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article

Against the tide of depoliticisation: The politics of research governance

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Research has identified a general trend towards depoliticisation. Against this trend, we identify opportunities for politicisation through the international emergence of a research governance tool: 'responsible research and innovation' (RRI). Drawing on face-to-face interviews with university staff, we reveal two factors that influence whether research governance becomes a site of politics: actors' acknowledgement of their societal responsibilities, and the meanings these actors attribute to RRI. RRI provides a focus for political struggles over the public value of research and innovation at a time when science policy is given a privileged role in driving economic growth.

key words politicisation • science policy • responsible research and innovation • universities

Introduction

Since the 2007–08 global financial crisis, states increasingly depend on science, technology and innovation as key drivers of economic growth (Davis and Laas, 2013; de Saille, 2015; de Saille and Medvecky, 2016). As a consequence, demands are placed on scientific research to address societal needs and on policy-makers to ensure public support for science. These political realities have created conditions within which research governance can become politicised, potentially pushing back against the recent phenomenon of depoliticisation (Flinders and Wood, 2014). We define politicisation not as inherently pejorative, but as 'a process whereby people persistently and effectively challenge established practices and institutions, thus transforming them into sites or objects of politics' (Brown, 2015, 7). There is considerable evidence that decisions about the direction and purpose of science cannot be objective and value-free; they necessarily involve *political* questions (Sarewitz, 2015). For many scholars, the recent depoliticisation trend is closely associated with the denial or deliberate

cloaking of these political questions (Burnham, 2014; Flinders and Wood, 2014; Hartley, 2016; Hay, 2014; Sarewitz, 2004). In contrast, politicisation is a means to recognise and open up political questions to a broader range of voices and ensure that the role of values is visible. As such, we agree with Hay (2014) that politicisation is normatively preferable as it opens up decisions about the public good to public scrutiny through deliberation and accountability.

Against this backdrop, 'responsible research and innovation' (RRI)¹ has emerged internationally as a policy tool to shape the direction and nature of science, technology and innovation for the benefit of society, demanding public value from innovation that is broader than economic growth (de Saille, 2015; Owen et al, 2013b). RRI has the potential to politicise scientific research by pluralising expertise and opening it up to a broader range of voices and values: 'RRI cannot be decoupled from its political context, and will itself always embed a strongly political dimension, particularly if it concerns itself with the governance of purpose and intent' (Owen et al, 2012, 755). Despite this observation, politicisation is largely absent from the RRI literature. Yet if RRI is to effectively challenge existing practices and institutions then it will likely create tension and possibly conflict.

In this article, we investigate the potential for RRI to politicise research governance in practice in the way imagined in RRI theory. We interrogate the link between RRI-in-theory and RRI-in-practice through a case study of a research-intensive UK university; identifying how actors within the university interpret RRI and analysing how these interpretations shape possible pathways to politicisation. This case is important, as minimal policy guidance exists for RRI-in-practice, allowing actors significant latitude to ascribe their own meanings to the concept, and there remains 'neither a clear, unified vision of what responsible innovation is, what it requires in order to be effective, nor what it can accomplish' (Guston, 2014). It also addresses the separation of the theory and practice of RRI that is often found in the literature (Macnaghten et al, 2014). In this case, we will show how RRI is indeed having an impact on the university, but also demonstrate both a lack of knowledge about RRI-in-theory and a lack of imagination about what RRI-in-practice might look like. These empirical insights highlight that while the conditions for politicising research governance exist, 'the hard work has only just begun' (Owen, 2014, 116) to rebuild the democratic link between collective decision-makers and publics (Bang, 2009).

Politicising research governance: theory and practice

RRI-in-theory is a response to concerns about the 'societal face' of depoliticisation (Fawcett and Marsh, 2014, 176), aiming to increase levels of democratic input into research governance by providing time and space for broader participation and reflection about the purpose of publicly funded science (de Saille, 2015). In other words, it focuses on a particular part of the political process, politicising the policy 'inputs' which have been depoliticised in recent times (Fawcett and Marsh, 2014). This does not mean that depoliticisation has taken place *in totum*. Rather, it means that sites of politics in research governance have been concentrated on the 'output' side where publics mobilise and participate to challenge policy decisions (Bang, 2009). Most notably, genetically modified organisms have been widely rejected by publics within many European countries, despite regulatory approval. This rejection is a political act, but one which occurred on the output side, only after (initial) policy decisions were

made. So RRI-in-theory should be seen not as an attempt to repoliticise research governance *per se*, but as an attempt to rebalance the politics of research governance between the input and output sides.

