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32 The overlooked benefits of science popularization

Lionel Maillot

Abstract: What can be the benefits, for a researcher, from popularizing his or her research to the public? Since the 1970s, Baudouin Jurdant has provided theoretical insights into the effects of popularization on the researcher's thinking. To identify those effects, I explore verbatim responses from past surveys interviewing researchers. Although those generalist surveys place little emphasis on the question of benefits, traces of personal and professional effects can be extracted and analysed. Those traces, from which I extract five types of 'benefits', provide a basis for organizing field observations focused on certain popularization activities. The activities can bring about unexpected processes such as reassurance for researchers and a remotivation for their work. For young researchers, clarification of their field of study is also an attainable benefit. Considering these retroactive benefits right from the design of a public engagement activity makes it possible to envisage a new way of conceiving research–society relations.

Keywords: popularization, public engagement activities, researchers, benefits, self-rewards, dialogue, science–society.

32.1 A theoretical exploration

The aim of science popularization has historically been to enlighten the layperson. But what can popularization do to the popularizer? Research communicators are used to providing explanations without the main objective of being affected by the act of communication. Yet those actions may affect researchers in certain ways. While studies on the effects on audiences (knowledge, trust, participation, inclusion etc.) have been numerous since the 20th century, few address the question of the effects of popularization on the researchers themselves. In the 1970s, the findings were negative. Taking up the concept of 'academic rarity' to be acquired within the scientific field, Boltanski and Malidier (1970) explain that popularization can be detrimental to the social capital of researchers. Popularization is aimed at the outside of the scientific field (at those symbolically below the researcher), whereas the acquisition of 'rarity' is done through the seduction of higher ranking groups within the scientific field. Some scientists 'lower down in the hierarchy' even do popularization on the sly so that it does not harm their careers. Converse-

ly, scientists in higher positions can use media visibility to work on their capital.¹ In the 1980s, however, popularization was still frowned upon and was still wrongly considered to be outside the scope of scientific activity, which could lower a researcher's scientific reputation (Whitley 1985). The influence of science–technology studies makes it clear that, on the one hand, ‘by combining claims to universal validity and social utility through popularization, scientists lay the foundation for the domination and expansion of the sciences’ (Whitley 1985), while on the other hand, the public is not undifferentiated and passive: various groups can be involved in the knowledge factory (Knorr 1981). It is also postulated that the process of transforming knowledge to be popularized changes the nature of the knowledge (Latour 1980); that scientists use outreach for the internal political development of their research (Whitley, 1985); and finally that scientists learn about areas outside their immediate research areas from popular stories (Hilgartner 1990). Science can be affected by its popularization.

The Frenchman Baudouin Jurdant has deepened this research into the personal impact on the researcher's reflection of his or her science popularization activities. Let us follow his thoughts.

First, Jurdant studied the theoretical problems of scientific popularization (Jurdant 2009). He argues that popularization has an effect on scientific knowledge:

This [knowledge] acquires an objective existence, i.e., an existence of cultural objects, the term object implying both a certain opacity and a complete independence from the rules of their manipulation by a subject. (Jurdant 1973/2009:79)

We speak of objectification, and Jurdant later specifies a mechanism whereby the object is given depth, remodelled by popularization. The initially ‘scientific’ object takes on the status of ‘reality’:

One of the essential characteristics of reality is [that it] can take on contours. You can move around this chair, see it from different angles, without feeling that you are dealing with several different chairs each time you switch from one view to another. Popularisation does exactly that. The variety of forms it uses allows the supposedly identical content to be inflated with reality, to acquire depth. (Jurdant 1996:208)

The objectification thus described can help to make interdisciplinary exchanges in scientific communities more fluid (Naudon 2013). Jurdant concludes this reflection by analysing the researcher's use of speech. He is interested in ordinary language: ‘that language which puts us in the world of things rather than in the world of representations and which is rather useful for us to access those things’ (Jurdant 1996:206). He compares it to scientific writing, which—notably through the erasure of the ‘I’—can contribute to a deficit of reflexivity. The researcher imprisoned in their specific terms can lose awareness of the paradigm of their discipline, whereas ordinary speech ‘exposes me to an otherness that inhabits my awareness

¹ Later, Kiernan would find that publications in daily newspapers can increase the number of citations by other scholars (Kiernan 2003). Jensen et al. found a weakly positive correlation between H-index and public engagement activity (Jensen 2008).

of myself’ (Jurdant and Le Marec 2006). Through this dissection of the mechanism of speech, Jurdant describes a popularization that founds a capacity for reflexivity for the researcher.

