'Younger people have like more of an imagination, no offence': Participant perspectives on public engagement

A wide range of work has reported on the outcomes of public engagement activities and the views expressed by public participants towards specific areas of science and technology. Such work has rarely gone on to explore with public participants their attitudes to the engagement experienced itself, often focusing instead on more practical or quantifiable aspects. This article draws on public participants' reactions to eleven 'engagement' events, occurring across the UK in 2007-2008. Reporting on 33 semi-structured interviews we focus on their views of participation and engagement in terms of motivations, expectations and expertise. The results suggest that participants have considerable expectations in terms of information and interaction, operate with critical but respectful notions of other 'publics' and expertise, and may develop habitual tendencies regarding engagement.

Key Words

Public, Engagement, Expertise, Robotics, Participation.

1. Introduction

Across the globe a wide range of organisations, policymakers and informal educators are 'engaging' publics with science and technology. Engagement brings new responsibilities to citizens that are involved to be 'representative', and to contribute to processes that are still encountering practical and ideological challenges (Irwin, 2001). Yet research remains limited from the perspective of citizens who participate in public engagement and their views on the process of engagement. Despite a good deal of focus on the motivations and aims of scientists and engagement practitioners involved in such procedures (Martín-Sempere, Garzón-García, and Rey-Rocha, 2008; Poliakoff and Webb, 2007; Pearson, 2001) the attitudes of publics themselves to engagement processes are frequently overlooked (Felt and Fochler, 2008). In

this article we consider the role that publics identify themselves as taking, as well as their motivations, needs and expectations when participating in engagement around science and technology. We focus on a single area of science and technology - robotics - in order to maintain greater consistency of comparison. This research went beyond an *evaluation* of the citizens' involvement, to a deeper investigation of what it meant to them to be involved.

Previous research has examined in depth the motivations, benefits and deterrents for scientists seeking to engage with members of the public (Bauer and Jensen, 2011; Burchell, 2007; Burchell, Franklin and Holden, 2009; Classens, 2008; Davies; 2008, Jensen, Rouquier, Kreimer, and Croissant, 2008; Poliakoff and Webb, 2007; Royal Society, 2006; Authors Reference, 2010). Aspects of this work, as well as the recognition that numerous definitions of public engagement are in operation despite or perhaps due to its broad uptake as a concept (Tlili and Dawson, 2010; Trench, 2008), has led to criticism that some organisations may be driven by a public relations and/or acceptance strategy. Such approaches ascribe additional responsibilities to publics, responsibilities that are deemed acceptable by experts (Corbyn, 2008; Kerr, 2003; Powell and Colin, 2009). Despite the shift to dialogic, participatory and engagement approaches, the notion of an 'ignorant' public to be rationalised or educated can remain beneath the rhetoric (Alsop and Watts, 1997; Burningham, Barnett, Carr, Clift, and Wehrmeyer, 2007; Featherstone, Wilkinson and Bultitude, 2009; Kerr, 2003; Michael and Brown, 2005). This has led to calls not for a rejection of public engagement 'exposing what public participation exercises do *not do*, what they fail to do, what their deficits and restrictions are' but instead 'it is important to investigate what they *are* doing' (Braun and Schultz, 2010;406 emphasis in original). The role of publics in this setting, and how they perceive their own role(s), is thus of prime interest and importance.

Efforts to increase public participation have been criticised for the lack of attention to deliberative processes and citizens' outputs, in comparison to aspects such as procedural

matters (Abels, 2007). More recently however, within the UK Burall and Shahrokh (2010) investigated citizens' attitudes towards their involvement in Government consultations and national decision making forms of public engagement. Their review of previous evaluations of Government-commissioned public engagement activities found that:

> Members of the public who have participated in pre-organised public dialogues consistently comment that they see a high level of value in the processes and the opportunity to influence national decision-making. (Burall and Shahrokh, 2010: 6)

European data is less optimistic; 29% of Eurobarometer survey respondents agreed that the public should be consulted and public opinion considered when making decisions about science and technology (European Commission, 2010). However little is known about participants' attitudes to public engagement events with less direct policy implications, or differing settings and agendas (Lehr et al., 2007). How our conceptions of expertise may (or may not) be challenged by modern science and technology (Puliot, 2011), how lay/expert lines are bridged (Kerr, Cunningham-Burley and Tutton, 2007) and the interplay of science and society that surrounds it are key topics of debate (see for example, Collins and Evans, 2007). Work at a theoretical level has led some to view publics not only as 'romanticised' but also as seen to possess a reflexive agency which is no longer accorded to experts in such settings (Durant, 2008).

