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Designing Debate: The Entanglement of Speculative Design and Upstream Engagement

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Abstract: This paper offers a critical reflection of a design practice in which a speculative approach to design became entangled with upstream engagement with biotechnology research. Given that both practices claim to enable a public discussion about emergent technology, what is the nature of their mixing, and how should an analytical account of such a design practice be made? I focus on the project Material Beliefs as a case, and argue that the move on upstream engagement by speculative design is an imbroglio that goes beyond mixing the formal features of practice, and requires a discussion concerning the actions of the designer in relation to a broader set of accountabilities. Ultimately, I contend that this mixing provides an opportunity to foster a reflexive and empirical account of speculative practice, inciting analysis of the organisations and settings that support a speculative approach, and providing a critique of upstream engagement.

Keywords: Speculative, Engagement, Qualitative, Empirical

1. Introduction

In this paper I argue for the value of empirical analysis of the activities undertaken where speculative design's impulse for debate become mixed with upstream public engagement with biotechnology research. There is an emerging literature within the design research community dealing with speculative and critical design (SCD) approaches. Ph.D. theses include Ramia Mazé's account of critical design as a ideational tool for interaction design research (2007), Simon Bowen's critical artefact workshops as an innovation method (2009). Other academic accounts of critical practice include an account of critical making by Matt Ratto (2009), and a Ph.D. offering a taxonomy of critical design by Matthew Malpass (2012). More recent developments include a discussion of events in practice based design research to conceptualise the integration of critical approaches with co-design (Lenskjold & Jönsson, 2013), an analysis of the formal approaches adopted in a design for debate project (Mollon

& Gentes, 2014) and a feminist discussion of normativity in speculative and critical design (Prado de O. Martins, 2014). In this respect SCD is becoming established as an object and method of enquiry for design research, providing a much-needed context for enquiry, where designers who identify with SCD are supported in making analytical accounts of their practices.

In relation to the case discussed in this paper, wherein SDC's impulse for debate becomes mixed with upstream public engagement, there exists a more focused set of literature, which takes the public settings into which the outcomes of SCD travel, as sites for conceptualising the relations between design, issues and publics, including Ramia Mazé and Johan Redström (2008) and Carl DiSalvo (2009). For example, DiSalvo makes a case for the emergence of issues during public encounters with speculative representations of technology, arguing that publics come together through the capacity of speculative encounters to elicit those issues. However, like Mazé and Redström, DiSalvo does not develop an empirical discussion of the design process or the effects of these practices in public settings. Additionally, analysis of practice in these projects does not extend to a sceptical treatment of the programmes and institutions that frame the topics and structure of the design activity. There are opportunities to develop and extend this emerging literature of SCD, to treat the methods and processes of the making of speculative outcomes empirically, and to treat critically the coalitions and topics that enable SCD practices to move into diverse professional and public environments.

2. The entanglement of a speculative practice and upstream engagement

In this section I provide a review of descriptive and analytical literature that provides context for the case of practice discussed in this paper, a design project where speculation and engagement became mixed. It is seen that SCD infuses technology with narrative, to generate debate rather than provide utility, and to move from an academic environment into public settings, enabled by the formation of a network where "design thinking can be encountered by the public" (Dunne, 1999), and as an alternative to academia which is seen to confine the appeal of the work (Debatty, 2007). In order to deliver these ambitions, designers sought partnerships with other organisations that would act as clients of SCD. For example, in the UK, public perception of risk in relation to novel forms of technology including biotechnology have precipitated programmes of funding that encourage scientists to make partnerships with artists and designers in order to engage the public about their research. This supported the expansion of SCD commitments to public debate. For example, Biojewellery (Thompson & Kerridge, 2004) and Hybrids (Ashcroft & Caccavale, 2004), sought and were granted funding, from the EPSRC and Welcome Trust respectively. These projects saw conceptualisations of debate rooted in disciplinary notions of criticality, challenged by versions of public engagement that are responsive to the interests of science educators and funding councils. As a result of these concrete associations with programmes of funding and specific professional networks, I argue that designers' expectation that SCD drives public

debate became refined through the rubric of upstream engagement in particular (Wilsdon & Willis, 2004). The promise of the upstream, that early stage scientific research provides a context for democratic engagement in relation to potential future issues of technology (Stilgoe, 2007), supports designers' commitment to speculation.

