we discover that it has not been underlined enough that the "commitment to be (….) deliberative" has to be interpreted in a more grounded perspective. This perspective is prospective. It emphasizes the dimensions of *care* and *responsiveness* (pp. 36, 44). Indeed, the authors follow Adam, Groves and Grinbaum (Adam and Groves, 2011; Groves 2006; Goves and Grinbaum, 2013), borrowing themselves to the famous philosopher Hans Jonas (1903-1993). We have already mentioned him and submitted some critics in other GREAT deliverables (i.e. Del 2.2). Care ethics is presented as the philosophical anchor of all the Owen *et alii* book, despite of the diversity of the different authors[9]. In their text, *care* seems to cover and ground RI. As we will see at the end of this section, this emphasis and prominent role attributed to care ethics is problematic. Indeed, all seem to agree that: "the predominant reciprocal and consequentialist view of responsibility is inadequate" (p. 36). They add just afterwards that the new conceptualization of

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[9] One of the reasons of the importance of care ethics in the book is perhaps due to the fact that the only professional philosophers with a long training in philosophy are Groves and Grinbaum, who precisely defend this ethical theory. Strictly speaking Grinbaum is physicist and more epistemologist than moral philosopher.

responsibility should be future-oriented. With this Owen *et alii* propose a very simple RI definition:

> "Responsible innovation is a collective commitment of care for the future through responsive stewardship of science and innovation in the present." (Owen *et alii*, p. 36)

It is this definition that provides their general framing. What is deliberation for Owen *et alii*? At first glance, deliberation is concerned with the problem of *inclusiveness*[10] of "diverse stake-holders". It encompasses many different things. It means: the "introduction of *broad range of perspectives* to reframe issues", to " authentically embody *diverse sources of social knowledge, values, and meanings*"[11] and identify "areas of potential contestation". To manage this openness, they propose a "*collective* deliberation". It is a very vague: "processes of *dialogue*, *engagement,* and *debate*". In term of communication, "they only speak of listening to wider perspectives".

Before starting to discuss their conception of deliberation, I will consider the three other dimensions of RI they propose.

Anticipation could be summarize as "the entry point for reflection on the other purposes, promises, and possible impacts of innovation". In terms of modalities it is a kind of counterfactual asking the question, "what if…" or "what else might it do?" Anticipation is closer to "plausibility" than predictability.

Reflectivity has a very special and narrow meaning. It reflects on "underlying purposes, motivations and potential impacts", focused on "what is known and what is not known. Interestingly, for what is known they put: "areas of regulation, ethical review, or other forms of governance," and for the unknown: "associated uncertainties, risks, areas of ignorance, assumptions, questions, and dilemmas".

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[10] My italics.
[11] They refer here to the works of Andrew Stirling.

Deliberation comes after these two first dimensions, and is followed by the last one, responsiveness.

Responsiveness like deliberation means different things. "Iterative" responsiveness is an "inclusive", "open process of adaptive learning, with dynamic capability". It is presented as a "collective process of reflexivity" to "set direction" and "influence" innovation trajectory. They speak in favour of "effective mechanisms of participatory and anticipatory governance". They add in a footnote, that this anticipatory governance is a "broad-based capacity extended through society" to manage "emerging knowledge-based technologies while such management is still possible". In this sense they reduce responsiveness to what we can understand as anticipatory governance. We could remember for instance to the famous proverb "to govern is to anticipate".

To be complete, the authors think that these dimensions meet two goals:

a) they collectively build a "reflexive [12] capital", "in an iterative, inclusive and deliberative way";

b) this capital is coupled "to decisions" about the "goals of innovation", the "uncertain and unpredictable" modulation of its trajectory, "that is, how we can collectively respond".

2.2. Discussion

To express it **analytically**, anticipation is focused on the exploration of other paths, other "narratives" than the promissory ones, **reflexivity** is focused on what is *known* and *not known*, **deliberation** is a *broad debate*, when **responsiveness** gives the tempo of the process of collective reflexivity, as a *learning with dynamic capability*.

