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# The Architecture of the Ivory Tower

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Navigating Structural Constraints & Conceptions of the Public  
in Communication of Scientific Knowledge

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This thesis explores how scientific knowledge is made public by natural and health science researchers at Danish universities, with a focus on the systemic and conceptual constraints they encounter. It adopts a radical ontology, viewing knowledge as produced through translation chains and is enriched by the notions of invisible work and standardization. Further, the concept of Issue Publics (IPs) is used to illustrate how the public organizes around specific issues, providing a backdrop against which current conceptions of the public are criticized. The methodology includes 13 semi-structured interviews and a design game workshop. The thesis characterizes the University as a standardized configuration which prioritizes Key Performance Indicators and esoteric dissemination. This creates significant obstacles for making knowledge public, including that communication is often extracurricular and invisible. A prevalent 'publish or perish' culture is identified, exacerbated by the University Law's vague wording which absolves the University from its responsibilities. Moreover, the notions of the general public and specific target groups are shown to be hindrances for making knowledge public, while an issue-oriented approach to defining audiences is shown to afford researchers greater flexibility. The thesis proposes amending the University Law to ensure funding for communication and reallocating overhead costs to support this essential work. The thesis additionally develops a reflection tool that aids researchers in identifying their IPs and refining their communication strategies. These changes aim to reduce unrecognized labor and foster a more inclusive practice of communication of scientific knowledge, contributing to the democratization of scientific knowledge.

# **The Architecture of the Ivory Tower**

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We hope you'll enjoy reading it half as much as we have enjoyed writing it.

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# 1 Knowledge and democracy

Knowledge<sup>1</sup> has historically taken on a role of capital, one of superiority and power. It was reserved for the societal elite to be used in ruling endeavors. The first European universities permeated social exclusion even through their architecture:

*“The act of creating Oxford and the other medieval universities was an act of enclosing knowledge, limiting access to knowledge, exerting a form of control over knowledge and providing a means for a small elite to acquire this knowledge for purposes of leadership of a spiritual nature, of a governance nature or a cultural nature.”* (Hall 2015:2)

A great deal has happened since medieval times. Colonization and the act of *epistemicide* that followed (de Sousa Santos 2014; Bennett 2007). The first major instance of democratization of knowledge through the invention of the printing press (Price et al. 2003). The more recent advent of the Internet as a purported democratization of knowledge through even larger accessibility than its informational predecessor (Pfister 2011).

It is not our purpose here to outline all the ways in which epistemic conceptualizations of knowledge have changed at different points in history. Instead, we turn to a contemporary version of knowledge, one which pervades the institutions which have long been bastions of scientific knowledge, the University (Gruening 2001). The University has “... *come under an economic spell, expressed in the idea that the prime function of Higher Education is the training of a high-skilled workforce and the production of high-quality scientific knowledge.*” (Biesta 2007:467). Knowledge has become a commodity in the post-industrial society of today. It has become economically valuable in itself, rather than through technical application (Biesta 2007). We have effectively created a knowledge economy in the Western world (Powell & Snellman 2004). Just last year, the current government in Denmark proposed a restructuring of higher education consisting of reducing a range of master’s programs from two to one year to supply larger numbers of skilled workers in a shorter time (Højsgaard 2023).

The University has traditionally had an epistemic monopoly on the production of scientific knowledge (Biesta 2007). This monopoly has been stripped away in the post-industrial society, this knowledge produced in a myriad of places outside of the University. It has increasingly become subject to neo-managerial influences of efficiency and production

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<sup>1</sup> Please note, that throughout this thesis we use the descriptions of *knowledge*, *research-based knowledge* and *scientific knowledge* interchangeably. Therefore, whenever we simply write *knowledge* this is taken to mean the scientific and/or research-based subtype, so as to avoid confusion with other types of knowledge.

(Delanty 2002). New Public Management (NPM) has manifested itself within the University (Gruening 2001), evident in current funding structures. Once exclusively a publicly funded institution, the University now has to primarily fund its activities on its own (e.g., University of Copenhagen n.d.; Aarhus University 2024). It has to operate like a business, reliant on taking a percentage of the funding acquired by the employed researchers as an overhead (Ministry of Higher Education and Science 2021). It has led to the marketization of the University (Weymans 2010); the product the enlightened citizen who has made its way through its educational programs. The democratic contribution of the University has been reduced to this production (Biesta 2007).

Several scholars have challenged this conceptualization of knowledge and role of the University (e.g., Weymans 2010; Biesta 2007; Rowell & Hong 2017). As Hull (2015:8) writes: “*we have found the use of the concepts of the knowledge economy and knowledge society to be wanting from the perspective of justice.*” Management paradigms have overshadowed the relational role of knowledge in contemporary society. Scientific knowledge has infiltrated everything that we do. As written in the introductory chapter of a recent report on the state of science communication in Denmark written by the Danish Board of Technology (DBT): “*Research-based knowledge ... is ... essential for virtually all activities in business and the public sector. ... Knowledge that we, both as individuals and in political processes, use as a basis for assessments and decisions*” (Danish Board of Technology 2023:11, translated by the authors). The civic role of the University thus extends beyond solely the production of high-quality knowledge and providing this to students as means of education. While scientific knowledge is heavily marketized, it is simultaneously essential to solve the issues we face in this post-industrial world. Scientific knowledge can no longer be reserved for the few allowed within the walls of the university, within the *ivory tower* (Shapin 2012). Continuing from the report quoted above: “*Therefore, a well-functioning democracy requires that we all have access to scientific knowledge, that we can use it as a basis for reflection and decisions, and that we can critically engage with it.*” (Danish Board of Technology 2023:11, translated by the authors). It is this definition of the *effects* of scientific knowledge that we rely on throughout this thesis (we discuss the *nature* of this knowledge in the following chapter). We approach research-based knowledge with the intent of democratization. Access to scientific knowledge in a techno-scientific society (Latour 1983) is a democratic requirement, this knowledge possessing an emancipatory quality (Bianchi 2021). It is through scientific knowledge that we come to know enough about the issues that we are implicated in to intervene (Marres 2005, 2007). In this thesis we flip the notion of access around and investigate not how scientific knowledge is

accessed by citizens in a potentially overloaded informational landscape (Bawden & Robinson 2020). Instead we investigate how scientific knowledge is made available for those outside of the University. This thesis is concerned with how contemporary science communication is carried out under the influence of the managerial forces of today.

## 1.1 Granting access to scientific knowledge

Science communication is a contested term, often defined in various ways. One prominent definition is posited by Burns et al. (2003:183), who relates science communication to “... *the use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science ... : Awareness, Enjoyment, Interest, Opinion-forming, and Understanding.*” We here offer an alternate definition, one which is not predicated on the impact the effort makes on the receiver. Instead, we are inspired by Latour’s notion of *making things public* (Latour 2005) and define science communication as the act of *making knowledge public*<sup>2</sup> – we discuss the philosophical implications of this move in the following chapter, including what this entails for conceptions of the public. This definition has several affordances compared to other definitions of science communication. It allows us to focus distinctly on those who make knowledge public, including the efforts leading up to this moment, as well as to whom such knowledge is made available. Indeed a vocabulary for dealing with this duality of science communication.

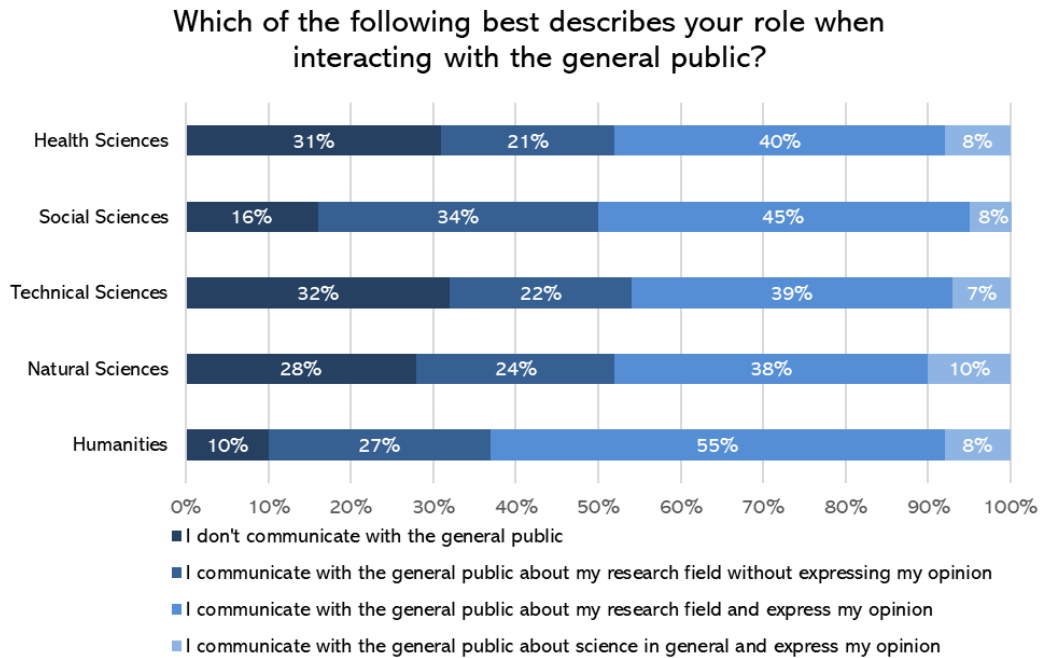
This thesis focuses specifically on the traditional knowledge producers, researchers employed by universities. The current investigation is limited to concern universities due to the legal obligation of these to communicate the knowledge that is produced, manifested in §2 section 3 of Law No. 403 of 28.05.2003 (henceforth referred to as the University Law). As a means of garnering a direction for the empirical work of this thesis, two specific branches of science have been singled out. This choice has been made on the basis of a survey conducted as part of the aforementioned report authored by DBT. In this survey researchers indicated their role when interacting with the general public (See Fig. 1). Of the five represented branches, the health, technical and natural sciences share a similar percentage of researchers who do not communicate with the public. This disproportionality provides the largest possibility for the democratization of making knowledge public. Further, the natural and health sciences have been chosen for a non-representative subset of Danish citizens’ interest in these.<sup>3</sup>

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<sup>2</sup> Throughout this thesis we use the terms *communication of research-based knowledge* and *making knowledge public*, with all their variances, interchangeably.

<sup>3</sup> A representative subset of the Danish population indicated that they were most interested in the following three categories: 1) Health, 2) Psychology, and 3) Biology (Danish Board of Technology 2023, Fig. 3.7).





**Fig. 1:** Recreation of Danish Board of Technology 2023, Fig. 4.6. Original graph based on a non-representative survey conducted among researchers employed by Danish universities (n=3.846). All values are original. All text has been manually translated by the authors of the present report. Recreation has been authorized by the responsible senior project manager.

Plenty of studies has been conducted on researchers’ attitudes towards and capabilities for engaging in science communication (e.g., Entradas & Bauer 2017; Hvidtfelt Nielsen et al. 2007). Danish researchers in general find making knowledge public to be an integral part of their work, alongside conducting research and giving lectures to students (Hvidtfelt Nielsen et al. 2007). The recent report authored by DBT similarly concluded that:

*“The Danish population has a strong interest in and trust in science and researchers, while the country's researchers engage in science communication on many different platforms, take the responsibility seriously and otherwise show interest in expanding this engagement.”* (Danish Board of Technology 2023:87, translated by the authors)

When turning towards the structural conditions under which these communicative activities are carried out a range of issues emerge. Several actors have recently denounced the conditions that come with being employed by Danish universities. A movement called *Forskerbevægelsen* was officially formed in May of this year, intent on “... *setting research free*” (Petersen 2024). This includes advocating for a thorough overhauling of the University Law and of the funding schemes that Danish universities rely on. The union DM has similarly called the required external fundraising a waste of valuable time, time that would be better spent on conducting research (Gregersen 2024). Rather than reiterate the findings outlined above, this thesis

investigates the conditions under which scientific knowledge is made public by researchers employed by Danish universities. The structure that has led to these calls for change. Additionally, it addresses the question of *to whom* knowledge is made public, fleshing out a socio-ontological version of the public outside of academia. This, to provide a substantiated critique of contemporary management structures and to develop a pragmatist-inspired tool for including the right actors in communicative efforts. Specifically, this thesis addresses the following research question:

## 1.2 Research question

*How is scientific knowledge made public by researchers employed by Danish universities, which structural and conceptual constraints hinder these efforts, and in what ways can these constraints be alleviated?*

To answer this research question we employ the concepts of chains of translations, invisible work, marginalization and Issue Publics. This patchwork is operationalized via a qualitative methodological approach consisting mainly of a semi-structured interview study, while a design game workshop plays a supportive role. This approach lets us explore the structural conditions for making knowledge public as well as providing a vocabulary for describing definitions of the public and the world-building efforts of researchers. In turn, this provides the empirical and analytical backdrop for the action-oriented nature of the final chapter.

## 2 Conceptual framework

The conceptual framework for this thesis consists of two distinct yet interrelated theories originating from within the field of Science and Technology studies (STS): Susan Leigh Star's conception of a Feminist approach to STS and Noortje Marres' pragmatist influenced notion of Issue Publics. Below, we first clarify our mobilization of a definition of scientific knowledge as something which is produced, before introducing these two approaches in sequence. Throughout this chapter we additionally reflect on the affordances of employing these approaches and the ways in which it has structured how we view both knowledge and the world.

### 2.1 On the nature of scientific knowledge

Scientific work is inherently heterogeneous (Latour 1999a; Star & Greisemer 1989). Scientific facts do not simply appear in front of the researcher, in a supposed moment of revelation. It is through incessant and careful work, employing measuring tools and approaches, at times inventing new ones, that scientists come to know about the world. Scientific work is not streamlined, a recipe to follow to obtain truth. It is not cold and methodical. It is warm and often dispersed across disciplines, methodologies and technical apparatuses. Scientists are human too, full of passion and steeped in know-how. Science does indeed think, contrary to the Heideggerian outlook on science adopted by the humanities during the Culture Wars (Latour 1999b).

An example. A sample of soil is taken from within the Amazonian jungle. It is removed from its brethren but speaks on behalf of that which is left behind (Latour 1999a). It speaks as a representative, revealing the mineral levels of the soil, of the microbial life it hosts and its capacity to (or not to) carry the weight of vegetation. We would not present the soil as we have found it, or claim that 'it' holds scientific knowledge per se. We have before reserved such a moniker to text and words, to language, as if it were an entirely different ontological domain than the world it describes. If that supposition holds true, it is simply a matter of finding the right words to describe this worldly phenomena. In practice it is not so simple. Which words to use, and the meaning they carry, differ from discipline to discipline, from method to method, from person to person. The soil sample is reconfigured through technical instruments and disciplines, appropriated to represent the paradigm from which theories and stories of the world are told. The moves made to ensure the validity of one claim to knowledge over another are central to understanding how scientific practice produces facts. In other words, the chain of translations that leads from soil samples to scientific evidence, published in journals and

applauded by like-minded colleagues. The chain of translations that “*accord a truth-value*” (Latour 1999a:40) to the claims put forward. The production of the referent that refers back to the initial sample, the initial observation.

Some chains of translations might result in mundane knowledge. After all, much scientific work is conducted to confirm by falsification what we believe we already know (Popper 2002). Other chains might result in controversial knowledge. Knowledge of the emerging patterns of jungle expansion and recession that could challenge current sustainability conceptions or of cancer-inducing chemicals in tobacco. While the controversial type seem vastly more relevant for the public,<sup>4</sup> we argue that there is no inherent difference between mundane or controversial scientific knowledge. Both are the result of complex chains of translations and negotiations. In both cases it is in the end the scientist (most often it is not a singular one, but a consortium of researchers) who decides when the final link is forged. The scientist has mastered the world, published their findings in scientific journals, and moved on to another sample, another observation, another experiment. At times, the knowledge produced remains within the esoteric world of academia, available within journals and presented at conferences. At other times, the knowledge produced seeps into public life (Latour 2005).

In Latourian terms, the effort of making knowledge public is a link in the chains of translations. Inhabiting the privileged position of producer of knowledge comes with power, for as Sir Francis Bacon told us already in the 16th century: “*knowledge itself is power*” (Bacon 1597, quoted in Azamfirei 2016:65). If knowledge is power, then who is more powerful than those who produce it? We do not intend to say that scientists have formed a cabal, maliciously withholding knowledge about the world, leaving the rest of us to suffer a knowledge-less existence. The power that we ascribe to them in this thesis is less disparaging than that. It is the power to choose *what* knowledge makes its way out from the academic world. To choose *who* are the ones that wind up benefitting from the knowledge so graciously divulged from behind the towering walls.<sup>5</sup> Of course, it is not exclusively these scientists who have a say, it is not an autocracy. Inquisitive journalists who pick up the scent of a good story or politicians seeking insights into a subject they are legislating on, shifts the initiative. Still, as a consequence of the chains of translations, the researcher has come to inhabit a position from which they can speak on behalf of their network, on behalf of soil samples, machines and their immediate colleagues.

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<sup>4</sup> We here define the public momentarily simply as all actors outside of academia. We treat the notion of the public explicitly in section 2.3 and there develop a more thorough definition.

<sup>5</sup> We here draw a parallel to the medieval universities of old and to the still-elitist nature of the contemporary European University (Biesta 2007).

They call the shots, so to speak. Whether knowledge is made public, or is kept within the academic realm, to be molded and transformed once more.

One thing is following chains of translations to their purported endings. Another is what happens after that. Science and scientific knowledge has a way of making its way into areas not initially relevant for the translation of say a soil sample, namely politics and the public. It is this phenomena which interests us here, more so than the initial production of scientific knowledge. The phenomena of making scientific knowledge public to those outside of academia.

## 2.2 Standardization and invisible work

The chains of translations described above are part of a radical ontology which has formed the basis of one of the most influential approaches within STS, Actor Network-Theory (ANT) (Law 1999). In short, this radical ontology posits that the world is made up of fleeting actors, both human and non-human, structured through alliances and spokespersons speaking on behalf of other actors in socio-technical networks (Latour 1990, 1992). Feminist scholars, such as Star (1990), have criticized the approach for its seemingly inherent insistence that control and management are the primary forces of development within these networks. Likewise, ANT has been accused of creating narratives of mobilization of networks based on the actors that wind up as spokespersons, without regard for all the supportive actors who makes action possible. “*A Machiavellian management theory*” (Gad & Bruun Jensen 2007:96), if you will. We are also at fault; we have appointed the researcher the great position of power that rests at the end of the chains of translations that produce knowledge. Their position is likely more fractured and subserving than it seems at first glance. To exemplify this, a conceptual apparatus is required. It is this apparatus that we elaborate on below.