However, STS literature is sceptical of the claims made for these enlightened and participatory styles of engagement (Irwin, 2006; Wynne, 2006). The upstream is seen to be a rhetorical posture that merely seeks to negotiate the risks associated with predetermined paths of innovation (Wynne, 2006, p. 218). Indeed, the conceptualisation of technology as following a 'stream' reproduces technocratic models of expertise that have been empirically challenged (Bijker, 1987; Wynne, 1992). These sceptical accounts of expertise and power provide nuanced and conceptually rich registers that extend both SCD's assumptions about debate, and those expectations about dialogue incipient in upstream talk.

3. Material Beliefs as a case of practice

In this section I take episodes from Material Beliefs as the basis for an empirical account of the mixing of SCD and upstream engagement. Material Beliefs was a public engagement with science and technology project funded by the Engineering and Physical Sciences Research Council (Kerridge, Custead, & Gaver 2006), in which I acted as project lead with a wide set of collaborators who are credited in the end of project publication (Beaver, Kerridge, & Pennington 2009). Both the project publication and my Ph.D. thesis, which I have drawn upon for the arguments of this paper, extend and support this section.

Initially I discuss labs as sites where designers, scientists, and non-experts come together to discuss and to problematize accounts of biotechnology research. Next, I examine the process of making speculative designs, and here I emphasise the ways in which issues, materials and practices become compiled as exhibitable prototypes. Finally I consider the circulation and reception of these designs in public settings, including exhibitions, workshops, and online formats.

3.1 Situating biotechnology

The funding proposals for Material Beliefs saw that biotechnology and cybernetics facilities were at the centre of a programme of activity, and it articulated three core expectations of labs (Gaver, Kerridge, & Custead, 2007). Firstly, labs were seen as the locus of biomedical and cybernetic research activity, whose likely future applications would entail controversy, for example privacy of data (RS, 2004), and would therefore offer potent start points for SCD projects. Secondly, labs were seen to be venues that would host interdisciplinary collaborations between designers and researchers. Thirdly, it was envisioned that these collaborations would make the lab available as a venue for public engagement. In particular, the issues and topics identified by the designer as a result of their association with researchers would become developed through the delivery of events in the lab, an expectation that aligned with models of upstream engagement (Wilsdon & Willis, 2004). In

the proposal, the designer was seen to be an intermediary who convenes activity that encourages others to imagine the implications of lab research.

After funding was granted, Initial project activities sought to build a network of designers and biomedical researchers to undertake the aims of the proposal. Four designers were recruited to the project, and subsequently a series of interviews were undertaken with biomedical researchers, which were filmed and photographed. Designers encouraged researchers to elaborate upon discursive contexts of biotechnologies rather than technical aspects of research. For example, a discussion about biomedical implants led to chat about the 'worried well' and other features of the market for healthcare. These tangents were seen by designer 1 (d1) and designer 3 (d3) to provide anecdotal treatments of biotechnology that supported the conceptualisation of design scenarios. In this way while researchers might be expected to act as technical consultants, or as experts who can verify and authenticate the biotechnology which is seem to be extended by the design, they in fact contributed to discursive and imaginary treatments of research that supported design speculation.

The interviews also acted in various ways as start points for public engagement activity. A discussion with researcher 1 (r1) about the public controversies of genetically modified organisms led to reflection on the need to communicate the value of nanotechnologies. The conversation led to r1's participation in a public event with d1, despite divergences in their respective expectations of the event, which was for the researcher an opportunity for educating young people about nanotechnology, and for the designer a chance to develop a workshop activity that allowed biotechnology to treated imaginatively.