Brawn and Schultz (2010:406) examine the assembly of 'publics' within participation arrangements, suggesting that approaches to participation can be both enabling and restricting: '"The Public," we argue, is never immediately given but inevitably the outcome of processes of naming and framing, staging, selection and priority setting, attribution, interpellation, categorisation and classification'. Whilst this perspective is useful in considering the different ways groups and organisations may seek to 'regulate' participation,

such work has rarely reflected how publics themselves may identify with such roles (Michael and Brown, 2005) or may come into being when controversial disagreements arise (Marres, 2005).

At a broader level there has been discussion of the conceptualisation of publics via such approaches (Stirling, 2005). Michael's (2009) work highlights the way in which publics are made, typified, patterned and importantly, performed as an identity, within public engagement arrangements. The important point is that within the wider public engagement agenda 'it is assumed that laypeople 'want' to engage in this way with scientists' (Michael, 2009:620). Priest (2009) has argued further that many people simply may not have the time to engage, whether they wish to or not. Michael's (2009:618) theoretical work suggests publics' complex performances conform to cultural and social resources surrounding expectations as to what 'being a member of the public' means.

Accounts are emerging in the literature which seek to elicit the views and experiences of publics in participation processes, often utilising transcripts of such approaches or evaluation reports (Abelson et al., 2007; Burall and Sharokh, 2010; Davies, 2006; Kerr et al., 2007). Burri (2009) examined the strategies that members of citizen panels developed when dealing with uncertain and emerging technologies, suggesting participants often rely on analogy and habitualized interpretation from similar previous experiences to formulate views around uncertain and evolving areas of science and technology. Similarly, Scheufele and Lewenstein (2005) proposed that members of the public do not use all available information when making decisions about new technologies, instead utilising existing ideologies, religious inclinations and familiar media coverage.

Experts and stakeholders play a role in providing information and perspectives for public deliberation (MacLean and Burgess, 2010), with public participants being responsive but also critical of the information which they receive. Work in the informal learning field (Falk,

Moussouri, and Coulson, 1998; Falk, Storksdieck and Dierking, 2007) has suggested that public participants can however become less questioning and 'scientific' in their views towards science itself. Visitors 'were more likely to think that science has the answers to all problems, and were less likely to think that scientists often disagreed with each other' (Rennie and Williams, 2006:884) in one such account. Felt and Fochler (2008) examined the views of citizens involved in an activity considering genomics and found that many citizens, including those engaged in a participatory process, found it difficult to identify what their role might mean at either an individual or societal level. Finally, recent work has suggested that public participants contributing to research funding decisions enjoy participating and that it influences knowledge and opinions, to the extent that it would encourage attendance at similar activities in the future (Rowe, Rawsthorne, Scarpello and Dainty, 2010). In this article we consider what are the roles that publics identify themselves as taking? And what are citizens' motivations, needs and expectations when participating in engagement around science and technology?

2. Methods

The work described here was part of a wider programme which focused on public attitudes towards robotics and the types of approaches to engagement that were utilised within the robotics field at the time (2007-2008). The project was novel in this focus as few projects have sought to capture information across a series of unrelated but parallel engagement activities within a distinct field of science and technology. Often the findings and evaluations of such projects are based on single activities or generic and wide scale overviews of a particular technique. This project took an innovative approach as it sought to observe public attitudes towards robotics, under-researched in contrast to areas of science and technology such as genetics and nanotechnologies, whilst utilising pre-existing engagement activities which were occurring at a number of organisations. The UK focus was selected due to the

presence of significant robotics research, as well as a vibrant engagement community. Permission was granted from an existing programme of robotics-related public engagement, 'Walking with Robots', to observe a selection of their activities. This provided a good starting point via which to identify others seeking to engage the UK public about robotics. Robotics researchers, science centres and/or science communicators coordinating robotics focused engagement activities were contacted across the duration of an eight month data collection period (June 2007-January 2008) to fulfil a quota sample of 10 engagement activities. The project did not seek to systematically analyse, compare or evaluate the activities occurring in a normative manner (Rowe et al., 2008; Kasperson, 2006), it was exploratory in nature and utilised predominantly qualitative methods.