We can summarise their framing as a **collective process of reflexivity**.

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[12] This shift between « reflective » and « reflexive » let us to take them equally.

Having paid tribute to this first courageous attempt to clarify RI and making it operational if it is not a try to translate the 6 keys of the EC-RRI description, I can yet discuss this proposal, with some remarks and underlining some limitations.

2.2.1. Redundancy

Some definitions of the different dimensions are redundant. We find the need of inclusiveness in deliberation and responsiveness. In the same way the need to listening to wider perspective is in anticipation, reflectivity and deliberation. Responsiveness reintroduces reflexivity in its definition. Risks and uncertainty in reflectivity have their place in anticipation too. We could improve their definitions making theme more precise and distinguishable.

2.2.2. More logical Ranking

The ranking of the four dimensions could be different. More logically we can begin with what they call deliberation, then continue with the need to open the discussion as wide as possible, then to be responsive and to learn, trying to be more reflective and finding finally other narratives. Incidentally these narratives are more general attitudes than communicative capacities (distinguished from interpretation, argumentation or reconstruction).

2.2.3. Only a first Step towards Discussion

Deliberation and responsiveness are here more political concerns, mainly linked with participation, when anticipation and reflectivity are more cognitive or constitute a first premise, a step into the epistemological and normative discussion. This discussion concerns responsibility and different order of reflectivity. It concerns the content and the constraints of deliberation as well.

2.2.4. Premise towards second-order Reflectivity hidden in Heterogeneousness

Reflectivity is the more advanced term to show the way the different stakeholders have to follow to deliberate. But it points in very different directions.

Firstly, the things we know are presented as "forms of governance". For this reason they should be in Owen *et alii* definition of responsiveness. Indeed, this is the place were they speak of governance.

Secondly, with the unknown we find elements that are at different levels. For instance, ignorance is not dilemmas. With dilemmas we know different positions, for instance moral positions, but we do not know how two choose between them. Dilemmas are not pure and broad ignorance.

Incidentally, we are rarely confronted to real ethical dilemma. More often we have oppositions without any discussion to understand really where the lines of oppositions are, or how to reinterpret the situation to find agreements.

I do not see the place for "questions" as what we do not know. The more promising element in their list is probably *assumptions*. I will return to this in my conclusion, but I can already repeat that the need to make explicit our assumptions is part of what we have defended in GREAT project as "second order reflexivity", they are in descriptions of situations or normative propositions.

2.2.5. Responsibility as a whole reduced to Responsiveness

At a first glance I have a problem, seeing responsibility (in the sub-title of this section) as the main problem to handle with the four dimensions, and at the same time a selected definition of responsibility in one of theses four dimensions, understood as

responsiveness. The whole of responsibility cannot be reduced to only one definition of responsibility. We have presented eleven conception of responsibility in Del 2.2[13].

2.2.6. Finally Capacity?

When we look closely, we find that *responsiveness* is transformed, or at least associated with *capacity*, or as the authors write it: "capability". Incidentally, they do not quote any of the many authors like the famous Nobel prize Amartya Sen or the neo-Aristotelian Martha Nussbaum, who have extensively use this terminology of capability, between philosophy and economy, not to speak about the epistemic tradition on responsiblity.

In other parts of their book, we know more about Owen *et alii competencies* understanding. Indeed, the more explicit passage refers to Webler *et alii* (1995) or Renn *et alii* (1995), *Fairness and Competence in Citizen participation.* This title explains the participative scope of all these authors (pp. 146, 163).

2.2.7. Responsiveness, Capacity or Care?

If responsiveness has been changed into capacity, regarding the Owen *et alii* understanding of responsibility, we find other definitions or responsibility if we read carefully what they have written through all the book. We have presented their ground for the four dimensions of RI. It is not only responsiveness but also *care* mainly. Here too we see a conceptual hesitation towards responsibility that I make explicit for the sake of the discussion and to know better what is the core of RI for them.

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[13] For a more complete presentation see (Pellé and Reber, 2016).