First, a few words on multiplicity. Multiplicity represents the notion that human and non-human actors can take on different outward appearances, different relational positions, and utilize different strategies while confronting each other. Being enrolled in one network does not necessarily exclude the possibility of being part of another. An actor can belong to different worlds at the same time, in a form of *multiple marginalization*. As Star describes this:

*“We become multiple for many reasons. These include the multiple personalities that arise as a response to extreme violence and torture and extend to the multiplicity of participating in many ... worlds – the experience of being marginal”* (1990:29)

The multiple actor is the one delegated to, the disciplined, the one expected to comply. The multiple actor is forced to be represented by a representative who is unable to perform this task adequately. While lending face to the executive of the network the individual is forced to choose which parts of oneself to forget. To fit in, you must be like the others. Subscribe to the programme of action (Latour 1990) or be left behind. Refuse to conform to gender norms in a cis-normative society and be treated like an outcast (Star 1990). Stop publishing scientific articles and your academic career is likely to be short-lived.

A certain type of work is carried out by those who are marginalized. A type of work that is often not recognized as work, or just not noticed at all. A type of work which is *invisible*. Once more, we draw on the power of example, this time Star's own as she has posed it in her article *Power, technology and the phenomenology of conventions: on being allergic to onions* (1990).

Onion allergy. An extremely niche, somewhat mundane allergy. It can be surprisingly difficult to avoid onions in your everyday diet. The vegetable is ubiquitous in Western cuisine. It is in every dish, even fast food. The surprise rears its ugly head not until one tries to avoid said onions, as Star is forced to do, lest allergic discomfort is imminent. Running late for a meeting one day, she decides to stop by McDonald's to grab a quick meal en route. When she got to the counter she ordered a burger without onions, a simple subtraction from the usual recipe one would think. Not quite. 45 minutes she stood waiting for her burger to be prepared, the hungry patrons all around her fed in but a few minutes. Her order fell outside of the norm and she is forced to wait accordingly. McDonald's is not equipped to accommodate her rare allergy.<sup>6</sup> Frustrated, she left the restaurant, later for her meeting than ever.

Why was McDonald's unable to accommodate Star's order in a more fitting timeframe than 45 minutes? It is because McDonald's has become a *standardized configuration* (Star 1990). It is a network that has developed and enforced certain guidelines for participation in and interaction with it. The standardized configuration tries to make its services suitable and inclusive for as many different actors as it is deemed viable, while simultaneously forcing a singular form of action upon participants. The standardized configuration is created only when a network can begin to speak on behalf of other actors, forcing them into submission, quieting their voices, so that "[...] *only voices speaking in unison will be heard*" (Callon 1984:19). The dissidents and the rebels are suppressed by the might of the masses (Latour 1999b). The

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<sup>6</sup> We realize that the current configuration of McDonald's does in fact allow patrons to add or remove elements of the burgers that are ordered. This does not take from the illustrative power of the example however, as it but an allegory of general encounters with standardized configurations.

standardized configuration gains traction with its ease-of-access for the majority; if you can eat onions, you probably won't mind onions in your burger when you order at McDonald's. Only if you are allergic to onions will you oppose the standardized configuration, order a burger without onions, and suffer the consequences.

The next time Star goes to McDonald's she orders a regular burger, onions and all. For McDonald's she is now nothing but a regular customer. She has been disciplined, forced to neglect her onion allergy as the price for participation. As an act of invisible rebellion, Star has brought a knife from the counter to her table where she sits down to eat. One by one, she meticulously removes the finely diced onions, out of sight of the clerks at the counter and out of the metaphorical sight of the standardized configuration. In the eyes of the network she has conformed. In the shadows she rebels, challenging the disciplinary power of the standardized configuration while still lending face to the public stability of it:

*“A standardized network is only stable for some, and that is for those who are members of the community of practice who form/use/maintain. And part of the public stability of a standardized network often involves the private suffering of those who are not standard – who must use the standard network, but who are also non-members of the community of practice.”* (Star 1990:43)

Remove onions from your burger while sitting at the table. Maintain the illusion of heteronormativity to be allowed the familiarity and comfort of family (Star 1990). Publishing the required number of scientific articles to maintain your career, while investing your free time into other communicative activities. The *invisible work* required to fit in, in a world of standardized configurations (ibid.).

We extend this notion of fitting in to researchers and their communicative efforts. They do inhabit a position of power but it is a precarious one. As we unfold in the following chapters it is not a position of freedom. They, too, face standardized configurations in their work, restrictive programmes of action that limit them. They, too, are multiple in belongingness, split between responsibilities. They, too, pay the price for participation.

### 2.3 The issues that brings us together

The second part of the conceptual framework then, the part that relates to the notion of the public, the socio-ontological role of issues in the forming of publics. *“Issues Spark a Public Into Being,”* as Marres (2005) titled her article. Fittingly, the results of this socio-ontological conception have come to be named Issue Publics (henceforth referred to as IPs); publics which

come into being around a given issue (Marres 2005, 2007). While this conceptualization has been used to argue for the role of public involvement in post-industrial societies, we extend this notion to the practices of communication of research-based knowledge. Before delving into the argument for this extension, a few clarifying words on what the notion of IPs entail, its ontological reasonings and the implications for popular perceptions of the public as a singular entity.

Much recent work in STS has been centered on the role of issues in the democratization of science and politics (e.g., Wynne 2006; Irwin 2001). We here rely explicitly on the contributions of Noortje Marres, and her elucidation of the relevance of the Lippmann-Dewey debate. For Dewey, and consequently Marres, it is the indirect consequences of issues which create publics:

*“Industry and inventions in technology, for example, create means which alter the modes of associative behavior and which radically change the quantity, character and place of impact of their indirect consequences. ... The new public which is generated remains inchoate, unorganized, because it cannot use inherited political agencies.”*  
(Dewey 1991 [1927], quoted in Marres 2007:769)

Issues here have a worldbuilding quality to them. They bring actors together who were not so before. The consequences of these issues affect certain actors, both human and non-human, while other actors go free. It is through these consequences that the actors which form a given public are informally gathered:

*“The public consists of all those who are affected by the indirect consequences of transactions, to such an extent that it is deemed necessary to have those consequences systematically cared for.”* (Dewey 1991 [1927], quoted in Marres 2005:213)

The characteristic of this type of public is that it is *exclusionary*. It is a direct answer to the conundrum of inclusion warranted by the ideal of a deliberative democracy posited by Habermas (Susen 2018; O’Neill 2005). Assume for a moment that a singular public exists a priori to any engagement processes. If this public consists of rational actors, who should be invited to participate in the deliberation? The parameters of choice become arbitrary. ‘The Public’ is a red herring, a Phantom as Lippmann put it during the aforementioned debate (Marres 2005). Such a conception of the public hinders action due to the never-ending search for ways to involve *everyone* – a search that much resembles the illusion of flexibility of standardized configurations intending to be as inclusive as possible (Star 1990). The pragmatist



focus on issues brings non-arbitrary parameters for inclusion in political debates and processes. Through issues the relevant actors can be identified, demarcated by the consequences that affect them. Instead of alliances between actors, the world is structured through shared indirect consequences. The notion of IPs is thus “*a relational ontology*” in which “*actors organize into a public to the extent that they are implicated in a problem that requires their intervention*” (Marres 2007:768).

In the globalized world of today these actors might well be distributed, unknowing of each other. We argue that such acknowledgement is not a prerequisite for being part of a given public. The dispersed public is still a public. Even though the identification of implicated actors is done through the requirement of their intervention, we argue that this does not necessarily entail direct action on behalf of the actor. This, to avoid overlooking disenfranchised actors who are forced to live in between standardized configurations which might hinder their direct ability to intervene of their own accord (Star 1990). Instead we take this requirement of intervention to mean that an effort of inclusion should be made to involve even those who cannot intervene on their own. Indeed, systematically caring for the implicated actors as well as the consequences of a given issue (Marres 2007).

IPs are not so different from socio-technical networks. Socio-technical networks are formed with a purpose, recruitment carried out through interestment; align yourself with the network and avoid consequences (Callon 1984). The network's purpose can be equated to the problem-solving reason for the IP to come into being while the effort of recruitment resembles the requirement for intervention. Both rely on a relational ontology which acknowledges the fluidness of the world as well as the recognition of both human and non-human actors. In effect, it is only the structuring method that differs. Hence, we allow both versions of structure to influence our work. Standardized socio-technical networks still exist, even if the public is made up of issues.

The notion of IPs is beneficial to our work in several ways. It offers a philosophical backdrop against which we can argue against definitions of the public as a singular entity, providing a vocabulary for why this definition makes the goals of communicative work impossible to reach. Additionally, it allows us to sketch the practical requirements for these IPs to be incidentally discovered – even when the public and thus the world is viewed through a much different lens – and describe the decidedly positive implications of this. In turn, this allows us to develop a tool for helping researchers identify the IPs they are a part of without realizing it, through the appreciation that research itself is connected to these issues.

### 3 The empirical foundation and its implications

Collaboration is the key to success (Williamson et al. 2010). A phrase that we have likely all been told at some point. At Aalborg University (AAU) it strikes even truer, with the Problem Based Learning-format (Aalborg University n.d.) practiced here. For most students at AAU, and especially for those studying Techno-Anthropology, *external* collaboration is almost as important as the collaborative projects carried out in groups of students. As Techno-Anthropologists we are urged to work on real world problems. Common among these is that we are likely to find others currently engaged in a similar problem. Allying ourselves with an actor of this type has a range of benefits. It ensures that the problem with which we engage is in fact a problem also in the real world (although a case can certainly be made for problems that indeed exist without anyone currently engaged in solving them, and vice versa). It is a way of obtaining access to the problem that we study. Many of the problems that we face, such as the climate crisis and eroding democratic institutions are large, at times seemingly insurmountable problems. Rarely are these problems faced in their entirety, tackled all at once – just the practical ramifications of doing so makes it unfeasible. Instead, we tackle bits of them. A specific city square secured from cloudbursts. A Citizen’s Assembly (Nielsen & Sørensen 2023) hosted on a specific issue, slowly contributing to the rebuilding of democratic governance initiatives. When we transform the all-encompassing collective problems into their practical, smaller scale siblings, the alliance with enmeshed actors allows entry into the situation at hand. Access to municipal decision-making rationales, to the inner workings of the Assembly. The external collaborator is the gatekeeper (Hammersley & Atkinson 2007) through which we begin to form our empirical field of inquiry.

Access comes with conditions and obligations. Rarely are we invited inside to observe, analyze and then simply leave once again. We are often expected to provide *something* for the trouble of allowing us inside. Recommendations, policy briefs, and proposals for alternative courses of action are commonplace requirements. We have many a time found ourselves in this position of duality: Providing external value to a project partner while maintaining the academic integrity of the reports that we produce. Lean too far one way and you neglect the other. Focus too much on perfecting your piece of academic writing and lose the interest of your external partner. Concern yourself too much with contributing positively to your partner’s work and risk losing your academic credibility – the role of the fabled, to-be-avoided consultant.

We have not entered into a collaboration of the sort that we have described here. As such it might seem contradictory that we have bothered to describe it at all. Lacking a formal collaboration partner we should already have found ourselves in the realm of academia and should seek to excel there. While proper academic work is certainly important, it is only part of our objective. Put grandly, we want to democratize the landscape of communication of research-based knowledge. We have to strive for the other part of the duality. Actively seeking out the moniker of consultant rather than struggle with not letting it take over. For with this role comes the ability to translate results into action. It is how we become liaisons.

Throughout this report we investigate structural conditions for communication of scientific knowledge with the aim of supporting this activity. What sort of researchers would we be (granted that we are still but student-researchers), if we did not engage in this effort ourselves? Thus, the present thesis has several audiences. One audience is, of course, our university, our supervisor and our censor. We might be tempted to call this audience our primary one, as this thesis is the finalization of our education. We have chosen not to do so; the other audiences are equally important to us. Without them lending us an ear nothing will change, our research doomed to collect proverbial dust in the digital library of AAU. Getting our work 'out there' entails taking responsibility for it, bringing it with us also when we have finished our studies. The current report is more than a stepping stone.

While a seminar at Christiansborg in December 2023 marked the official end of the project that spurred the report authored by DBT quoted in section 1, they have since received funding to revive the project. They now continue the efforts of bringing science and citizens closer together, delineating the role that both science and scientists inhabit in our democracy. For this reason DBT makes up our second, but not secondary audience. Equipped with the capacity to advise policymakers and influence policy, they are crucial in the enactment of formal change. Developing insights, strategies and recommendations that might wind up being useful for DBT is a way of obtaining such influence ourselves. Even though DBT is aware that we are writing this thesis, they are not familiar with the nitty-gritty of it, not yet. They have not set directions for our work or asked us to focus on specific aspects of making knowledge public. A parasocial relationship, the fruition of which hinges on our ability to make the knowledge that we produce both interesting and relevant. Though we rely on DBT, we also make a concerted effort of disseminating the results of this thesis on our own to a third audience. It consists of policymakers equipped to influence the foundations of the contemporary University, as well as university administrations. We intend to spark political debate and make

these aware of the issues that are identified in the following chapters (we elaborate explicitly on targeting this audience in section 5.3).

We ensure the relevance of our findings by making available our own chain of translations for scrutiny. Balancing the roles of student-researchers and consultants once again relevant, even in the lack of a formal collaboration partner. Transparency both as guarantor of academic reliability and external credibility. Therefore, we dedicate the following chapter to describing the methodological framework from which we have obtained our insights. It consists mainly of a collection of 13 semi-structured interviews conducted with researchers currently engaged in scientific research, within the natural or health sciences, as well as the employment of a design game workshop conducted with three citizens. Although we view the world through the relational ontology described in the previous chapter, we do not follow the world-building efforts of researchers implicated in the issue of making knowledge public. Making knowledge public is a fleeting effort, for most not systematized or scheduled to occur at specific times. Additionally, we are not necessarily explicit members of these worlds; we are to a degree outsiders looking in. We are interested in how they experience these worlds, the position of the marginalized. It is these experiences that form the ways that they deal with the standardized configurations around them and these that influence their communicative work. As for the workshop, this is our way of approaching and gathering actors from entirely different IPs to take stock of their preferences for obtaining knowledge about scientific subjects. A way of taking stock of the jumble of structures that structure the relational world. It is by no means exhaustive, yet it provides some pointers on how to navigate this jumble. In the following chapter we take the time to both describe our use of each of these methodologies and reflect on their execution.

### 3.1 Obtaining insights from knowledge producers

Having delineated our field of interest, we need to get to know those who communicate research-based knowledge within this makeshift field. Do note that while the scope has been narrowed to concern the natural and health sciences, we have not narrowed it to specific subdisciplines. This, in order to overcome the first of a number of selection biases related to forming the empirical foundation of this thesis: that we ourselves are not students of these two disciplines, at least not currently,<sup>7</sup> and thus not intimately familiar with the range of fields and subdisciplines. Increasing the granularity of our scope would mean limiting ourselves to the

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<sup>7</sup> One of the authors has a bachelor's in biomedical laboratory science which she obtained in January of 2017.

disciplines that we have already encountered. The opposite of arbitrary choice, the selection would inadvertently be biased. We are personally deeply discouraged by the over-exploitation of natural resources and the damage this does to the Earth. Rising sea levels. Animals and insects driven to extinction. It is likely that we would wind up recruiting only from disciplines that align with our own matters of concern. Were the insights we produce to be relevant only to researchers who share these concerns, then we would not have hesitated to limit our investigation to their subdisciplines. It is not so. A more prevalent matter of concern takes precedence. Understanding the dynamics of making knowledge public and removing obstacles for doing so goes beyond these issues. Closing the gap between researcher and public in general, not just to relieve our own worries.

We have chosen to focus our recruitment of informants to the two largest universities in Denmark, each employing about 5.000 researchers, namely University of Copenhagen (UCPH) (2024) and Aarhus University (AU) (2024). Informants were recruited from a range of institutes and departments at these two universities. In keeping with the above-described avoidance of selection bias, these institutes, as well as the disciplines practiced by the researchers employed there, were chosen without prescreening. An approximate form of random sampling akin to the strategy used in quantitative survey-based research (Noor et al. 2022). Attempting to avoid bias has meant considering the potential informants to be a homogenous group, one and all valuable for the explorative empirical work at hand. The stories of each informant might vary, yet all of these are emblematic of practices of making knowledge public. No one story or informant can be deemed more important a priori.

The approximate random sampling of informants resulted in a list of 48 researchers, found through the respective university's employee database. The recruitment effort then consisted of reaching out to these via email to request their participation in our thesis. The recruitment material has been compiled in Appendix 1, and consists of a consent form, a series of practical information and the recruitment email itself. In total, this recruitment effort yielded eight informants, five from the natural sciences and three from the health sciences.

A further recruitment effort was made through the professional network of one the authors, who has previously been engaged in work related to the health sciences. Random sampling made difficult by the network approach, this part of the recruitment effort was organized through a friendly gatekeeper (Hammersley & Atkinson 2007) who forwarded our recruitment material to potential informants on behalf of us. The avoidance of selection bias here consisted in allowing another to make the choice for us – those who would answer our call for participation were initially more unknown than those we contacted directly; we didn't

even know their names! This meant abiding by the discretion of our gatekeeper, who likely forwarded our recruitment letter and accompanying material to ones they thought might be interested. In total, four additional informants were recruited through the gatekeeper, one of these employed by the University of Southern Denmark (SDU). While we have not ourselves targeted this university in our recruitment effort, we have seen no reason to leave the informant out. The informant is still engaged in university-based research. One additional informant, who recently has been a subject of public controversy, was recruited through a friend of ours.

“*Did it work, then, your attempt to randomly sample participants?*” one informant asked us. It was a great question at the time, knee-deep in data collection as we were, and it still is now as we write this.

RESEARCHERS					
<i>Date</i>	<i>Duration</i>	<i>Pseudonyms</i>	<i>Job title</i>	<i>University</i>	<i>Discipline</i>
19/Mar	1 hour	Gry	Associate Professor	SDU/Hospital	Nursing
20/Mar	1 hour, 9 min.	Tim	Post doc.	Copenhagen/Hospital	Endocrinology
20/Mar	1 hour	Helene	Associate Professor	Copenhagen	Physics
20/Mar	42 min.	Arne	Associate Professor	Copenhagen	Physics
22/Mar	1 hour 9 min.	Mads	MD/Consultant/Associate Professor	Copenhagen/Hospital	Nephrology
26/Mar	30 min.	Irene	Clinical Professor	Aarhus/Hospital	Womens's Health
02/Apr	60 min.	Paul	Associate Professor	Copenhagen	Public Health
03/Apr	40 min.	Aske	MD/Consultant	Aarhus	<b>Undisclosed</b>
03/Apr	47 min.	Nicolai	Associate Professor	Copenhagen	Climate Mitigation
08/Apr	51 min.	Miriam	Associate Professor	Copenhagen	<b>Undisclosed</b>
08/Apr	1 hour, 17 min.	Jonathan	Professor	Copenhagen	Marine Biology
10/Apr	54 min.	Casper	Associate Professor	Aarhus	<b>Undisclosed</b>
12/Apr	50 min.	Michael	Professor	Copenhagen/Hospital	Clinical Biochemistry

**Table 1:** Overview of interviewed researchers. Includes interview dates, duration of each interview, pseudonyms, job titles, affiliations and research disciplines. The disciplines of three researchers have been withheld to preserve anonymity.