As a visiting researcher at a biomedical institute, d1 led a number of workshops, one of which is described briefly here. Mind the Loop was a half-day workshop convened at the institute for a small group that included a clinician (r4) a participant from a previous public event participant (p1) who was also a patient of r4, a researcher who was developing an artificial pancreas (r5), and a filmmaker. An aim for the workshop was to allow the participants' diverse perspectives on an artificial pancreas to be shared, elaborated and documented.

It was demonstrated that such biomedical therapies are likely to have effects that are additional to the control of the disease, including the demands of data interpretation upon the patient and clinician, and the affective nature of the technology upon the patient. R1 reflected that these types of insight challenged their own expectations about the workshop as a mechanism for generating speculative design concepts, and became exposed to forms of knowledge that challenged the formulation of controversy for debate that characterised the critical inheritance of their speculative approach. Where speculative design is treated as research, it is possible for an account of practice to give expression to, and find value in, forms of activity that are not well aligned with the exhibition narratives that would otherwise be the dominant mode of outcome.

3.2 Designing speculatively

This section provides an overview of making designs in Material Beliefs. The four project clusters of Material Beliefs led to a range of prototypes for exhibition including Neuroscope, Carnivorous Domestic Entertainment Robots and Vital Signs. Despite the diverse approaches and outcomes of these projects, three criteria are useful for considering the mixing of speculative design and upstream engagement. Firstly the designers' association with researchers is conceptualised and managed in different ways, secondly the functionality of a design enables experimental forms of practice, and thirdly the ambition for the design as provide alternatives for biomedical research acted to displace existing variety. I expand upon each of these three criteria below.

Firstly, different forms of association between designers and researchers are evident in the cases of Neuroscope and CDER. In the first case, the designer (d3) and researchers met at the beginning of the project and set a course for subsequent and frequent association. Here the designer takes an experimental approach to their practice by setting up occasions for co-authorship of design materials, including a brainstorming session about future products. However, a later discussion between the d3 and researchers demonstrates that the collaborative generation of such material exposes differences in disciplinary approaches regarding scientific rigour and design open-endedness, and reveals expectations from researchers that d3's design will communicate the value of their research. The second case provided a different approach, where the designers of CDER worked relatively independently, with researchers providing periodic advisory input. Here, the designers see biotechnology as providing raw material for design, where researchers descriptions resource initial design concepts. In contrast the design of Neuroscope leads to a more complex entity.

Secondly, the features of designers' association with researchers during the making of Neuroscope and CDER shaped the development of functionality in the prototypes. Design functionality for Neuroscope became challenged through the technical requirements of system integration, while for CDER there was a focus on behaviours that demonstrated function in order to communicate the design proposal. Both design processes are mindful of the status of the prototype as a public entity, though different forms of publicity are anticipated and embodied in the design, including dissemination, demonstration, debate, promotion, education and ethics. CDER aligned strongly with the designers' initial ambition, a substantial set of speculative work was produced, and design characteristics align with the format of critical design. In contrast, the Neuroscope followed a deep and complex association with researchers, where the speculative nature of the design was challenged by functional integration with biotechnology, and the outcome was experimental and risky.

Thirdly, where the Vital Signs project offered a speculative alternative to a platform for biometric sensing, the design scenario acted to displace expressions of variety that already existed in researchers own accounts of their work. In treating the digital plaster as a monolithic biotechnology, d1 suggested that once the platform leaves the lab, the platform becomes reconfigured to support market driven applications, including biometric

surveillance, with dubious implications for liberty. However, the platform had already been presented as enabling a range of applications including assisted living for the elderly, elite athlete monitoring and the internet of things (Burdett, 2009). In this way, biotechnologies in the making are being both concretely and speculatively tied to entities 'outside' of the lab by researchers. Like the designer, the researcher is actively engaged in the production of scenarios, and the practice of biotechnology research is inherently social.