The resulting sample included a range of different types of activities which we have classified here according to their objectives and the Public Engagement Triangle Tool (BIS, 2011). This tool has been designed for conversational use, to be adapted and flexible but to encourage science communicators 'to test, challenge, analyse, broaden and draw out explicit and implicit (public) engagement objectives' (British Science Association, 2011). Each activity description below (Table 1) includes its type, location, target audience and size (where possible to estimate), and funder. In addition a note is provided to indicate which activities were additionally observed on video.

< Insert Table 1 about here>

A small number of the above activities can be seen to involve educational motivations. Although not the main focus of the research, such activities were included to provide a representative perspective of existing science communication activity. They were supported by schemes designed to encourage wider public engagement and/or included engagement aspects. Therefore they represent a 'snapshot' of public engagement activity at the time. Additionally, as other authors have highlighted (Braun and Schultz, 2010; Kerr,

2003), many public engagement processes, for example participatory mechanisms, continue to include elements of education, not just deliberation and decision making.

Participant reactions to eleven 'engagement' events were explored via 11 structured observations, 8 video observations and 61 semi-structured interviews. The semi-structured interviews involved three distinct groups: 1) event organisers who arranged the activities (n=17); 2) engagers or experts that were involved in delivering the activities (n=11); and 3) public participants or people who were engaged in the activities (n=33). This article reports on the 33 semi-structured telephone and face-to- face interviews with public participants, carried out in the seven days following the engagement. For succinctness this article does not report on the video and observational based data. A break was incorporated in order to allow a reflective period for participants, and to reduce the interruption to interviewees' experiences of the engagement events. However in certain locations (mainly science centres and museums) participants stated a preference for immediate interviews instead of telephone interviews a week later. 20 interviews with public participants occurred at the engagement event, the remaining 13 occurred via telephone.

The interview guide included a short amount of open questions on attitudes towards robotics, reactions to the activity and views towards public engagement in science and technology more widely. The interview guide was kept brief to encourage involvement in busy locations and to reflect that participants were giving up their free time. The interviews covered questions such as 'why did you become involved in this activity?' and 'how did the activity meet your expectations?'

Interviews were digitally recorded and transcribed, before coding and analysis using the qualitative software programme NVivo. A coding frame was developed between the three researchers based on Ritchie and Spencer's (1994) five-step framework analysis. Throughout this process we set out to agree upon and negotiate common themes and key findings across

each of the datasets. Standard ethical research procedures were followed at all times and pseudonyms are used here.

3. Results and discussion

3.1 Motivations for engagement

Habitual engagement

As this research sought to examine a range of engagement mechanisms and styles, we were interested to find out what motivated people to be involved in the specific activities observed. For many participants engagement fulfilled a 'cultural' role; they were motivated to contribute since they enjoyed participating, or had been to the venue before and found the activities they hosted rewarding:

> We come along quite regularly, we live nearby and we have found it very informative in the past. The girls have come with the school and they change on a regular basis doing, covering different topics. (Beverley, Participant, Activity 5: Robotic Show/Presentation)

> I mean that's [attend a lecture] something that we do every month…I suppose what motivated us is the quality of those lectures is usually of a pretty high standard, there are the occasional disappointing ones, but that doesn't happen very often. (Alan, Participant, Activity 1: Robotics Expert lecture + Q&A)

For some, involvement in an activity had become a habitual aspect of their free-choice routine, with visits to a venue providing social contact or an opportunity to spend a few hours in an environment they liked or that was convenient to them:

> I go down the [names venue] reasonably regularly, it's a quite entertaining place to go when I've got a couple of hours to kill midweek, evening, it's basically an excuse to

exercise my brain outside of the confines of work…and they've got some decent wine and food there as well. (Phillip, Participant, Activity 11: Discussion Events in Science Café Style (with experts present))

The participants' comments suggested that the location, facilities and past experience of similar engagement style activities often had a strong influence on participation.