As shown in Table 1, we have covered a few disciplines. It is by no means exhaustive, but it is satisfactory. Yet, an additional dimension of the question must be considered. Whether the participants overrepresent a subset of researchers who engage disproportionately more in communicative work. After all, one could argue that their participation in this thesis could be

considered such work. Providing a clear answer to this question is not quite possible, as it would require a baseline to measure against to be answered wholly. What we can say, is that while most of the recruited informants do indeed engage in making knowledge public, their efforts vary in magnitude. Some do so more, some less, some barely at all. In short, it seems that we have managed to sample informants that are indeed different from each other, despite the nature of our approach to sampling. A best-case scenario. We might still be blind to other ways of communicating research-based knowledge, to other types of researchers. Such is the nature of qualitative work.

### 3.1.1 Utilizing semi-structured interviews

The semi-structured interview as an approach is beneficial for several reasons. It allows a researcher to cover themes and answer questions deemed relevant before an interview and has the flexibility to allow chases of interesting lines of questioning that arise during it. It is a powerful tool for eliciting an informant's thoughts and ideas about a specific subject (Tanggaard & Brinkmann 2020). It strikes even truer when we as conducting researchers are not part of the community of practice. We know a little about science communication, but not a lot. We know little about the practical implications of neo-managerial influences on the contemporary University besides what the literature has relayed to us.

We do possess some knowledge, though. We have come across research on social media, attended lectures, read articles from many different outlets, and thoroughly examined DBT's recent report on the subject (Danish Board of Technology 2023). We possess a peripheral knowledge of science communication that has enabled us to ask qualified questions. We acknowledge that this initial position is one of limitations, of unknowingness. Employing the methodology of semi-structured interviews has been our way of embracing the dual position of known and unknown, the known contained in themes and predefined questions, the unknown allowed to frolic in the spaces in-between. Navigating this schism has required a degree of formalization on our part. While our empirical approach has been inherently explorative, we have developed two different interview guides (Tanggaard & Brinkmann 2020; Kallio et al. 2016) to guide this exploration (Appendix 2). This, in order for us to not get lost along the way and as a means of ensuring a degree of comparability across the conducted interviews. The first of these is the Master version, used for 12 of the 13 interviews we have conducted. The Alternate version was tailored to better fit the informant who has become subject of public controversy. This version differs from the Master in themes two and three (see Table 2 for an overview of themes in both interview guides).

<b>MASTER INTERVIEW GUIDE</b>				
<i>Theme 1</i>	<i>Theme 2</i>	<i>Theme 3</i>	<i>Theme 4</i>	<i>Theme 5</i>
Current dissemination practices	Quality criteria in dissemination practices	Barriers or challenges in specific dissemination methods	Relevance of research dissemination	Extent of reach
<b>ALTERNATE INTERVIEW GUIDE</b>				
<i>Theme 1</i>	<i>Theme 2</i>	<i>Theme 3</i>	<i>Theme 4</i>	<i>Theme 5</i>
Current dissemination practices	Reflection on consequences of public debate	Media and management	Relevance of research dissemination	Extent of reach

**Table 2:** Overview and comparison of themes across the two interview guides.

Both interview guides observed the same basic outline: a formal introduction to the purpose of our research, followed by a description of the estimated duration of the interview, and finally asking permission to record the session. Then followed five different themes, each in some way relevant to the topic of communication of knowledge, ranging from current communicative practices to reflections on relevance and reach. Each theme then contained a list of questions relevant specifically to that theme. In keeping with our explorative approach, these have been devised based on the principles of Spradley's (1979) Grand-Tour questions. As an investigative tool these questions are invaluable. The predetermined questions were open-ended ways of initiating conversation, rather than questions demanding specific answers. This way, the informants were prompted to shape the conversation with what they deemed pertinent. The Grand-Tour questions were a way for us to grapple with our own unknowingness and start to grasp what is at stake. Following these broad questions more specific ones were posed, either generated in the spur of the moment, or pertaining to one of the themes written in advance. This allowed us to be flexible in both following the informants' trains of thought while also ensuring that the questions we previously deemed important were answered in some capacity.

### 3.1.2 Conducting interviews and ethical considerations

12 of the 13 interviews were conducted online via Microsoft Teams, while the 13<sup>th</sup> was conducted in the office of the informant. This in turn has had implications for the building of rapport (Spradley 1979) with our informants. As the sessions were fit into the researchers' busy schedules, we lacked the opportunity to engage in informal conversation ahead of the interview. All the more reason to attempt to establish rapport in the first minutes of the interview, and even in the correspondence ahead of it. This entailed remaining transparent about the purposes of our research and concurrently the informants' participation. The effort of transparency



extended for example to sharing our interview guide ahead of the session, so that they were aware of the sorts of questions we would pose. The effort extended even to the interviews themselves. Here we highlighted our role as independent students, not affiliated with their organizations. This clarification contributed to assuring them that we held no power over their professional lives, thereby creating a safe environment for them to freely express their views without fear of repercussions. Our external status made way for more candid conversations, enhancing the depth of our findings. In opposition to the traditional dynamic of interviewers interviewing the interviewee, we prompted the informants to ask questions about our research along the way. While we initially specified that each of the interviews would be conducted within a timeframe of 45 minutes to an hour, the length of these varied significantly, ranging from just 30 minutes to over an hour and 15 minutes. During an interview we were careful not to transgress the initially scheduled time, but often the informant invited further discussion if they did not have other obligations, resulting in the varied durations.

For the purposes of transcription, coding, and presentation within this thesis, all 13 interviews were recorded. Accordingly, each informant was required to sign the consent form sent during recruitment. The consent form contained descriptions of their participation, outlining the fact that they appear pseudonymized and without personally attributable information when their experiences are discussed in this report. This choice served as a means of getting around the ethical dilemma of the researchers discussing matters of their employment that might reflect negatively on their employer. To protect the identities of our informants the signed consent forms will not be provided as they contain their real names and signatures. These are available in print by request from either our supervisor or censor. We have additionally chosen to not disclose the specific disciplines of three of the researchers, as it is likely that knowing these would make identification only a short step from a guarantee. Finally, the consent form outlined how we store and handle their data and their rights as informants. These rights for example include the right to revoke statements or their consent at any given time. None of the 13 informants have at the time of this writing revoked their consent, and all will thus appear in the following chapters. All 13 interviews were conducted in Danish.

### 3.1.3 On categorizing speech

Following the completion of the interviews, we transcribed the recordings in their entirety. These are compiled in Appendix 3. The act of transcription is a translation of the spoken word. It turns it into written language, void of physical expressions and pitch. It is thus a translation that must be done thoughtfully, with awareness of what changes to the meaning of expression

occurs underway (Kvale & Brinkmann 2015). Sarcasm, laughter, and the interpersonal dynamics of the interview are all sacrificed in the effort of making the conversation available for detailed analysis – and fitting it into the format of a written report. Necessarily a reduction of the empirical data. A necessary reduction.

All interviews were transcribed using the paid version of the GoodTape transcription service (Good Tape n.d.(a)). Good Tape is an AI-based transcription software developed by the Danish newspaper Zetland. It is fully GDPR-compliant and as part of this treats all data on servers located within the EU (Good Tape n.d.(b)). The use of this service has also been outlined in the consent form signed by the 13 informants. We have made this choice for a few reasons, the first being a question of magnitude. With almost 12 hours of raw recordings, the time investment needed to manually transcribe them would be substantial; an estimated minimum 48 hours of focused work (Chazen n.d.). The second reason is that the reduction in our case is less problematic than it might be in others. The transcriptions are meant to support a *meaning analysis*, rather than a *discursive analysis* (Kvale & Brinkmann 2015). We operate with less emphasis on pitch and the use of interruptive interjections than one would if focused on the discursive constructs that informants use to make their world. Following the use of the Good Tape software all transcriptions were looked over as a means of quality assurance, and to ensure that the transcriptions were not nonsensical – that they were, in fact, transcriptions of the recordings. Lesser mistakes and odd wordings occurred quite often, prompting a return to the recordings to manually transcribe small sections.

After ensuring that the transcriptions were of redeemable quality, we proceeded to code them (Kristiansen 2020; Linneberg & Korsgaard 2019), consisting of categorization of themes in the material. Generally, there are two strategies the qualitative researcher can follow when coding, namely inductive coding and deductive coding (Kristiansen 2020). Inductive coding, or *in vivo* coding, draws inspiration from Grounded Theory (Glaser & Strauss 1967) and entails letting categories emerge from within the material, made possible only by deep immersion. Conversely, deductive coding is a strategy where the researcher defines categories or codes before delving into the material, with the purpose of confirming theoretical positions or earlier empirical discoveries akin to scientific falsification (Popper 2002). Two distinct styles, each with their own merits. Experience with similar analytical work during the course of our education has told us that a division of the two in practice is more superficial than natural. The Grounded Theory approach might well lead to novel insights about the unknown worlds of informants, but the material has already been shaped by the questions that have been posed.

Shedding preconceptions, too, is often quite unobtainable. Earlier categorizations inevitably make their way into subsequent analyses. It starts to resemble deductive coding.

In our case we have employed both strategies. Instead of shedding preconceived notions about the material, we have embraced them, jotted them down and used them as our initial categories. They acted as bearing marks for where to start in the jumble of close to 400 pages of text. Soon after delving in, the first in vivo codes emerged from within the material, themes and statements not covered by the deductive codes. Chewing through the first three of the interviews led us to create 19 codes in total. From these, more general themes emerged, themes that have informed the structure of the subsequent analytical chapter of this thesis. The three major ones were *structural constraints*, *conceptions of the public* and *target groups*. This initial analysis of the material directed our exploration of the remaining transcriptions. Soon, the strategy resembled more of an elaborated deductive coding. As the themes solidified, they became clearer and clearer bearing marks, leading us to gradually abandon the in vivo approach in favor of these broad themes. The inductive part of the coding process was conducted in the coding software NVivo (Dhakal 2022), while the following deductive part took place in text documents where relevant sections were manually copied to a separate document for each of the three themes.

Throughout the following chapters we present excerpts of the transcribed interviews. These appear as independent sections of text, with line breaks both before and after. The excerpts are fully indented in the left margin. The person speaking in the excerpt is introduced in the last sentence before the line break which indicates the starting point. Whenever an excerpt is used to head a section the name of the informant is written as a reference, similar to references to literature. All excerpts have been manually translated by the authors. As described above, all informants' names appear pseudonymized.

## 3.2 The Science&You workshop

The second part of the methodology for this thesis, then. The part that serves a supportive role: a workshop built on a *design game*. Design Games are a methodology that resides under the umbrella of Co-Design. It is broadly described as a variety of activities which “*support collaborative explorations of future opportunities in inspiring atmospheres*” (Vaajakallio & Mattelmäki 2014:63). There exists no univocal definition of what a Design Game should contain, the literature on this topic consisting of a variety of games constructed to be applied in relation to particular design situations (e.g., Salen & Zimmerman 2003). While this is the case, some central elements can be synthesized. These include for example that the game should

frame participation through tangible materials and that it should be guided by a set of structuring rules. These rules differ from other types of games in that they are open for reinterpretation. Brandt (2006) suggests that vague rules and props play a crucial role in triggering players to actively reflect on the problem contained within the game, leading to explicit descriptions of the players' interpretations. In turn, a common meaningful language is built among players.

We have done as those before us and built our own version of a design game which acts as the foundation of an explorative workshop, one we have named Science&You. It relies on a set of rules which are purposefully flexible; place cardboard pieces on a relative scale. Several people play at once, although in sequential order, their interpretations built in collaboration with both the simple materials of the game and each other. The objective is exploratory rather than competitive and serves an explicit purpose: to prompt reflection on the players' preferences when it comes to ways of obtaining knowledge about scientific subjects. While we rely on the tenets of this methodology to explore preferences for communicative channels, our design game is not exclusively design oriented. The insights both serve a comparative purpose and as inspiration for forming the fourth step in a proposed tool that prompts researchers to reflect on their communicative practices – a tool which we develop in a later chapter (section 5.2 onwards).

Science&You consists of a relative scale ranging from 'less preferred' to 'more preferred' on which players manually arrange six different categories glued to pieces of cardboard (see Fig. 2). These are amalgamated from the list of 14 possible answers<sup>8</sup> presented in the report authored by DBT (2023, Fig. 3.10). The categories are as follows: 1) news media on the internet, 2) family and friends, 3) search engines/Chat-GPT or other AIs, 4) TV, radio and streaming services, 5) printed media, and 6) social media. The scale fosters interactive exploration of the player's informational preferences and the relational interplay among different channels, while encompassing both positivity and negativity (Jungk & Müllert 1984; Vidal 2006). The wording 'less preferred' is necessarily more negative than 'more preferred,' but it is not absolute negativity as it in essence is a relative scale. At the same time, it is reasonable to assume that a participant might have never used or even despises one of the six categories. In this case the 'less preferred' end is then able to represent this absolute negative opinion.

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<sup>8</sup> In order: 1) TV (DR and TV2), 2) Internet Searches, 3) Online News Media, 4) Books, 5) Social Media, 6) Family and friends, 7) Printed newspapers and magazines, 8) Podcasts, 9) Radio, 10) Streaming services, 11) Other TV channels, 12) Newsletters, 13) Live Events, 14) ChatGPT / Other AIs.



**Fig. 2:** Science&You Design Game. Accompanying categories placed randomly. From left to right: 1) news media on the internet, 2) family and friends, 3) search engines / ChatGPT or other AI's, 4) TV, radio and streaming services, 5) printed media, and 6) social media.

The Science&You workshop is an intense moment of specificity made possible by the capacity of the game to both erect contextual barriers and cross those that exist already (Carlile 2002; Star & Griesemer 1989). Communication of research-based knowledge is a complicated subject. It is abstract and ephemeral. Science&You brings the abstract phenomena of science, research, communication and knowledge down to very concrete physical cardboard pieces and a scale. It transforms the ephemeral into a nuanced conversation with no right answers. The simplicity makes it vague. The vagueness makes it open to participants' own interpretations within the established context.

We aimed to assemble a heterogeneous audience of participants for the Science&You workshop based on age and occupation. Another key criteria was that the participants should not closely resemble ourselves in that they are not part of the academic world. A further requirement was that the participants would be able to physically attend the workshop held in the home of one of the authors. The recruitment for the Science&You workshop then consisted of placing a large sign in the same author's front yard where many locals pass by daily, augmented by a door-to-door recruitment effort in the surrounding neighborhood. The combination of these two efforts yielded three participants for the workshop (Table 3). The participants did bring diverse and contrasting backgrounds to the workshop. These ranged from Mogens not “*even hav[ing] a smartphone,*”

WORKSHOP		
<i>Pseudonyms</i>	<i>Age</i>	<i>Occupation</i>
Mogens	60	Industrial machinist
Freja	35	Dental Assistant
Aage	90	Retired Merchant

**Table 3:** Science&You Workshop participants.

Aage who “use[s] Facebook sometimes, but prefer reading the local paper” to Freja who “can start the washing machine from work.” At the start of the workshop the participants were asked to sign the same consent form as described in section 3.1.2, and for permission to record the session. The recording was consequently transcribed using the same software as described in section 3.1.3 (the transcription can be found in Appendix 4). This transcription has not been coded in the same way as the conducted interviews. The structure of the design game had already divided the conversation thematically into six, one theme for each of the cardboard categories, a division we have relied on in the subsequent analysis of the data.

The workshop was designed around two central themes, here presented as questions: 1) “where do you find knowledge about scientific subjects?” and 2) “where would you ideally like to find this type of knowledge?” To facilitate discussion around these, each cardboard category was addressed in sequence, accompanied by a question to be answered by each of the participants: “what do you think about [category], is it something you use? Why, or why not?” During the workshop one author acted as the main facilitator, standing next to the easel carrying the wooden board at the end of the table. The main facilitator was responsible for asking the initial questions and placing the cardboard pieces on the scale. The other author took on the role of moderator, tasked with ensuring that all participants participated in the conversation and asking follow-up questions (Fig. 3 & 4). The workshop was planned to last about an hour and a half. The workshop commenced with an introduction of us and of the purpose of our research, followed by a round of introduction of the participants. The participants were then asked the aforementioned question for each category and to reflect on where on the scale they would put the cardboard piece in question. The participants showed both enthusiasm and self-reflection in answering the questions, waiting their turn even when encountering polar opposite opinions. The group dynamic was indeed so friendly that the living room into was turned into a safe space leading to the participants addressing each other's standpoints with respect throughout the whole session.

The three players played the game collaboratively (Vaajakallio & Mattelmäki 2014). This entailed the players collectively placing the cardboard categories on the scale of preference. Some preferred a given category and wanted to place it on the right-hand side of the scale, while others disagreed to the degree that they would place it on the left-hand side. Rather than have the players come to agreement on where to place the categories through persuasive means, we averaged the preferred positions when facilitating the game. It became a co-creative endeavor in which the players and we in unison decided the position where the average of the individual placements should be on the basis of the prior discussion.



**Fig. 3 (left):** Participants and moderator seated at the table. **Fig. 4 (right):** Main facilitator places a cardboard category on the wooden board. Photographs taken during the Science&You workshop.

While the intent was to play the game twice to cover both themes described earlier, timing optimism got the better of us. The first playthrough of the game wound up taking over an hour, eliminating the possibility of playing it again within the allotted time. Lacking time, the questions originally meant to be posed during stage two of the workshop were condensed into a single, forward-looking one: “*What would an ideal world look like in relation to finding knowledge about scientific subjects?*” It follows that the second stage was significantly shorter than the first. Hence the insights gained from the workshop relate mostly to the participants’ current ways of obtaining knowledge. While this at first glance seems like a limitation, it still fits the purposes for which we use these insights. We utilize them to challenge assumptions about channels for communication that researchers employ. A non-representative mirror of preferences. We have not sought patterns, gathering insights that allow us to say that a certain channel or format is superior to others. Our intention has been to obtain an appreciation of the jumble of preferences. It is partly this position that allows us to suggest a future path forward, one that is based on flexibility and reconfiguration rather than comfort and assumptions.

