

Communicating science through competing logics and a science-art lens

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Abstract

This essay takes a starting point in the well-known tension between the media logic and the scientific logic and the challenges when communicating science in a mediatized society. Building on the experience of engaging in research comics, both as a method for communicating science and a creative example of a meeting between science and art, we introduce a framework — a pedagogical tool — for how science communication can be understood through the two competing logics. We contribute to literature about the balancing act of being a ‘legitimate expert’ and a ‘visible scientist’, and suggest that the meeting between science and art can be understood as a lens for how to communicate science that goes beyond the deficit model.

Keywords

Science and media; Science communication: theory and models; Visual communication

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Introduction

Society is highly influenced by media and is to an increasing extent mediatized,¹ meaning that it is partly driven by — and constantly adjusting to — what is described as a media logic [e.g. Adolf, 2011; Altheide, 2013; Hjarvard, 2013; Lundby, 2009; Schillemans, 2012]. It has even been suggested that individuals and organizations do not exist *with* the media but *in* the media [Deuze, 2012]. The academic community is no exception, and research on science communication has explicitly focused on how the media logic influences the practices of how science is communicated [for overviews see e.g. Bauer & Gregory, 2007; Bucchi, 2012; Olesk,

¹Different researchers use mediatization and medialization as interchangeable concepts. Weingart [1998], for instance use medialization, whereas Schäfer [2014] use mediatization. As stressed by Meyen, Thieroff and Strenger [2014, p. 272] “mediation, mediatization, and medialization are used in parallel, partly as synonyms and partly with clearly diverging meanings that should not be reduced to “semantic confusion” [Livingstone, 2009, p. 5].” However, Adolf [2011, p. 154] stresses that this has led to conceptual confusion and notes that despite the many concepts “the m-word tell us something about the role of the media and the media discourse in the public and academic discourse”. In this paper we use the term *mediatization* as it is most commonly used [cf. Välvirronen, 2021].

2021; Rödder, Franzen & Weingart, 2012]. Weingart [1998, 2012], Väliverronen and Saikkonen [2021] and Väliverronen [2021] for example, argue that the media has become an important arena for researchers in competition for legitimacy and expert authority. Hjarvard [2008, p. 108], with reference to Väliverronen [2001] and Weingart [1998], even argues that science is dependent on media when producing and circulating knowledge. And Rödder [2009] notes that ‘visible scientists’, who try to exploit the media to ensure the priority for a finding — a result or a product — and gain public attention, are also noticed by their peers who learn about their findings from consuming media content. Research on the role of the ‘visible scientist’ has also shown that efforts to engage in science communication are expected to improve trust and understanding of science, which in turn is expected to have a positive effect on attracting funding and number of applying students [Olesk, 2021; Guenther & Joubert, 2017].

However, at the same time Väliverronen and Saikkonen [2021] and Weingart [2022] stress that there is risk with this development and that the expert role is challenged and may even become devaluated — not least because of various social media — when an increasing number of actors with different knowledge claims are competing for attention. This is especially challenging when scientists are, in their expert role, accused for having a scientific jargon and asked, or even pushed, to simplify and adjust to the media logic — with the result that what is communicated is by laypeople understood as common sense [cf. Olesk, 2021; Peters, 2008; Schäfer & Fähnrich, 2020; Van Dijck & Poell, 2013]. Thus, the adjustment to the media logic might even harm the legitimacy of being an expert, and increase the mistrust in science [Weingart & Guenther, 2016]. This is also mirrored in the long-standing (norm and) view in the scientific community that public visibility may harm the credibility and even jeopardize the ‘productivity’ of researchers, meaning that time to communicate (differently) takes time from writing and producing scientific knowledge [e.g. Goodell, 1977; Weingart, 2012]. Hence, while the proponents argue for the necessity of ‘public visibility’ — pushing researchers to play by the rules of media — the opponents stress the risk of too far-reaching adaptations of these rules and ‘reducing the autonomy of science’ and devaluating the expert role [cf. König & Jucks, 2019; Olesk, 2021; Rödder, 2012].