Attraction of Robotics

The subject matter also influenced people's decisions to participate; a number of participants mentioned robotics as being an attraction:

It was for the boy really…all of us have never been here before and then we saw the cyborg on the internet, we researched it this morning and he seemed interested in the robot so I said, right, let's go. (Sharon, Participant, Activity 4: Robotics and Design Exhibition)

Well my daughter and her friend…they have…set up this science and engineering club in their school...and they are actually covering robots in the…engineering side. They are trying to put robots together…I knew there was a lot of robot stuff going on…so I thought I will just bring them along. (Sue, Participant, Activity 5: Robotic Show/Presentation)

The appeal of robotics was more evident for those attending events targeted at younger age groups. In contrast a number of those who attended engagement activities aimed at older or mixed groups, appeared more responsive to engagement per se and a commitment to participation, than the subject matter itself (Michael, 2009). Motivations to attend varied across participants and within participants, where there could be multiple agendas driving involvement (Falk et al., 1998), but there was often a noticeable expectation that the

engagement would be of good quality based on prior experiences, suggesting many of these activities were reaching participants who already have a connection with or to the science engagement opportunity.

3.2 Views towards participation

Influence of Engagement

Scientists who participate in public engagement often see value in receiving public recognition and comment on their field of research (Authors Reference, 2010), though it is not always clear to participants how public questions or attitudes can or may influence the research in question. The dialogic or discussion based role that public engagement might take was difficult for publics to conceptualise, despite being part of the remit for many of the participatory activities observed. Who should be 'engaged' and how their views can or may influence were key topics within the interviews. However this often proved understandably difficult for interviewees to discuss. This was the case across all eleven observed activities, including those with a more active policy or two-way remit. Margery responded to the role that publics might take in such activities:

> Into the labs, I'd like it to be a two way thing, he comes to tell us about robotics and stuff, and it'd be quite nice for us to come and tell him what we think about it and ask more questions, because we didn't have a lot of time for questions...they think the poor things will get tired, so we can't possibly ask more than half a dozen questions…it tends to be a bit one way I suppose (Margery, Participant, Activity 1: Robotics Expert lecture + Q&A)

Although Margery made the above comments in a light-hearted manner, she also made reference to her age as being a relevant factor; the differing ages and responsibilities of participants was a common issue that arose. Linda, a participant in the same robotics expert

lecture (which was primarily aimed at those over 65), talked about the function that such activities could provide, as offering a rich source of information for scientists, as well as maintaining a sense of value, whilst Alan highlighted other forms of relevance:

> Interviewer: do you think it's important to engage members of the public with issues around science and technology?

> Put it this way, there's a lot of very, very eminent people that are in our [community], that I think could be used even now...I don't think that knowledge ought to be wasted (Linda, Participant, Activity 1: Robotics Expert lecture + Q&A)

> It's where we are in society, it's [technology] just part of our lives and because my wife and I are both over seventy, we have health problems, umpteen issues to do with health...technology is just everywhere and all the issues involved in it are around all the time. (Alan, Participant, Activity 1: Robotics Expert lecture + Q&A)

Alan's comments drew an analogy with the health issues he was currently experiencing, suggesting that this interaction could lead to a potential insight into others. This capacity to draw analogies, particularly as 'patients' when dealing with potentially 'risky' technologies has been noted elsewhere (Burri, 2009; Kerr, Cunningham-Burley and Amos, 1998). Whilst Linda and Alan highlighted the significant experiential knowledge older generations were equipped with, for others the main incentives related to the impact that they could see such developments having on others, particularly their grandchildren:

> I suppose we are very much influenced by the developments of technology, in the way we live our lives... a whole lot of things going on in laboratories which may have a profound effect on our lives in the future and those of our grandchildren in my case, so we should

know about it, understand it and discuss it. (Terry, Participant, Activity 1: Robotics Expert lecture + Q&A)

As Terry's statement demonstrates, participants often suggested there were particular characteristics or stages in life which would make one more open or duty bound to 'citizenly' tendencies (Michael, 2009). They frequently identified with a 'supplementary' expertise, as noted in Davies' (2006:246) work whereby 'their own experiences articulated with and at times supplemented expert views'. Some of the younger participants we spoke with discussed both their potential roles in taking scientific research forward as well as personal career aspirations. Here Joshua (a school student) describes the relative importance of engaging younger or older people in science and technology issues:

Younger people probably have different ideas and younger minds probably think better.

Interviewer: ok, so it's a sort of innovative?

Yeah, so you get a view from younger kids and older people, then you might probably find out a really good idea because younger people have like, more of an imagination, no offence.