In the following chapter we present an excerpt from the workshop. This excerpt is indicated by line breaks both before and after and is fully indented in the left margin. The excerpt contains utterances from all three participants. As such, the speaker is indicated by name before the quote is written. Similar to the interview-excerpts, it has been manually translated by the authors and all names are pseudonymized.

## 4 Exploring how knowledge is made public

The position that researchers inhabit is at first glance one of privilege and power. Near omnipotent they choose how others will make their world. That is indeed one conclusion. However, such a conclusion would be nothing more than an echoing of the one dimensional, management-oriented view of the world described in section 2.2. To draw such a conclusion would omit the fact that researchers are not independent from the world which surrounds them. They are employed by universities and thus subject to management themselves. They are legally obligated to make their knowledge available for the public per the University Law, although the legislation stating this is rarely directly enforced – a conundrum that we deal with later in this chapter. As we argue, to make knowledge public is not a choice made in isolation. It is made public in the face of a standardized configuration, leading to work that often goes unnoticed. Consequently, the following chapter addresses the dynamics of making research-based knowledge public in several ways. Firstly, it investigates the institutional conditions for making knowledge public and the work required to do so. Secondly, this chapter investigates the conceptions of the public that dictates who researchers deem relevant in the process of making public the knowledge that they produce.

### 4.1 A standardized configuration and the work that goes unnoticed

*“It is simply so important to get that researcher collaboration up and running if you want to conduct research.”* (Helene, Associate Professor, 20.03.2024)

Scientific work is not an individual activity. A single researcher would likely get nowhere relying only on their own work. In fact, where would such work even start? What would a zero-level of knowledge be? It feels preposterous to even ask these questions. If you have received an education, then you have already relied on the work of others. If we overlook this and instead state that from the minute you are given your diploma you stop relying on others' contributions, would you be able to reach anything but surface-level conclusions about the world? Likely not. Scientific discovery is a product of iterations and collaboration. It relies extensively on the work of others, evident in the ever-present tradition of citations and references on which a given scientific article is built. Without collaboration no progress is made.

It is therefore no surprise that it is a central activity for researchers to publish their research in scientific journals. It is the very foundation for a career in academia. As Arne, an associate professor employed by UCPH indicated:



*“The main channel is scientific literature where I write articles. It typically involves collaboration with many colleagues, and then it goes out for review. That means strangers will also look at it to see what they think about it. That is also what I am employed to do. It is something that gets looked at, how much we publish, how much our publications are viewed by others. And this is part of one's career, being in that business.”*

Arne underscores the importance of the collaborative process in scientific publishing, highlighting it as a necessity for disseminating<sup>9</sup> research. Through collaboration with colleagues and the rigorous peer review process the article undergoes scrutiny from external experts to ensure its credibility. Scientific findings are accorded the final truth-value (Latour 1999a) through this process of review. Shared responsibility for the robustness of the knowledge claims produced. Esoteric dissemination is conditional for engaging in academic knowledge production at all.

This engagement in esoteric dissemination is integral for a researcher's career in two ways. Firstly, it enables the very collaboration among researchers already described, but it also establishes a researcher's name among their colleagues. If your name is known, and you have an acknowledged bibliography under your belt, others are more likely to work with you. Secondly, it is the basis on which the researcher's employer measures their employees' impact. The number of publications, of views and citations that these obtain, are used to quantify the results of a researcher's work. Larger numbers means that a researcher is more successful. Larger numbers strengthen the reciprocal ranking of the university against other universities (SSFNRIG 2017). Esoteric dissemination is institutionalized by the institutions that employ researchers as a measure of ensuring that they fulfill their allotted role of carrying out research. As relayed by Nicolai, an associate professor employed by UCPH:

*“Researchers are also ranked based on their index, and there are various opinions about this. But citations are one way to see if one's research is being used in the academic world. Therefore, the impact factor and index still hold some significance for our research.”*

Impact factors and bibliometric indexes (Donthu et al. 2021) act as substitutes for the work carried out by researchers. These quantifiable values are easily available for university

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<sup>9</sup> We employ the term *dissemination* whenever we describe the activities related to publishing research in scientific journals. Dissemination therefore differ from communication, in that the former targets those within academia, the latter used to describe the effort of making knowledge public outside of academia.

management, taking on a role akin to Key Performance Indicators (KPIs) (Domínguez 2019). Higher KPIs equals more impactful research. Conduct impactful research and your career will be secure. Publish or perish.

This is the first hint of a socio-technical configuration which operates in a standardized manner. The demands made of researchers are one dimensional, in that impact factors and indexes do not care about the *type* of research, nor necessarily the content of a given publication. The work of the researcher is reduced to the quantifiable waves it makes in the academic community. The configuration values esoteric networking above all else. As Mads, another associate professor from UCPH, told us during an interview: *“The focus is primarily, of course, on publications in peer-reviewed journals, which are one of the measurable factors that the employer, in this case UCPH, values.”* To be a researcher means conforming to this demand as it even extends to a minimum number of articles published a year. Granted, we have not spoken to researchers who do not like engaging in the activity of writing and publishing scientific articles. As noted by Nicolai in the quote above, however, some discontent is to be found in the use of KPIs as a stand-in for the actual work carried out. It is blind to other forms of work that do not result in views or citations. The KPIs are blind to communicative work that extends beyond the esoteric walls of academia.

Some funds and funding organizations might have requirements for doing outreach that extends beyond these esoteric walls. This is especially true for Horizon 2020-projects, as Helene, an associate professor from UCPH told us. Here, the standardized configuration is forced to reckon with non-esoteric communication, forced to divert from its otherwise singular outlook. For other funds and funding organizations the University’s approach is largely accepted. As Mads put it:

*“It falls under what is called communication and is essentially the spreading of information and there are some who do not want to contribute to communication because it should be part of the overhead. In other words, it is an integral part of the organization, on the same level as lights and heating.”*

The University is often responsible for scoping communication; the funding organization wants no part, it will not allot additional funding for communicative initiatives. The configuration is free to maintain the course of esoteric dissemination already traversed. Unless funding is earmarked for dedicated communicative work, only the esoteric version will prevail. Unless funding organizations take it upon themselves to ensure it, knowledge is unlikely to be made

public, at least in a manner acknowledged by the configuration – a point which elaborate on in the following.

#### 4.1.1 Half-n-half, but what about the rest?

Being employed by a university as a researcher does not necessarily mean that you are allowed to conduct research full-time. The other expected task is of course teaching the students enrolled at the university, supplying to these a research-based education. In effect, a researcher's time is split approximately 50/50 between research and lectures, as Miriam, an associate professor from UCPH told us during our interview: *“There is more or less a concrete requirement for how many articles I must write per year. ... The way our time is distributed from above, we have 50% time for teaching and 50% time for research.”* For other informants, this effort of education has been exchanged for the expectation that they also spend their time seeing and treating patients. The 50/50 split still holds true. Publish or perish is the reality whether engaged in research within the natural or health sciences. A split that has been decided upon by the university, by those ‘above’ Miriam. Once more, the configuration that is the university has set the direction: ‘We expect you to educate students or treat patients, while you conduct enough research to hit your minimum number of publications.’ Conducting research comes with responsibilities outside of said research. Together they take up a full work week – simple addition tells us that fifty and fifty makes a hundred. Where does communication of research-based knowledge to the public outside the esoteric walls of academia fit in, when the full-time position of a researcher has already been taken up by educating students, treating patients and conducting research?

In short, it doesn't fit. The configuration has no room for this activity, it goes against the set direction. One type of communicative work is prioritized while the other is not. One is formalized, written into contracts and exemplified in KPIs and requirements, while the other is neglected. In turn, this leads researchers like Miriam to prioritize esoteric dissemination, while trying her best to still fit in the public variant:

*“But I have to prioritize it over other forms of communication. ... It's not that I don't think communication is important and fun. What's a bit tricky is that we don't really have any official time allocated for it. So it's something you have to find time for around other things. Or you have to integrate it into the things you already do.”*

Lacking formal prioritization of communicative work beyond the esoteric, it is up to the flexibility of the individual to find time to engage in this work. So many other tasks occupy the

everyday of a researcher. Making knowledge public has become an individual activity, left to the discretion of the researcher. A position of power, indeed, but also a position of significant marginalization. Engage in communicative work and do so without support from the configuration. Engage in communicative work and your work is invisible, unquantifiable, overlooked and not acknowledged.

For some researchers, this leads to even further complications. A number of funds do in fact award funding based on a researcher's bibliometric scores, these taken as an indication of said researcher's reach and influence. Other funds need to first be made aware of a research field's existence. They need to know *why* it is important to conduct research in this field. Here, societal impact is more valued than KPIs and bibliometrics. As Casper, associate professor at AU, reasoned during an interview:

*“I believe it's simply necessary to go out and become a bit known, even to the public, in order to draw attention to the research area you're in. Because the more people have heard about it, those who evaluate whether you should get funding also get the impression that it's actually important for something to come out of it.”*

Creating rustle and bustle around a scientific field is thus in some cases the very condition for being able to conduct research in the first place. The rigid nature of the standardized configuration with its one-dimensional directive of esoteric benchmarking ends up hindering the furthering of itself. It impedes researchers who wind up relying on funding from this other type of fund. The blindness towards non-esoteric communicative work overlooks the potential for an increase in esoteric networking and dissemination.

Paradoxically, the standardized configuration still encourages researchers to contribute to public debate. It is even required to do so, as an effect of the University Law. Here an introduction is in order. The University Law outlines the function of the eight Danish universities, inducted as Law No. 403 of 28.05.2003. The special remarks which elaborate on the paragraphs of the legislation are compiled in Appendix 5. We do not intend to describe the entirety of the University Law, only the specific paragraph and section relevant to this study, §2 section 3. It is specified as follows:

§2 section 3: <sup>10</sup> *“The university shall cooperate with the surrounding society and contribute to the development of international cooperation. The university's research and educational results must contribute to promoting growth, welfare and development*

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<sup>10</sup> The paragraph has been translated by the authors.

*in society. As a central knowledge and cultural institution, the university shall exchange knowledge and skills with the surrounding society and encourage employees to participate in the public debate.”*

§2 section 3 outlines the legal responsibility of universities to make their employees available for and participate in the public debate. The paradox emerges when the legislation is filtered through university administrations and makes its way into the everyday of researchers. Jonathan, a professor on the verge of retirement from AU, has at this point encountered the paradox of encouragement more times than most other researchers. That he has come to form opinions about it should then come as no surprise. Still, we were startled by his bluntness:

*“It is essentially listed as one of the tasks the university is supposed to handle, but there typically isn't any actual funding for it. It's not like the university says ‘well, now you've participated in Deadline, it takes a whole day to prepare, go there, and participate, so you get it credited as part of your work program.’ It doesn't work like that, really. And that's the big mistake. The university does not take this task seriously and does not face the consequences or support it.”*

The standardized configuration disclaims responsibility; it has fulfilled the obligation of encouraging researchers to participate in public debate. The configuration is concerned only with esoteric dissemination and complies with the University Law in the manner that necessitates the least effort. The special remarks has provided no further guidelines that hinder this interpretation. Only one of these remarks concerns the aforementioned paragraph, yet it essentially states the same thing using a few more words. In turn, the responsibility is shifted to the researcher who has to contend with a lack of acknowledgement, of getting credited for communicative work. Unwillingness on the behalf of the standardized configuration to “*face the consequences*” as Jonathan put it, shifts the burden from management to employee. The creation of invisible work inherent to communicative efforts is at least partly a result of the lackluster wording of the University Law.

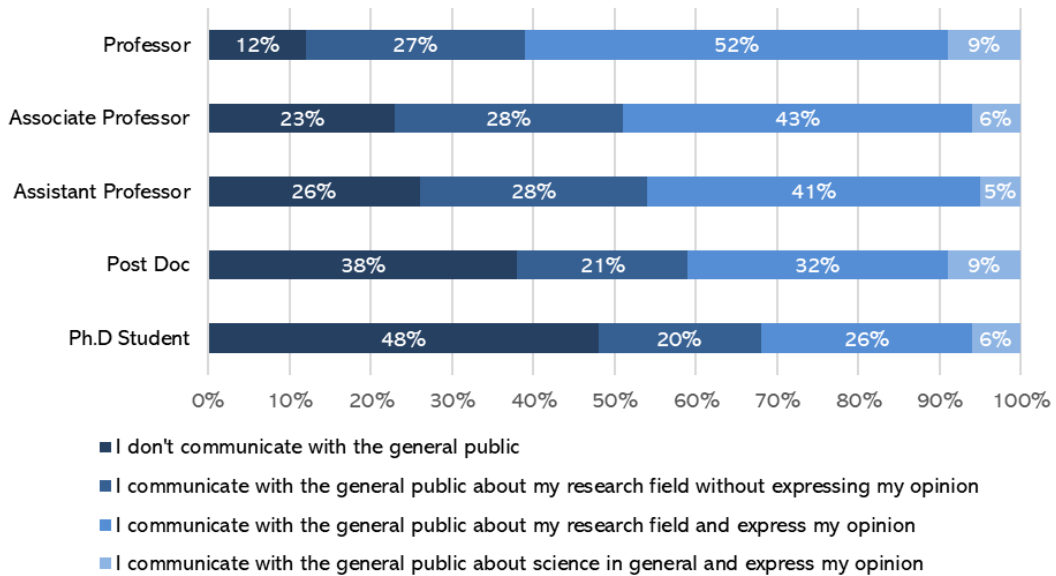
It is not only Jonathan who has encountered the standardized configuration's paradoxical demands. Nicolai reflected on the same point during our interview, when discussing barriers he had encountered in his communicative work:

*“Communication is not rewarded in our timekeeping system. For many, it can be said to be kind of like a free time activity. ... Generally, we are encouraged to contribute to the public debate, and you could say that we are thanked for it. But that's all it is, just*

*thanks. So, it's a barrier, you might say; the time taken away mostly comes from research."*

Just a thanks, and that's it. Fleeting acknowledgement at best. Work seemingly valued but not attributed value. A superficial reward for fulfilling the directive to contribute to public debate. Fulfilling the directive even has consequences; essential time is taken away from the time that is available to conduct actual research. For, as Nicolai continued: *"It primarily comes from research, because teaching is pretty much fixed, right? You can't cancel it. You can't cancel a lecture just because you have to go on TV."* Only two choices then follow, if the researcher is to comply with the directive to contribute to public debate. Either do it on your own time at odd hours of the day or take time out of your remaining 50 percent of available hours to comply. Pick option one, and you will not be monetarily compensated. Pick option two and you limit the time you have available to achieve your KPIs. Superficial recognition in exchange for worsening your own possibilities of having the time to conduct enough research and write enough articles. The inherent paradoxicality of the standardized configuration creates an abundance of invisible work. It has set requirements for two oppositional courses of action but chosen to reward only one of these. All non-esoteric communicative work has essentially become invisible, the passing thanks an indication that the directive to communicate has been achieved but also a blindness to the work put into it. It offers little advantage to engage in this work, no compensation at all. Jonathan even goes so far as to state that engaging in this type of work is a luxury that only well-established researchers have: *"I can't recommend it if you're a younger researcher. Because that would mean you secure less funding and publish fewer research articles. And that would definitely be negative for your career moving forward."* A researcher who has risen through the ranks have published their articles and had their work cited. They are a more well-known name within the academic domain. Their career has advanced sufficiently for them to be less worried about securing funding, for the funding they receive are likely for larger, multi-year projects. The long-term implications for career progression is likely contributory to the stark difference in communicative work (or the lack hereof), as this is presented in Fig. 5.

### Which of the following best describes your role when interacting with the general public?



**Fig. 5:** Recreation of Danish Board of Technology 2023, Fig. 4.7. Original graph based on a non-representative survey conducted among researchers employed by Danish universities (n=3.846). All values are original. All text has been manually translated by the authors of the present report. Recreation has been authorized by the responsible senior project manager.

#### 4.1.2 Extending a dying olive branch

An aside before we proceed. A concerted effort to support researchers in contributing to public debate has indeed been made by the standardized configuration. A final structural feature of the configuration that we sketch here. You might think that we have tried to trick you, dear reader, as we have not touched upon it until now. We have saved this point for last, but not with ill intent. We have done so to illustrate the pervasive inadequacy of this structural feature. All the descriptions above, all the invisible work uncovered, has occurred while this feature has been solidly in place. The feature? Communication departments. Researchers research while the communication department communicates. Have people trained in public communication be responsible for outreach, while researchers handle the tasks they have been hired to do – KPIs, KPIs, KPIs. A division of labor that on the surface makes quite a bit of sense. As Arne described this division:

*“We have a department at UCPH for that [communication]. When we write an article or create something new that we think is really exciting, we contact them. They assist in writing press releases, which are then distributed. The phone usually rings afterward because someone needs something, perhaps an interview or the like.”*

The same constellation is to be found within AU, both Aske and Casper going out of their way to mention this resource. On the surface it is a division of labor which is beneficial for the researcher. Scratch the surface a bit and the truth begins flowing out like sap from a tree.

The first drop trickling down the fractured bark. The question of the proportionate size of communication departments. As Casper described it: *“We have some communication partners attached who actually help all researchers at the institute who are interested in getting their work out.”* One set of partners who helps all employees. It falls outside our field of expertise to suggest a golden ratio of communication employees to researchers. Instead, we point to the quite obviously flawed ratio through the power of example. As Helene told us when discussing her available support structures for communication:

*“At the Institute we have some very nice and very talented people who do most of our outreach. We are around 400-500 people employed at the Institute, and one person to do outreach. Really, it’s completely hopeless. One or two. So we simply haven’t been able to, well, use what the university offers for anything really. Because they simply don’t have the time.”*

One or two persons provided by the standardized configuration, made available to aid 500 researchers in the contribution to public debate. No wonder the communication department is completely swamped. Hopeless indeed. A band-aid solution, one where the band-aid should have been a full cast for it to have any real effect. It is nothing more than a way for the configuration to say ‘see, we have formalized a support structure, so now you can do as we say and contribute to public debate without trouble.’ A recognition of the fact that work goes into making knowledge public, but not the magnitude of it. The invisible work carried out by researchers remains in the shadows, the standardized configuration blind to the amount of it. The configuration has once more achieved its goal. If it did not comply with the University Law’s legal requirements before, it does so now. Communication departments have become the manifestations of the configuration’s compliance.

