JCOM

BEYOND DISSEMINATION — SCIENCE COMMUNICATION AS IMPACT

Reflections on the impact of (playful) deliberation processes in contexts of responsible research and innovation

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Abstract

This commentary shares a personal 'learning curve' of a science communication researcher about the impact of (playful) tools and processes for inclusive deliberation on emerging techno-scientific topics in the contemporary era of two-way science and technology communication practices; needed and desired in responsible research and innovation (RRI) contexts. From macro-level impacts that these processes are supposed to have on research and innovation practices and society, as encouraged by the RRI community, the author discovers more about 'micro-level' impacts; through conversations with peers of her department Athena (VU University, Amsterdam), as well as through experiencing the SiP 2015 conference in Bristol. Based on that, she defines several 'impact-spheres': a modular set of flexibly defined micro-level impacts that events in RRI contexts can have on both academic and non-academic participants, with respect and relationship development as focal assets to aim for; individual (micro-)changes that potentially build up towards an 'RRI world'

Keywords

Participation and science governance; Public engagment with science and technology; Science communication: theory and models

As designer of playful tools for stakeholder and citizen deliberation, I feel an urge to make this contribution playful. Therefore, I use a narrative style: I wrote two letters to Frank Kupper,[1] a colleague with whom I currently design and organize events for inclusive deliberation on synthetic biology for Synenergene.[2] To elicit my personal learning curve on the meaning of the 'impact' that such processes can have on their participants, one letter is written before my visit to the Science in Public Conference 2015 (Bristol, U.K.), while I wrote my second letter afterwards.

Hey Frank!

Let's talk about the impact of science communication, and in particular in the current 'era' of Responsible Research and Innovation (RRI) that we are getting into.

[1] http://www.falw.vu.nl/en/research/athena-institute/staff/kupper.asp.
[2] See http://synenergene.eu.

The Science in Public conference organizers asked me to write a commentary for JCOM about 'impact'. For a few days, I was puzzled which angle to take. A notion of our Synenergene consortium[3] platform-partner Dirk Stemerding[4] in the Journal of Responsible Innovation 'angled' my mind [Stemerding, 2015, p. 141]: *"The challenge of RRI is to create* ***spaces and processes*** *in which innovators and societal actors are invited to critically examine both opportunities for innovation and societal needs, and to identify ways in which these opportunities and needs might mutually shape each other in responsible trajectories of innovation"* This notion caught me, for I think the targeted impact(s) of many science communication 'spaces and processes' in RRI contexts are way 'smaller' than (t)his notion of what is 'needed'.

Entering the RRI era myself, my current learning questions are: how differently should process and event-developing science communicators think when committing to RRI? (In) how (far) can we aim for impact on the actual research and innovation practices? In our current project these questions count as well: (in) how (far) can we achieve (and evaluate) R&I impact with our playful tools for deliberation on synthetic biology, which we design and apply for our Synenergene platform 'SynBio futures'?[5] Can we afford it to test *'which deliberation tools work with whom'* first, before actually going for impacts on the R&I system,[6] or even society as a whole? Or do we need to achieve all these impacts right away? And if so, how to design such processes and how to evaluate them?

Pondering on these questions I first asked our colleague Barbara Regeer[7] how she would make visible the impacts of — as she calls it — transdisciplinary science communication [Regeer and Bunders, 2003]. She said to me: *"Look at the learning that occurs on the sides of each involved actor in the process"*. Fair enough. From previous projects I know we distinguish between first and second order learning [cf. Schön and Rein, 1994]. We eventually aim for the latter, thus evaluate as such. Additionally, design engineering principles [e.g. in Eekels and Roozenburg, 1991] inspire us to approach deliberation processes as a science and technology communication design problem, which we divide into smaller sub-problems that the process eventually needs to 'tackle', e.g. *'providing an adequate introduction' 'warming-up the participants to get them in an interactive mode'*, *'giving space to the multitude of thoughts that may be present among participants'*, etc. These sub-problems become our event sub-aims. Consequently, we create an integrated event or process that forms a satisfying 'whole'. We evaluate the impact of our events on this sub-aim level too, mostly by means of criteria that align with our department professors Broerse and De Cock Buning [e.g. 2012]: the occurrence of substantive, procedural and reflective learning. Altogether, our approach is rather 'micro-level'; namely at the level of individual change.