2.2.8. Care without Aristotle?

I have another problem following Owen *et alii* with the priority they give to care ethics in the line of Hans Jonas. Indeed they quote René von Schomberg who "argues that we cannot aspire to the abstract ideals of the Aristotelian "good life" however contested this may be, and takes a more pragmatic view" (p. 37). I do not see how it is possible on the same time to depart from Aristotle, one of the fathers of virtue ethics, and favour a virtue ethics theory under the name of care?

2.2.9. Consequentialism stays as a main Candidate

Despite Owen *et alii* have said, quoting Jonas interpreted by Groves, that the predominant consequentialist view of responsibility is inadequate (p. 36), they take for themselves René von Schomberg claims, following the precedent quote, to define his pragmatic view: "that (are) at least in a European context, the "right impacts" (…) those constitutionally enshrined in the European Treaty, such as competitive social market economy, sustainable development, and quality of life". The mention of impacts carries them towards consequentialism. More than that, the mention of the European Treaty and law could be interpreted as a deontologist perspective.

2.2.10. Consequentialism is not only local

The authors of this famous chapter reduce consequentialism with localism and reciprocity. If it is still problematic inside the consequentialist moral theory to now if the consequences to take into account are the reasonable or the real ones, if they are for short or long terms, if they are based on deterministic, probabilistic basis or without any probabilities, this theory has never said that it is valid only for intersubjective, reciprocal or local frame.

2.2.11. A smaller or wider World?

The way Owen *et alii* quote Jonas could be understood as contradictory. On the one hand they think that the main "reciprocal" (p. 36) view of responsibility is inadequate,

because the new "conceptualization" of Jonas goes beyond the "ethics of neighbourhood" and on the other hand they say that our world has been certainly "far smaller (and) interdependent".

Owen *et alii* mainly build deliberation on participation, inclusiveness and dialogue. We will see in the next section how to move from inclusive discussion to a denser conception of deliberation.

3. From Deliberation to a democractic Theory of Deliberation

The last words of Owen *et alii* in their article, *A framework for Responsible Innovation*, are directed towards democracy. Their RRI framework "might open up new possibilities for science and innovation and support their democratic, and responsible, emergence in society" (p. 46). In the same vein, when they commit themselves normatively and try to justify the building of their four dimensions of RI, they write: "dialogue is the right thing to do for reasons of democracy equity and justice." (p. 38). They refer to the chapter 5, written by Sykes and Macnaghten.

Democracy seems important on the normative side to back their proposal, but what democracy and what theory of democracy? Paradoxically, or at least astonishingly, they do not mention the TDD in the entire book analysed above. In their index, deliberation (10 token) is connected with *Dialogue*. The most important and explicit source for deliberation (p. 146), presented as "analytic-deliberative approaches" might have made a link with the TDD. But it is not the case. We see more Ortwin Renn *et alii* (1995), Stern and Fineberg (1996), and Webler *et alii* (1995). It is much more a question of *participation* and *information* of the lay people regarding technological risk, or what Wynne (1991, 1992, 1993) or Hartz and Karp (2007)[14] call vaguely as "*co-intelligence*"[15] to "include varied viewpoints" (p. 232). We do not move further than the "public dialogue" (i.e. with Bernd Stahl *et alii*, p. 211).

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[14] Despite the quoted article has been published in the *Journal of Public Deliberation*, its definition of deliberation is not very specific and kept equivalent with a dialogue: « Deliberation. The second tenet is the opportunity for these disparate people to engage in egalitarian discourse on a public issue, taking into account multiple views and comprehensive, balanced

According to me, these proposals are only a first step. We know that the dialogue has to be open widely, we know that we have to address the problem of diversity, *but we do not know how*, under what kind of *communication and justifications*, and how to manage the debate crossing from *plurality* (diversity) to *normative pluralism,* it is scientific or ethical (Reber, 2005). As I have developed elsewhere (Reber, 2015, 2016), these problems have to be tackled in order to reach a high level of expertise due to the importance of the issues at stake, and to avoid the risk to cause big or irreversible damages as the precautionary principle frames the question.