The second drop of golden sap makes its way down the trunk of the tree. Had the communication department succeeded, the burden of invisible work put on researchers would have lessened in a sort of ripple effect. Then, how about a dedicated press office, tasked with outreach on the behalf of the organization, on behalf of all the institutes and departments? A proverbial bigger sibling to the communication department described above. If the communication department at Helenes institute is on the frontlines of research so to speak, then the press office is more centralized. It resides behind the frontlines in friendly territory, within



the headquarters of the configuration where it oversees the multiple branches of the organization. It is responsible both for outward outreach and for dealing with journalistic and political inquiries. It follows that more resources have been allotted to this part of the configuration. A seemingly more constructive contribution, yet no more than seemingly. Rather than a question of whether the communication department has time, Helene described that the press office comes with a different set of obstacles:

*“UCPH has a slightly more professional press office that handles some types of publications, if you let them know that it's coming. So then you have to send one person out, but you don't talk to them on a daily basis, and they don't understand physics. It's difficult to communicate with them at first, it takes a really long time, and then it's simply de-prioritized for many.”*

The centralized position of the press office means that they serve researchers from a wide range of different disciplines. One cannot reasonably expect the persons in the press office to be experts in all of these. Jacks of all trades, masters of none. Yet their position means that they are both physically and metaphorically far away from researchers like Helene. They are centralized in the configuration, far from the branches that it serves. Large universities like UCPH and AU are spread across a multitude of different campuses, creating physical distance between a branch and the press office. In turn, the possibility of an informal approach to planning communication activities becomes near impossible due to the lack of day-to-day interaction between outreach professionals and researchers. Even when traversing the formal route, considerable time has to be invested in ensuring that the knowledge that is communicated retains its integrity when framed in press releases. What to management or to the standardized configuration itself might seem like a simple handover event is anything but so. The official support structure is anything but supportive. It exacerbates the amount of work required to make knowledge public through official channels. The work is invisible exactly because the product of the interaction between press office and researcher carries no signs of its originators when it reaches the proverbial desk of the standardized configuration. An act of rebellion occurs as a result. As Helene implies above, her and her colleagues would rather avoid working with the press office than use the formal support structure provided by the configuration. The press office is made at least partly redundant. Upon closer inspection this act of rebellion is essentially an act of conformity. If time is not spent making knowledge public, more time is spent researching, writing and publishing articles. In the end, the original prescription of the standardized configuration is followed. The configuration can be satisfied with this result. It

has extended an olive branch to the researcher at the behest of the University Law, however dying or rotten this branch has shown itself to be.

#### 4.1.3 A position of power? Yes, but...

*“We don't have time to disseminate everything, but it's also only the big things. We can choose whether there is room for them or not.”* (Michael, Professor, 12.04.2024)

In section 2.1 we painted a picture of researchers as if they inhabit a position of agency, of vast decision-making power. We painted this picture on the basis of theoretical and philosophical insights gathered and refined within our own field of Science & Technology Studies, in order to be transparent in our view of the production of scientific knowledge. The insights are less empirically founded the moment that we add the variable of making the produced knowledge public into the equation. As we have shown throughout this chapter, it is not a univocal power that researchers possess. They are not autocrats, residing on top of the chains of translations they forge, residing on the top of the world. Rather, they are deeply enmeshed within the socio-technical infrastructures that make up their places of employment, the funds that fund their work as well as the legislative foundation on which the University operates. They might be the CEO's of their respective chains of translations but are relegated to menial employees when the research is made public. They have agency, yes. But they are restricted in more ways than one. In the face of a standardized configuration that enforces its will upon the researcher, this agency manifests itself not as a choice between whether knowledge is made public or not. It manifests itself as an act of rebellion, of bringing the burger to the table to scrape off the onions (Star 1990), of making knowledge public *in spite* of a configuration that hinders doing so.

We have sketched quite a few ways that the standardized configuration hinders researchers in making their knowledge public. The configuration has transformed communicative efforts into invisible, unacknowledged work, both formally and professionally. The difficulty associated with this work has resulted in a subtle enrollment on behalf of the standardized configuration. The subliminal threats posed to researchers – do it for free, or don't do it at all – prompts them to lend face to the executives of the network (Star 1990). In a world of KPIs and otherwise indisputable responsibilities and solidified schedules, it comes down to priorities. As Arne told us:

*“It's simply a matter of prioritization. If I spend a lot of time talking with the media and communicating, then I spend less time on research and teaching. You can't do it all.”*

*That's where I make the best contribution. So, I leave the communication to others, you could say.”*

It is not that communication of research-based knowledge is unimportant. He finds his time better spent on research, in turn furthering the underlying intentions of the standardized configuration. It is a sentiment that mirrors the prerogative of the configuration, a sentiment that might be a consequence of being part of that very configuration, inflexible as it is.

It is a predicament that is only exacerbated by the vague wording of the University Law, the official and formal reason for researchers to make their knowledge public. In the following sections we provide a critical reading of this piece of legislation, especially in regards to its inadequate definition of the public. We show that this definition, and the definitions of the public that researchers rely on in their communicative efforts are in effect inhibiting these very efforts. We show that these conceptions of the public in large part contribute to intensifying the amount of invisible work carried out when the rebellious researchers follow through on the subversive command of the legislation.

## 4.2 Inadequacies of the University Law and conceptions of the public

*“It's a law about what a university is supposed to do in Denmark. And it essentially states that universities must conduct research, and they must provide education at the highest level which must be research related. And the third point is that Universities must participate in public debate. Or contribute to public debate. And that's where I believe that I have a duty to answer the phone when a journalist calls.” (Jonathan, Professor, 08.04.2024)*

The University Law is at least a rhetorical *immutable mobile* (Latour 1986). It is both available, mobile and acts as the official framework for how universities should operate. The moment it was voted into law in 2003 it was expected to act as one. This has not been the case. Had the University Law acted as such a mobile, then this thesis would likely have an entirely different focus, one of investigating how the legislation structures practices. No matter how we might speak of such a hypothetical world, it is likely that the invisible work created by offhand encouragement from management and lacking structural recognition and support would be less prevalent. We here take the time to address the inadequacies of the University Law as a mobile meant to be immutable which has turned out to be anything but.

The first inadequacy is one that we have already fleshed out partly. It lies in the lackluster wording of encouraging employees to participate in public debate that has created

the conditions under which researchers are currently making their knowledge public. The breadth of the University Law has no room for specifics. Little formalization of the decree has manifested within the walls of the standardized configuration of the contemporary University. The result of this is a shifting of the responsibility away from the University and onto the researcher. As Nicolai described it: *“There are also expectations that we manage it ourselves. Manage how much we can contribute. There is no, there are no hours set aside for it. So it's up to the individual to assess how much they can contribute.”* The moment the University Law left Christiansborg it became interpreted and appropriated. Some researchers, like Jonathan quoted above, take it upon themselves to make their knowledge public out of a sense of duty. Others, such as Irene, a clinical professor from AU, get immense satisfaction from making their knowledge public: *“If I find a way to get the knowledge out, I'll do it. If I can find a hole to stuff knowledge into, I simply can't help myself.”* Still others might succumb to the pressure of the responsibility in the long run. This much is true for Aske, a medical consultant employed by AU, who in recent years have participated disproportionately much in the invisible work of making knowledge public. He reflected on this when we asked him about his recent communicative engagements:

*“I just needed a break from it all. I got a bit tired of it. I don't want to do too much. On average, I do something at least once a week, and it becomes too much. It becomes too hard when I also have shifts and everything like that. ... We're obligated to do so under the University Law, to communicate our knowledge, or knowledge sharing, or whatever you call it. But it actually takes a toll on me, it does.”*

Fulfilling the responsibility of making knowledge public takes its toll no matter how much one might get enjoyment out of doing so. The work often needs to be carried out during odd hours of the day, the official workday spent within lecture halls and office spaces. The additional work takes time away from one's family and friends. After all, researchers are human too, both in their work and outside of it (Latour 1999a). Do too much without proper support structures and burn out. Vicarious flexibility in place of immutability, researchers pay the price. A position of further marginalization. Yet, this is only the first inadequacy of the University Law. The second is just as consequential, the embodiment of a conception of the public as a singular thing – the Phantom Public (Marres 2005, 2007).

#### 4.2.1 The general public is nothing but a Phantom

The second shortcoming of the University Law, then. An inadequacy which, chronologically speaking in the paragraph that we address, comes before the one we have described first. It is an inadequacy which rears its ugly head several times over in the brief paragraph on which much of this chapter is based. *The society that surrounds the university*. Thrice is the notion of the surrounding society mentioned, and once the public (see section 4.1.1) – even in legislation the esoteric walls have been erected. On its own this is not substantive enough to be called an inadequacy, although we might harbor reservations against such restrictive divisions of science and society. The shortcoming is far more practical than that, as evident by its consequences.

Consider this. A researcher employed by a Danish university tries their best to follow the directives of the University Law. They aim to contribute to public debate and exchange knowledge and skills with the society that surrounds them. Where should they start? A question that beckons a series of other questions. *How* can they make their knowledge public? Who do they *need* to reach? Indeed, for *whom* is the researcher's subject important? The University Law provides no answers to these questions. It is on purpose, for it is meant to be applicable for every university, in every situation. 'The surrounding society' is so broad a category that it provides no pointers. Conversely the notion of a surrounding society has morphed into what our informants have termed *the general public*, a public that exists 'out there' prior to any engagement effort – the polar opposite of the notion of Issue Publics (IPs) (Marres 2005; 2007). Almost six million people, if the general public is taken to mean all who live within the borders of Denmark (Danmarks Statistik 2024). Mr. & Mrs. Denmark, and all those in between. An insurmountable number, unrealistic for anyone to reach. A conception of the Public that is *too* inclusionary. The general public is an expression of the Phantom Public, impossible to reach for its status as a phantom, intangible (Marres 2005). The vague wording of the University Law, combined with the lack of formal support structures, has done nothing to stop this definition of the public as an amalgamation of the Danish population at large. How, then, does a researcher navigate this when they comply with the University Law?

One way is to do like the majority of the researchers whose reflections we build this chapter on and employ a middleman from the craft of journalism. Throughout the latter half of the 20<sup>th</sup> century, journalism solidified itself as the main channel for science communication (Danish Board of Technology 2023; Albæk et al. 2002). Therefore it is rather unsurprising that it is the preferred method for making knowledge public among researchers. Utilizing this middleman entails a similar handover-event to the one that communication departments

necessitates. On the surface it seems to limit the invisible work of the researcher to just this event. As with communication departments, this is not the case. Journalism's propensity to spin stories to make them more interesting to its readers makes the handover-event a back-and-forth exchange, the responsibility resting with the researcher to ensure that the knowledge made public is truthful and not spun to fit a narrative. While being a go-to solution, it much resembles the standardized configuration's structural feature. Even the go-to solution entails invisible work.

Once knowledge is handed over to a journalist, often in the form of a press release based on a recent study, they take on the responsibility of making the knowledge public. In effect, it is not this Phantom Public that is reached through this middleman. Instead, it hands over the definitory power to journalists and media outlets, the ability to choose who gets to be privy to new knowledge shifted to actors with commercial interests. They have specific audiences and often hide their content behind paywalls and subscriptions. The general public is a Phantom even to journalists and media outlets, who carve out their own audiences from the amalgamation.

The implicit assumption that a researcher will be able to reach the Phantom Public by utilizing a journalist is treacherous. It neglects those citizens who do not read newspapers or check the news, those with busy schedules or those who have gotten tired of journalistic spin. We here take a moment to engage with a non-representative sample of citizens that participated in our Science&You workshop. We do so to illustrate that their reservations against journalism are deeply rooted and that there is no channel through which the Phantom Public can be reached when making knowledge public.



**Fig. 6:** Result of the Science&You Workshop representing co-creatively averaged preferences. From left to right: 1) printed media, 2) social media, 3) news media on the internet, 4) TV, radio and streaming services, 5) search engines/Chat-GPT or other AI's, and 6) family & friends.

Fig. 6 illustrates the result of the first round of the workshop, the cardboard categories placed according to the co-created average described in section 3.2. Of these, three categories relate directly to the field of journalism. It speaks volumes that these three find themselves at a placement no better than the middle of the scale. Neither the physical manifestations of the craft nor its digital sibling of online news media is seemingly preferred. The same goes for these formats' more visual and audial cousins of TV programs, radio and content found on streaming services. Granted, all three are still used at times by the participants, but they are not ideal vehicles for obtaining research-based knowledge. We have grouped them together, yet as the participants reflected during the workshop, the distinction between them should likely be enforced:

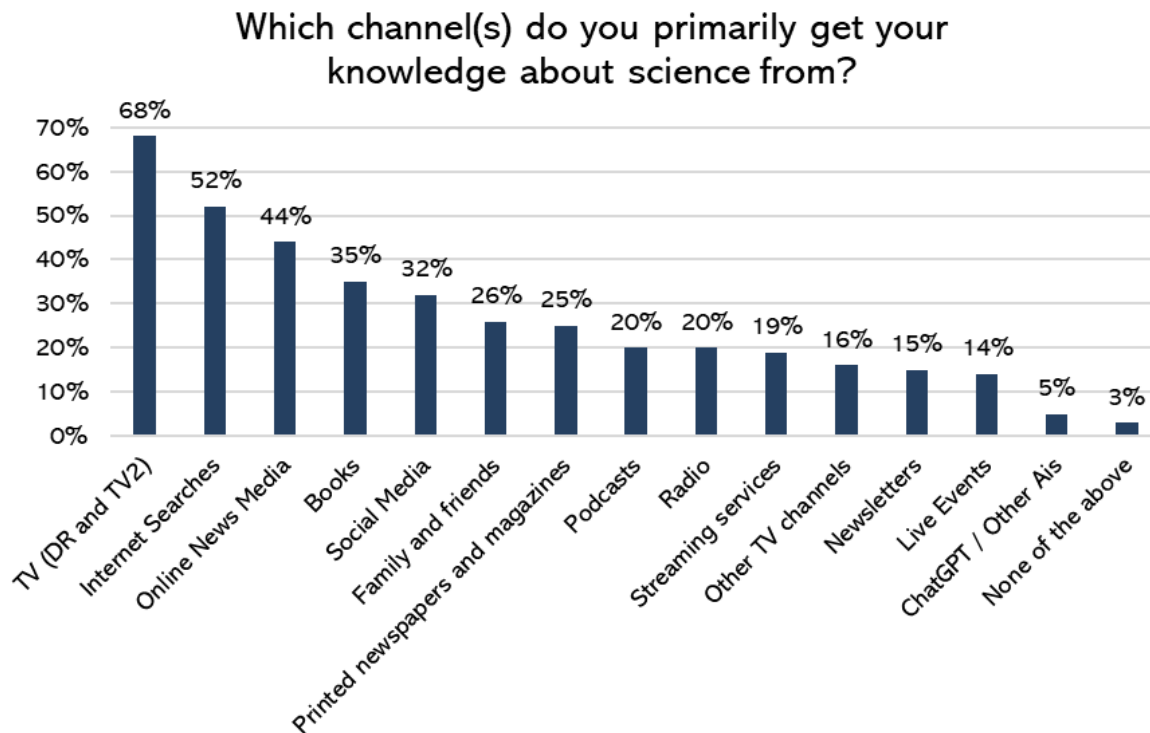
Aage: *"I can't do without my local newspaper. Now, I have the Berlingske at home. I get it once a week from the neighbor."*

Morten: *"And there's nothing better than a used newspaper, even if it's a week old. But if you haven't read it, then it's still news. Like, if there's a newspaper at work, I'll take it and read it. Because I haven't read it, so, well, maybe there's something there."*

Freja: *"No, I don't read newspapers at all, I simply can't be bothered. I can get it on the news. If I want to read a newspaper, I'll go to a website I can find and flip through all that, if I really want to."*

Arne values traditional media, particularly enjoying both his local newspaper which connects him to his community and his weekly newspaper he gets from the neighbor. Morten is less concerned about the timeliness of news; he values the content's relevance, regardless of its age. Freja on the other hand embodies the shift toward digital consumption, favoring online news for its immediacy and accessibility, viewing traditional newspapers as inefficient. Still, none of these were favored ways of obtaining knowledge. A consensus was reached among the participants despite their differences: journalistic angling of stories can be difficult to decode and thus remains indistinguishably biased.

If not through journalistic outlets, then where might a researcher hope to reach the inhabitants of the Phantom Public? We can provide no clear answer, because such an answer is unlikely to ever come to be. The Phantom is an illusion, and accommodating illusions is impossible (Star 1990). The participants in our workshop instead reached for a category that the Science&You game did not even encapsulate; that of in-person formats referring to public lectures and the like. An unfeasible format for many researchers.



**Fig. 7:** Recreation of Danish Board of Technology 2023, Fig. 3.10. Original graph based on a survey conducted among a representative subset of the Danish population aged 18 and over (n=1.101, respondents asked to choose up to three categories). All values are original. All text has been manually translated by the authors of the present report. Recreation has been authorized by the responsible senior project manager.

The channels and formats that citizens use to obtain knowledge about science are both many and varied. And while public service TV channels (Ministry of Culture 2024) rank highest on the list presented in Fig. 7, 32% still prefer other channels to this one. The generally preferred practice of handing over responsibility for communicative work to journalists only gets a researcher so far in their quest to reach the Phantom that is the general public. What other efforts do they then make to reach it? It is to this question that we turn over the following sections.

#### 4.2.2 Doing extracurricular activities to grasp the Phantom

Another way to try to reach the researchers' definition of the general public would be to do like Jonathan, who does not limit his communicative channels exclusively to journalism. He views it as his responsibility to make the knowledge he has obtained through his research public to *the* public, the Phantom. This entails committing to a vast series of communicative efforts, as Jonathan reflected when we asked him whether he feels that he reaches this amalgamated demography:

*“Well, I believe I do. As I mentioned, I appeared on [TV-show] this fall. I've also been featured several times on local radio, and then I go deeper on platforms like P1-*



*Orientation or Deadline. Additionally, I've participated in some podcasts. Last Friday, I was interviewed for a special episode of a podcast hosted by two young journalists. As I understand, many young people get much of their news from it. I also give public lectures, typically for local associations like the Folk University.”*

Jonathan’s extensive use of various communicative channels demonstrates his commitment to engaging with his conception of the public. It shows versatility and availability, made possible by the fact that he has obtained a position within his university where he can rest comfortably; he has secured enough funding to last him the rest of his career. For researchers on the lower rungs of the career ladder there is little room in half a workweek, if you also had to conduct research, reach your KPIs and secure further funding. It is unsustainable for most. It is a problem of which Jonathan is keenly aware:

*“In the old days, when there was no requirement for external funding, you just had to complete the teaching tasks assigned to you, and you were supposed to do some research, which was occasionally published so you could show that you were productive. But today, we have to finance our entire salary ourselves through external projects and then it becomes a really big problem.”*

If communicative work took a toll on Aske, then so does the effort required to reach the Phantom Public. The second inadequacy of the University Law only exacerbates the amount of invisible work required to make knowledge public to *the* public, the singular Phantom. Comply with the legislation, exchange knowledge with the surrounding society and sacrifice your KPIs.