Opening up opportunities for engagement earlier in the innovation process through ‘participatory agenda setting’ formed a focus of collaborations between social scientists and the Engineering and Physical Sciences Research Council (EPSRC), paving the way for EPSRC’s adoption of RRI in 2010 (Owen, 2014): ‘Responsible Innovation is a process that seeks to promote creativity and opportunities for science and innovation that are socially desirable and undertaken in the public interest’ (EPSRC, 2015).

In addition to this integration of RRI within research policy, RRI is also identified within specific technology areas. One illustrative example is synthetic biology (Owen, 2014). In 2013, the government announced the Synthetic Biology Roadmap for the UK (the ‘Roadmap’) and the allocation of over £170 million for research and innovation in synthetic biology (Willetts, 2013). One of the Roadmap’s core themes is RRI, seeking to make synthetic biology ‘[a]n exemplar of responsible innovation, incorporating the views of a range of stakeholders and addressing global societal and environmental challenges’ (UK SBRC Group, 2012, 4). Both EPSRC policy (2016) and the Roadmap (UK SBRC Group, 2012) emphasise that RRI must be open to broader participation and provide the means for regulators to be responsive to changing social priorities. These characteristics locate RRI-in-theory directly within the broader depoliticisation debate, mapping directly onto calls for greater politicisation of policy inputs, or what Bang describes as ‘how demands are converted into collective decisions’ (2009, 102). Research assessing how RRI-in-theory translates into RRI-in-practice remains relatively scant. Empirical observations are required, particularly regarding the degree of interpretive flexibility required to practice RRI effectively and the responsibilities of actors (Davis and Laas, 2013; Horst and Nielsen, 2015; Owen et al, 2012; Wickson and Forsberg, 2014). The EPSRC provides minimal guidance for RRI-in-practice, providing practitioners, such as university researchers, with significant opportunity for re-interpreting RRI. Meanings are fundamental to understanding the practice of actors (Yanow, 1993; Pearce et al, 2014), and can provide insights into the emergence of RRI with a focus on the way ‘meanings that shape actions and institutions, and the ways in which they do so’ (Bevir and Rhodes, 2003, 17). While RRI-in-theory may hold a stable definition in EPSRC policy texts, multiple different interpretations of these texts can co-exist and be represented within research (Ribeiro et al, 2016).

RRI represents a new piece of language in research policy within which we can expect multiple meanings to be embedded, affecting actors’ understanding of RRI-in-theory as it is translated into RRI-in-practice (Yanow, 2000). We expect multiple interpretations to be the norm, explaining both failures and successes within policy implementation (Yanow, 1993). Analysing these interpretations can reveal and clarify value disputes, study how divergent meanings play out, and how actors persuade others about the superiority of their interpretation (Wesselink et al, 2013). These meanings are necessary to explain future pathways for RRI-in-practice, and whether they will politicise policy inputs as imagined within RRI-in-theory.

We take actors’ understanding of their responsibilities to be a key factor in assessing the translation of RRI from theory to practice. Douglas (2003) identifies two types of responsibilities to which researchers are subject: 1) *Role responsibilities*, that are specific to professional status; and 2) *General responsibilities*, that extend beyond researchers’

professional ambit to the rest of society. Douglas argues that while ‘the search for truth’ (Douglas, 2003, 66) is a good, it does not transcend other goods such as human rights and environmental health. Hence, it is incumbent on scientists to reflect on the broader implications of their research and the scientific choices they make, balancing their role responsibilities with their general responsibilities and opening up scientific research decisions to societal actors at an early stage.

General responsibilities imply a collective approach to questions including how to define grand challenges, how to think about innovation in terms of values rather than consequences, and how to institutionalise responsiveness to the public (Owen et al, 2012). All members of society have general responsibilities beyond the specific roles they fulfil, but the potential for scientific research to do good and/or harm, and the preponderance of unknowns that cutting-edge research seeks to address, makes general responsibilities of special importance for researchers. In these terms, RRI encourages societal actors to acknowledge and respond to the general responsibilities that lie beyond their role responsibilities.

Methods

The research adopted a case study approach allowing for exploration of meanings and responsibilities through interpretive policy analysis (Yanow and Schwartz-Shea, 2006). As recipients of EPSRC funding and centres for synthetic biology research, universities are key to understanding RRI-in-practice. The case selected (the ‘University’) is a typical UK research-intensive university, with a funding portfolio worth several hundred million pounds and supporting over 1800 projects. The University has an excellent reputation for knowledge exchange and technology transfer, with hundreds of industrial collaborators and numerous spin-out companies. It also has a number of public outreach and engagement programmes, a policy on research conduct and ethics, and a broader institutional strategy. However, none of these documents refer to RRI, suggesting no University definition of RRI and no top-down pressure on researchers from University governance to address RRI. Although the University has no internal policies addressing RRI, a keyword search conducted in June 2014 provided four explicit mentions of RRI all of which related to existing projects and programmes, indicating RRI had begun to penetrate the University.