For sure, scientists need to understand how to respond to the media logic, or at least be aware of it, when engaging in science communication [cf. Baram-Tsabari & Lewenstein, 2017; Peters, 2012]. In order to avoid the risk of disappearing amongst the voices of other groups claiming to be experts — such as consultants, journalists, influencers and other thinkers who think, feel, and express opinions — it is imperative to understand the rules and norms by media [Olesk, 2021; Väliverronen & Saikkonen, 2021]. However, it is equally important to be aware of the scientific logic and to be able to communicate the preferences and principles for how scientific knowledge is developed. For example, when communicating about covid-19 it became evident that when media searched for black-and-white answers, we could see that some researchers fell into the ‘media logic trap’, when communicating their results and downplaying the discussion about methods and results of other researchers. We also witnessed other experts entering the scene wanting to offer ‘their knowledge’ — opinions, in many cases — about the pandemic. Many actors, claiming to be experts, were competing for attention and visibility, including journalists and those specializing in science journalism [cf. Yong, 2021]. For the public, and someone who has not been trained in scientific

methods and principles, it was not obvious how these experts differed in terms of knowledge claims. However, in Sweden, where this essay emanates from, we could after a while — as a consequence of a growing mistrust against authorities due to different, and sometimes conflicting recommendations — also see examples of researchers as well as journalists, who stressed the role of science and the importance of communicating the methods behind different research results. Voices were raised that in order to meet the pandemic — or other societal challenges — media and science must be understood as dependent on each other, but with different purposes [e.g. Irenius, 2020; Palme, Bergstrand & Lindberg, 2022]. Surely, the ability to communicate to fit both the media logic and the science logic is a balancing act that needs to be understood [cf. Besley, Dudo & Yuan, 2018; Fähnrich, 2021].

While research has seen a growing interest in science communication elaborating on various aspects and consequences of a mediatized society, [e.g. Bucchi & Trench, 2016; Hall Jamieson, Kahan & Scheufele, 2017; Kupper, Moreno-Castro & Fornetti, 2021; Trench & Bucchi, 2010], there is a dearth of research that builds on the experience and reflections of how researchers understand and translate efforts of communicating science and when engaging in the meeting with others [cf. Kahan, 2015]. In this essay, we build on our experiences of engaging in various forms for communicating science differently [Grafström & Jonsson, 2019, 2020] and for developing a method for how to communicate science through the meeting between science and art, and in particular comic art [Jonsson, 2020; Jonsson & Grafström, 2021]. During the collaboration with the comic artist a new understanding of science communication and how to (re-)think the well-known tension between the media logic and scientific logic has evolved. It is these experiences that we describe, interpret and communicate in this essay. The *aim* is to develop an understanding of science communication in a mediatized society.

The essay is structured accordingly: we introduce literature focusing on various trends that challenge, and at the same time create new conditions for, the scientist and the expert role and efforts to communicate science. Following our theoretical framing, we introduce and discuss the experiences from communicating science with a developed method as an example of a creative meeting between science and art [Jonsson & Grafström, 2021]. Building on previous literature on science communication and our reflections, we introduce a framework — a pedagogical tool — for how science communication can be understood, and communicated, through the two opposing logics. We conclude with implications for research and practice for how scientists in their expert role can be strengthened and made more visible when embracing *both* the media logic and the scientific logic.

The expert role in flux: trends and logics influencing science communication

Scientists have always been assumed the role of expert [e.g. Franzen, Weingart & Rödder, 2012; Gundersen, 2018; Peters, 2008]. However, this role is in flux when numerous actors are claiming to be experts in a mediatized society [e.g. Peters, 1995; Bucchi, 2012, 2019]. In a digital media landscape new arenas, or platforms, emerge and the conditions for gaining legitimacy for traditional experts, including scientists, are challenged [Koivumäki, Koivumäki & Karvonen, 2021; Schäfer & Fähnrich, 2020]. The earlier legitimacy of traditional experts, which was built on professional authority, has become temporal and local [Furusten & Werr, 2017].

Consultants, influencers and even journalists are now *taking* on the role of experts making [different] knowledge claims.

Yet, it is not only mediatization and digital media that change the landscape for experts. The expert role is also challenged by an interrelated trend — marketization [cf. Davies & Horst, 2016; Horst, 2013; Koivumäki & Wilkinson, 2020]. Higher education, like much of the public sector, has during the last two decades faced an increased marketization, which has spurred commercialization and corporatization pushing for branding activities and emphasis on public relations [e.g. Engwall & Weaire, 2008; Wedlin, 2011; Weingart, 2022]. This is also in line with the ambition to communicate universities as ‘complete organizations’ [cf. Brunsson & Sahlin-Andersson, 2000], which influences conditions for, and ideas about, science communication. The overriding idea following those trends is that universities should be constructed as market actors that need to legitimize their resources and existence by having something to ‘sell’ [Nærland, 2016]. As a consequence, the number of communication professionals, some titled ‘science communicators’ and some ‘communicators’, has increased [Engwall & Wedlin, 2018], with the mission to engage in media relations [Vogler & Schäfer, 2020] and create opportunities for visibility, through various media channels [Engwall & Wedlin, 2019; Kohring, Marcinkowski, Lindner & Karis, 2013; Rödder, 2020; Schäfer & Fähnrich, 2020]. They are often ‘carriers’ of the media logic, not least because some of these have a background as journalists [cf. Grafström & Rehnberg, 2022; Rödder et al., 2012], and are therefore also likely to adhere to the media logic and the deficit model [e.g. Olesk, 2021; Rödder & Schäfer, 2010; Schäfer, 2014]. As addressed by Weingart [2022, p. 291] “[by] doing so, they get caught in the logic of attention-seeking, namely, that all competing voices have to be continuously outperformed by even more (louder, more compelling) communication.”