Popularization can objectify scientific knowledge, make communication between disciplines more fluid and make the researcher aware of their disciplinary paradigm.

32.2 Traces of effects identified in surveys

32.2.1 Detection

Equipped with this theoretical framing, I searched for effects reported by researchers in 13 surveys conducted between 1967 and 2014. They were conducted in seven different countries, without building on each other.² The surveys were chosen for their potential ability to elicit statements about what researchers think about science popularization or public engagement with science. Six surveys had collected over 900 responses from researchers (Kunth 1992; Corrado et al. 2001; Royal Society 2006; Torres-Albero et al. 2010; Jensen 2010; Searle 2012). I will also refer to four other surveys (Pearson et al. 1997; Burchell et al. 2009; Zorn et al. 2010; Mizumachi et al. 2011) that interviewed researchers following public engagement activities. I have collected 18 potential benefits (listed in Figure 32.1). Each of the studies saw a maximum of 10 benefits. My list is therefore a capitalization starting with the more ‘personal’ effects and moving towards the more ‘professional’ effects.

Fig. 32.1. Overview of the benefits of science popularization for the researcher, as seen in 13 studies

		A) Boltanski – FR	B) Dunwoody – US	C) Kunth – FR	D) Gascoigne – AUS	E) Pearson – UK	F) Corrado – UK	G) Royal Society – UK	H) Jensen-FR	I) Torres – SPA	J) Searle – AUS	K) Mizumachi – JAP	L) Burchell – UK	M) Zorn – NZ
Personal effects	Satisfaction			+	+	+	+			+	+	-		
	Pleasure			+						+			+	

² See Maillot (2018a): 157, 159 for a table presenting the characteristics of these surveys.

	Satisfaction with informing the public						+	+					+			
	Self-esteem					+							+	-		
	Motivation to popularize					+				+				-	+	
	Motivation to research					+									+	
	Esteem for research					+								+	+	
	Putting one's work into perspective				+	+								+	+	
Professional effects	Progress of research			+		+							+	+	+	
	Societal awareness														+	+
	Societal recognition	+				+									+	
	Public knowledge													+	+	
	Peer recognition	-														
	Career advancement						+	+	NS							
	Team spirit	-				+										
	Communication skills					+	+	+					+	-	+	
	Career orientation	+														
	Research funding		+	+	+		+						+		+	

AUS = Australia; FR = France; JAP = Japan; SPA = Spain; NZ = New-Zealand; UK = United Kingdom; US = United States. In the table, 'NS' means that there is no statistically significant correlation.

Note: The + sign indicates that the effect is mentioned and positive in the study, the - sign that it is negative. These are mentions, not overall trends. Only the H) Jensen and M) Zorn studies offer correlations.

Sources: The references for the studies A), B) ... M) are given in the bibliography.

32.2.2 *A disappointing yield, but rich in lessons*

Despite institutions repeatedly expressing a desire to learn more about and improve the engagement of researchers in public communication, I note that the question of benefits for the researchers is of little interest to the institutions. In fact, the institutes and learned societies such as Market & Opinion Research Inter-

national (MORI) and the Royal Society have focused their surveys on the barriers that impede the engagement of researchers. Most of the surveys contain a few questions asking about the benefits, and traces are reported by the respondents, but there is limited analysis of the items.

Why is there so little interest in beneficial feedback?

The explanation seems to me to be both theoretical and practical:

1. The deficit paradigm prevalent in the institutes' communication policies does not put particular emphasis on envisaging situations in which popularization is reciprocally beneficial. The 'myth of scientificity' promulgated by 19th-century popularization reinforces the rupture between scientific knowledge and popular knowledge. It follows that popular knowledge is not intended to alter the source of the popularizing message, thus rendering null and void any potential effect on science. This paradigm not only explains why there is little interest in these effects, but it may also help us to understand why many public engagement activities most probably do have little effect on researchers, since that is not sought.
2. This lack of interest in feedback on the research itself may be reinforced by a practical fact: collecting effects requires more qualitative and specific survey contexts (observation, long interviews), which would be more complicated to set up.