Interviewer: no that's alright, I still consider myself to be a younger person (laughs)

So they have more imagination, so they'll be able to kind of think outside the box, but then older people will be able to have more technical thing, so they'll be able to take those ideas and put it into reality. (Joshua, Participant, Activity 3: Robotics 'Summer School')

In these quotes participants of differing ages clearly felt they had something to offer scientists. Their contributions were however, framed loosely, with little reference to specific methods for influencing scientific or technological development.

Engaging Subjects

Across the interviewees the idea of how publics might participate could be difficult for participants to envisage but was rarely rejected outright for a reliance on 'expertise' alone. Participants highlighted that certain subject areas would be more appropriate for participation than others:

> I think if it's something which is going to be in society to change people's lives then everybody in that society does need to be part of the decision…something like voting or…I don't know – give them some kind of questionnaires to find out what they're feeling about different things. (Sharon, Participant, Activity 4: Robotics and Design Exhibition)

> I think where we're talking about um, biological or chemical side of things, certainly I think GM crops, I think [people] probably should be aware of what's going on and should be able to veto stuff they don't agree with...I think there's a large amount of technology that doesn't really need the attention of people and a lot of people aren't really interested in. (Steve, Participant, Activity 6: Robotics Expert with Demonstration)

Previous work has highlighted how public engagement approaches are often shaped to specific aspects or technicalities that experts deem to be of relevance (Cunningham-Burley and Kerr, 1999, Kerr, 2003). The comments above were interesting as they suggested that participants similarly felt that specific areas were of more relevance than others. Unfortunately we were not able to assess whether this had been shaped by their engagement within the process itself; that those involved might now perceive some aspects as being best left to the experts due to their interaction. However views on the degree of importance of public participants playing an active role in the activity varied.

Participating

Interviewees identified a range of preferred degrees of 'participation'. Some were active. Terry was keen to probe issues and voice his own views:

> The most satisfying result for me was to be able to ask a question about that particular issue, about would a robot ever feel it had free will and [names scientist] I think gave me a quite a long reply, to the degree to which I hope in the near future to be in touch with him again. (Terry, Participant, Activity 1: Robotics Expert lecture + Q&A)

Terry recognised his level of personal involvement in the events but also associated such involvement with possible follow-up activities. Matt also liked to ask questions, but in his response focused mainly on the style and atmosphere of the setting involving, suggesting it had been constructive, with the setting supportive and relaxed:

> I don't think I can remember anybody getting too het up about anything or upset by anything that was said, by any of the questions, and yeah I really enjoyed it... I think it was a really nice forum...and for there to be intelligent conversation in a pub for a change. (Matt, Participant, Activity 10: Science Café on Artificial Intelligence)

Matt suggested his confidence arose due to the relaxed environment lacking hostility. Deirdre, in contrast, explained how she found the questioning and debating aspects of some public engagement activities difficult, a theme echoed by Caroline:

> A lot of people there seemed to know a lot more about it...at some point it became more of a debate... I'm all for people talking, [but] I don't really want to better the person and I felt that some, in a way, that's what a debate is almost, that you are trying to get the other person to acknowledge what your thoughts is, and I wouldn't be doing that, I would want

information… I thought it was perhaps too basic a question or too basic a thought, to put forward, so I felt I wouldn't do it, but I would still have liked to have known it.

Interviewer: do you feel more comfortable approaching the speakers in the breaks then if you are worried about talking?

Yes, I would do if I wanted to…unless you are absolutely geared up...when you do ask a question you always wonder whether you can field the answer quite as well. (Deirdre, Participant, Activity 10: Science Café on Artificial Intelligence)

Yeah, I wasn't very familiar with the subject so I wouldn't [ask a question], I wanted more time to absorb what [happened] then, but when I am more familiar with the subject then I would ask a question...I like the fact that it's not formal, there is no stage as such and people feel free to ask (Caroline, Participant, Activity 11: Discussion Events in Science Café Style (with experts present))

Inevitably some participants felt more comfortable and confident asking questions or contributing to discussion than others, but this also drew out issues as to how desirable 'engagement' was. A key element here was participants' expectations; how well prepared they felt and whether there were opportunities for them to contribute. Bella discussed the problem she felt occurred when an event that normally incorporated multi-way discussion focused instead on a more traditional format:

An absolute must would be to actually leave time for discussion, that was a big problem for me at this particular session... it's still a Q&A, it's not a discussion, there was not enough time left for the audience to actually bounce off each other. (Bella, Participant, Activity 11: Discussion Events in Science Café Style (with experts present))

Thus logistical aspects of the activities impinged on the ability for some to feel involved and fulfil their own motivations. The impact of such practical aspects has been noted elsewhere, for example issues arising through engagers maintaining a strict agenda and oversimplifying even if the intention is to be more discursive (Cherryman, King, Hawkes, Dinsdale and Hawkes, 2008; Rennie and Williams, 2006; Schibeci and Harwood, 2007).