We undertook face-to-face semi-structured interviews with 22 University staff including members of the senior management, senior research support managers, outreach officers and academic researchers from science, technology, engineering and mathematics (STEM) and social science and humanities (SSH). Interviews were conducted over two time periods: 10 between June and July 2014; and 11 between February and March 2015. In each period, interviews continued until saturation was reached. As RRI was in its infancy at the time of the interviews, participants were first asked about their own research interests and what the notion of responsibility meant to them. Subsequently, we asked whether they had heard of RRI, and if so, where they had heard about it. We also asked participants what RRI meant to them. Participant responses were not recorded to allow for free and frank discussion, helping to make the interviews as conversational and informal as possible (Hammersley and Atkinson, 2007; Pearce, 2013). Written notes were taken during interviews and reflections documented immediately afterwards. Notes were subsequently analysed

for commonalities and divergence between meanings and the degree of awareness and focus on general responsibility.

Analysis and results

RRI in the university

Within our case study, we found that research council policies on RRI were beginning to have an impact on university researchers and staff. In the first round of interviews, the majority of participants were largely unaware of research councils' meanings of RRI and drew significantly on prior knowledge, interests and values rather than specific knowledge of RRI. Two participants had never heard of RRI. The first of these was Principal Investigator on an EPSRC funding application that included an RRI component, yet had no knowledge of RRI or EPSRC's RRI framework. The second participant was funded by EPSRC and was practicing all the elements of the EPSRC's RRI framework yet had not heard of it. Several participants drew on their knowledge of existing frameworks for considering the social dimensions of science such as appropriate technology, research ethics, stage-gating, stakeholder engagement, ELSI (ethical, legal, social issues), technology assessment and anticipatory governance. Several participants had heard the term RRI and regarded it as self-explanatory.

Although research councils are a primary source of information about RRI, we found that the University's activities played a role in disseminating knowledge about RRI. Between the interview periods, the University held a workshop and invited a key RRI academic to deliver a lecture, directly influencing levels of knowledge about RRI. In the second round of interviews, all participants had heard of RRI and the majority sought out specific knowledge from a range of sources. Table 1 shows participants' sources of knowledge. Participants from STEM and SSH working in areas of synthetic biology, industrial biotechnology, ICT and energy held most knowledge of RRI.

Without prompting, half the interviewees suggested RRI had potential to avoid a repetition of the 'GM crisis' in the 1990s that led to the rejection of genetically modified (GM) technologies in food and agriculture. Only three researchers had direct research experience of GM, indicating this link between RRI and GM was being made widely across the University community. For example, one interviewee whose background was in ICT, stated that she first became aware of RRI when reading a paper about GM organisms. Although other politically contested topics such as nanotechnology and sustainability were mentioned by participants, the frequency with which GM was brought up deserves further consideration. In particular, several participants saw RRI as a means of securing public support for scientific developments and this motivation is considered through the context of the GM crisis later in this article.

One similarity across participants was the lack of imagination about what RRI-in-practice might look like, and the degree to which this was a constraint on progress. In particular, participants (STEM and SSH) found it difficult to imagine what constitutes SSH research and/or stakeholder/public involvement and what value these activities might add to scientific research. Even some STEM participants who acknowledged their general responsibilities for practicing RRI could not imagine social scientists² as researchers integrated within interdisciplinary projects. Instead, social scientists

Table 1: Sources of knowledge about RRI in a UK university**EU and UK research funding councils**

- Research and doctoral training funding applications/bids for EPSRC, Innovate UK or BBSRC
- Web searches – EU and UK research councils, particularly EPSRC
- Synthetic Biology Roadmap
- External panels and advisory groups, particularly BBSRC’s Bioscience for Industry Strategy Panel

Academic research

- Academic articles, particularly the book *Responsible Innovation* by Owen et al (2013a) and other articles and lectures by Professor Richard Owen

Internal university activities and expertise

- Interdisciplinary RRI workshop
- RRI lecture
- Expertise of colleagues, particularly social science colleagues in collaborative research, development of funding applications/bids and general conversations about RRI
- Expertise and activities in a university priority area and research institute with a focus on Science Technology and Society

Social media

- Twitter, particularly Jack Stilgoe (@jackstilgoe)

were seen as ‘facilitators’ to assist STEM researchers understand public perceptions or conduct outreach activities, or as ‘guides’ who could help define research questions. In addition, many participants who felt aligned to the principles of RRI and wanted to engage stakeholders in their research as a means to improve research outcomes lacked a vision of what stakeholder involvement might look like in practice. They struggled with the identification of stakeholders and range of possible engagement mechanisms. Interdisciplinary involvement was seen as more difficult than public outreach and stakeholder involvement was seen as more difficult than interdisciplinary involvement. The majority of participants felt public outreach was an essential element of RRI, although motivated by a different set of goals. A smaller number of participants thought SSH or stakeholder involvement in STEM research was essential for RRI.