However, the 'fathers of RRI' express a call for science communication processes with impacts on the R&I practices or society as a whole: *"It is the aspiration to institutionally embed such integrated processes in such a way that deliberation and reflection can be coupled to action (i.e. responsiveness)"* [Owen, Macnaghten and Stilgoe,

[3] See http://synenergene.eu.

[4] http://www.rathenau.nl/en/employees/employee/dirk-stemerding.html.

[5] See info about Synenergene platforms and the objectives at http://synenergene.eu/information/project-organisation.

[6] R&I system refers to 'Research and Innovation system'.

[7] http://www.falw.vu.nl/en/research/athena-institute/staff/regeer.asp.

2012, p. 755]. Their words 'such processes' refer to *"substantive processes of inclusive reflection and deliberative democracy, supported by mechanisms of anticipation that describe the uncertain translation of values through to visions of impact"* [p. 755].

The events we are designing now for Synenergene resemble 'such processes' that Owen and his colleagues refer to, and I think that they *can* elicit high-quality content for input on R&I; especially the playful tools that we are currently designing and applying. It is complex for people to think of future(s) [cf. Guston and Sarewit, 2002], impacts, or express desires, values and beliefs [cf. Kupper and De Cock Buning, 2010]. A playful state of mind helps people to function well in complex processes and tasks [e.g. Lieberman, 1976; Barnett, 2007; Proyer, 2011; Proyer and Jehle, 2013]. The added value of applying playful learning and reflection tools in our science communication efforts, then lies in the fluency it evokes in people to cope with the complexity of processes of deliberation on science or technology. This implies that more substantial conversation content may be exchanged in playful deliberation processes; potentially of higher value for the R&I system compared to content of 'normal' debates and dialogues, where people often get stuck in routinized ways of reasoning or even polarize. In other words, our playful tools like the Frame Reflection Lab[8] and the Theatrical Debate[9] have great potential.

Still, it sometimes seems rather beyond our power to couple deliberation processes to actual actions in R&I practices or society. We'd have to invite many stakeholders and researchers (especially ones with decision making power) to our public events, while they often refrain now saying *"this is not our business"*, or *"not relevant enough for our work"*. We'd have to overcome differences in background knowledge and power, preventing hierarchy in such heterogeneous settings to ensure equality. We'd need to ensure commitment of people with decisive powers on governance, or a will to convert the things being conversed about into actions. We'd have to apply additional processes to facilitate that actual (mutual) impact.... Rather beyond our often limited budgets, but I'd love to. Otherwise science communication in the RRI era might be pointless, right?

Alternatively we could choose to say *"regarding the emerging stage of synthetic biology, **raising awareness** is the targeted impact of our current events"*, but I am slightly scared that too many interactive two-way SC events in RRI contexts are focused already on these 'smaller' impact level aims like raising awareness for RRI[10] or the particular technology or science at stake during the event. I do see a value in triggering citizens to have an eye for science or emerging technologies in their daily life activities, or having the insight that they can 'speak up to science' and 'have a say' in its pace, direction and hence potential impacts [cf. Owen, Macnaghten and Stilgoe, 2012; or Boerwinkel, Swierstra and Waarlo, 2014]. Still, aiming for this 'awareness-impact' feels too much like 'an easy way out' if impacts on the R&I system seem beyond our reach. But may it be clear, we will have to work hard and not only adjust our communication event designs to go for 'deeper' impact.

[8] See http://2014.igem.org/Giant_Jamboree/SpecialEvents and (in Dutch only) https://nvbioethiek.files.wordpress.com/2015/04/podium-15-1-nieuwe-didaktische-werkvormen.pdf, p. 20–23.

[9] www.synenergene.eu/sites/default/files//uploads/SynenergeneNewsletter02-TheatricalDebate(1).pdf.

[10] E.g. see https://ec.europa.eu/research/swafs/pdf/pub_public_engagement/options-for-strengthening_en.pdf.