Interacting with the subject

Some participants (especially those interacting at science museums and centres) expressed a desire for more direct interaction with robotic artefacts (Tlili, Cribb and Gewirtz, 2006):

> It was all heavily reading things and looking at things, whereas to me, if you're involved with kids, they need hands on, somehow – to get them involved and then…At their age they're too impatient to sit and read, aren't they? (Kayla, Participant, Activity 7: 'Robot' Building /Craft Workshop)

> I know she did take a little boy up on stage but I think it would be nice if there was a bit more, where the crowd got more interactive with the actual robots. (Sue, Participant, Activity 5: Robotic Show/Presentation)

A variety of views were expressed regarding preferred participation levels, including with robots themselves, but there were also expectations implicit as to what the engagement activity would provide. When these expectations were not seen to be met disappointment was noted.

3.3 Requirements for information

Pitching for literacy

A number of comments highlighted more traditional notions of science communication; the need to increase understanding, awareness and information. Concepts of scientific literacy

and public understanding of science (as opposed to public *engagement* with science), were pervasive amongst participants. Indeed some participants commented that they had not received the level of detail they would have liked or expected:

I'd like more information...maybe he [engager] was trying to pad it out because there wasn't an awful lot of information in there, really... if it goes over our heads, that's fine, we can always look up the words in the dictionary later [interviewee laughs] (Margery, Participant, Activity 1: Robotics Expert lecture + Q&A)

I think she was trying to give people an introduction into what artificial intelligence was, but I think she [engager] could have done that in a far more concise way and then given some more meaty information really, but I don't know, I'm not a computer scientist so maybe it just all went straight over my head. (Toby, Participant, Activity 10: Science Café on Artificial Intelligence)

In the case of Toby and Margery it was apparent that information 'provision' in the engagement activities had not satisfied their inquisitiveness, despite neither having prior expertise in the subject. Such comments also demonstrate the hesitancy researchers and practitioners in the field may face when embedding information or learning provision within such activities: 'conceptualizing "dialogue events" and other public engagement efforts as sites of learning may seem dangerous in the context of the failure of the "deficit model"' (Lehr et al., 2007:1472)

Perceptions of 'others'

Some of the participants we spoke to had an existing science background. This 'bias' has been found in other work within the field, where those with a professional or educational interest appear in 'public' settings (Rennie and Williams, 2006), and the arguments made by such participants were strongly reminiscent of deficit model approaches and a depiction of an

'irrational' wider public despite their own rational reflection (Kerr et al., 1998; Michael and Brown, 2005):

> We are biased in my house… I did a PhD... I worry very much that, huge parts of the youth of today is doing media studies, and all that kind of thing, and very few are doing pure science and I compare us with a lot of the other countries where there's a much greater interest. (Michelle, Participant, Activity 2: Robotics exhibits at a science museum)

> I like it when the public's perceptions of science are furthered or challenged and I don't particularly appreciate the sort of stereotypes and misinformed views that everyone, people have for everything from electromagnetic radiation through to nuclear power through to stem cells through to genetics, I think there is a vast amount of ignorance. (Phillip, Participant, Activity 11: Discussion Events in Science Café Style (with experts present))

Michelle and Phillip's comments sought to distinguish themselves from the public 'out there' (Kerr et al., 2007:396), who lack awareness about science and as such hold misinformed views. Instead their self image as 'into science' increased their self-confidence in learning informally (Alsop and Watts, 1997). Such comments demonstrate the concept of Michael's (2009) 'the public-in-general (PiG)' in practice whereby a small number of participants depicted a generic and uniform public 'against' science and one which they were not keen to identify with. This distinction made by some participants to separate themselves from publics as a whole also draws similarities with the views sometimes expressed by engagers in such contexts.