Unsurprisingly most of the researchers we have spoken to do not feel that they reach this Phantom when they make their knowledge public. The effort required in doing so simply makes it unrealistic. And if a researcher does as Jonathan, engages in communicative work across a variety of different channels, still some will not be reached. Paul, another associate professor employed by UCPH, put it this way when discussing his communicative reach:

*“When it comes to communicating information to the individual citizen, at home in the living room, that’s difficult. I don’t think I reach out there, except maybe through a podcast that they happen to listen to, or a TV broadcast they watch that may contain elements of what they are interested in, and so on. But otherwise, no.”*

Paul acknowledges that his influence is likely limited to those who incidentally come across his contributions in podcasts or TV broadcasts. Reaching the general public becomes

happenstance, incidental. It is not a feasible goal for communicative efforts. It is the definition of the public that is farthest from being actionable, farthest from identifying those who are the relevant ones to communicate to. Aske adds on this point, noting that these efforts typically attract individuals already interested in scientific subjects:

*“With the public lectures, I don't just stand somewhere and do it on my own; people need to come there, or else you don't reach the general public. You can do it more through those podcasts, but then again, you don't listen to a science podcast unless you are somewhat interested in it. So, I don't think I reach everyone in the whole world, or everyone in that sense across the general population, it's just a segment.”*

The Phantom out of reach, the notion continues its evolution. For Aske, the general public is shrunk into an *interested* public. This version of the public is more available for the preexisting interest in the subjects of the knowledge to be made public. It leads to lesser amounts of work required to reach it. We argue however that this conception has become *too* exclusionary. Initiatives like the Folk University (Københavns Folkeuniversitet n.d.) might be open to the general public (if we are to keep to the conception of the public on which our informants operate), but it is only open to those who seek it out, have time to spare and are resourceful enough to participate. The busy parent, the shift worker working odd schedules, indeed, ordinary citizens might not be able to attend. Interest comes with a resource surplus. Not all actors implicated by an issue are resourceful enough to be considered interested when interest is measured as actively seeking knowledge. Limit the invisible work, reach only the interested public, and you exclude those who are less resourceful. A subsection of the general public has inadvertently been cut out and has been so arbitrarily. Exclusions must be made as both Dewey and Marres (2005, 2007) have taught us, but such exclusions must be made on other parameters than that of pre-existing interest.

#### 4.2.3 From Phantom Public to tangible targets

*“In terms of sheer volume, my [communicative] focus is on the administrative level, the policy level, and what you could call the commercial level.”* (Nicolai, Associate Professor, 03.04.2024)

Research most often addresses issues. It follows then that some research *is* more relevant for some than for others. Specific actors have a vested interest in a given type of research, be they policymakers, industries, patient groups or just regular citizens. The central actors of IPs, the ones who are affected by the direct consequences of the issues that form these publics. At times,

funding institutions insist that these stakeholders be kept in mind as part of the communicative work. Making knowledge public also at times entail making it available to these target groups. It is often crucial in making knowledge actionable. One might suppose that a deal would be struck between the obligation posited by the University Law and this other obligation necessary for making a difference in the world outside the esoteric walls of academia. A compromise that in large part would resemble the constitution of an IP, stakeholders making up the immediately identifiable center of this public, the borderland inhabited by those indirectly affected<sup>11</sup> by the issue. Directly and indirectly affected in place of a Phantom Public. That is not the case, at least not explicitly nor with intent. Especially when the research field turns specific are the scales tipped too far in favor of those with vested interests.

Take Tim, a post doc employed by UCPH. Tim's field of study is diabetic foot ulcers. There is a reason that we have not quoted him before this point. The communicative work he engages in is a bit different than the other researchers we have mentioned, it is more specific. He seeks specific outcomes for his research, as his is a new approach to the treatment of these ulcers. In turn, Tim's target group is mainly those with a vested interest in this issue, a target group that he tailors his communicative work to. As he described it during our interview:

*“I have to communicate with the people who are responsible for treatment. That means the outpatient clinic, the municipalities, doctors, various specialists, orthopedic surgeons and the like. I have to communicate what I need to because they are the ones who are the gateway.”*

Tim's targeted approach ensures that his research is highly impactful for specific patient groups. And while he does engage in more “popular” communication as he describes it, it is a second order endeavor. The primary focus of his research and consequently his communicative work is on those immediately connected to the issue of diabetic foot ulcers, the initial part of an IP. By chance, he has stumbled into our vocabulary, by way of wanting his research to make a difference. With this stumbling comes another advantage as well. The invisibility of his work is lessened by the tangibility of the outcomes the communicative work has. It is recognized, if not by his employer, then by the IP that he is part of. At a glance, this seems like implicit insubordination against the University Law. If ‘the surrounding society’ is taken as the general public then it is an act of rebellion, evident in the narrowness of scope. On the other hand, the

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<sup>11</sup> We here utilize the monikers of directly and indirectly affected actors as substitutes for *actors affected by the direct or indirect consequences of an issue*. It is thus still the nature of the consequences that determine whether an actor is directly or indirectly affected, and not their relation to said consequence nor to other actors implicated by the issue.

wording could be interpreted as if Tim is doing *exactly* what the University Law posits. He exchanges knowledge and skills in the most effective manner that he can think of. The notion of IPs might yet have a place even within the legal framework on which universities are built. While approaches like Tim's are effective in generating significant impacts for targeted groups, it may inadvertently overlook the broader applicability of the findings. It artificially limits his relevant public before he reaches the natural boundaries of it. The coincidental alignment with the notion of IPs stops here.

Too wide or too narrow conceptions of the public. The two avenues a researcher can pursue. However, a third avenue exists, a combination of the two, a path paved with a research subject that is both controversial and diffuse: how to minimize deaths when patients are hospitalized. A field that Gry, an associate professor from SDU, has devoted her time to. This field of research has severe implications for making her knowledge public. She lacks a defined target group, on top of her research highlighting that hospitals are not only a place where one gets better. You might end up sicker than when you arrived. A delicate matter that could easily be misinterpreted. As Gry put it during our interview:

*“We highlight issues in the Danish healthcare system. I find it difficult, and I haven't quite cracked the code yet, on how to communicate this to the citizens. Because it's actually about shedding light into a black box that the citizen knows nothing about.”*

For Gry, to make her knowledge public entails relaying positive messages of change while also shattering conceptions of the healthcare sector as a place of betterment. Indeed a delicate subject, one that has had Gry abstain from communicating explicitly with those who might end up in the hospital, her work instead focused on making clinical staff aware of these issues. A strategic focus on niche audiences rather than on the general public. An esoteric dissemination that differs from the type described earlier in this chapter but rather esoteric, nonetheless.

Gry's reluctance is only increased by the fact that her target group, while being hospitalized patients, is much broader than others'. It is not those afflicted by a certain illness, nor is it those who are hospitalized at this very moment. Her target group is diffuse exactly because anyone might need to be hospitalized at one point or another. Indeed, the general public might need inpatient treatment. Blurred borders of a target group can be defined – ‘those who are currently hospitalized or will be so in the future’ – but the contents of this group cannot. A position in between the phantom of the general public and specific target groups. An intermediary position characterized by envy, as Gry put it:

*“I have sometimes been a bit envious of those who research a specific patient category. ... Where you can visualize the patient category and that doesn't happen so much with my research, because it actually affects everyone who is hospitalized. But everyone can quickly become no one.”*

In clinical research you often have a primary target group, the patient category. People with diabetic foot ulcers are quite a tangible target group. You know who to speak to. You have the luxury of the first constituting part of your IP. It makes the shortcomings of the standardized configuration outlined earlier less practically severe. It lessens the inadequacies of the University Law, although the knowledge is made public to an exclusionary public. The middle ground between predefined target groups and the Phantom Public might be the most equitable position to communicate from, the most inclusionary position. The one we here describe as an IP. The compromise between the Phantom and tangible targets. In practice, this compromise differs from the intermediary position inhabited by Gry. The intermediary position paralyzes action. Incidental alignment with our vocabulary is predicated on the ability to identify the actors directly affected by an issue. Lacking this ability, the potential communicative effort has no starting point. The insurmountability of making knowledge public permeates this position. Gry carries out invisible work even in trying to figure out which actors make up her public, invisible also for the fact that it has not yet materialized.

Alignment with the notion of IPs in communicative work can be achieved of a researcher's own accord for reasons that are more practical than philosophical. The compromise between Phantom and narrowness. A concerted effort of both inclusion and exclusion. We exemplify this with an example that Casper highlighted, drawing from his experiences with trying to reach a challenging target group, that of drug users:

*“To give an example, we have recently had some stories aimed at drug users. These stories include information they need to be aware of to avoid fatalities when using drugs. ... It was covered in political discussions and the like because the media found it an interesting study. But those who really need to know this are the drug users who live on the streets. It's doubtful they read political analyses. I'm not sure they do. So, we tried to target professional magazines that might be closest to the topic. At least some of these are read by those who encounter them daily.”*

Drug use is certainly an issue and drug users are certainly a target group with vested interests, although addiction at times is such a consuming state that these interests might be clouded. It is certainly a target group worthy of being described as the target for communication, the

directly implicated actors. In trying to reach them, Casper and his colleagues were forced to reconsider whether a narrow focus on this group would wind up making their knowledge public to those who stood to gain the most from it. Recognizing this limitation they made a dedicated effort to reach other, indirectly implicated actors, intending for these to act as a bridge to the drug users who might be out of reach and provide the indirectly affected with resources to help the directly implicated. In doing so, Casper and his colleagues shied away from their otherwise established practice of relying on journalists to communicate their knowledge. All this got them were political discussions, far removed from those who are implicated. Reconsidering the channel through which they communicate narrowed their communicative scope to “*those who really need to know this*” as Casper put it. For these practical reasons, the borders of the IP of drug use has been widened to include social workers and healthcare personnel as well as potential friends and relatives that stumble upon these magazines. It starts to resemble an IP in full. Here it is not the general public that is relevant. Though the media has participated as they found it interesting, interest in an issue does not necessarily mean being implicated in it. It is not the entirety of the Phantom Public that should be included in the public of drug use. Casper and his colleagues have thus aligned their definition of a relevant public to that of an IP as a way of grappling with the practical conditions under which they have made their knowledge public. We have done nothing but put his actions into words. IPs emerge naturally in practice and carry with them advantages for making knowledge public to those which it matters to.

### 4.3 Once more on structural and legislative inadequacies

An overarching theme for this chapter has emerged at this stage: the notion of structural constraints in communicative work. In the metaphorical words of the standardized configuration: ‘contribute to public debate, but not really.’ At this point we have outlined a secondary voice, that of the University Law. Its words are but a whisper, yet invasive: ‘your research shall contribute to the surrounding society, and you are responsible for making it so.’ Both *whether* to make knowledge public, and to *whom*, remains questions to be answered by the individual researcher. The experiences and strategies discussed by the researchers underscore a critical gap between the intentions of the University Law and its practical outcomes. The wording leaves much to be desired, as is to be expected from such legislation. Acts of insubordination are committed against it when not living up to its expectations, whether one aims to reach the surrounding society at large or not. After all, the general public is nothing but an intangible phantom.

Faced with these inadequacies, researchers at times make what we term pragmatic choices about their communicative work. While they might define the public as the general, amalgamated version, they also carve out target groups, a way of circumventing the all-encompassing nature of the Phantom Public. In doing so they initiate the process of regarding the public not as a singular thing but as fragmented ontological building blocks, the actors relevant for their stake in a given issue. At times, the second step is taken as well, resulting in the operationalization of the concept of indirectly affected actors. For a researcher to identify their IP three requirements must be met. Firstly, the researcher must stray from the all-encompassing definition of the public described above. Secondly, the researcher needs to identify a target group or groups who are directly affected by the issue under scrutiny. Thirdly, indirectly implicated actors need to be identified. Ideally, this third part occurs even when the initial target group is within reach.

This thesis is concerned exactly with ensuring the most preferable conditions possible for the constructions that these building blocks help build. We value these constructions for their ability to both limit the amount of invisible work required in making knowledge public, while simultaneously being more inclusive than its too specific counterpart. In the following chapter we turn to this effort of ensuring preferable conditions.

## 5 Addressing communicative constraints

We have so far been descriptive and analytical. We have been critical. Our endeavor reaches beyond these efforts, for critique without proposals for change are but empty words from external critics who will not face the consequences. We are more entangled than that. Our work is not complete until we lay out suggested solutions that could address both the structural and conceptual constraints that we have identified in the previous chapter. Therefore the following chapter takes on another tone of voice, one of discussion and solution development. It is split in two, one part engaging with the systemic issues that we have identified and the other engaging with the practical effort of making knowledge public. While we treat these parts separately, they are intimately interconnected. Two sides of the same coin, each necessary for making the most out of the other.

### 5.1 A commission-based business model in reverse

*“Even in the very much changed circumstances of the present time, most universities are still run on some degree of academic self-governance in which professors and students have a dominant voice in the governance of the university. However ... this is very much diminished as a result of neo-managerialism which has undermined academic self-governance.”* (Delanty 2002:186)

The contemporary concept of the University has changed vastly in recent years (see section 1). We have touched upon it in previous chapters as it relates in large part to the way research activities are funded. Obtaining external funding is the be-all and end-all, a requirement to both progress one’s academic career and to even conduct research in the first place. It has created a dependency on funds and other funding organizations, adding a third obligatory activity for researchers. The 50% of their time that they have available to conduct research is encroached upon by these fundraising activities.

It would be one thing if these fundraising activities resulted directly in grants that would allow a researcher to progress their careers or carry out large research projects, for as Mads expressed it: *“It requires huge grants to tackle some of the huge issues that we have in order for it to actually make a difference.”* The contemporary university, however, has come to resemble consultancy firms and other project-based organizations in the way that they operate. They rely on taking a percentage of the funding acquired by the employed researchers, an overhead (OH). And not small a percentage at that. In fact, universities are allowed to demand up to a 44% OH on the acquired funding to cover expenditures on rent, utilities and



administrative tasks (Ministry of Higher Education and Science 2021). A significantly higher margin than the up to 25% that the European Commission allows for their research grants (Ministry of Higher Education and Science 2023). A commission-based business model in reverse. The university relies on the sales activities of the employed researchers to make ends meet – public funding through the Finance Bill only covers about 50% of the expenditures of the university (e.g., University of Copenhagen n.d.; Aarhus University 2024). Never has the category of employee fit more perfectly than to describe the reconfigured role of researchers as they strive to engage in research. It is New Public Management (NPM) in effect (Gruening 2001). The university has become so business-like that it has become a business as a whole, making the notion of academic self-governance (Delanty 2002) seem ever so unlikely.

It adds another dimension to the standardized configuration's reluctance towards complying directly with the wording of the University Law. Communication of research-based knowledge is not a guaranteed funding endeavor. Not all research fields benefit funding-wise from making the field more popularly recognizable. The fabled KPIs take precedence, as measure of activity and esoteric reach. Another reason, and perhaps the most pervasive one, for why the responsibility is seemingly not taken seriously. Running the university as a business means making sacrifices, sacrifices felt especially for researchers on the lower rungs of the career ladder. It requires external funding to progress from one rung to the next. It is likely that the exorbitant OH percentage prevents at least some researchers from progressing. Reserving 44% of the allotted funding for administrative costs is bad value for money for the funding institution. The money might be better spent on pure research grants that are not going towards career progression. A further marginalization of less experienced and less progressed researchers.

The influences of neo-managerialism and NPM are not something that we would be able to reverse solely with contributions from this thesis. It is the result of decades of supposed optimization of public spending and management (Gruening 2001). It is ingrained in our institutions. What we can do is highlight that this current configuration is highly unsustainable. Here we align ourselves with the union DM who are currently campaigning for an increase in the base contribution allotted universities on the Finance Bill in order to decrease the amount of time spent applying for grants (Gregersen 2024). Time is money, and time spent applying for funding is time taken away from one's KPIs. Couple this with the exorbitant OH that universities are allowed to carve out of funding, and you have a recipe for career stagnation and potential researchers shying away from a career in academia altogether (ibid.). If these are the conditions for conducting research, it is no wonder that making knowledge public is so

difficult. KPIs and fundraising takes precedence. It makes even more sense now that funding organizations at times consider funding for communicative initiatives to be part of this OH (see section 4.1). It is expected that the 44% is also directed towards communicative work, for why else would it be so significant a portion?

Why, indeed, are effective support structures not prioritized when the university's cut is as large as it is? We cannot provide a satisfactory answer to this question. All that we can say is that it should be. We agree wholeheartedly that increases to base funding is the correct direction to go. It is likely conditional for recognized communicative work to be carried out at all. And while we align ourselves with DM's campaign it will likely not diminish the amount of invisible work that goes into making knowledge public. One activity should replace the other; limit time spent on applying for funding to free up time for acknowledged communicative work. This exchange is not self-evident. For it to take place, a further reconfiguration of the university as an institution will need to take place. We approach this reconfiguration through the formal foundation on which the contemporary university is built, the University Law. This, in hopes that centering our suggestions around this law will allow it to obtain a lesser penchant for flexible interpretation.

### 5.1.1 Reconfiguring the role of the University

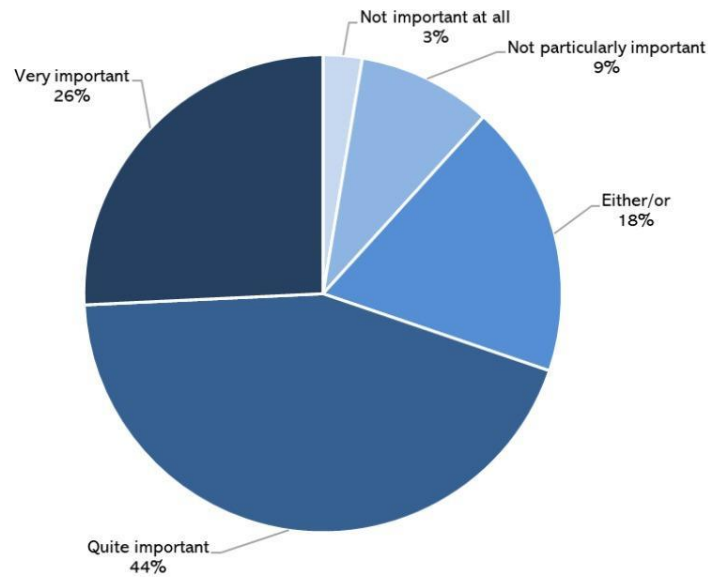
Throughout this thesis we have demonstrated that the University Law is unable to wholly shape how universities are managed, even though it is its explicit purpose. The vague wording of the law and the special remarks that accompany it does little to positively obligate communicative practices. It is all too easy to get around its command of encouraging employed researchers to contribute to public debate. The wording has allowed for an insufficient interpretation of the law to flourish. NPM and neo-managerialism has manifested itself despite the lack of a legal demand.

