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The Ethics of Distributing Scientific Knowledge: Epistemic and Ethical Injustices in Context

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ABSTRACT: Science communication is fundamentally about distribution, knowledge distribution. Like all distributions, it raises issues of justice. This paper discusses core issues for contemporary science communication by mapping them onto well-defined theories of distributive justice. Importantly, considerations of epistemic justice force us to look not only at the classic recipients (the audience), but also at the distributors (science communicators), as they are, themselves, also recipients of knowledge.

KEYWORDS: epistemic justice, distributive justice, radical egalitarianism, luck egalitarianism, science communication, distributor justice

1. INTRODUCTION

The field of science communication is premised on what we might call a “lay theory” of distributive justice. We might call it ‘lay’ because the motives and reasons given for doing science communication touch on some of the key aspects of theories of distributive justice without paying systematic attention to them. However, much of the activity that goes on under the banner of science communication or public engagement with science is focused on distributing knowledge from its reputed points of origin to other points on a wide social map. Thus far, most of the ethical problems of the field have been interpreted as problems in the relationship between the producers of knowledge and the distributors. To make this more concrete, there are worries that science communicators could be “too close” to the scientists producing knowledge, thus “hyping” or calling attention to scientific work undeserving of public awareness. Alternatively, there are concerns that science communicators are “too remote” from the production of knowledge. They might not have the background to effectively mediate scientific knowledge, thus spreading error or confusion. These are very worthwhile concerns. Other ethical problems have arisen around access to information: Is science communication only for the already “information rich”? Do our public institutions such as science museums, public broadcasters, and public research institutions do enough to appeal to a wide array of publics? This is another important concern. However, what we want to do in this short paper is re-focus on the ethical dilemmas that emerge from seeing science communicators as knowledge distributors—to turn the lens of distributive justice back on the distributors and not the distribution of knowledge.
What has led us on this path is a series of observations about current scenes of knowledge distribution. The most glaring contemporary case is of MOOCs (massive online open courses) where claims about the “free” availability of knowledge prevail. In 2011, the mantra was “let knowledge be free.” Interestingly for the arguments in this paper, by 2013, there are a substantial number of knowledge distributors asking why anyone thought this knowledge was “free” to be distributed in the first place. While the contexts of science communication are diverse (from institutions such as science centers that see science communication as a core aim to research institutes that see science communication as something they must do), they share some features with the “classic case” of knowledge distribution—the university. And so, contemporary arguments about justice in relation to knowledge in the university (and in emerging arguments about MOOCs) are remarkably relevant to science communication. In 2011, we undertook interviews with 17 university lecturers in the sciences who were identified as “early adopters of technology.” The interviews aimed to get some basic information about how they were integrating communication technologies in their teaching and assessment. We wanted to know if the availability of new communication technologies (social media, video capacity on mobile phones, the relative ease of podcasting applications, etc.) was making inroads into the teaching of science communication in the science disciplines. While we did find that there are innovative practices and a keen interest among early adopters and students for science communication activities using digital media, our data was full of something else entirely, namely, confusion.

This confusion ran along several lines that are also picked up in key issues for the general field of science communication. In the following sections, we tease out what we found in our data of “confusion” by mapping it onto well-defined theories of distributive justice. We use this to talk about some core issues for contemporary science communication. In the last section, we focus solely on the problems that science communicators, as distributors of knowledge, face in terms of distributive justice.

2. EQUALITY OF ACCESS: THE OLD STORY

If you’re just doing a little hand held video off your phone or something then maybe not everybody has that capacity. (Interviewee 17)

During our research, equality of access was commonly mentioned by science academics as a serious concern with, and sometimes as a barrier to, the adoption of digital media in tertiary teaching. The concern with equality of access is straightforward: not every student has equal, or equally good, access to the technology required to fulfil a digital media assessment. Consider setting students in an ecology class an assignment to create a blog that describes and catalogues the events of a field trip. Many, and probably most, students will have smart phones, tabs, laptops or netbooks to use as recording devices. However, not all students will have these technologies, and some will need to rely on devices provided by the university, assuming the university and/or department is sufficiently well-funded and capable of offering their students such support. Moreover, even amongst those who do have devices, not all will have equally good devices. In many ways, this is not a new concern; it has always been the case that some students are better-resourced than others (better books, better calculators, more supportive parents, etc.), and technology is just the new frontier of inequality (Hendrix, 2005). Some argue technology is worse than previous instigators of inequalities because, on top of maintaining current inequalities, “technology is widening the gap” (Latimer, 2001; Trend,
INEQUALITY OF ACCESS TO DEVICES (OR EQUALLY GOOD DEVICES) WAS A REOCCURRING THEME WITH THE SCIENCE ACADEMICS WE INTERVIEWED AND IMPLIES A STRICT OR RADICAL EQUITARIAN VIEW OF EQUITY.