Meanings and responsibilities in practice

Despite the early stage of RRI’s impact on the University, there are identifiable emergent meanings of RRI-in-practice. Participants identified the practice of RRI in terms of public outreach, interdisciplinary involvement, stakeholder involvement and training and education. Further, we identified whether participants did or did not acknowledge their general responsibilities to society. In the following section, we detail these meanings and responsibilities and show how they interact to illuminate potential paths to the politicisation of research governance through RRI.

Meanings of RRI

All participants identified with one of more of these practices of RRI: public outreach, interdisciplinary involvement, stakeholder involvement and training and education. RRI as *public outreach* is concerned with impassioning future scientists, raising the

reputation of science and increasing scientific literacy. Responsibility for RRI falls on outreach officers and science communicators joined by scientists providing outreach activities with the public at schools, community forums, science shows and through social media. Opportunities for anticipating impacts and for reflecting on the purposes and potential impacts are minimal. Six participants saw public outreach as an education activity. Twelve participants saw it as an essential component of their general responsibilities, providing a foundation for interdisciplinary and/or stakeholder involvement.

RRI as *interdisciplinary involvement* allows a broader range of experts to participate in shaping the research and delivering potential benefits. The majority of participants believe RRI involves varying degrees of interaction between STEM and SSH researchers. For three participants, RRI research was ‘tagged on’ the end of a project already in development. In contrast, for nine participants STEM and SSH researchers could share in knowledge co-production with equal opportunity to shape research questions. Four of these participants thought successful RRI collaboration required early interaction on an equal footing in the project planning process, and universities or research funders should foster such interactions. Although no direct role for public/stakeholder involvement exists, social scientists may conduct research on public perceptions in order to support outreach and communication goals allowing for indirect public influence.

RRI as *stakeholder involvement* is concerned with engaging with multiple organised groups or communities who are often closely affected by the research (end users who could benefit or suffer from the outcomes of research) and/or have specialist knowledge to contribute to the research. Nine participants described a role for stakeholders in RRI in order to increase the quality and efficacy of research and described RRI as the co-production or co-creation of scientific knowledge.

RRI as *training and education* is concerned with embedding a particular meaning of RRI over the long term through the education of scientists and students. It involves education programmes in undergraduate modules, doctoral training centres and mentoring schemes for grant applicants. The key is to embed training as early as possible. Thirteen STEM and SSH participants believed training and education is a core RRI function. Four participants believed training and education is needed to negotiate the new landscape while seven participants believed it is concerned with achieving long-term cultural change.

General responsibilities to society

Thirteen participants acknowledged their general responsibilities. These participants believed RRI was the right approach to publically funded research that should deliver social benefits in response to societal needs and substantively improve research outcomes. These participants were often engaged with environmental sustainability research, ethics and/or ‘appropriate technology’ approaches to engineering and had experience with community, public and stakeholder engagement and interdisciplinary research, especially across STEM and SSH disciplines. RRI validated their beliefs and principles and offered recognition for their work. For example, one participant described her work as the ‘bottom-up movement meeting the top-down RRI’. Many of these participants were already practicing RRI and saw it as a re-labelling or extension of existing practices. Some of these participants raised concerns that

other researchers might see RRI as a threat to existing practices. Five participants believed RRI might address value conflicts in scientific research, based on the belief that scientific knowledge alone cannot solve societal problems, therefore values discussions needed to be incorporated in decisions about the direction of scientific research. One SSH participant believed RRI could address the wider socio-political aspects of scientific research. These participants, who believed scientific research involved general responsibilities, found it easy to justify stakeholder involvement in shaping scientific research.