Without reaching these goals entirely, the TDD helps to go further than only asking for inclusive dialogue. Incidentally, with the sole mention of dialogue, with Owen *et alii*, we have no references to the different dialogic theories. Among them we have the proposal of Emmanuel Lévinas[16], the famous philosopher of responsibility, or, for the connection with ethics and argumentation, the very interesting Florence Quinche's PhD, *La délibération éthique. Contribution du dialogisme et de la logique des questions* (2005)*.* To dialog means more than to discuss. Without too much exaggerating, we can say the Owen *et alii* conception of deliberation is less demanding than the claim to be democratic.

As promised in the introduction I will consider here the main lines of the TDD. Political theories of deliberative democracy[17], or more generally the important role dedicated to deliberation in politics have imposed themselves in contemporary political philosophy. Deliberative democracy has been ascendant in practice too. It is the case with the President of the United States, Barak Obama with his book entitled *The Audacity of Hope* (2006, p. 92). It is not a US exception; even the Chinese Communist Party appears to be open to

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information. The hope is that through respectful dialogue, people will creatively problem solve and find common ground that reflects the common good », p. 3.

[15] In the French debate around participation, the people in charge of the Commission nationale du débat public (*National commission for the public debate*) speaks of « exercice d'intelligence collective » (collective intelligence exercise).

[16] For an original exploitation of Lévinas in RRI see (Blok, 2014).

[17] To have a sate of the art on this theory in French in philosophy see: Girard and Le Goff (2010), Le Goff (2009) Reber (2012a).

In English among the main books we can refer to: Bohman and Rehg (1997), Dryzek (2010), Parkinson and Mansbridge (2012).

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deliberative experiments[18]. Deliberative turn taken by democratic theory already since 1990, has gone from strength to strength. "This turn put communication and reflection at the centre of democracy" (Dryzek, 2010, p. 4).

Obama's quote of "deliberative democracy" offers an interesting first definition:

> "What the framework of our constitution can do is to organize the way in which we argue about the future. All of its elaborate machinery – its separation of powers and checks and balances and federalist principles and Bill of Rights – are designed to force us into a conversation, a "deliberative democracy" in which all citizens are required to engage in a process of testing their ideas against an external reality persuading others of their point of view and building shifting alliance of consent."

It is as if the US Constitution was grounded on the need of deliberation. With the federalist mention this statement is inspiring regarding the European constitution.

Despite interpretative quarrels, the TDD could be provisionally described in this way:

> "The notion of deliberative democracy is rooted in the intuitive ideal of a democratic association within which the justification of the terms and conditions of association proceeds through public argumentation and reasoning among equal citizens. In such a political order, citizens share a commitment to solving problems of collective choice through public reasoning and consider their basic laws legitimate if they furnish the frame for public and free deliberation." (Cohen, in Girard and Le Goff, p. 216).

Less constitutional we have this definition, often quoted (Mansbridge *et al*, 2006, p. 7; Mackie, 2006, pp. 298-299):

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[18] Presentation of James Fishkin during the last *Congrès de l'Association française de sciences politiques,* workshop, *The future of deliberative democracy*, Aix-en-Provence, 22-24 June 2015.

"Deliberation is debate and discussion aimed at producing reasonable, well-informed opinions in which participants are willing to revise preferences in light of discussion, new information, and claims made by fellow participants. Although consensus need not to be the ultimate aim of deliberation, and participants are expected to pursue their interests, an overarching interest in the legitimacy of outcomes (understood as justification to all affected) ideally characterizes deliberation"
(Chambers 2003, p. 309).