Radical egalitarianism is one of the simplest forms of egalitarianism, and argues, broadly, that all members of society ought to have (or at least have access to) the same level of “benefits and burdens” (Nielsen, 1979). Radical egalitarianism is fundamentally concerned with the equal distribution of welfare and resources (as opposed to the equal distribution of opportunity, which will be discussed in section III). These resources need not be limited to material resources and can include equal access to employment and equal freedoms, as well as equal levels of material goods (Roemer, 1998). In its most basic form, radical egalitarianism argues that resources should be redistributed such that “If there are n Fs, each [F] is entitled to 1/n of all the G,” where G is the set of resources available to the community (Raz, 1978). The defining feature of radical egalitarianism is that each individual is equally entitled to the resources available to the community, irrespective of desert, what Raz (1978) calls universal entitlement. It is this form of egalitarianism that is appealed to in the argument for equality of access. The equality of access argument claims that some students have better access to technology than others, and that “this technological injustice and digital divide is a threat to justice” because each individual is (or should be) equally entitled to the resources available to the community, in this case, technology (Hendrix, 2005). But radical egalitarianism faces numerous challenges which is why, as Peterson and Ove Hansson explain, it has few “real-life adherents, [rather] it is a ‘purified’ standpoint that represents an important element in many practical standpoints.” (2005)

A leading objection to radical egalitarianism as a theory of distributive justice is that it assumes universal entitlement: the view that resources (or access to resources) should be equally shared irrespective of desert. This view clashes with another fundamental assumption of what is just, namely the notion of desert: “that each one of us ought to get what we deserve” (Bojer, 2003). Indeed, empirical studies suggest that “egalitarian policies that reward people independent of whether they and how much they contribute to society are considered unfair” (Bowles & Gintis, 2000). In education, in particular, the notion of desert plays a central role. An education system that allocates all students an equal mark irrespective of desert would seem rather odd (if not useless). One of the roles of assessments, as the name suggests, is to assess the students’ level of understanding, their capacity and so forth. For this to be effective, the marks need to reflect the different levels of understanding of a student, their capacity and so on, or else the assessment is redundant. The assessment needs to be marked according to what the student deserves, at least to some extent. This is clearly contrary to the radical egalitarian’s assumption of universal entitlement. However, unless it is the actual use and access to the technology that is being assessed and marked, the concerns with desert have little teeth with regard to the use of digital media in assessment setting. A more relevant concern with radical egalitarianism is that pre-existing injustices are ignored. Radical egalitarianism argues that everyone should have an equal share of (or an equal share of access to) the resources. But a top-of-the-range computer in the hands of a privileged member of society is a more powerful tool than the same computer in the hands of one of the least-privileged members of society. It is this latter concern that has led to calls for equality of opportunity (or equity of access) as opposed to simply equality of access (Gorski, 2005). But before moving on to those arguments, it’s instructive to pause for a moment on the particular case of science communication.
Case 1: Equality of Access in Science Communication

Equality of access is pretty much a central pillar for science communication, in some cases its entire raison d’être. The argument usually goes something like this (see Gregory, Miller, & Earl (1998) and Stocklmayer, Gore, & Bryant (2001) for more and variations): In a democratic society where science is supported by the public purse, all members of the public need equal access to the results. Science communication is the mode by which science is made public (note the invisibility of science communicators in this process, a feature to which we will return in the final section of this paper). This is generally coherent with classical accounts of distributive justice, such as Rawlsian and egalitarian accounts, where “the state” is in the role of distributor (Sen, 2009; Rawls, 1999). However, this immediately raises a set of difficult issues for national science communication policies. In Australia, for example, the Inspiring Australia Policy has targeted national science communication and engagement activities at ”youth” and “regional public.” For the purposes of argument, let’s consider the focus on “youth.” Given that Australia leads many Western nations (including the US) in the quality of its primary education system, and that Australia’s scores in science, while certainly not equal to Singapore’s, exceed those of the US and many European examples, “the youth” seems an inequitable focus as they already enjoy good access to the results of science and even specialized attention via teachers in the explanation of science. In short, the emphasis on any one group needs to be justified within the frame of “equality of access.” Such conversations are uncomfortable ones as they require reasons for why one group should be privileged over another.