Eight participants focused on their role responsibilities and did not acknowledge general responsibilities, seeing them as outside the scope of their activities or addressed elsewhere. They saw RRI as a top-down imposed requirement (another 'hoop to jump through') and were unclear about its aims and utility. Some of these participants described RRI as a tick box, fad or buzzword while others argued general responsibilities were addressed in practice through life cycle analysis, commercial licence agreements and Memorandums of Understandings between universities and industry. There was a sense that RRI might have value in gaining public acceptability, satisfying funder requirements, increasing competitiveness and leveraging funds from research funders. Although they recognised that RRI potentially had value they raised concerns about the additional time burden placed on researchers, the degree to which science is already constrained by responsibilities and that RRI might be allowed to halt research. However, there was a strong belief that if RRI (or a similar policy tool) was not implemented, the public may reject science. These participants objected strongly to the politicisation of scientific research and argued against a role for the public in shaping research projects. One SSH and one STEM participant argued the government's role is to set overarching research priorities and the public could participate in the usual representative and participatory democratic mechanisms. Further, the public has an additional opportunity as consumer to shape research. These participants argued scientific research should not be a site of politics and the public should not have a direct role in shaping its direction.

Possible pathways to politicising research governance through RRI

In Table 2, we show that as actors increasingly acknowledge their general responsibilities so we can expect challenges to existing practices in scientific research and the potential for politicisation increases. The nature of these challenges varies across the four meanings of RRI identified above, but what they have in common is that scientific research becomes a potential *site of politics* as actors increasingly embrace their general responsibilities. Where acknowledgement of general responsibilities remains low, similar meanings of RRI do not facilitate scientific research becoming a site of politics. In this section we detail these possible pathways to non-politicisation and politicisation.

Securing support: The GM crisis was understood to be due to secrecy and the public's misunderstanding of the risks, fuelled by an irresponsible media. As public outreach, RRI is a tool to depoliticise scientific research in order to avoid a repeat of the GM crisis. RRI is the responsibility of scientists to tell the public about the benefits and importance of the science, bringing public understanding of the benefits of scientific research into line with that of the scientists, and ultimately leading to greater public trust and acceptance. This pathway is challenging as the public is thought to be

Table 2: Possible pathways to politicising research governance through RRI

	General responsibilities		
Meanings of RRI in practice		Unacknowledged	Acknowledged
	Public outreach	Securing support Communicates the benefits of scientific research <i>Not a site of politics</i>	Preparing for dialogue Provides information as a foundation for public engagement <i>Possible site of politics</i>
	Interdisciplinary involvement	Outsourcing RRI Limits the role of SSH researchers to arm's length facilitators <i>Not a site of politics</i>	Integrating RRI Empowers SSH researchers to contribute to scientific research <i>Possible site of politics</i>
	Stakeholder involvement	Integrating commercial stakeholders Engages stakeholders with a commercial interest in the scientific research <i>Not a site of politics</i>	Integrating broad range of stakeholders Engages stakeholders as experts with valuable knowledge to contribute to scientific research <i>Possible site of politics</i>
	Training and education	Negotiating the new landscape Maintains a 'business as usual' approach to scientific research <i>Not a site of politics</i>	Achieving cultural change Develops 'social-leaning' scientists over the long term <i>Possible site of politics</i>

incapable of understanding the science. RRI entails explaining clearly and loudly the value of research offered as the solution to pre-determined grand challenges such as global food security.

Preparing for dialogue: Public outreach is seen as necessary but not sufficient for RRI. It is essential for successful interdisciplinary integration and stakeholder involvement and considered to be a general responsibility. There is a need for unbiased information to be available to the public to enable it to understand the state of the science including what types of new technologies were emerging. The public is then able to engage with debates about the desirability of scientific research and has a role shaping it. In this way, public outreach is a foundation for possible future pathways to politicisation.

Outsourcing RRI: Social scientists are invited onto research projects to write the appropriate section of applications in response to funding requirements. Social scientists may be identified and brought onto projects by university support staff to write RRI sections of a proposal once it is underway. STEM researchers favour RRI research that provides a service by identifying barriers to commercialisation or conducting public outreach. Principal investigators may have limited knowledge of the RRI component of their project, and social scientists are unlikely to be included in team meetings unless the RRI component of the project needs to be addressed. It is the social scientists who take on general responsibilities and 'represent' the public by translating public sentiment and understanding public perceptions through surveys,

public perception studies or focus groups. As such, interdisciplinary involvement will be unlikely to provide a pathway to politicisation.

Integrating RRI: In this pathway, STEM and SSH researchers work together in interdisciplinary project teams sharing general responsibilities with equal opportunity to shape research questions. Interdisciplinary integration is possible due to established, and often rewarding, working relationships. While social scientific knowledge is essential to deliver social value from scientific research, social scientists may also be facilitators who bring value to a project without conducting research. RRI may be understood as *only* concerned with interdisciplinary integration with no place for stakeholder involvement of any kind. Following established approaches within ethics, social science experts may be regarded as capable of thinking about longer-term societal impacts without a need to engage others. This pluralisation of expertise may result in a pathway to politicisation.