Despite some differences, deliberative theorists stress the same ideal, that decision-making should be preceded by a process where citizens[19] are involved in exchanging of arguments that potentially leads to the transformation of their preferences (Lindell, 2011; Cooke 2000, pp. 947-948; Andersen and Hansen, 2007, p. 539; Dryzek, 2000, p. 1). According to this democratic ideal, decisions should be based on discussions among equal citizens, or their representatives, and the arguments that are put forward should be weighed according to their merits (Setälä *et al* 2010; Grönlund *et al* 2010; Smith and Wales, 2000; Andersen and Hansen 2007). It is expected that deliberation filters participants values too (Elster, 1998). In this way democratic deliberation is said to encourage respect, and, hopefully, mutual understanding (Smith and Wales, 2000; pp. 53-54). Arguments relating to pure and narrow self-interest become difficult to defend in a deliberative context (Mansbridge *et alii*, 2010). This theory is opposed to conceptions of democracy that want to insist on bargaining, aggregation of preferences or a more inclusive participation (participatory democracy). This last point is important regarding the Owen *et alii* conception and of most of the people working in the field of *Sciences and society*. They often confused participative democracy with deliberative democracy. Participative democracy is only concerned by the need to be more inclusive or, at least to let the affected people to participate into the decisions. This theory does not say why and how to participate. If TDD requires an open debate, it is more

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[19] I let here aside the question of the number of participants that reach quickly limitations regarding the quality of deliberation.

specific in the way participant should behave (i.e. following an exchange of arguments). It is easy to see that a too broad participation can affect negatively the quality of deliberation.

Thus the TDD defends a more ambitious conception of citizens (or other actors, individuals or institutions), their interactions, and the political community. Different virtues could be recognized in this theory, including normative ones. Its defenders expect that political representatives – or the principal stakeholders in RRI - have the capacity to justify and perhaps argue for their decisions. They expect citizens (or participants) to be able to justify their choices, and not to stay with their often vague preferences. Justifications are expected on both sides, the one of decision-makers (or stakeholders) and the one of the general public. TDD thinks that citizens have the capacity to search for and collectively formulate the common good within public deliberations that link common good, justification and legitimacy, and respect citizens' autonomy. We will see that this capacity is still an open question.

4. Abundant empirical Research based of the Theory of deliberative Democracy

Despite of debates and disagreements in political philosophy or political sciences, reformulation of the TDD has been proposed by the Swiss political scientist Jürg Steiner and its colleagues[20] to be able to produce empirical research in due form. It was a "first try to put Habermas into the lab". Instructively Habermas was very astonished to see that it is possible to produce real empirical works thanks to his work in philosophy of social sciences. To summarize their approach, a workable list of traits of deliberative democracy theory could be:

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[20] For a critical presentation see (Reber, 2006).

> 1) Arguments should be expressed in terms of "public good"[21]. If somebody wants to defend his/her interests, he/she should be able to show their compatibility and their contribution to the public good.
>
> 2) Participants should truthfully and truly express their views.
>
> 3) They should listen others arguments and treat them with respect.
>
> 4) Parties should defend their claims and logical justifications, through an exchange of information and good reasons[22].
>
> 5) Participants should follow the strength of the better argument, that is not a priori given, but to be looked for in the common deliberation.
>
> 6) Everybody participates on an equal level, without constraints in an open political process.

With these dimensions[23] of TDD they have produced a *Deliberative Quality Index* with the following questions: participation, level of justification for demands, content of justification for demands, respect towards groups to be helped (empathy), respect towards the demands of others, respect towards counterarguments, constructive politics. With this *DQI* they have been able to assess the quality of deliberation in formal arena of different national Parliaments.

If argumentation or the requirement to argue are often mentioned here and in the literature on the theory of deliberative democracy, their definitions is not given. Steiner and his colleagues in *Deliberative Politics in Action* speak only of inference like a semiotic process deriving a conclusion of something given (premises). In this they follow the semiotic account of Sebeok (1986, pp. 50s), which they quote.

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[21] Rawls says « public reason.»
[22] On this point Habermas will go beyond with his belief in its universality.
[23] Remember footnote 2, this is a normative model to equip empirical research and not a « pure » description of the reality of democracy.

In his recent work, Steiner (2012)[24] has introduced a new dimension around the presence and use of narratives in the debates that he has called "stories".

In these two books we find a big amount of empirical research based on the TDD. We can refer as well to Lindell (2011) or the *Journal of Public Deliberation*[25] to have access to these flourishing empirical studies.