3. EQUITY OF ACCESS: THE CURRENT NARRATIVE

[Co]atering for that very broad spectrum and diversity of students from cultural, social, from areas of learning or non-learning, they might be conversant with technology, they might not. So it really does create another layer of difficulty. (Interviewee 5)

A common concern we encountered in our interviews was the fact that users of the technology are not uniformly competent with it, often because of social reasons. Importantly, there seems to be no moral reason to punish (or reward) individuals because of their varying levels of competence. Take gender as an example. In terms of equality of access, statistics released in the 2009 report on online participation, Australia in the Digital Economy, indicate that “gender has minimal influence on whether people use the internet or their frequency,” with similar statistics reported in the United States and Britain (ACMA, 2009; Gorski, 2005; Helsper, 2010). Despite this equality of access, women do not enjoy the same levels of employment in this technology sector as men, nor do they share the same breadth of use of this technology (Gorski, 2005; Helsper, 2010).

The difference is not equality of access; it is equity of opportunity to use the technology, which includes access and support, both technical support and a supportive culture. While women may have as much access to digital media and the Internet as men, they are not equally welcomed to all parts of it (Gorski, 2005). In some cases, women are simply not invited or welcomed to participate in digital media and Internet activities in the same way as men are. Socially entrenched sexism permeates throughout the Internet and the perceived anonymity offered by the Internet encourages the dissemination of offensive, sexist and racist material (Bemiller & Schneider, 2010). In other cases, particularly in professional settings,
women face barriers such as the lack of women mentors for new entrants, or less training and support compared to their male counterparts (Orser, Riding, & Stanley, 2011). This results in an unequal distribution of confidence and competence with regard to ITC.

There are many reasons why some groups are less comfortable, confident or competent with ITC, ranging from discrimination, to socialization, to socio-economic background (Singh, 2001). In order to have a fair system, we need to first ensure a level playing field with regards to confidence and competence; we need to ensure equity amongst users—where all users can use and access all of the digital media as freely and in as supportive an environment as any other (Gorski, 2005). Unlike equality of access, equity amongst users cannot be resolved simply by controlling the resources allocated to specific groups. Providing students with audio recording devices does not make them all equally comfortable in creating a podcast. From a distributive justice theory perspective, equity amongst users relies on the principle of equality of opportunity and implies a Luck Egalitarianism view of equity.

Equality of opportunity is premised on the view that we owe to differentiate between the aspects of a person’s life she can be held responsible for, and those she cannot be held responsible for (Roemer, 1998). This view, often termed Luck egalitarianism (Mason, 2001), holds that “inequalities in the advantages that people enjoy are acceptable if they derive from the choices that people have voluntarily made, but that inequalities deriving from unchosen features of people’s circumstances are unjust” (Scheffler, 2003).

Unchosen features like age, gender, race, or socio-economic background are considered the result of brute luck, and inequalities arising from them should be compensated or “be made equal, so far as this is possible” (Duus-Otterström, 2011; Dworkin, 2003). The defining features of luck egalitarianism is that equality is not measured in terms of resources, as is the case with radical egalitarianism, but is measured in terms of opportunity. Whereas strict egalitarianism calls for an equal division of resources (or access to resources) amongst members of a community, luck egalitarianism calls for an equalization of opportunities by addressing existing inequalities stemming from morally irrelevant features. In the case of ICT, an endorsement of luck egalitarianism could lead to support for those who are less competent, additional training options, or financial compensation, amongst others.