However, this flexibility is expressed primarily through networks that support innovation, comprised of actors able to provide material, financial and political resources (Wynne et al., 2007). This network construes the public as outsiders, who are characterised as irrational in their misunderstanding of the value of these biotechnical innovations in the making. It is in this context that public engagement becomes a tool for the positive promotion of emergent biotechnology to a lay audience, and at that point the variety and instability of biotechnology becomes fixed (Wynne, 2006). I argue that despite the limitations of Vital Signs as a project, which acted at times to reify these boundaries (of expert and public, lab and society, research and application), an analytical treatment of practice allows these entanglements to become unpicked.

3.3 Circulating design

In this final section I review three pairs of episodes where designs circulate in public settings. Firstly, two group exhibitions, one at LABoral in Gijon, Spain and the other at the Royal Institution in London. Secondly, two evening events at the Dana Centre in London, where designers worked with venue staff to deliver public workshops. Thirdly, the compilation of project documentation on a website and in a book, as examples of publication. These examples of circulation, representative of the public-facing activity delivered throughout the project, are discussed below.

Exhibitions are seen to be a core activity for speculative designers, conceived as being the final stage of a designer's work, and considered as the settings where the public encounter speculative designs in the flesh, and where debates happen. However, I argue that the assumption of debate at exhibitions should be treated sceptically, and wonder why, given the value placed on exhibitions, that accounts of what goes into exhibitions and what happens there are so sparse.

Two exhibitions from Material Beliefs were Nowhere/Now/Here at LABoral in Gijón, and Crossing Over at the Royal Institution in London. Nowhere/Now/Here is a contemporary design show that fosters a curatorial agenda about the role of designers in driving cultural change (Feo & Hurtado, 2008), while Crossing Over is a contemporary art exhibition where artists are credited with rearticulating the characteristics of biomedicine (Albano, 2008). These curatorial themes at times aligned with the topics of individual projects and elsewhere required compromises to be made. Therefore while the idea of discussion and debate is largely associated with general expectations regarding public encounters of a design, it is an

explicit yet under articulated feature of the negotiations of event partners that take place during planning.

It can also be said that designers and researchers raised doubts about the value of exhibitions as a mode of public engagement. D3 disputed the idea of debate happening at exhibitions given the absence of the designer and their partners, a subject echoed by r14 who commented "you can't ask questions at an exhibition unless there's somebody there to ask the questions to". Elsewhere, d5 saw that in contrast to live events like workshops, exhibitions tend to emphasise role of the designer(s) exclusively, and that therefore the features of collaborations and partnerships become displaced (Dawson, 2009).

The second example of design circulation is a pair of evening events at the Dana Centre. This London venue provides a programme of informal adult education, and identifies with the informal and deliberative formats of public engagement proposed by the Café Scientifique movement (Dallas, 2008). The first event took place after project collaborations had been established but before design work had started, while the second event was delivered nine months later, when designs were well established though not complete. While initially seen as marginal, or as the poor relation of the exhibition, over the course of the project, workshops emerged as preferable formats for some designers, at least in relation to their own conceptions of public engagement.

Sessions at these workshops broadly took one of two formats, firstly where a researcher's account of their work and the designer's proposal for an alternative became synthesised, and secondly where a monolithic account was delivered my either a designer or a researcher. In the first case, design scenarios extended the research narrative, demonstrating that the potential outcomes of research are not necessarily constrained to the applications anticipated by the researchers. These sessions supported discussions that at times aligned with a designer's proposal, and at other times related to practical and personal issues, for example the embarrassment of using biomedical technologies in the workplace. Here, the workshop format exposed variety and generated discussion, in contrast to d5's comments on exhibitions.