Cutting costs is key to operating a successful business. For this reason it is no wonder that researchers are forced into unpaid and unrecognized labor if they comply with the University Law. Addressing this inequality involves tackling the very law on which the university operates. Our first suggestion is thus that the University Law be amended to include a guarantee of monetary compensation when engaging in the otherwise invisible communicative work. Such a formalization will force the university to recognize that this work is currently carried out deep in the shadows. We argue that the exorbitant OH should be used to cover these expenses. If combined with the proposal posited by DM there should be plenty of room in the budget for recognition.

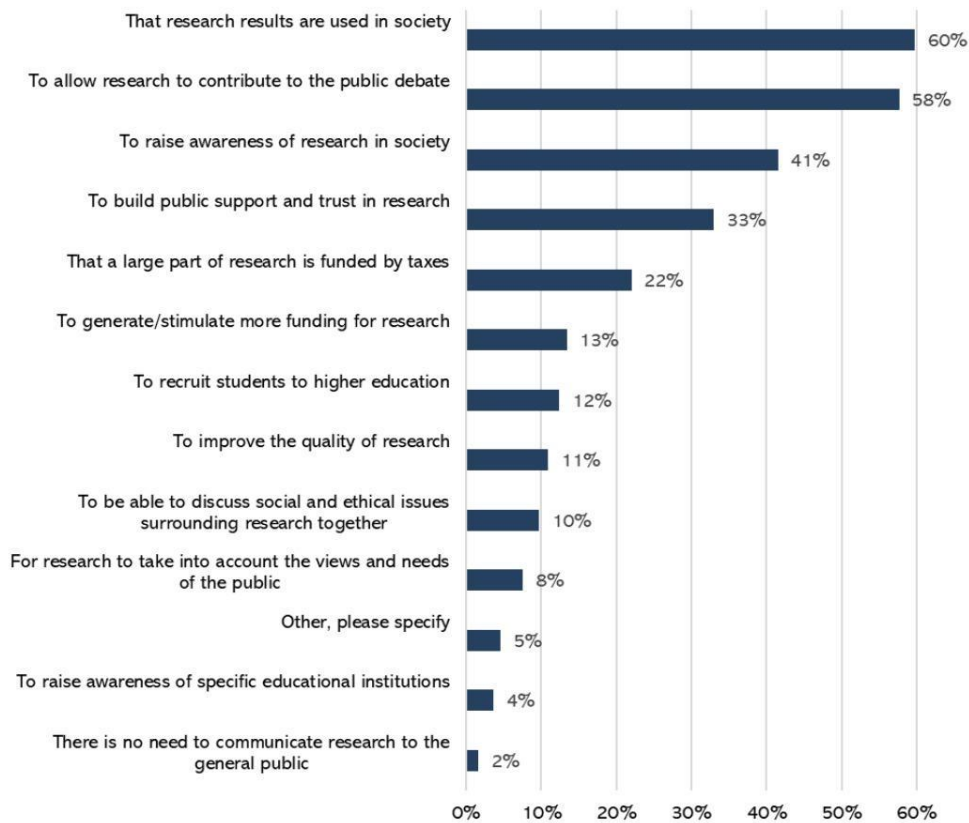
While we do propose that an amendment to the University Law should be made, we are not students studying law, familiar with the inner workings of lawmaking. For this reason we abstain from proposing a specific wording of the suggested amendment as it would take away focus from the underlying argument of its necessity. What is important is that the University Law is made to underline the organizational responsibility of the university to support communicative work both through formal structures and through monetary compensation. The Ministry of Higher Education and Science should create a supportive notice as a means of positive obligation, containing a demand for explicitly earmarked funding for communicative efforts. The supportive notice should shift the responsibility from the researcher and back to the university and juxtapose communication of research-based knowledge with teaching, clinical work and research in general.

We realize that altering legislation is an extremely difficult and deeply bureaucratic process. While we hope that this thesis will spark political debate on the issues that we have identified, relying only on chasing this avenue for positive action would be naïve. Therefore we extend the same plea directly to the universities themselves. In spite of the unrecognized nature of communicative work, researchers in large part participate in it and find it an integral part of their role as researchers (see Fig. 8). Granting the possibility for researchers to be compensated for their work brings the societal purpose of universities as bastions for problem solving and knowledge production back into focus. At the same time it has several organizational benefits. By allowing researchers monetary compensation for making their knowledge public it lessens the amount of burnout associated with ensuring one's research makes a difference in the world; the primary reason for engaging in communicative work (see Fig. 9). At the same time, it is likely that retention of talented and societally engaged researchers would be increased and by extension so would the quality of the scientific knowledge produced within the university. Being slightly less cost-effective could lead to more satisfactory KPIs. No longer does it seem like a compromise to recognize the work that goes into making knowledge public.

In general, how important is it for you to communicate science to the general public?



What are your main reasons for communicating research with the general public?



**Fig. 8 (top):** Recreation of Danish Board of Technology 2023, Fig. 4.8. **Fig. 9 (bottom):** Recreation of Danish Board of Technology 2023, Fig. 4.10. Both graphs are based on a non-representative survey conducted among researchers employed by Danish universities (n=3.846, respondents asked to choose up to three categories in Fig. 9). All values are original. All text has been manually translated by the authors of the present report. Recreation has been authorized by the responsible senior project manager.

## 5.2 Developing a recipe for identifying Issue Publics

Above we have outlined a range of systemic interventions that would shift back communicative responsibility to the university. A strengthening of the *raison d'être* of the University Law. While these suggested interventions would force recognition of the invisible labor performed by researchers, they would still not lessen the difficulties associated with making knowledge public. Therefore we dedicate the following to developing our second suggestion: A reflection tool (RT) that acts as a recipe for identifying the IP within which a researcher's knowledge fits. We employ the analogy of a recipe for two specific reasons. The first is that we throughout the previous chapter have identified the ingredients that make up coincidental alignment with the vocabulary of IPs. We have the list of ingredients to concoct the dish, and now only lack the formalized step-by-step instructions of how to prepare it. The second reason is the flexibility that one has in choosing a recipe to cook a given dish. Another is likely available, one that either has slightly different ingredients or instructions. Our recipe is not the only one developed for the purposes of making knowledge public. We are inspired by the framework for scientific communication developed by the RETHINK-project (Langkjær & Hyldgård 2021) but have substituted ingredients and changed step-by-step instructions. Thus the analogy also serves to illustrate that our solution is only a suggestion. The structure of the tool that we develop below, as well as the reflection-prompting questions on which it is built, is not necessarily an exhaustive or complete answer to all instances of making knowledge public. What we can say is that it has a certain measure of generalizability (Flyvbjerg 2020). Any researcher hindered by the operationalization of the Phantom Public, or too narrow conceptions of a fractured but whole public, can stand to benefit from utilizing the RT that we develop here.

### 5.2.1 Detailing a tool for reflection and rebellion

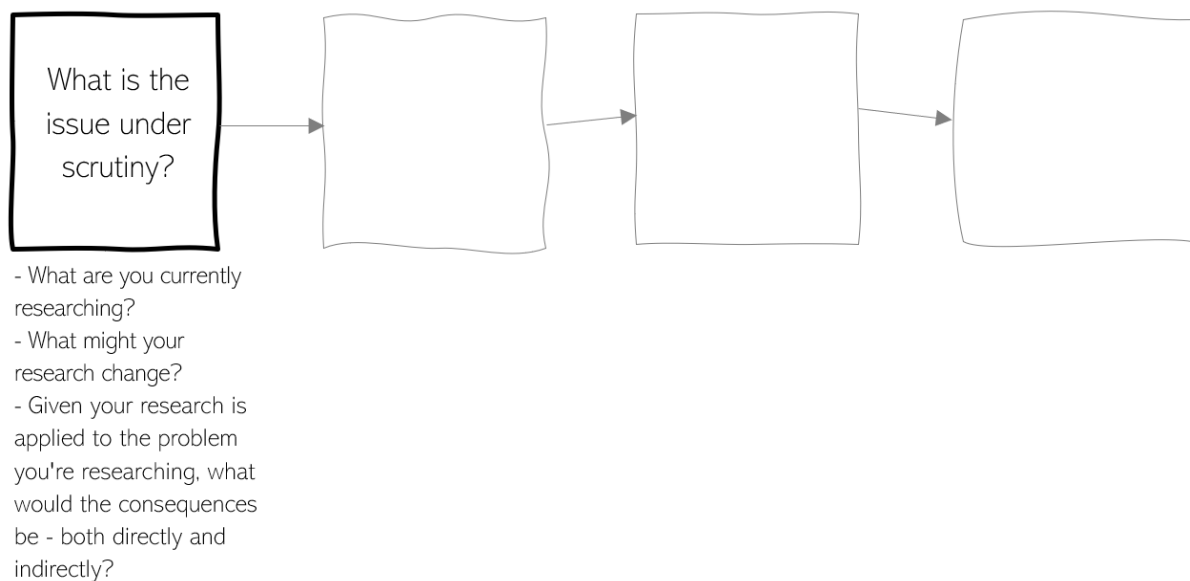
A wide range of formalized communication models have been developed over the years. Aristotle's model of persuasive communication intended for public speaking (Cuofano 2024), Berlo's (1977) SCMR-model and Westley & Maclean's (1955) feedback-driven model to name a few. Common for many of these models is that they are sequential and treat the relationship between sender and receiver of information. We follow the same basic structure, but with a few alterations. In particular we are inspired by the final step of Aristotle's model, relevant for its focus on *effect*. We abstain from using the rest of it, concerned with the concepts of *logos*, *ethos* and *pathos* for which Aristotle is so widely known. Instead we form our own steps, starting from this appropriated notion of effect – or, as we come to use it, the notion of *consequences*.

Conducting research entails conducting research about something, an issue of some sort. Even basic research might at some point become relevant for the issue to which it relates. Research has a purpose and an outcome, although vision of this outcome might be clouded. As mentioned in some shape or form by 11 of the 13 researchers we have spoken to, the knowledge produced can be too complex, too specific or too vague for a researcher to initially think that it is relevant for others than themselves and their colleagues. It might hold true for some research endeavors, the extent to which we cannot say. We wish to avoid the assumption that this is true for all of a researcher's research. Even technical and specific scientific knowledge likely also has relevance outside the esoteric walls of academia, relevance for the issues being addressed. It is not assumptions that should limit the activity of making knowledge public. Rather, it should only be through active reflection that the knowledge is deemed unfeasible for communication. This point forms the purpose for our RT. It is exactly a tool for stripping away assumptions related to the relevance of making a given research finding public. The tool is meant to broaden horizons while simultaneously narrowing them. An interplay of divergence and convergence. The RT that we develop here is less a model of how knowledge is made public than a tool for identifying the *what*, to *whom* and *how* of science communication. The tool is not an immutable mobile (Latour 1986). It is instead more akin to a boundary object, flexible in use (Star & Griesemer 1989).

The RT rests on the theoretical foundation of IPs that we have relied on throughout this thesis. It is a pragmatist approach to qualifying communication efforts. It is not meant as a one-time-thing to be done, the results produced through the tool applicable for subsequent times a researcher obtains new knowledge. It is developed to assist anew every time new knowledge is to be made public. It is a tool for planning communicative work in ways that will garner the most effect for the least amount of effort, a tool for limiting the invisible work that characterizes communicative efforts. Therefore a central theme of the RT is that it itself does not demand a large amount of effort to use. It consists of four sequential steps, each accompanied by a list of reflection-prompting questions. While the tool consists of eight questions in total, some of these might be answered quite quickly. Additionally, while we in this chapter utilize the vocabulary of IPs in the development of the tool, the wording of the tool itself does not rely explicitly on this notion to avoid issues of unfamiliarity from affecting the effectiveness. Instead the tool relies on the term *target group*, as this has been conceptualized by the researchers that have formed the empirical foundation for this thesis, as well as the notion of consequences. We use this notion for its nudging towards the outcomes of research rather than the intent of conducting it. After all, when research-based knowledge is made public it is often on the basis of already

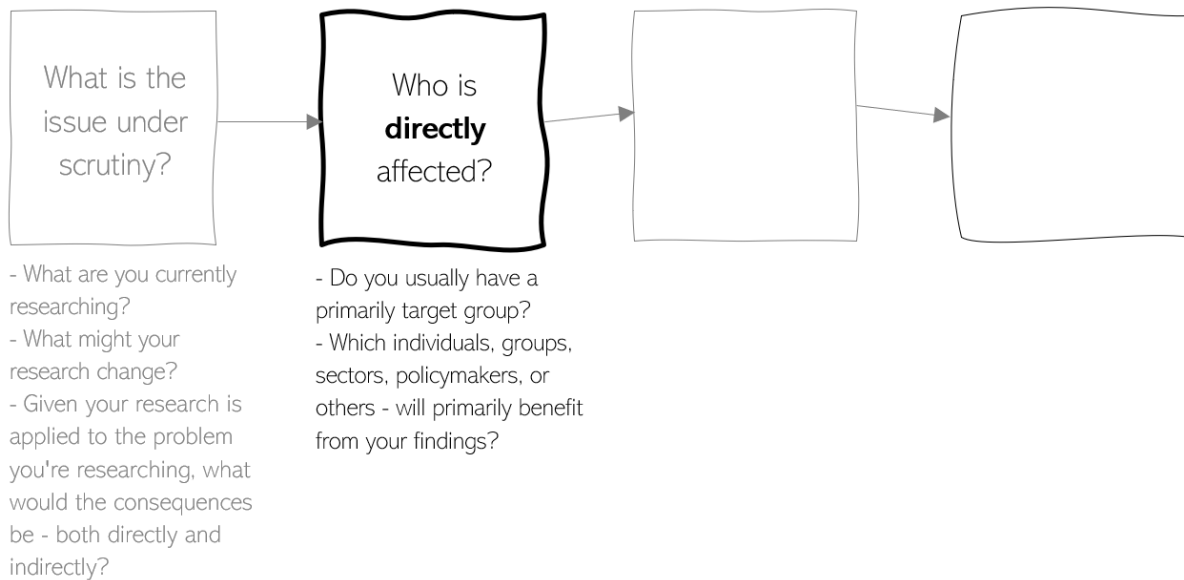
conducted or ongoing research. Over the following we incrementally build this tool one step at a time, while providing descriptions of what each of these contain.

The first step of the RT is concerned with the issue under scrutiny as part of conducting research and the consequences said research will incur. Appreciating the consequences at the communicative outset guides the strategy to ensure that outcomes are communicated to those who stand to be affected by these. The first step in the RT is thus to consider the purpose for conducting the very research one is engaged in. It is a fundamental part of stripping away potential assumptions about one's topic, enmeshed in it as you get when conducting research. This entails not arguing whether or not knowledge should be made public, but exploring *why* it should. It urges consideration of the non-esoteric impacts of the knowledge produced; an academic issue might take on a different form once it leaves the premises of the university.



**Fig. 10:** Visualization of the first step of the reflection tool.

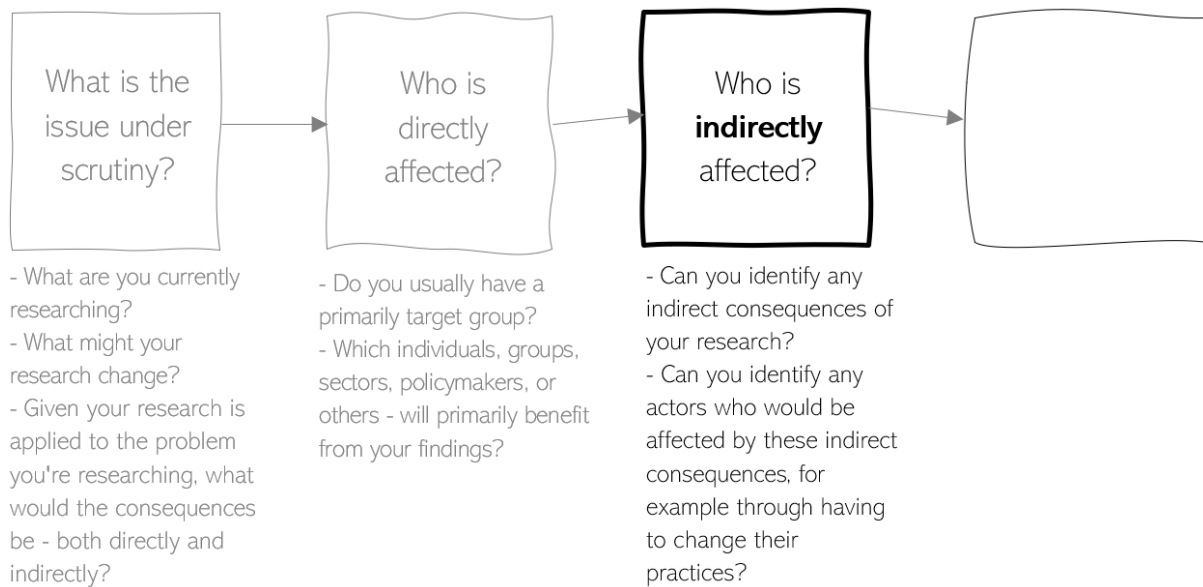
To guide this exploration, this part of the RT poses three questions to be answered in sequence (see Fig. 10). The first two questions – “*what are you currently researching?*” and “*what might your research change?*” – invites the researcher to pause and reflect on the reasons for conducting said research. The third question centers the reflection on the notion of consequences, asking “*given your research is applied to the problem you are researching, what would the consequences be – both directly and indirectly?*” It is through an appreciation of these consequences that a researcher can start to put into words the IP that they by necessity are a part of. Through these can relevant actors be carved out of the Phantom. The first convergence.



**Fig. 11:** Visualization of the first and second step of the reflection tool. Second step emphasized.

Reflecting explicitly on the direct consequences of the issue under scrutiny makes up the second step of the RT (see Fig. 11). It is through these that directly affected actors can be identified. These are akin to the target groups that some researchers rely on in their communicative work. While we have previously criticized the reliance on these, we realize that this position is a bountiful point from which a researcher can start to flesh out the IP that they are a part of. The first question – “*Do you usually have a primary target group?*” – prompts reflection on whether a researcher has one of these, whether knowingly or tacitly. The second question – “*which individuals, groups, sectors, policymakers, or others, will primarily benefit from your findings?*” – then aims at connecting the notion of target groups to consequences. Identifying directly affected actors and the groupings these have formed allows a researcher to avoid the trap that the Phantom Public represents, with its all too damaging implications. Directly affected actors might not always be as obvious as people living with diabetic foot ulcers or other patient groups, these identifiable through the very topic of the research. Conceptualizing the search for such actors through an appreciation of an issue and its consequences intends to diminish the difficulty and make it tangible who appears to be at the center of the IP. A second, more encompassing convergence.