Yet surveys that focus on analysing practices or interviewing researchers at length are those that reveal the most benefits (Pearson et al. 1997; Burchell et al. 2009). A field community (mediators, meeting organizers or sociologists approaching those professionals) collects statements related to those benefits. The process is confidential, but the importance of what is at stake for understanding researcher–society relations is conveyed:

It is unreasonable to expect researchers to take an active role in public understanding of science if they are asked to consider only the benefits to society ... (Pearson et al. 1997:288)

Three studies (Pearson, Searle, Burchell) reveal evidence of similar personal benefits. They concern:

1. the pleasure of popularizing in the moment and then the satisfaction of having done so
2. the esteem of one's research accentuated by encounters
3. putting one's own research work 'into perspective'
4. potential advances for one's research programmes
5. strengthening one's communication skills.

32.3 Discussion of reported benefits

Let us go back to the list above.

32.3.1 Popularization can bring pleasure and then satisfaction

Dunwoody et al. (2009) have shown that, for researchers, ‘intrinsic rewards’ are significantly correlated with science communication activities involving the media. Those intrinsic rewards include the pleasure of speaking in the media, explaining and discussing applications and issues. With regard to activities involving meeting the public, there is an enthusiasm and excitement for the public engagement activity (Kunth, Torres-Albero, Searle, Burchell) which can have an ‘adventurous’ character. According to Jolanta Opaka-Juffry:

It’s hugely rewarding. It’s that kind of pleasure which you can derive from a conversation with a, say, randomly met stranger of perhaps a different cultural background and suddenly you realise that you’re clicking and you understand each other. (Burchell et al. 2009:52)

We notice a gradient transforming a notion of immediate pleasure of the ‘fun’ or ‘reward’ type into a more general notion of satisfaction with a job well done.

32.3.2 The esteem of one’s research accentuated by meetings

Searle explains that the ‘fun’ experienced in meetings can lead to a boost in self-esteem that should not be overlooked. Through her survey, she accumulated 1,886 verbatim responses to that effect (970 personal benefits, 916 professional benefits; Searle 2012:236). With regard to the esteem acquired, it is not only linked to personal skills, but also to the meaning of the work provided, as this physicist testifies:

It reminded me how important our work is. (Pearson et al. 1997)

For a researcher, the esteem and strength drawn from the act of popularization can be applied to the heart of their subject and help them to extricate themselves from the artefacts of scientific production, like an artistic work freed from its scaffolding. Stephen Gentleman adds:

Actually it really helps when you go back to the lab and realise there’s a real reason for doing this that may not always be apparent when you’re just stuck in the lab. (Burchell et al. 2009:47)

By passing through the outside world, popularization can inflate science with reality, as Jurdat predicted (Jurdat 1996). One can imagine that popularization, when it knows how to use this process of esteem and objectification, can be of great benefit for researchers with reservations. It can be a training ground for young researchers. I will come back to this at the end of this article. Beyond a few statements, this perspective receives very little attention in surveys on researchers and public engagement with science.

32.3.3 *The effect of putting one's own research work 'into perspective'*

Does popularization allow researchers to clarify their thinking? Does it allow them to consider their subject or their activity more clearly? In 1992, French researchers suggested resurrecting the 'old state thesis' and making it a popularization exercise for PhD students because 'one of its main virtues was to allow for a high level of vision and a synthetic perception' (Kunth 1992). Ever precise, Jolanta Opaka-Juffry adds:

Well, the public brings a vision of a bigger picture. The public, as I understand it, sees the landscape maybe without the details on it. Details are below their resolution level but they see the bigger landscape. Whereas the research community very often sees the details very sharply, has a focus on the details and often forgets about the landscape. That's how I see it and that's why public input is needed to keep that large landscape in mind. (Burchell 2009:46)

Researchers may hover around the 'clarification' effect without naming it, but my selection of studies did not reveal any researcher who said that popularization helped them to understand their subject or activity better.

This blind spot could be explained by a bias: it is not normative to state that one does not have a clear grasp of one's research topic in a survey response situation. Therefore, researchers speak instead of 'putting things into perspective', 'taking a step back' or 'opening up'. We can deduce that this contributes to a better understanding, which according to the researchers is more a 'putting things into perspective' than a 'clarification' (a term that could mean questioning the foundations of the work). We will see that the phenomenon is not the same for young researchers.