Engaging educationally

There were examples within our sample where an educational remit was apparent. As such it was unsurprising that comments related to education were garnered around those activities

which suggested a more traditional function. This included some participants who deemed themselves on the periphery (like parents) such as Sue below when asked if she felt they had got anything out of the activity:

> I thought it was very, very interesting, I sort of learnt new things, it sort of made me think, but I think the two girls quite enjoyed what they saw, so yes it was quite informative and taught us a few new things. I mean to be honest I didn't really know what to expect but I did come away having gained something from it. (Sue, Participant, Activity 5: Robotic Show/Presentation)

Sue's comments stand out because her primary motivator for attending was not her own learning but that of the young people she took along. Prior work has suggested that an individual's motivation can be key to increased educational impacts from such an experience (Falk et al., 1998), however this work suggests it may also occur at a more discreet level, when an individual does not anticipate any such outcome or where attendance with others can motivate adults (Gutwill and Allen, 2009; Rennie and Williams, 2006). Even when participants were in attendance for primarily educational reasons, they often appreciated the attempt to include more interaction:

> We do it [group work] at school but we never do it on issues like this, so I thought it was good and you get to know other people [laughs] and you get your confidence you feel like, if you take part, you feel proud and you feel okay yeah I can talk with other people. (Vamil, Participant, Activity 9: Robotics Visions Conference)

As the above comment indicates, a variety of views were expressed towards the information and engagement participants seek from such activities. What is notable is that there were such differences, often amongst attendees at the same activities.

3.4 Expertise and preparation

Perceptions of expertise

Findings from our data suggest publics have particular expectations of 'expertise', which were sometimes contradicted within informal activities. Practical aspects including facilitation, structure and organisation were central to an activity being perceived as successful. Appropriate planning and time to organise public engagement became problematic if overlooked. Interviewees commented on practical aspects of the engagers' delivery, including how up-to-date information was, how familiar they were with equipment and the formality or informality of their communication style. Some participants discussed how a more relaxed attitude could contradict with their perception of an expert:

> It was nice to have somebody sort of chat to you, but for a scientific presentation I think it would have been much better if it had had a more rigid structure and a more understandable development of ideas... it didn't go from an introduction to a description to a conclusion, so it was easy to get a bit lost, and to have the impression that she was just kind of talking about whatever she wanted to talk about at the time.
>
> (Toby, Participant, Activity 10: Science Café on Artificial Intelligence)

In other work it has been noted that engagers can often take a relaxed attitude to preparation, equating it to prior teaching experience or adapting materials they might use in other settings (Authors Reference, 2010). However factors such as 'likability' and 'trustworthiness' can impact on public participants' views (Rowe et al., 2010) and the more casual attitude of some engagers, perhaps in an attempt to make the situation less formal or to invoke at times a lay identity (Kerr et al., 2007) jarred with some participants. Although participants seldom criticise expertise (Pouliot, 2011), these surrounding factors provided an opportunity to do so. A number of individuals recognised a lack of preparation on the part of the engagers as Toby continued:

When I hear somebody who is important speak, I like them to have an opinion and for me to be able to judge that opinion on its pros and cons, to hear their argument to hear it brought through to conclusion.

Interviewer: and does it matter to you, how do you gauge whether a person is important?

Well first of all she was speaking in front of a room of people suggested that she was important, the billing sheet...she started out her talk by giving her qualifications, saying where she worked and what field she worked in and all that sort of stuff, so for somebody who says they're important to give an argument as if they weren't important was not, not as interesting as it could have been. (Toby, Participant, Activity 10: Science Café on Artificial Intelligence)

Although the need for the inclusion of a range of experts and representation of differing expert perspectives did not occur within our interviews (Burall and Sharokh, 2010), Toby's comments stressed the significant role experts take in engagement settings (Tlili et al., 2006). Some expressed a sense of surprise and appreciation that experts were prepared to contribute or suggested that the attendance of named experts had drawn the participant's attention to an activity:

I gained a lot more knowledge and I met different kinds of experts and I was like shocked, I was shocked you know?

Interviewer: So you were surprised to meet the experts?

Yes, I was surprised, yes. It was really good yes, I was happy. (Deepak, Participant, Activity 9: Robotics Visions Conference)

I guess it was the connection with [names scientist] and the big name which kind of attracted me , but the [names research group] were really good, and also people from [names research group] it was nice to see them and learn about the types of collaboration that are happening within robotics. (Bella, Participant, Activity 11: Discussion Events in Science Café Style (with experts present))

Whilst positive and negative views towards expertise were expressed, it was clear that there were expectations from publics regarding what an 'expert' constituted and how they should behave. Some of those expectations were based on issues around anticipated levels of respect, insight and behaviour, although within our sample we saw examples of both confirmation and contradiction within a more informal engagement setting.