**Fig. 12:** Visualization of the first, second and third step of the reflection tool. Third step emphasized.

The third step is similarly concerned with the consequences of a given issue, although of the indirect kind (see Fig. 12). It is through an appreciation of these that a researcher can move beyond relying exclusively on primary or specific target groups. While researchers at times engage with the actors indirectly affected by a given issue, it solemnly happens explicitly and instead occurs for practical reasons. Therefore we here provide a more formalized prescription for communicative work to also include those actors who are not always immediately visible. Specifically this step entails decreasing the granularity of the search for actors. Through decreased granularity Casper found social workers and friends and family to be part of the IP of drug use. They are not drug users themselves, but implicated in the IP, nonetheless. In asking the two questions – “*Can you identify any indirect consequences of your research?*” and “*Can you identify any actors who would be affected by these indirect consequences, for example through having to change their practices?*” – consideration is extended to those actors who are not systematically cared for, the incoherent public (Marres 2007). These include for example actors whose conditions and practices could be altered as a consequence of the research. Identifying these connections can help researchers develop an overview that includes all relevant actors in their IP, while still limiting who is included. Divergence of a tempered sort.



**Fig. 13:** Visualization of the first, second, third and fourth step of the reflection tool. Fourth step emphasized.

The fourth and final step (see Fig. 13). Where can the constituents of the IP of the issue at hand be reached? It is the Science&You-workshop that we conducted that has directed our attention towards the multifacetedness of this question. While not all findings from this workshop have warranted inclusion in this thesis, the scene quoted in section 4.2.1 is exemplary of the insights gained from said workshop. It is the appreciation of the varied nature of preferences that has led to the creation of this fourth step.

It falls outside the scope of this thesis to answer this question in full, as it would likely require an additional thesis altogether if that would even be exhaustive enough. It is a complicated question to answer for several reasons. Firstly, digitalization and the advent of social media has caused the number of channels where information is available to skyrocket (Danish Board of Technology 2023; Bawden & Robinson 2020). No longer is it sufficient to rely squarely on editorial media, if it ever was, for the reasons outlined in the previous chapter. Secondly, and more important for our purposes here, sketching such an answer would miss the point entirely. Tailoring communicative efforts require intimate contextual knowledge of the research subject, obtained only through prolonged engagement with said subject. Lacking this knowledge, any preconceived answers to the question of where the constituents of a given IP can be reached would strip away the generalizability of this tool. It is up to the researcher themselves to answer this question. Only they know who they need to reach – insights gained from the three previous steps of this tool. What we can do is guide them down the right path by providing the question of “*what efforts can you make to reach both directly and indirectly affected actors?*” and general recommendations.

Researchers have preferences for utilizing certain channels when making their knowledge public. These may stem from earlier successes, plain accessibility or something else entirely. We here urge researchers to experiment with other types of channels and formats than the ones they are used to, asking them to “*consider which channels might be useful in reaching these actors.*” The key is to experiment. It does not have to be as successful as the preferred methods, at least not the first time around. Through experiments experience is gained. In this case experience is an antonym to assumptions and the only way to know for sure whether parts of a given IP are to be found through a given channel. The fourth step urges researchers to reflect actively on the channels they employ when making knowledge public, to once more shed the assumptions that might have formed about these.

The RT that we have developed here has taken on the form of a sequential model. Such a model in itself is not likely to achieve anything. Therefore we have included instructional questions, yet the underlying reasons for the model to be centered around the notion of consequences is not contained within these. For this reason, the final version of the RT includes contextual descriptions for each of the four steps that in large part resemble those that have accompanied the development in this chapter (see Fig. 14. A PDF version can be found in Appendix 6). Further, non-exhaustive examples are given for the first three of these, providing inspiration for how to approach them. The final version thus warrants the moniker of tool, not simply a model. It is a formalization of the process of identifying IPs. It is both ingredients and step-by-step instructions, a recipe whose outcomes differ every time it is followed. A recipe meant to be hung on the bulletin board of the office, consulted the next time knowledge is to be made public.

# Reflection Tool

## A GUIDE FOR QUALIFYING COMMUNICATIVE WORK

WHAT IS THE ISSUE UNDER SCRUTINY?	<p><b>STEP 1</b></p> <ul style="list-style-type: none"> <li>- What are you currently researching?</li> <li>- What might your research change?</li> <li>- Given your research is applied to the problem you're researching, what would the consequences be - both directly and indirectly?</li> </ul> <p>This step helps clarify the relevance of your research through the accompanying consequences in preparation for the next steps.</p> <p>Example: <i>Link between lung cancer and cigarette's.. This work could lead to targeted treatments and shape public health policies on smoking, significantly impacting healthcare outcomes</i></p>
WHO IS DIRECTLY AFFECTED?	<p><b>STEP 2</b></p> <ul style="list-style-type: none"> <li>- Do you usually have a primary target group?</li> <li>- Which individuals, groups, sectors, policymakers, or others - will primarily benefit from your findings?</li> </ul> <p>This step helps you reflect on the immediate consequences of your work. Through these you can define the audiences that are directly affected by your findings.</p> <p>Examples of possible audiences: <i>Local community members, patients, consumers, (environmental) advocates, educational institutions or prof. associations, health care/technology/energy/agriculture sectors, local government officials etc.</i></p>
WHO IS INDIRECTLY AFFECTED?	<p><b>STEP 3</b></p> <ul style="list-style-type: none"> <li>- Can you identify any indirect consequences of your research?</li> <li>- Can you identify any actors who would be affected by these indirect consequences, for example through having to change their practices?</li> </ul> <p>This step helps you include actors who are indirectly affected by the consequences of your research when you plan your communicative strategy.</p> <p>Example: <i>research on drug use may not directly affect social workers and family members, but these groups often deal with the broader implications and are thus key actors in this field.</i></p>
WHERE ARE THEY?	<p><b>STEP 4</b></p> <ul style="list-style-type: none"> <li>- What efforts can you make to reach both directly and indirectly affected actors? Consider which channels might be useful in reaching these actors.</li> </ul> <p>This step encourages you to go beyond your typical or familiar communication methods. Consider where your audiences of both directly and indirectly affected actors might be located. There are a lot of different ways to go about this, so experiment with new channels and formats to see if these let you more effectively reach these. This is a matter of trial and error.</p>

**Fig. 14:** Finalized reflection tool. Includes the four steps, contextual descriptions and examples. PDF version can be found in Appendix 6.

There is one significant caveat to this tool that we must deal with. That of magnitude. Depending on the number of actors identified through steps two and three, the fourth step might start to resemble the efforts carried out by researchers when they try to reach the Phantom Public. The scale might become too immense. In a globalized world of global impacts (Alexander 2006; Wynne 2005) issues start to implicate everyone if one searches long enough. We rely on the words of Dewey to propose one more effort of convergence, a final revisiting of his distinction of what makes actors eligible for participation in a public: “... *that it is deemed necessary to have ... [the] consequences systematically cared for.*” (Dewey 1991 [1927], quoted in Marres 2005:213). The final convergence entails weighing the degree to which indirectly affected actors are indeed affected. Some will necessarily be more affected than others, similarly to the distinction between directly and indirectly implicated actors. We cannot provide a recipe for how this process should be carried out. It is too context dependent. Instead, we provide the theoretically founded reasonings of this chapter to assure the researcher that efforts of exclusion are both beneficial and necessary. Only through exclusion can the ramifications of the Phantom Public be avoided.

The RT developed above contains a dimension of rebellion. It is slight, but it is definitely there. A rebellion against the standardized configuration outlined in the previous chapter and the demands it makes: seek funding, publish articles or relinquish hopes for a career in research. It is also a rebellion against the literal interpretation of the University Law, specifically the part of it which posits that researchers shall contribute to the surrounding society and public debate. The source of the Phantom that haunts researchers’ conceptions of the ephemeral public. If the law were enforced in accordance with this literal interpretation the RT would appear meaningless. As we have shown throughout this thesis, such enforcement does not in effect take place. The University Law is content with acting as the flimsy foundation for how universities are intended to operate. Defiance against the literal interpretation already occurs, and rightfully so. It is through this defiance that knowledge has been made public in spite of structural constraints. The RT serves as an acknowledgement of the revolt against the vague wording of the University Law, a formalization of this act. A formalization that allows more researchers the comfort of knowing that it is alright if communicative efforts are exclusionary, as long as the reasons for it being so are transparent. As long as the reasons are not arbitrary.

Conversely, if the RT gains traction among researchers, it could lead to a secondary strengthening of the *raison d’être* of the University Law. Ultimately the goal of §2 section 3 is to establish that research is made public by assigning this responsibility to universities and

researchers. Suppose that the RT is able to tear down the notion of the Phantom and prompt researchers like Gry to start making their knowledge public through the reliance on the worldbuilding qualities of issues and consequences (Marres 2005, 2007). Insurgency against the literal interpretation in trade for more researchers joining in, more researchers making their knowledge public. A transgression against the University Law that strengthens its authority rather than diminish it. The outcome to which the beneficial consequences outweigh detrimental ones. The first step towards democratization of scientific knowledge. Indeed, the choice a pragmatist would make.

### 5.3 Tying things together

We started this chapter with the familiar idiom of *two sides of the same coin*. The two solutions that we have proposed fit this idiom to a tee. Two ways of diminishing invisible work and increasing the amount of knowledge made public. Each could in theory stand alone. However, each address only part of the problem. One deals with structural constraints, while the other deals with the Phantom of the public. Combine them and see an amplified effect of both. Reconfiguring the role of the standardized configuration that the university has become forces recognition of invisible work but does not necessarily limit the work required of researchers to make their knowledge public. Employ also the RT that we have developed, and potentially see the required workload shrink. A veritable win-win situation for both standardized configuration and researcher. Utilize the RT and gain an appreciation of the issues that form the public instead of relying on the notion of the Phantom. Limit the amount of invisible work through the focus on consequences of research and make knowledge public predicated on reasoned exclusion. But do so knowing that it entails rebellion against the legal framework that regulates the university, the place of employment. Discomfort that we cannot remove with any sort of guarantee. Reconfigure the standardized configuration into one of support and tackle this discomfort directly. Two sides of the same coin, yet stronger in unison.

A few closing remarks are appropriate here. Specifically on how we, the authors, intend to make our newly obtained knowledge public. We have followed our own prescriptions and identified the IP that we are a part of. We therefore turn once more to the audiences for this thesis. Other than our supervisor and our censor, the list also includes DBT, policymakers and university administrations, as well as researchers employed by Danish universities. We require their intervention in the issue (Marres 2007) of improving conditions for making knowledge public. Policymakers and university administrations are the ones who can change the structural conditions according to the first suggestion that we have outlined above. Consequently we are

in the process of applying for the opportunity to appear before the Ministry of Higher Education and Science<sup>12</sup> to present our findings and appeal to them in hopes that they will take action on these. Additionally we strive to spark wider political debate on the issues that we have demarcated here to extend awareness of these to the university administrations. For this reason we intend to write an op-ed article to be published in *Altinget*, an “*independently owned public service news provider and ... leading political news site in Denmark*” (Altinget 2019). DBT remains integral to our communicative effort, both in enacting formal change and especially in making the RT available for researchers to use. Our hope is that the tool, and the insights on which it is formed, will lead DBT to incorporate the notion of consequences into their existing frameworks for communication of research-based knowledge (e.g., Langkjær & Hyldgård 2021). Perhaps a version of the tool itself could make its way into the future work conducted by DBT. The best-case scenario for dissemination of the tool. With these efforts we plant the seeds for improving the conditions under which researchers make their knowledge public. We make it a continual effort to fertilize and weed the soil. It is our hope that this will allow the seeds to take root and grow tall, the effort of making knowledge public becoming commonplace, not riddled with the rot of unrecognized work. A foundational step on the path to cultivate the garden that is the democratization of knowledge in general.

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<sup>12</sup> The opportunity for citizens, associations, interest organizations and the like to appear before a parliamentary committee to share views on a topic or proposal that the committee is working on (Folketinget n.d.).

## 6 Reflections and future work

The current thesis has relied on a conceptual patchwork, combining influences from theories of democracy, relational ontologies and a feminist approach to describing the oppressive consequences of the ways that the world comes to be structured. This outlook on both knowledge and the world has necessarily had implications for how the thesis has been formed, both empirically and analytically. We here take the time to reflect on what other approaches to knowledge and the world would have meant for the work conducted in this thesis. Consequently we relate this to the future work to be carried out on the subject of making knowledge public.

This thesis has focused on the structural marginalization that researchers experience when making their knowledge public. Had we instead relied on for example a Foucaultian definition of knowledge (Foucault 1998; Richter 2011) our focus would have shifted towards the lopsided relational nature of power between researcher and citizen,<sup>13</sup> one inhabiting a position of expert, the other the position of receiver. Such a conceptual framework would have afforded us to explore the ways in which citizens resist the exercising of the lopsided power relation. A conceptual shift of this nature would entail viewing the world that surrounds the individual as something static, rather than relationally structured. The emancipatory focus would additionally shift away from researchers and onto citizens, the methodology following suit. This exploration of power relations and emancipatory opportunities should be guided first and foremost by qualitative investigation of the role knowledge plays in the lives of citizens and the degrees of autonomy they have in their democratic citizenship. The action-oriented element of this configuration should rely on participatory and co-creative influences, approaching the power relations empathetically to develop emancipatory solutions to these – possibly in collaboration between both researchers and citizens. A normative position akin to that of Design Justice (Costanza-Chock 2020).

We have chosen not to do so, to avoid the ascription of power on exclusively normative and theoretical grounds. Investigation of the structural conditions for how researchers make their knowledge public has thus far been an underdeveloped activity. It is an activity which we find necessary to develop before an adequate Foucaultian analysis of knowledge and power or emancipatory design schemes can be carried out. We have reserved the pages of this thesis primarily for investigating these conditions, the Science&You workshop left in a supportive

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<sup>13</sup> This category is here used in the broadest sense, defined simply as those outside the world of academia.



role and excluded other citizen-centered perspectives to let this investigation obtain the necessary credence. Our contribution is only the first move towards this end. Therefore future work on the subject of how scientific knowledge is made public should focus chronologically on the following areas.

1) Qualifying and building on the findings: Future work should investigate whether the same structural constraints apply to other branches of research than the natural and health sciences covered here. The same goes for definitions of the public, where future work should delimit whether the understanding of the public as a Phantom or as a whole but fragmented phenomenon is prevalent across disciplinary divides. Further, comparative application of the conceptual framework of Issue Publics needs to be carried out in order to explicate whether other elements are necessary for the incidental inception of these publics. In turn, this will strengthen the practical benefits of employing this framework when knowledge is made public.

2) Developing novel ways of communication: While this thesis has been concerned with current configurations of making knowledge public, future work should investigate which affordances the changing technological and media landscape brings for novel ways of engaging in this activity. Here, we urge the explicit exploration and development of dialogue- and interaction-based formats to challenge the dogmatic one-way communication most typical of today.

## 7 Conclusion

The present thesis has investigated how scientific knowledge is made public by researchers from the natural and health sciences employed by Danish universities, with specific attention devoted to the constraints that these researchers experience. Latour's radical ontology has been adopted and thus this thesis views knowledge as produced through chains of translations. The act of making knowledge public has been defined to be part of these. This perspective is augmented by Star's concepts of invisible work and marginalization, allowing for exploration of the unrecognized labor and exercising of power within the socio-technical infrastructure of the University. Further, the thesis utilizes Marres' concept of Issue Publics (IPs) as an alternate approach to the structuring of the radical ontology. This vocabulary provides alternative conceptions of the public as assembling around issues, a perspective which is especially beneficial for communicative efforts. The empirical operationalization of these perspectives is made up of an interview study consisting of 13 semi-structured interviews conducted with researchers and a design game workshop conducted with citizens.

The contemporary University is outlined as a standardized configuration concerned only with reaching Key Performance Indicators for esoteric dissemination of research. In turn, researchers who engage in making scientific knowledge public encounter a range of obstacles that leads to the creation of invisible work, described as structural features of this configuration. The constraints include the predetermined division of a researcher's time forcing communicative efforts to be carried out as extracurricular activities, a prevalent 'publish or perish' culture and a renunciation of the communicative responsibility posed by the University Law. These are especially detrimental to researchers on comparatively lower rungs of the career ladder. One formal support structure has been identified, that of communication departments and press offices. This structure is shown to be lackluster in serving its supportive role, in turn exacerbating the amount of invisible work carried out if a researcher chooses to utilize it. In the face of this standardized configuration the act of making knowledge public is characterized as an act of rebellion.

The wording of §2 section 3 of the University Law, and specifically the parts concerned with *the surrounding society* has prompted some researchers to rely on a conception of the public that resembles the Phantom Public. This conception hinders communicative work, intensifying the amount of invisible labor required to accomplish the unrealistic goal of reaching the entirety of it. Conversely, when the research field turns specific the scales are tipped too far in favor of those with vested interests, neglecting indirectly affected actors. One

instance of incidental ontological structuring resembling an IP by a researcher has been identified. This instance has been described as one of pragmatic exclusion, knowledge made public to those actors who are directly and indirectly affected by the issue of drug use to the degree that their intervention in the issue is required.

Two sets of suggestions have been developed in this report. The first is based on a reconfiguration of the contemporary structure of the University, which has been likened to that of a consultancy firm due to the exorbitant overhead the University carves out of research grants obtained by the employed researchers. Engaging in these fundraising activities further limits the time available for a researcher to make their knowledge public. The first suggestion entails that the University Law be amended to specifically include allocation of funding for communicative work. Further, it is argued that part of the exorbitant overhead should go towards this type of work in order to force recognition of it. The second suggestion is a reflection tool developed to help researchers qualify their communicative efforts by identifying the IP that they are a part of. The tool consists of four sequential steps, each concerned with a different aspect of this identification, from appreciating the issue under scrutiny, through identifying directly and indirectly affected actors to considerations of how to reach these actors. It is argued that employing this tool is potentially beneficial for all types of researchers, both those who operationalize the Phantom Public and those who rely on narrow target groups. Taken together, these two suggestions are meant to limit the invisible work currently carried out by researchers by addressing the structural constraints of the contemporary University and illusions of a Phantom Public. It is argued that limiting this type of work is the first step towards the democratization of scientific knowledge.

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