32.3.4 *Popularization can advance research*

The above findings lead me to believe that popularization does not consciously undermine the scientific foundations of a researcher's activity, but implicitly inflates them with reality. Some of Burchell's and Searle's verbatim responses indicated that esteem-building motivated researchers in their work. One could then infer that popularization is beneficial to research. However, more directly and repeatedly, studies indicate that popularization advances research. This is due to colleagues, the public and the contacts generated.

Colleagues

French people interviewed by Kunth talk about the opportunity to work with new colleagues and, for example, 'to go deeper into the subject of the "other", to ex-

change methods to adapt and extend them' (Kunth 1992). Pearson points to the 'team-building' effect of a 'Science Week' experience, which can be easily imagined as contributing to the scientific activity of a team.

The public and contacts

The MORI and Royal Society surveys show significant response rates on benefits such as 'popularization helps to generate ideas'. More specifically, using data from the Spanish survey by Torres et al., I found a high rate of humanities researchers reporting that they come up with ideas when they participate in the Madrid Science Fair. But what are those ideas? No survey refers to a specific idea that emerged from public engagement activity. A sympathy bias could lead researchers to please the interviewer. Nevertheless, I did find two relatively specific statements about potential advances: 'Research on AIDS has been stimulated by comments from young people' (Kunth 1992) and David Porteous's more developed reflection:

We're absolutely convinced that the project is stronger and better for having done that serious public engagement early on in the process. And not as a sop to funders or to the publics but as a fundamental component part, and that was something I was very firmly of the opinion should be built in right at the beginning. (Burchell 2009)

These examples are related to the medical field and concern the public as potential subjects of study.³ It is therefore understandable that popularization offers a field of observation of the public or contacts for accessing subjects of study. This may also explain why researchers in the social sciences and humanities are more likely to state that they advance their research through contact with the public.

32.3.5 *Communication skills can be strengthened*

In 2009, the Burchell survey analysed the fact that public engagement activities can provide communication skills that, according to its verbatim responses, strengthen researchers' ability to write funding applications. Searle's verbatim responses also report this skill acquired for writing grants. Here is a thought developed by Daniel Jacobi (1999) highlighting that the use of popularized writing can reinforce the argumentation skills of researchers in interlocutions with their peers:

... contrary to what was expected, the register of popularisation is fertile ground that authors seize upon to improve the argumentative effectiveness of specialised scientific communication.

³ This confirms the findings of Michel Callon (1998), who shows that the logics of public engagement that could lead to the adaptation of scientific knowledge are only effective with 'involved groups', such as patients.

However, it should be acknowledged that this transposition of an effect of popularization into a skill that contributes to research is rare. The surveys tend to relay the satisfaction that researchers have in improving their communication, without going into detail. Indeed, in the deficit paradigm, improving one's communication has the effect of improving the objectives of bridging the knowledge gap, gaining confidence and exercising responsibility. And—in this paradigm—that is enough.

32.4 Observation and testimonies

For six years, colleagues and I observed groups of young researchers engaged in a dialogue about their research with different audiences: the Experimentarium (Maillot 2018a:287–348).

32.4.1 *Fertile clarification by mirror effect*

The observation allowed us to uncover the case of an idea formulated by laypeople during a meeting in which a researcher, Ludivine, was talking about her thesis. This idea was fertile for Ludivine. As part of a public engagement activity, she had recounted some of the preliminary stages of her work leading up to her current investigation. She shared this story with her audience and afterwards said that they had 'given her new leads'.⁴ In fact, her audience reactivated an idea that she had already had, but which she had forgotten or put aside, even thinking that she had 'explored all possibilities' of that subject. Owing to the mirror offered by the encounter, Ludivine explored this avenue in her thesis work during the two months following the encounter.

Many young researchers at the Experimentarium say that the encounters 'clarify' their thesis. They are in training. Therefore, admitting that their understanding is not totally clear is not a departure from social norms. Another researcher, Diane, went even further. Just before a meeting with classes, she confessed the following via text message to a mediator: 'I'm practising for this afternoon, I think I've finally understood my thesis.'

Based on the observations of the effects on young researchers made at the Experimentarium, Frédéric Naudon undertook a thesis proposing a more radical framework of encounters, in particular a 'laboratory meeting' bringing together a researcher and four to eight laypeople. The objective of that meeting was clear: to help the researcher find answers to an open question about his research topic (Naudon 2022). Another series of experiments was conducted, this time in the context of technological innovation. The results of those experiments highlight the

⁴ See Maillot (2018a:343) for the verbatim responses of the interview with Ludivine.

cognitive benefits that experts can derive from encounters with laypeople: formulation of new questions and research proposals, testing of the technological project or research question, the emergence of alternative solutions, and so on (Naudon 2021).