The second format for the workshop sessions was a monolithic presentation that supported the speaker's conceptualisation of public engagement. For example at the first workshop, the convener acted as representative for the Dana Centre's broad interest in informal adult education around contemporary science research, whereas a designer mobilised speculative design as a framework for the debate of liberty and privacy, in contrast to a spokesperson for transhumanism who vociferously promoted a gerontology foundation. At times a particular approach prevailed, and activity became largely framed by the concerns of that particular presenter. In this respect, where designers see that their interventions exclusively set the terms for a debate, it should be recognised that their expectations merely contribute to a variegated scene of public engagement.

Finally, it can be seen that a website and a book supported aims of the original proposal to make the project process visible to less immediate audiences. Both these outcomes drew substantially on the same material, including interviews with biomedical researchers, the process of designing artefacts and the exhibitions and public events of the project. However, the website was formative in character and so a blog became a distinctive feature, whereas the summative nature of the book supported indexes and essays that surveyed the project and its themes.

Due to its formative nature, online documentation presented a challenge to the effective formation of a design outcome. Early stage drawings of the CDER designs were posted on the project website, and the editor of a popular design blog was contacted and sent a set links to this content, resulting in an interview about Material Beliefs accompanied with the CDER drawings (Debatty, 2008). This was seen by d4 to diminish the impact of the design as a finished proposition. Here, the idea of a stable 'public image' seems at odds with speculation as a format that encourages debate and discussion, which would seem to entail versions and opinions rather than a single agreed format. However, d4's concerns can be seen as a response to what is seen to be premature and badly executed promotion, rather than a rejection of an experimental approach to engagement, and this is due to the somewhat strange conflation of promotion and engagement enabled by the website.

Nevertheless, there is also a sense that a designer's control of the representations of a design, and the role of a designer as sole arbiter of the terms of debate, become challenged by attempts to connect design practice to public engagement. Certainly an ambition for a responsive mode of documentation of design processes interferes with the focus on the exhibition of finished designs that has been inherited from critical design's version of public debate.

4. The value of empirical speculation

In this paper I have treated a case of speculative design practice empirically, taking a focus on project episodes associated with fieldwork, making and dissemination, in order to deliver a reflexive analysis of the mixing of the designers' ambition for public debate and the funders expectations of upstream public engagement of biotechnology. At the outset I argued that such an empirical description of practice would make a constructive contribution to a developing theme within design-research that makes analytical account of SCD. In this final section I discussion three features of this empirical case.

4.1 Developing the rhetorical claims of speculative design's practitioners
The idea that speculative design engages the public and enables debate need to be grounded in the analysis of actual events. Frequently, designers' and curators' claims for practice are rhetorical and anticipatory, and are not supported by analysis of the circumstances of making, installing, exhibiting, and promoting designs. I am therefore sceptical of claims made for the effects of SCD by its practitioners, which often suggest that

the creation of a network for exhibitions and other public events, enable the critical discourses that inform their design work, to become more widely available as a form of public debate (Debatty, 2007; Dunne & Raby, 2003; Kerridge et al., 2006). Coupled with this notion of establishing a network for the circulation of speculative design is the idea that exhibitions enable a broad medium for the discussion of critical ideas, where those concepts in their original form are seen by designers to be inscrutable, scholarly and remote. However, I contend that the discourses used by curators and practitioners to make rhetorical accounts of design projects are not somehow unshackled from disciplinary and specialist knowledge, indeed the languages and conventions of the network that SCD has established is opaque and mysterious.

I have demonstrated that an empirical analysis of speculative practice deals with the process of design as well as the outcomes. In the case presented here, outcomes included the exhibition of designs and their documentation in catalogues and project publications. While these forms of circulation are taken for granted, their features have been described elsewhere in limited ways. Additionally a range of activities took place during the trajectory of the project, including proposal writing, interviews, workshops and the making of prototypes. Treating these various processes as episodes for reflection and analysis requires an account of speculative design that includes the positions of non-designers. In taking focus away from the intent of the designer, a richer picture of the design setting has been captured, and the claims made for the effect of a design have become challenged and shown to be multiple and at times contrary.