5. Limitations and open Questions in the Theory of deliberative Democracy

There are of course many theoretical and practical debates around deliberative democracy: How to evaluate deliberation, the prioritization of freedom and opportunity, questions of reciprocity among participants, publicity and decision making processes, core goals, and whether deliberative democracy cultivates respect or civility between rivals. Of course the TDD has been attacked by some critics, generally or in part, by Young (2001), Sanders (1997), Hauptmann (2001), Basu (1999), Sunstein (1997, 2002), Shapiro (1999) and Mouffe (1999). As we have seen, TDD is not immune to controversies and it is defined in varying ways (Chambers, 2003). Chambers signals at the same time the profusion and the interpretative quarrels.

I will know approach different open questions and limitations of the TDD, trying to indicate ways to go beyond them.

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[24] He has changed some formulations of the first *DQI*, to be « adapted to the local context of the experiments », p. 268s. According to me the new formulations are more appropriate to assess arguments, notably a new mention: « Content of justification of arguments (abstract principles) », p. 271.
[25] See: http://www.publicdeliberation.net/jpd/editorialboard.html

Compared with participative democracy model, deliberative democracy put the emphasis on the need to produce arguments. But we find here different theoretical problems, more sensitive if we want to move from participative dialogue to deliberative one, or to move from participative technological assessment (Reber, 2016c) to RRI. The problem of reflective governance as well is linked with this problem.

5.1. Arguments?

The first theoretical problem is the definition of an argument. Most of the tenets of deliberative democracy require arguments without defining what is an argument! It is the case with Habermas since *Communicative Action Theory* (Reber, 2011). Therefore I propose to deepen the notion of argumentation. On the one side we can recognize the different **conceptions** of arguments depending on the context, and on the other side, the steps entering in the complete **composition** of an argument.

5.1.1. Argumentation and Context

We can envisage the TDD - and RRI - according different conceptions. Arguments vary in relation to their communicative context: a. *Public plea*, b. *Mediation*, c. *Inquiry*.

a) **Public plea**. I use this term borrowed by the juridical world of the process, where one or several lawyers and a prosecutor try, from their perspective to convince the judge. In this case the arguments will be like guns to defend a position as the good, the just, the true, the safer, the more useful, to consider only these perspectives. The arguments are made and presented as complete, definitive, unbeatable. It could be for political decision makers to defend their positions in front a public or to convince an auditorium.

b) **Mediation**. Complete argumentation is too limited in the case where the expected role is a mediation between groups that are strongly opposed, with different epistemic and/or ethical references. This point is important to favour pluralism and openness. Indeed,

in this configuration everybody has mutually to convince the others to revise their positions if needed. We are close to conceptions of deliberative democracy that think that preferences should be modified. If we do not want to stay on very divided oppositions among arguments, we are obliged to deepen the disagreement. This expression has the advantage not to deny the conflicts, but could be paradoxical. Indeed, we can interpret by a stronger polarization of the divide between protagonists. On the contrary we have to take the conflict seriously to understand its constitution. According to the theories of argumentation chosen, we should search to know and check the solidity of every components of an argument that we will see afterwards (the data, the warrants, the foundations, the modal qualifiers, the exception and refutation conditions, and the conclusions). We are then obliged to go to a version of **dialogic argumentation**. Every partner lacks full data in her/his hands. He/she should discuss with the others to know the basis of everyone else's reasoning.

c) **Inquiry**. In the model of the inquiry we should discover new elements that go beyond the implicit of the precedent version. It is necessary to continue until conceiving a dialogical argumentation, exhaustive and systematic if possible, among inquiry, mixed with a back and forth between descriptive and normative dimensions.

The last conception seems to be more appropriate for interdisciplinary contexts, as it is the case with deliberative democracy in context of uncertainty and with RRI.

5.1.2. Components of an argument

If we want to answer the question: "What is a argument?" or at least to propose some elements to make the TDD operational, we can be inspired by the famous argumentative scheme of the philosopher Stephen Toulmin (1922-2009) that encompasses the following elements:

data (D), warrants (G) (very often implicit), foundations (F), modal qualifiers (Q), conditions of exception or refutation (R) and conclusions (C).