In many ways, Luck Egalitarianism strikes a very intuitive note and one that reflects much of our societal aspirations. We would not consider “a race where the starting line is arbitrarily staggered, where people's prospects for winning are not largely determined by factors for which they are responsible but rather largely by luck” as fair, and the same is true for a society so structured (Lamont & Favor, 2008). But in some ways, it is inevitable, perhaps even desirable, that there will be some inequalities between individuals, including inequalities arising from brute luck. Sesardic (1993) claims that “inequalities resemble Russian dolls”: once you remove one layer, a new layer of appears. Since, according to Luck Egalitarians, we should compensate or make equal (as best we can) any inequalities arising from brute luck, once we overcome obvious layers, such as discrimination over race, gender or religion, ought we next to turn our attention to natural endowments? The fact Michael Jordan is taller than me is a matter of brute luck, similarly with regard to the differences in intellectual prowess exhibited by various students. It would seem odd to claim these disparities need to be compensated for or equalised.

In defense against this objection, luck egalitarians argue for a distinction between natural endowments and social endowments. The former are those properties, usually physical or biological, that affect an agent’s ability to fulfil her ambitions, while the latter are those
which do not inherently affect an agent’s ability to fulfil her ambitions, but only do so in the
context of social structures and social processes (Pierik, 2006). But this distinction between
natural endowments and social endowments is a slippery slope since we could almost always
create social structure to overcome disparities arising from natural endowments. While
deciding where the boundary between natural and social endowment ought to be set is a
challenge for luck egalitarianism, the view of justice it aims to convey still resonates deeply
with both philosophers and the population at large.

**Case 2: Equity of Access in Science Communication**

Science communication, as a field of endeavor, is an interesting case for equity of access as the
relevant features are so often epistemic in nature. And how should we treat these? While there
is a wide literature on epistemic justice, it has yet to make inroads into discussions of science
communication (Fricker, 2007; Langton, 2000; Smith, 2000). If it were to begin to do so,
several issues would immediately become obvious. First, there may be a difficult question to
answer about whether one’s ability to engage science stems from one’s natural or social
endowments, or more probably, both. Much of science communication appeals only to those
considered “engaged” with science, the assumption being that “engagement with science” is a
choice. This is probably cognitively not true and raises serious concerns for the luck
egalitarian. Should science communication aim to engage the natural endowments of audiences
by teaching people science appropriate to their epistemic capacity, or should science
communication aim to address the social disadvantage of communities or individuals who have
little access to science and where being “engaged with science” is frowned upon?

4. **EQUITY FOR DISTRIBUTORS: THE UNSPOKEN TALE**

[Y]ou certainly start getting edicts that you must include a certain amount of new media or your
teaching is going to be seen as second-rate, and I guess losing the good with the bad from the
traditional forms of teaching. And certainly a competition between individuals who are very savvy
with that particular technology, providing, in some respects, an unfair advantage. (Interviewee 8)

To this point in the paper, as much of the literature, we have concentrated on justice for
students, or in the case of science communication, for audiences of science communication
activities. However, what began to emerge in our discussion with lecturers and our
observations of the role of science communicators is that while they clearly have concerns
about equity for their students, they also have misgivings about their own position in the
distributive networks. For example, numerous lecturers mentioned varying degrees in capacity
to work with digital media. Similarly, science communicators identify a range of issues, from
evaluation and research techniques, the use of social and digital media, and even dealing with
hostile community members as areas where they need additional resources and/or training. So,
while “good” science communication can be seen as a benefit to audiences for science much as
good teaching can be seen as a benefit for students, there are real questions about the roles
from which these benefits flow, namely the science communicators or lecturers distributing
knowledge.

For a radical egalitarian, what is important for knowledge distributors is that they have
equal access to resources for the creation and communication of knowledge. Thus, in the case
of digital media, if chemistry lecturers have the means to podcast helpful tips to their students,
so should lecturers in physics, biology, and English literature. Martha Nussbaum (2012) has discussed at length the difficulties universities face in equitably distributing resources among fields of scholarly endeavor and teaching. She powerfully makes the case that inequality in this field of distribution has significant “trickle-down” effects and also impacts the quality of knowledge produced in specific fields. So, the radical egalitarian might ask, does every science communicator have access to the same resources for communication? The rather immediate and obvious answer would seem to “no,” but their access is hindered at many levels. A recent study in Australia (Department of Innovation Industry Science and Research and Tertiary Education, 2012) indicated that certain areas of science are favored for science communication activities (environment, health, water). Those areas are emphasized in research, in resources to support communication activities, and in the training of science communicators. We might agree that these are the areas where opportunity should be enhanced, but for the radical egalitarian, those science communicators left to communicate about mining science, physics, and nanotechnology have legitimate complaints about their diminished access to resources.