Comparing views of impacts (and evaluation) that we adhere to at the VU Athena department[11] to the things needed for RRI, we may need to align our micro-level impacts approach with the aimed macro-level impacts of RRI. How? Let's see what people think, say and do during the SiP conference…[12]

Hey Frank,

I'm back. The conference caused some shifts in my view of the impact that we should aim for with deliberation processes in RRI contexts; or with inclusive, interactive science communication practices in general. My view seems to keep expanding, but I think I understand our Athena colleagues' views better now. I see that of course we need to think with great profundity of impacts on R&I practices, governance, institutions or society. However, throughout the conference sessions I noticed that SC professionals (including myself) can be rather occupied with macro-level impacts similar to the ones aimed at within the RRI era. While attending presentations, I caught myself asking *Do the events include a diversity of participants? Do events result in actions in R&I practice?* To speak for myself, I think it makes me blind for what (else) actually happens in science communication, which surely is of high value too. Feeling guilty for this preoccupation, I started searching for elements that we could achieve and evaluate on a micro-level, which could be indicators for change on a macro-level, working towards an 'RRI world'….

First, a notion about impact in the SiP 2015 session of Colleen Kelly (U.S.A.) made me think differently. She said: *"Every conversation with another person does change SOMEthing in you, doesn't it?"*. Yes. She made me realize that beyond all the ideas that RRI and two-way science communication should result in responsiveness and collaborative responsibility taking of multiple societal actors [Stilgoe, Lock and Wilsdon, 2014], the impact of each interaction that we as science communicators facilitate, is and always should be seen as highly individual and personal. This field is about human beings. RRI and change on the R&I system — or change in society — are about (micro-)changes in people. Then shouldn't we embrace that for each involved actor attending science communication events — each with an own background, own interests and duties — the exact 'change' that happens in the mind (or actions) highly differs? Due to the high individual variation between attendees, which we embrace with the concept 'diversity' in RRI,[13] the impacts of our events on individual attendees cannot be *fully* preconceived by us as organizers.

Second, attending the sessions at SiP made me (re-)realize that after all we (all) want to contribute to a *respectful science-society relationship* with our science communication efforts [e.g. Davies et al., 2009; Nisbet and Scheufele, 2009]; as I argue we do in RRI contexts as well. This idea gave me some handles for further defining the impacts to aim for with our events and processes; impacts we could also aim for in advance. Namely, without mutual respect people cannot converse about anything, let alone co-create something in a satisfying manner. So maybe the micro-level aspects such as *'development of mutual respect'* and *'(more) attention paid to others'* should be the most important 'impacts' to aim for. Plus undergoing this personal (mini-)change must

[11] http://www.falw.vu.nl/en/research/athena-institute/department-science-communication/index.asp.

[12] http://scienceinpublic.org/sip2015/.

[13] E.g. see http://www.rri-tools.eu/documents/10182/18424/D1.3_QualityCriteriaGoodPracticeStandards.pdf/f7a1d707-5e54-48cb-949b-053dc7c6f36f.

feel pleasurable, voluntary, fluent, natural, or in other words 'human', since people often voluntarily participate in our events. This is where playfulness comes in again, since playful tools have the potential to make these processes of learning feel more fluent than non-playful settings [Van der Meij, Broerse and Kupper, forthcoming]. Still, I argue that as organizers of SC events we can only *wish* for alterations in favor of respect between participants, again for this voluntary attendance.

To summarize, SiP helped me to realize that the impact of science communication in (and outside) the RRI era is (1) highly personal and (2) voluntary, and (3) therefore hard to completely define beforehand, yet definable in terms of (4) respect and relationship development between people (and a fluency in that). Therefore, I propose we start thinking of certain **'impact-spheres'**. I foresee them as somewhat loosely and flexibly defined levels of impacts to aim for with our events; as well they could be achieved with events that are not explicitly part of RRI practices. To create certain structure in the impact levels they could be coupled to behavioral theories where knowledge and attitudes play an important role in performing a particular behavior [e.g. Ajzen, 1991].

Imagine that (after all) the 'behaviors' we aim for in the RRI era are 'respectful behaviors towards scientists' (among non-academic participants of our events) or 'respectful behaviors towards non-academics' (among academic participants of our events), I would define the following impact-spheres to aim for with our events:

- Level 1: No immediate effects, but some **seeds planted** (for any of the following).
- Level 2: New **insights** in own and other people's thoughts related to the science / technology that is at stake during the event or process.
- Level 3: **Attitude** change towards respect for oneself, other and/or (non-)academic people in general.
- Level 4: **Behavioral** or skill advancement in line with respectful attitudes, such as:
  - Respectful **treatment** of (non-)academics (for example, I would plea for empathic listening!),
  - Acquisition of **deliberative skills** in terms of a critical nuanced stance (in a constructive manner) to knowledge, dialogues, science, or the world (and its continuous change) in general.
  - **Applying** newly acquired insights (see above) in the own daily/professional practice and decisions that are made in that.
  - **Intentions** for paying (more) attention to (non-)academics.