Integrating commercial stakeholders: Commercial stakeholders are invited as partners into research projects on the understanding that these relationships are vital for the rapid knowledge transfer and delivery of economic benefits from research. Commercial stakeholder involvement is encouraged and supported within the University and in strategic funding policies. This involvement places significant emphasis on economic values and challenges scientific norms about transparency of research results. There is some acknowledgement of general responsibilities in this pathway as researchers allow the project to be shaped by external actors, but politicisation is unlikely due to the exclusion of alternative stakeholders, domination of economic values and challenges to transparency.

Integrating a broad range of stakeholders: The line between stakeholder and researcher is blurred as stakeholders are considered experts with alternative forms of knowledge that are valuable for achieving and improving research outcomes. Research is seen as an interactive process with stakeholders: for example, patient groups who collaborated with researchers to help them understand patient experiences or community groups who helped researchers understand their technology needs. These groups may drive the research agenda prior to the development of applications in response to funding calls and research outcomes are likely to reflect a range of values (such as quality of life and environmental sustainability) rather than the economic values dominant in commercialisation. As such, stakeholder involvement may be a pathway to politicisation.

Negotiating the new landscape: Training and education are a means to equip STEM researchers with the skills necessary to negotiate the new RRI agenda. Training and teaching will likely be conducted by STEM researchers and be concerned with embedding a meaning of RRI that facilitates a 'business as usual' approach to scientific research. On this pathway, there will be little opportunity for politicisation.

Achieving cultural change: Training and education are concerned with addressing the social dimensions of science to achieve a growth of 'social-leaning' STEM researchers over the long term. Training and teaching will be conducted by social scientists to provide STEM researchers with the skills to submit grant applications that incorporate RRI and who are able to engage SSH researchers and stakeholders in research projects. Training and education as a means to achieve cultural change may be a pathway to politicisation.

Meanings and politics

The expression of multiple, diverse meanings through RRI should not come as a surprise (Ribeiro et al, 2016). However, adopting a meaning-focused research approach exposes a key tension within RRI: balancing the interpretive flexibility inherent to the inclusion of multiple actors with the shared meaning required for productive policy implementation. RRI has only recently been adopted into UK research policy and remains a nebulous and contested concept. Davis and Laas (2013) argue RRI needs to be left as a fairly general guideline open to reinterpretation rather than a specific definition that may be too strict and therefore detrimental for research outcomes. However, pressures have mounted for a more coherent definition with some commentators arguing that too much interpretive flexibility can render a concept meaningless (Wickson and Forsberg, 2014). So it is the *degree* of interpretive flexibility that is key in strengthening RRI, with a European group arguing for guidelines that ensure ‘the approaches developed in the Member States regarding RRI are coherent while still offering the opportunity to specify and highlight certain aspects of RRI and therefore providing a certain degree of flexibility’ (Expert Group on the State of Art in Europe on RRI, 2013, 48).

Our findings help shed some light on this debate. The UK research councils offer significant interpretive flexibility to researchers. Yet while most participants had heard of RRI, few had read any relevant academic literature or official funders’ documentation. Successfully negotiating the tension between interpretive flexibility and coherent meaning will require RRI guidance to provide sufficient information and specific examples to make RRI a meaningful concept, while still allowing sufficient flexibility to allow reinterpretation based on new information or arguments (Davis and Laas, 2013). Too much interpretive flexibility may result in a return to existing practices and RRI’s potential to make scientific research a site of politics by opening it up to a broader range of voices and values will be lost. For example, if RRI is interpreted solely as public outreach, it will fail to act as a pathway for challenging existing practices. Conversely, defining RRI too narrowly may result in the exclusion of too many researchers and again the opportunity to challenge practices will be missed.

Perhaps what is more important is that the findings illuminate a prevailing lack of imagination about what RRI might look like in practice, particularly regarding inclusion and responsiveness, even by those actors who acknowledged their general responsibilities to society. This resembles the depoliticisation diagnosis provided by Bang (2009), who identifies collective decision-makers as having ‘lost faith in the creative political ability of laypeople to contribute to the authoritative articulation and allocation of values for society’. Further, our case study demonstrates the potential role of universities in shaping shared understandings RRI, particularly in terms of creating space and opportunity for the development of shared understandings of RRI through interdisciplinary discussion and mutual learning. However, where the interdisciplinary element of RRI is ‘outsourced’, rather than integrated, politicisation is curbed. SSH scholars become placeholders for ‘the public’ rather than facilitators of broader public dialogue about the values underpinning scientific research. This meaning of RRI is an example of depoliticisation where ‘star quality’ politicians, managers and social scientists (among others) sideline conventional civil society in public debate (Bang, 2009, 101). So the role for universities in shaping RRI can also

make a broader contribution to countering the broader depoliticisation trend. For RRI-in-theory to be realised effectively in practice, there is a clear need and desire for case studies of successful RRI implementation and opportunities to develop shared understandings of RRI.