Another level that might trouble the radical egalitarian is the resource hierarchy generated by institutions. In Australia, the CSIRO can afford to resource about 400 science communicators; an NGO, such as “healthy waterways,” might resource two to a lesser degree. For the science communicator standing up at a public event, the resource allocation has significant effects on their ability to communicate knowledge generated by their institution. While it is tempting to rush to criticize this resource allocation and the effects it has on what audiences hear about science, there is an ethical problem for the radical egalitarian at the level of the science communicator who has been compromised by unequal access to resources.

The luck egalitarian might be able to quickly dispense with these worries by arguing that these inequities are due to social decision making; we have, as a society, decided that we want to resource certain areas over others (water over nanotechnology, for example). But more troubling issues for science communication emerge at the global scale for the luck egalitarian. As “science” itself has an unequal profile globally, so does science communication. The World Federation of Science Journalists (WFSJ), for example, following luck egalitarian intuitions, have poured resources into Africa and Middle Eastern nations where science communicators have been under-resourced in both communication and epistemic terms. Thabo Mbeki’s denial of the cause of AIDS in Africa was abetted by the poor resourcing of science communicators to offer counter-narratives (Claassen, 2011). There is now a strong organization (SAASTA) in South Africa to continue in this vein and the WFSJ has added additional training resources for science communicators in order to provide more equal access to the opportunities for science communication.

Case 3: Equity for Distributors in Science Communication

Around the world, there has been recognition that science journalism plays an important science communication role, yet journalists come to the task of science communication with varied histories, experiences, and abilities. One popular remedy to ensure accurate reporting is to create knowledge brokerage houses, called Science Media Centres (these currently exist in the UK, Australia, Europe, and one is being developed in the US). The questions arise: What are these centers doing? Whom are they serving? On the one hand, they are ensuring that broad publics have access to equally good information. This would make the radical egalitarian happy indeed. On the other hand, they sometimes focus on compensating for the differences in
knowledge and expertise held by different reporters. This appeals to the sensibilities of a luck egalitarian but is applied to distributors, not to the ultimate audiences for science.

This focus on the distributors, at least in part, is an important ethical turn for science communication, acknowledging that not only are science communicators themselves distributors, but they are also recipients of distribution. The arguments for and against science media centers pick up on this issue and raise important challenges. Should it be the role of a science media center to provide the same information to all reporters? Some science journalists have argued that their edge in the field relies on their ability to gather and tell stories—that is exactly what they trained for. They don’t want nor need a science media center. Editors have largely welcomed the development as it enables the audience access to quality science reporting at a general level, regardless of the training or specialism of their reporters. Thanks to the science media center, all reporters can cover science. Note that this raises a different line of argument than the longstanding one that we should train specialist science mediators to ensure quality information for everyone.

5. CONCLUSION

We’ve used some interviews with science lecturers and some recent survey data on science communicators to raise a range of issues about the ethical stance of science communicators. We recognize that there are differences between teachers and science communicators. But, given the explicit attention to equality in education, lecturers operate as an important limit case for science communication. For science communicators, whose roles are variously formalized, the issues appear somewhat murkier. However, in places like Australia where there is a formal job title of “science communicator” and science journalists tend not to object to the association with science communication, there is a real opportunity to address some of these inequities at the level of training and national policy. We also recognize that we have been “assuming” at some level that science communication is a “social good.” We are not naïve enough to assume that all strategic communication for science plays this role. However, with the principle of charity, if we can find the problems for science communication in the best light, this will extend further to other problems emergent in the field.

A standard argument for science communication relies on a radical egalitarian view—everyone should have equal access to science. However, there are trends that suggest that intuitions driven by luck egalitarianism are emerging. These push the field in different ways and raise the possibilities of incongruent ethical positions. From a justice point of view, this raises interesting questions. Theories of justice are supposed to be universally applicable and not relative to context. But we suggest that context does matter. The theory of justice that we appeal to when assessing the distribution of knowledge to the ultimate audience for science communication is often different to, and conceptually incompatible with, the theory of justice we appeal to when distributing knowledge to the distributors. For science communication and knowledge distribution, grand theories of justice may not be helpful.
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