4. Conclusion

Our interviewees frequently expressed an expectation to receive information, and whilst they felt confident to express views, challenge and question they wanted to hear the latest contemporary developments or the expert's perspective and argument around a situation. This is supported in other work which has suggested the crucial role that appropriately designed expert input can play in the scene setting for deliberative approaches (MacLean and Burgess, 2010) and that poor quality or omission of information can provoke dissatisfaction amongst participants (Abelson et al., 2007).

In participants' accounts we noted respect and admiration towards experts, but participants would also politely voice criticism, making judgements of expertise. The capacity to criticise speakers, in addition to challenging and deliberating views expressed by other participants, has been witnessed in work elsewhere (MacLean and Burgess, 2010). Shifting from an impersonal experience with experts that participants are familiar with, to something more collegiate and friendly in nature can be overwhelming and unsettling

(Pouliot, 2011). This situation suggests that engagers should be cautious of the more discreet indications (such as how casual, prepared, confident an engager might appear) on which publics are making judgements and should consider the implications in terms of outcomes. Davies' (2006) work notes a shift in positioning of public participants whereby over the duration of an engagement process they can develop a growing empathy for those decision makers they are working with, or become 'insiders' (Kerr et al., 2007). Although we were not able to explore this in depth, the admiration and critiquing we noticed of expertise suggests it is worthy of further consideration.

As is the case in other examples of similar work (e.g. Abelson et al., 2007; Rowe et al. 2010) our sample has a degree of bias in that we were only able to talk to those occupied in engagement processes. We were not able (within the constraints of this project) to speak to those who have no need or desire to participate in such activities, though our interviewees did include those who identified themselves as on the periphery of engagement, accompanying a child or attending for work purposes. Interviewees also mentioned past attendance at similar events as a motivator, in line with other work of this type (Falk et al., 1998). For a good number of interviewees participation has become a habitual aspect of their routine, and in terms of further work it may be insightful to focus on those experiencing first visits (Rennie and Williams, 2006). Nonetheless it is important to note that there are likely to be certain groups who are more effectively and readily targeted by engagement activities (Bell, 2009; Stein, 2003). Encounters with engagement might also lead to a greater propensity, the 'development of democratic capabilities', to continue to be involved in such activities in future (Burall and Sharokh, 2010:6).

It would be insightful to extend such work to consider the cultural and social factors that may encourage particular individuals to engage more readily (Kerr et al., 1998). That there were multiple and overlapping motivators for public participants is not unexpected but

it also indicates the complex contexts in which engagement occurs. It was noticeable that some comments had more in common with scientific literacy agendas than might be expected, with an expectation of information transfer and lack of expertise amongst 'other' poorly informed publics. This suggests a 'murkier' distinction between science and publics, with participants also drawing on 'models of the public that stress fickleness and cumulative scepticism' (Michael and Brown, 2005:50). Comments relating to 'publics', the contribution of various 'ages' and 'experiences' saw interviewees defining and conceptualising 'others' and the role they might play and defining themselves as 'particular sorts of publics' (Michael, 2009;618).

Participants often struggled to identify how members of the public might participate and contribute their view in engagement settings, though often there was an underlying perception that engagement was considered 'citizenly'. They identified that certain subjects had a greater relevance to public participation than others, in particular those with societal relevance. Interviewees were able to draw on existing experiences to make analogies in order to cope with contributing to an issue (robotics) which they did not always know a great deal about in advance (Burri, 2009). Amongst the participants in these activities we noted a variety of drivers for information, engagement, interaction and participation. Interestingly there were no clear trends in the expectations of the participants, related to the objectives of the activities they attended. Similar views were frequently present regardless of the style of activity on offer, with the exception of 'receive' type activities which appeared to draw harsher criticism if opportunities for views, skills, experiences and knowledge to be shared went unmet. The challenge for those engaging publics is thus to effectively communicate the aims of such activities and appreciate the differing notions of role and participation that may exist amongst their participants. As our sample of activities for observation were drawn from a range of different environments it was evident that many participants associated them to

opportunities for 'free-choice learning' and despite participatory elements, information provision and learning may continue to underlie participants perspectives of public engagement.

5.   Acknowledgments

6. References

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