Note that insights in science or technology itself are not part of this list. In contrast, it pleas for a focus on relationship development with a mere attention for 'people'. As a consequence, insights are meant to be gained in values, beliefs, dreams, reflections, etc., yet connected to what some people call 'the facts' about the science or technology at stake during a deliberation process. Also, I wrote this list in such a way that the impact-spheres could be interpreted as impacts on the sides of either R&I or non-R&I attendees of our events. The degree to which these processes of

micro-change on these various levels of the impact-spheres feel original and new yet fluent, human and pleasurable, are good indicators of 'successfully evoked' playfulness; in case the process was designed to be playful. I picture the impact-spheres as onion-shaped figures 'around' the heads of each individual attendee of our events or processes (see Figure 1).

Altogether these aims may seem ambitious and only attainable by means of extensive, longer-term two-way communication practices with mutual commitment of attendees for actions. Indeed as it is right now, one-evening events will merely 'plant seeds' or 'provide new insights' or maybe result in 'attitude change'; and of course analysis of these impacts is still required to evaluate that. Also, the list surely contains open doors. This is true for it builds upon foundations set by so many insights of others. I see links to Abelson et al. [2003] and Carpini, Cook and Jacobs [2004], and after them many publications about RRI [Owen, Macnaghten and Stilgoe, 2012; Boerwinkel, Swierstra and Waarlo, 2014; Stilgoe, Lock and Wilsdon, 2014]. Still I think that these modular multiple impact-spheres approach provides us with a flexible list of evaluative aspects on micro-level linked to the bigger RRI picture in which our events play a role. As well they are aims we can set when re-designing our events for 'deeper' impact(s) on R&I practices, or society in general (ahh!); and for evaluating it.

Now let's get started!

Grtz Marjoleine

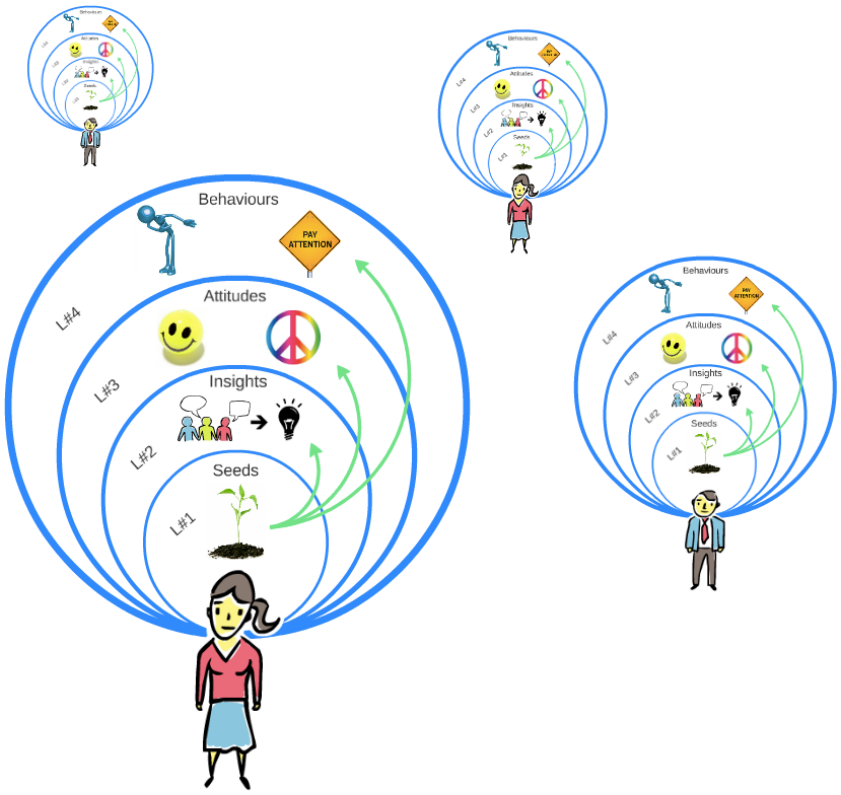

Figure 1. Schematic visualization of the individual impact-spheres one could aim for with science communication processes in RRI contexts (up to four levels of change that can be achieved among participants of our events).

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