The desire for coherent meaning is also reflected in activities intended to define and harmonise RRI (Expert Group on the State of Art in Europe on RRI, 2013). For example, the Synthetic Biology Leadership Council and Innovate UK are working with the British Standards Institute to develop standards for RRI (SBLC, 2014a). The Synthetic Biology Leadership Council states:

The British Standards Institution is working to establish the right approach to help (not hinder) the uptake of synthetic biology. It is the opinion of the SBLC that a framework standard for responsible innovation could be of benefit to the synthetic biology community, and that the UK will benefit more broadly from BSI leading the way in Europe. However, a framework standard should not be limited to synthetic biology: it may contribute a useful worked example, but ultimately a framework standard should be potentially applicable to all emerging technologies. (SBLC, 2014b, Item 12, Discussion with Minister)

Such standardisation may appear initially attractive in the absence of a clear, unified vision for RRI. However, recognising RRI as a potential tool for politicising scientific research places such standards in a different light. A process of expert-led standardisation may usurp the more open political and democratic debate about the values underpinning science that RRI seeks to open up. The data presented in this article suggests developing a shared meaning of RRI within a university presents a challenge with a fundamental cleave in values between those believing in greater inclusion in scientific research and those seeking to largely maintain the current shape of science–society relations. Such values are deeply ingrained, and the chances of reaching a consensus may be slim.

This challenge is not a barrier to progress, however, but a signal that discussion of values needs to take place within a robust, open process in order to enable compromises to be agreed regarding the role of societal actors in scientific research. Such compromises may be unpopular and disagreeable for many, if not all, of the actors involved (Brown, 2015). However, an open political discussion helps enable actors to accept such compromises and move forward. Where discussion of different values remains suppressed, there is a danger that the alternative will be violence (Brown, 2015), as occurred with the destruction of field sites for genetically modified crops in the 1990s (Kuntz, 2012), an extreme example of politicisation being squeezed from the input to the output side of research governance. Publics are not apathetic about scientific research but will choose to participate on their own terms. Under such conditions where policy precedes politics, publics may be left with no choice but to focus their efforts on the ‘output side’ of politics (Fawcett and Marsh, 2014). For such actors, the ‘GM crisis’ was not a crisis at all, rather an example of publics pursuing ‘good governance on the output side’ in the face of domination by a combination of political, corporate and scientific elites (Bang, 2009, 104). Here, research governance is input-depoliticised but output-politicised. Bang (2009) argues that this is a consequence of publics who value concrete actions in particular political realms over abstract forms

of participation. This may be so, but we agree with Hay (2014) that while output-politicisation is important it is no substitute for formal political engagement, and that input-depoliticisation signifies that ‘something very significant has...been lost’. In the case of RRI, that ‘something’ is an ‘upstream’ focus on the values underpinning science funding decisions, in favour of a persisting ‘downstream’ focus on governing technologies once they have emerged.

The instrumental attraction of RRI as a means for avoiding another GM crisis was clear to some of those interviewed. However, RRI holds this potential not because it depoliticises research governance, but because it can expose those conflicting values suppressed by previous policy tools governing science–society relations. The potential will only be realised through an acceptance by actors on all sides that progress will only be possible through political engagement with each other with the aim of discovering a shared meaning of responsibility to enable RRI to act as an effective research governance tool.

As a tool of research policy, RRI belongs to a category of activities through which politics influences science (Brown, 2015). This does not mean RRI *necessarily* politicises scientific research, merely that it holds the potential to do so by facilitating challenges to established practices and institutions, thereby making certain sites of science also sites of politics (Brown, 2015). While the move from ELSI to RRI signalled a change in research policy, the RRI frameworks provided by UK research councils are insufficient for understanding the meaning of RRI for the University. Rather it is the struggle between meanings expressed through RRI that will determine whether existing practices are challenged or defended, and the consequences of this struggle for the regulation and practice of science.