32.4.2 *Socialisation, reassurance and motivation for research*

Let's go back to the Experimentarium and Diane's text message. This PhD student confided a kind of confusion regarding the beginning of her career. This illustrates the importance of considering popularization in the light of the often complicated initiatory experiences of PhD students. Young researchers may experience isolation in a threefold sense: cognitive (being confronted with the unknown for the first time, suddenly finding themselves to be 'dunces' and no longer 'good students'; Levy-Leblond 2003); professional (receiving less support than they might have imagined; Faury 2012); and social (not being recognized and experiencing anxiety about their future; Chao et al. 2015). PhD students therefore have a need for encounters. Therefore, my colleagues and I noted three new benefits of popularization: socialization, reassurance and remotivation for research. The public engagement programme offers PhD students socialization opportunities (which are important at that time of life), but above all the possibility of sharing their experiences, problems and worries with counterparts.⁵ Indeed, the other PhD students involved have the advantages of having the same experience as them, at the same age, and they have no hierarchical relationship with them. Melanie said that 'it makes research more friendly'. Involvement in the Experimentarium offers fringe benefits to the formal practice of the programme (workshops with the public). Those fringe benefits are sources of discussion, dialogue and reassurance (Faury and Maillot 2018). The programme is supervised by scientific mediators who train the young researchers by taking care to listen to their experiences. The mediators are aware of the potential benefits of offering the young people a chance to speak. The PhD students feel listened to: 'It's the first time I've talked about my thesis, after all,' said Aurélie. 'I found them very, very attentive to what I was and what I was doing ... I was full of uncertainties about the fact that I had something to say and at the same time, they were very sure,' said Jacques, a young sociologist, about the Experimentarium mediators.

This dynamic can lead to a remotivation for research: 'The thesis is often compared to a pregnancy. For me, the Experimentarium is like an epidural, it makes the labour less painful!' said Clémentine.

Remotivation can be supported by good encounters with the public. Appreciating the availability of researchers and the fact that they do not hide their weak-

⁵ *Counterparts* who are both reflective and reassuring, who come under Cicero's ancient definition: 'a second self, a trusted friend'.

nesses but open up, the public can become an encouraging force. ‘I said to myself: I am no longer alone,’ said Florence in 2011 after popularizing her thesis.

This dynamic invites a total reversal of the appreciation of popularization or public engagement with science. From a minor, ‘humanitarian’ activity, the sole objective of which is to educate the ignorant and which ‘wastes time normally dedicated to research’, it becomes a humanist activity that reassures and boosts research.

The highlighting of this beneficial process is not new. Lévy-Leblond (2009) talks about the intellectual and emotional rewards of contact with an audience:

The researcher’s organic involvement in knowledge-sharing activities has great advantages in terms of their psychological equilibrium and enjoyment of the profession: nothing is more frustrating and anxiety-provoking than this occupation where one spends most of one’s time not finding anything, persisting in meanderings if not in mistakes. (Lévy-Leblond, 2009)

But scientific institutions reject those statements at the margins. Searle (2012) interprets this as a desired neutrality in science, which makes institutions wary of the idea that affect might play a role in the scientific field.

32.5 Considering benefits and changing public engagement with science practices

Public engagement with science programmes would do well to take into account the beneficial dimensions revealed by the above observations. Integrating cognitive, personal and professional benefits leads to a different conception of public engagement activities. It is a question of institutions no longer begging for participation out of civic duty (Maillot 2018b) or professional duty, but offering an activity that will be personally educational and enriching. The researchers themselves will then be able to adopt a new position and combine the position of transmitter of knowledge (or experience) with that of receiver of the contributions of others.

Numerous studies have shown that the paradigm shift in public science communication wishing to move away from the deficit model and supplement it with dialogue models was not successful (Joly and Kaufmann 2008; Bodin 2013). As long as researchers fail to realize the potential benefits of encounters with non-specialists, they will revert to their deficit position.

Therefore, the study of the potential benefits for the researcher, the theoretical exploration and the implementation of programmes integrating this dimension can lead to concrete changes in science–research–society relations.

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