He complicates the traditional Aristotelian scheme of analysis of micro-arguments under the form "minor premise, major premise and conclusion". In the making of a debate, all these elements are missing. It would be too demanding if a moderator skilled in philosophy requires from the participants the completeness of their arguments. But this could be taken in charge by an institution designed accordingly. We could speak of argumentative governance.

5.2. Deliberation between Ethics and Politics[26]

The second theoretical problem is the possibility (or not) **to articulate political deliberation and ethical deliberation**. Most of the time political theories, even pluralist, are reluctant to open the black box of ethical deliberation. I can mention here the famous Rawlsian burden of judgement supporting the fact of moral pluralism. Thus Rawls describes variations of judgement among reasonable people. These burdens of judgement marked a permanent diversity of religious, philosophical and moral doctrines in democratic societies and cultures. He thinks that these burdens apply to philosophical deliberation too. Like Rawls, theorists of deliberative democracy give priority to cooperation among individuals. It is a preliminary and necessary condition, but its cost is epistemic and **ethical abstinence** (to avoid the ethical discussion). The **pluralism of moral** philosophers should not be put under the too heavy constraint **of the pluralism of political** philosophers, which is really no better than the pluralism of political parties. Indeed, this position leaves little place for changes in preferences. Indeed, the representatives of a party are accountable to their voters and to show that the position of their party is superior compared with rival solutions.

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[26] For a more detailed presentation see (Reber, 2012b).

RRI needs to give the priority to ethical deliberation. Indeed, as we can see with criteria for secondary assessment in Participatory technological assessment (Reber, 2005) they are only democratic understood as a participation of diverse stakeholders. We do not meet the doorway of deliberation. If they are more inclusive for citizen they miss the specificity of technological controversies, here with the ethical technicality as well. That is even more the case for RRI where we need more deliberation regarding the complexity at work.

5.3. Ethical Argumentation and Pluralism

The third theoretical problem is the **recognition of moral arguments**. I have already mapped elsewhere the different possibilities to build a moral argumentation in a context of justification where people disagree and have to convince each others (see 5.1.1). I propose as a summary the following table of ethical and theoretical pluralism in a justification context with:

1) *Types of entities* that are assessed in a normative ethical perspective (state of affairs, acts, products, process, characters traits, feelings, institutions, behaviours (individual or collective) rules and foundational theories),

2) *normative factors* (the good, the just, equality, equity (to promote) or the evil (to avoid); the consequences and the results; the restrictions relative to what is permitted or forbidden (rights converging with ethics); general obligations and contracts (towards all or particular); promises; principles; norms; values; virtues). They can be modulated according to an optimist or pessimist perspective in the assessment or forms of engagements towards the future.

3) *Foundations* in the normative theories (justifying, making general and managing the factors in case of conflicts, according monistic or pluralistic view; personal point a view, impersonal or collective; targeting promotion or maximization; optional or supererogatory).

An ethical argument can be structured either with only with one of the foundational normative factor above focused on one type of entities. We adopt in this case a monistic perspective. But among a pluralist panel it is rarely sufficient. In RRI such a monistic perspective would be a weakness. For this purpose it is important to be vigilant to respect a moral pluralism of theories.

5.4. Pluralism and Interdisciplinarity

The fourth theoretical problem is the need to match **inter- and intra-disciplinary** dialogue of descriptive disciplines with moral **pluralism and the normative** ones. Both, the epistemic and the moral pluralisms constitute and **give density to the second-order reflexivity**. Often the ethical debate can begin on the scientific data that are stabilized. For emerging technologies or new research projects, very often it is not the case. The scientific side is controversial too. The plurality of participants or stakeholders and expertise should be articulated with the moral pluralism. These problems have impacts on the modes of **Governance of disciplines** we want to follow (Reber, 2015a). In the general debates, every discipline can take the lead of the discussion, imposing its rules. Often it is done by the political sphere. This sphere has an important capacity to match the others, like in a government with different ministries. But this solution can be problematic for RRI if we want to reach a high quality level or when the potential risks of damages are heavy.