4.2 Speculative design's enchantment with upstream engagement

In this paper I have grappled with speculative design's attraction to the idea of upstream engagement. As a consequence of writing analytically about this project, preliminary ideas about the compatibility of speculation and engagement have been challenged and developed. For, despite policy ambitions for experimentalism and democratic participation, upstream modes have reintroduced problematic and patronising models of public engagement (Wynne, 2006). Therefore, rather then applying the rubric of upstream talk to the rhetorical features of speculation, sceptical treatments of public engagement have supported a richer articulation of design practice, and allowed more robust accounts, not only of the practice but the frame in which the practice is carried out. This mode of writing has something in common with social scientists' accounts of practice (Doubleday, 2007; Horst, 2007), where researchers speak reflexively about project activities in which they have a hand.

The will to engage mobilises divergent and incompatible energies including education, public relations and deliberative policy. I have endeavoured to provide an alterative to articulations of speculation that would align it instrumentally to one or another of these schemes, particularly where the designer could become a conduit for the ambitions of an entrepreneurial, scientific innovator. There is a possibility here, that speculation becomes

reduced to a mode of communication regarding the benefit of biotechnology (RS, 1985). Crucially, though speculation also does not explicitly link into some later mechanism, such as the formulation of policy. Rather, speculative design offers a practical critique of public engagement's assumptions.

For I believe that a strength of speculative design is that its disengagement from engagement keeps the conceptualisation and evaluation of technology talk loose, whereas upstream engagement ultimately conceptualises discussion in relation to a linear model of technology development (Stirling, 2008). The notion of a 'stream' of activity that can be navigated goes against the open-endedness that is established in forms circulation described here. Michael has written about the multiplication of versions of technology in speculative projects, which "Spiral out in many conceptual directions, raising questions about a multitude of indistinct issues surrounding science and technology" (Michael, 2009). I have argued that rather than talking about creating debate, designers could admit to a less authoritative and central role, accept the proliferation and indeterminacy of their concepts, and commit to providing an account of this variety.

4.3 Speculative designers as practitioner-researchers

I hope that this paper is a tentative exemplar of a mode of writing where SCD practitioners provide analytical accounts of the activities they undertake, so that knowledge about their practice can be shared with others. Those who identify with a speculative approach may not be seeking partnerships with biomedical researchers, though they will probably be working with partners from another professional setting. They might not be conducting interviews in labs, but there will likely be processes of discovery within partner settings where ideas are generated and proposals are designed. Those outcomes might not be encountered by particular publics and responded to in ways that are characterised as challenging the configuration of biotechnology, but no doubt there will be an emphasis on the imaginative reaction of a particular community or participant. So this paper has provided an example of how the features of a particular case of speculative design can be captured and shared.

Having argued for the accountability of SCD through analytical writing, I would like to dispel what might be a persistent doubt in the minds of some speculative designers about doing practice-based research. For speculative designers, there is perhaps a discomfort in treating their own work critically, a sense that analysis would diminish the assurances and prestige granted by the circulation of finished designs. However, I contend that the discomfort experienced by a speculative designer as they adopt an analytical mode is in fact productive, and hopefully resources a conceptually rich and much expanded account of practice that is legible to other designers, academics and project partners.

5. Conclusion

I have emphasised that without robust analysis, speculative design is tied to modes of writing that offer limited and rhetorical accounts of its features. In moving beyond

descriptions that support the promotion and exhibition of their projects, speculative designers can become responsive to the features of the settings in which their work operates. Additionally, given the association of my speculative design case with upstream engagement, this paper provides a distinctive and critical lens for the idea of upstream engagement. Thirdly, given that the processes of making and circulating speculative design artefacts provide the grounds for a reflective analysis of practice, this paper encourages speculative designers working with partners in professional settings to treat the activities they undertake as research.

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