Pallas and Wedlin [2013], for instance, further argue that the marketization has turned scientific work into ‘products’, and students into ‘customers’ and which can be understood as translated through three processes shaped by mediatization and the media logic; 1) simplicity (reducing complexity), 2) standardization (introducing elements that support general validity), and 3) popularity (sensing what is relevant to a broad audience). When looking into the translated preferences, it is clear that these are in contrast to the preferences of the scientific logic [cf. Gross, 2014; Olesk, 2021; Rhomberg, 2010]. Playing by the rules and preferences by science rather call for what we define as 1) ‘complexification’ (embracing complexity), 2) ‘multifacetication’ (supporting validity with different scientific methods) and, 3) ‘peerification’ (mirrored in scientific articles and the review process performed by peers). This should of course not be understood as an attempt to describe science (as scientists have different epistemological and ontological preferences), but rather as a way to contrast the preferences towards the media logic. For a simplified illustration of the two logics and their preferences, see Table 1.

The two concepts — ‘media logic’ and ‘scientific logic’ — build on idea that social life is organized and structured through institutional logics [e.g. Thornton & Ocasio, 1999]. Logics direct, motivate, and legitimate individual and organizational action [Scott, Ruef, Mendel & Caronna, 2000], and function as “organizing principles” that supply practice guidance for individuals and organizations and determine what is, and what is not, perceived to be appropriate behavior

[Friedland & Alford, 1991, p. 248]. In this way, dominating logics provide ‘the rules of the game’ for actors in a certain professional field or social sphere [Thornton & Ocasio, 1999]. This means that scientific work — like any kind of work on a very abstract level — can be understood to be governed by a certain logic that determines what is considered to be worth attending to, what is legitimate and relevant, and what kind of answers and solutions are available and appropriate [e.g. Thornton, 2004; Thornton & Ocasio, 1999]. At the same time, researchers and communication professionals need to pay attention to the rules of the media — i.e. the media logic — and what receives attention and is considered ‘newsworthy’ in a mediatized society.

Table 1. An illustration of the preferences related to the media logic and the scientific logic.

Media logic	Scientific logic
Simplification <i>reduce complexity</i>	Complexification <i>embrace complexity</i>
Standardization <i>introduce elements that support general validity</i>	Multifacetication <i>support validity with scientific methods</i>
Popularization <i>relevant for broad audience</i>	Peerification <i>relevant for other peers</i>

The two logics are important to understand and address as there is a certain — sometimes well-motivated — resistance, or skepticism, amongst researchers to adjust to the media logic or even trust the work performed by communication professionals [cf. Gross, 2014; Nærland, 2016; Rhomberg, 2010; Peters, 2012]. In order not to be driven by the media logic, but to drive the development and practices of communicating science — by holding on to the scientific logic — there is a need to develop an *understanding of science communication* and perhaps rethink efforts to communicate science; researchers need to develop skills for how to balance being both a ‘visible scientist’ and a ‘legitimate expert’. The meeting between science and art opens up for opportunities to do so.

Communicating science through a science-art lens — illustrated by research comics

Informed by the challenges with communicating science we, two researchers and one comic artist and concept designer, were curious to explore how we could communicate science differently without playing too much by the rules of media jeopardizing the science logic [Jonsson & Grafström, 2021]. Our interest for comics is shared by an increasing number of actors — both researchers and comic artists — who in various ways elaborate with comics in science [for example see Farinella [2018], and Collver and Weitkamp [2018] and visit www.erccomics.com, www.jayhosler.com and www.cartoonscience.org for illustrative examples].