6. Conclusion: From Deliberation to Responsibility

As I have presented in my introduction through 10 reasons, deliberation is a promising concept for the governance of RRI, the *Sciences with society* research program and, besides that, the European institutional building. Deliberation has been mentioned in RRI research, they are empirical or normative theoretical. It is the case with Owen *et alii* book, one of the first collective attempt to clarify, defend and implement RRI. Therefore it has been often quoted with its four RRI dimensions. I have tried to present this interesting attempt fairly, discussing 11 limits, contradictions, confusions or possible critics. One of its weaknesses is that it stays at the doorstep of deliberation, promoting mainly an inclusive and plural debate, without giving answer in the way to deal with this diversity following a normative and an epistemic pluralism.

The thirty years old theory of deliberative democracy (TDD) is quasi absent in the RRI research when Owen *et alii* say that deliberation is required because RRI is a question of democracy (p. 38). To be more precise with deliberation I have presented here the main lines of the TDD and a list of requirements robust enough to have produced empirical original works.

The TDD, important for political theory, has already met and impacted the general politics. As we have shown, the President Obama himself mentioned it. He says that deliberation has "to organize the way in which we argue about the future". This sentence is a very relevant and economic way to present deliberation. Regardless of Owen *et alii*, this quotation sounds like an echo. Indeed, after the need to go further with TDD with the clarifications regarding argumentation, integration of both moral and political deliberations, and moral and epistemic pluralisms, the openness towards the future as a form of anticipation, is very promising for TDD (Reber, 2015c, 2016b). In this way, RRI could conversely contribute to TDD. This line reintroduces into the debate the Aristotelian conception of deliberation as a literary genre turn towards the future, when legal genre considers the past. With my

different contributions to break some limitations of this theory, I have taken into account the Owen *et alii* request pleading for plurality (they call that pluralism, p. 38), having put clearly in a table the different elements of a normative moral pluralism arranged under three levels. In the same way I have underlined the necessity to match ethical and political deliberation. Owen *et alii*, stay more on the political side.

In the GREAT project, we have already used different models of governance, dedicating different places and roles to the experts. With the TDD we can give a broader frame to place expertise inside a more general perspective, relevant for politics, ethics, and interdisciplinarity.

Obama's last idea on deliberation to "shift alliance of consent" is very new in the debate of TDD and very relevant for RRI research. Indeed its goes beyond the need to have the enlightened consent of human involved in research experiments in European funded project (Ethical review), issued from bioethics guidelines. It is relevant too for the GREAT project understanding of interpretation of norms in context. Norms cannot be automatically imposed without the consent of the people who have to obey to them, especially if they are moral norms and not legal ones. Indeed for legal norms you have not the choice to obey or not, without being sanctioned in case of legal proceedings. If you do not obey, you can be prosecuted and sanctioned proportionally to your disobedience. But compared to Ethical review EU actual practises[27], we are more in anticipation here.

As I have recognized in Owen *et alii* article, the more promising element in their list is probably the *assumptions* of the claims. The need to make explicit our assumptions is part of what we have defended in GREAT project as "second order reflexivity", they are in descriptions of situations or normative propositions. We can combine this point and one of the definitions of the TDD presented in my document, the Obama's general presentation. The concern for the enlighten consent is not only a question of interpretation of norms. It asks for second order justifications. Theses justifications are built through the elements of

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[27] For a comparison between ethical reviews and RRI see Pellé and Reber, 2016.

the normative moral pluralism I have presented and by the elements of the general Toulminian scheme of argumentation.

After having recognized some vagueness and confusions regarding Owen *et alii* conceptions of responsibility, I think that it is not a good way to depart from Aristotle conception of deliberation. On the contrary he could help their defence of anticipation, and, in the same way put the TDD further and, combined with moral pluralism, what they call "reflexive capital"[28].

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