Values are inherent to the meanings of RRI expressed by actors (Yanow, 2000). For those actors who value greater public inclusion in scientific research, RRI is a means to cement these values within the everyday practice of science. For these actors, public inclusion is currently lacking and has brought about negative consequences for both the scientific community and for wider society. So RRI provides an opportunity to promote these values, establishing it as a tool for change. Other actors favour a more limited role for the public research governance, expressing this value by interpreting RRI as a description of science–society relations rooted in the existing customs of ELSI and Public Understanding of Science. For this latter group, the challenge is to establish this meaning, thus suppressing more radical notions of public inclusion in science and resist science becoming a site of contestation and political struggle. Here, science remains a site of ‘nonpolitics’ (Brown, 2015). While protecting science from politics may sound instinctively attractive, a state of nonpolitics does not mean politics is not affecting science merely that the current accommodation between the two, as enacted through research policy, remains unchallenged. Within the UK, economic growth has been central to recent arguments for maintaining levels of government spending on science, with spending concentrated in the ‘eight great technologies’ identified as providing the greatest potential for long-term economic growth (Willets, 2013). These moves constitute politicisation of scientific research as much as calls for greater public inclusion do. The difference lies in the latency of the latter, as compared to politicians’ repeated public emphasis on the imperative for economic growth. Long-standing dissatisfaction with the state of science–society relations by some actors within the University was hard to express through previous

tools of research policy. RRI provided a means of publicising this dissatisfaction and activating the potential for contesting the status quo (Brown, 2015; Ribeiro et al, 2016).

Conclusion

At the beginning of this article we argued that RRI was, in theory, an internationally emergent research governance tool that appeared to counter broader trend towards depoliticisation. We noted that relatively little empirical work has been undertaken into how RRI-in-theory has been translated into RRI-in-practice. As a first step to filling this gap, we have taken a case study of a university to highlight two crucial aspects of RRI that have been underdeveloped in the academic literature to date. First, RRI has multiple *meanings* embedded within it, held by a range of relevant actors, and these meanings matter for the implementation of RRI within universities. Second, the challenge provided by RRI-in-theory to existing practices and institutions implies scientific research may become *a site of politics* where particular meanings of RRI intersect with an acknowledgement by actors of their general responsibilities to society. At the start of this article we described this as the politicisation of scientific research (meant positively, not pejoratively), situating RRI as potentially countering recent trends towards depoliticisation. This article has confirmed this potential, but also illuminated how RRI-in-practice might be harnessed to maintain scientific research as a depoliticised zone, in the belief that such a pathway might help to avoid a repeat of the 'GM crisis'. Our research suggests that this view is mistaken, and that RRI must open up possibilities for politicisation on the input side of research governance. If it does not, then scientific research will indeed remain a site of nonpolitics, but this will risk squeezing politicisation to the output side; in other words, significant public resistance to certain emerging technologies.

Universities provide a key site for the struggle between meanings of RRI that will determine the development of RRI-in-practice. The challenge for UK universities is to respond to national and supranational funding policies by bringing together existing project-level RRI activities under a governance framework. To achieve an effective response, universities need to foster dialogue across disciplinary boundaries, particularly between the natural and social sciences. This may help to bring greater understanding and coherence of meaning between different perspectives. This task will be aided by paying greater attention to the importance of RRI case studies as a means of moving away from abstract governance concepts in order to help actors imagine what responsibility might look like in practice. While we recognise significant challenges exist, such as resource availability, limited time, and university and disciplinary cultures, general responsibilities are inescapable – a failure to fulfil them will likely lead to greater external oversight at the expense of scientific autonomy (Douglas, 2003).

The case study also provides wider lessons for those interested in renewing democratic links between policy-makers and publics, demonstrating that depoliticisation is a trend that could potentially be arrested. Formal governance tools such as RRI are fundamental to politicising policy inputs, policymakers must also be aware of the ways in which these tools interact with the meanings in practice, which will ultimately determine the extent to which politicisation takes place. Further research is required to identify sector-specific examples of input-politicisation and the role of national

political systems (Dryzek and Tucker, 2008) and the ways in which policy-makers imagine the role of publics in democracies (Ezrahi, 2012; Nowotny, 2014).

Those who seek change often find themselves at a structural disadvantage in comparison to those who defend the status quo. This case study demonstrates that the impoverished state of politics identified in the politicisation literature extends to research governance. Yet, it also provides reason for hope, in that RRI has become integrated into research governance and is, in theory at least, a tool for broader participation in decision-making. RRI provides a seed for politicisation, but it has not been sown on fertile soil. In order to capitalise on the opportunities for politicisation in research governance, there is much 'hard work' still to be done (Owen, 2014, 116).

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Notes

¹ 'Responsible research and innovation' and 'responsible innovation' are both terms identified in academic and policy texts. For the purposes of this article, we use the term RRI inclusively.

² All participants referred to social scientists but did not mention humanists.

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