While comics may have different definitions, styles and formats [e.g. Cohn, 2005; Ernst, 2017; Meskin, 2007], they are often described as ‘simple illustrations’ that are easy to understand [Lin, Lin, Lee & Yore, 2015] at the same time as they invite the recipients to ‘not only break down the information into more digestible units but can also reassemble them into meaningful compositions’ [Farinella, 2018, p. 5]. Thus, although comics at first glance may seem ‘simple’ and efficient for black-and-white messages, which fit well with the media logic, they also open up for complexity and nuances by capturing (if well executed) ‘tacit knowledge’ [McCloud, 1994] — i.e. dimensions and perspectives that the written word cannot

easily express [Sousanis, 2015]; A complexity that fits with the scientific logic. The dynamics with comics fascinate us and we define and use comics as a playful format that allows for complex and even contradictory information in a way that it is immediate and does not require preunderstanding [cf. Farinella, 2018]. While it is debatable what can be defined as a comics and comic art [cf. Abbott, 1986; Cowling & Cray, 2022; McCloud, 2000], we adhere to the ideas by Theodor W Adorno who argues that art is non-definable and represent knowledge that is neither discursive nor conceptual, but sensitive and sensual [Burman, 2017]. Such perspective implies that it is impossible to offer an exact definition of art, but also that it offers new or alternative perspectives.

Following our definition and understanding of comics, we were curious to understand if the comic format would allow us to reach both a broader audience — ‘the public’ — and other ‘peers’ in the scientific community. Informed by the promises with comic art we wanted to explore if ‘simplifying’ science with comics could, at the same time, offer means for ‘complexifying’ without the risk of losing the publics’ and the peers’ interest.

Our collaboration resulted not only in a method for science communication [Jonsson & Grafström, 2021], which we refer to as ‘research comics’, but also reflections on how to think of science communication and the meeting between science and art. In particular it made us reflect on the two logics, how they are understood as in conflict and if there could be a way to understand and encompass both perspectives and preferences. Informed by research on the meeting between science and art [e.g. Davies, 2019; de Hosson et al., 2018; Dowell & Weitkamp, 2012; Flerackers, Jarreau & Krolik, 2022; McNiff, 2007], as well as calls for ‘writing differently’ [e.g. Grafström & Jonsson, 2020; Grey & Sinclair, 2006; Pollock & Bono, 2013; Pullen, Helin & Harding, 2020] we were interested in engaging in, and at the same time investigating, how comics could be used when communicating science.

To illustrate our method and how research comics — as an example of a creative meeting between science and art — can be used as a lens to communicate science through the two competing logics, we draw on examples from four of our projects for science communication addressing different purposes: 1) communicating collaboration between academia and practice differently, 2) developing illustrated abstracts for scientific articles, 3) interpreting and communicate research results by other researchers, and 4) describing and visualizing a transdisciplinary process. Below we briefly outline how the research comics for each project were developed and why, including choice of style and format.

Communicating collaboration differently

Collaboration between academia and practice is debated and mirrored in a polarized view of the scientist as being either in the ivory tower or at the market halls [Brechensbauer, Grafström, Jonsson & Klintman, 2019a]. To open up for discussions on how to approach collaboration differently, and overcome some of the well-known tensions addressed in research on collaboration, we initiated the work with an edited volume where we invited researchers to write an essay sharing their reflections and experiences. Each essay was reflected in a research comic, with the ambition to open up for further reflections and discussions

[Brechensbauer et al., 2019a]. These research comics have been used in various settings to talk about collaboration, write opinion articles and by other means open up for discussions on epistemology and ontology (and the scientific preferences). The style and format can be described as ‘single panel comic’, rather than a comic strip (sequence), and mostly ‘silent’, i.e. excluding words [e.g. Cohn, 2005; Meskin, 2007]. The motivation for choosing the single panel format was that we did not want to offer a ‘full story’ or a research comic that summarized the essay, but rather highlighted a core message or a certain aspect addressed in the essay. For an example see Figure 1.



Figure 1. The comic art “Tree of knowledge”, published in Brechensbauer, Grafström, Jonsson and Klintman [2019a]. It was used as an introduction and motivation to the edited volume about collaboration between academia and practice. It has later been used in various presentations and discussions, reaching both other peers and a broader audience.

Illustrating and communicating abstracts to gain visibility

Informed by the challenges with reaching a broader audience and attract readers to scientific journals, we have also developed research comics as illustrated abstracts [cf. Tabulo, 2013] for a number of scientific articles. These research comics have been used when circulating, or even ‘marketing’, the articles on various social media platforms such as Twitter and LinkedIn. By doing so we have noticed that we have not only attracted other peers but also other groups of readers. While the research comics for the essays in the edited volume were developed to mirror one or several messages — or provoked thoughts — to open up for discussions and to communicate with an open end [Jonsson & Grafström, 2021], these research comics have been developed to clarify the main message of the article. Some of these abstracts have adopted a silent and single panel format, whereas others have been developed as sequential and including words [McCloud, 1994] deepening on the choice of media. For two examples, please see the video abstract

www.youtube.com/watch?v=lAdD1kM3zY8 for the article by Jonsson and Vahlne [2021] and Figure 2. When developing the research comic for the article by Jonsson, Grafström and Klintman [2022] we chose the single comic format rather than a sequential, or a comic strip. The reason is that we wanted to capture the ‘dynamic process’ that at first glance might be seen or understood as a ‘static product’; We wanted to mirror the emphasis on ‘process’ and ‘product’ when discussing the lack of research focusing on the collaboration process, but also the two epistemological understandings of knowledge.



Figure 2. The comic art “Multiple directions” was developed as an illustrated abstract used for communicating the core message described in the article by Jonsson, Grafström and Klintman [2022]. The core message is that knowledge in a collaborative setting not only needs unboxing activities, but also takes different directions depending on the stakeholders’ perspective and epistemological understanding.

Interpreting and communicating results of research

In a few projects we have collaborated with other researchers, who want to find new ways to communicate their research. In that process we interpret and transform their research results to a number of research comics, which in some cases have opened up ‘the eyes’ of the researcher and ‘an aesthetic response of the viewer’ [McCloud, 1994, p. 9 in Tabulo, 2013]. The style and format have in these cases been adjusted to meet a specific target audience. In one project the target audience was the study object — local farmers who contribute to an ecosystems for sustainable food supply chains. When developing these research comics, it was

important that they would not be perceived as too ‘industrialized’ or ‘corporate’, as the target group represent, and perceive themselves as, the opposite to industry and corporatization. For an example please see Figure 3. Compared to Figure 2, this research comic was made with less clear lines and with a different color scheme.

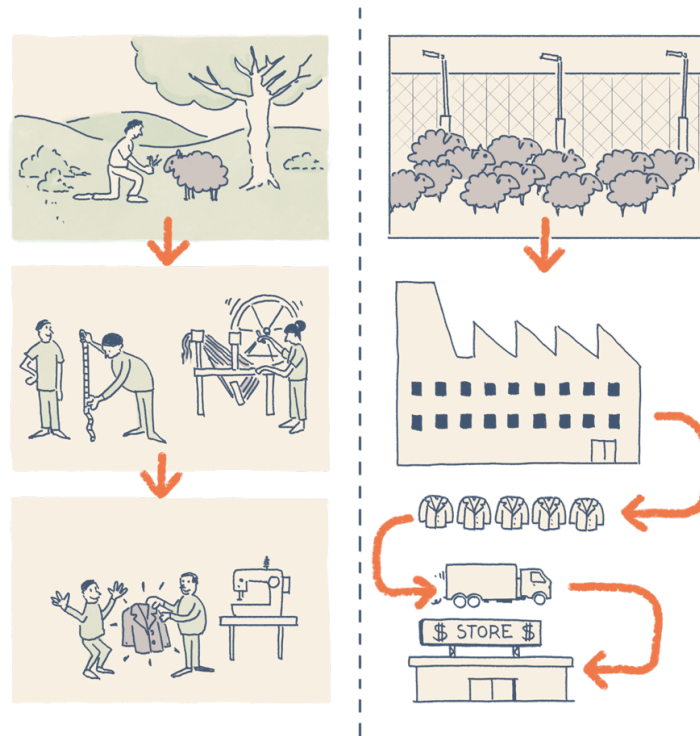


Figure 3. The comic art “Master production vs Mass production” was developed as one of several research comics translating the research by Dubois [2018, 2019]. This comic art illustrates the motivation for engaging in locally produced food and fabrics, and the ambition is to visualize the sustainability gains of local tailormade production.

Visualizing and capture a transdisciplinary process

To communicate a process without losing the complexity, and reminding others that a process is seldom linear, is challenging. One such example is to communicate the process of developing a satellite for space, which can be seen as an example of a result of different experts working together for a specific purpose. Research and development of space-related objects require transdisciplinary work, which is complex to grasp and understand not only for the public but also the different actors participating in that process. To learn from the process, and educating others about the work with developing a satellite, we worked with capturing and communicating the process. We did this by choosing to embody and personalize — i.e. putting a face to — space work. In this project we combined a written narrative about the story behind the satellite ‘Mats’ with what McCloud [1994] refers to as panel transitions meaning “moment-to-moment, action-to-action, subject-to-subject, scene-to-scene, aspect-to-aspect or non-sequitur” [Tabulo, 2013, p. 31; see also Mickwitz, 2016]. For an example see Figure 4.

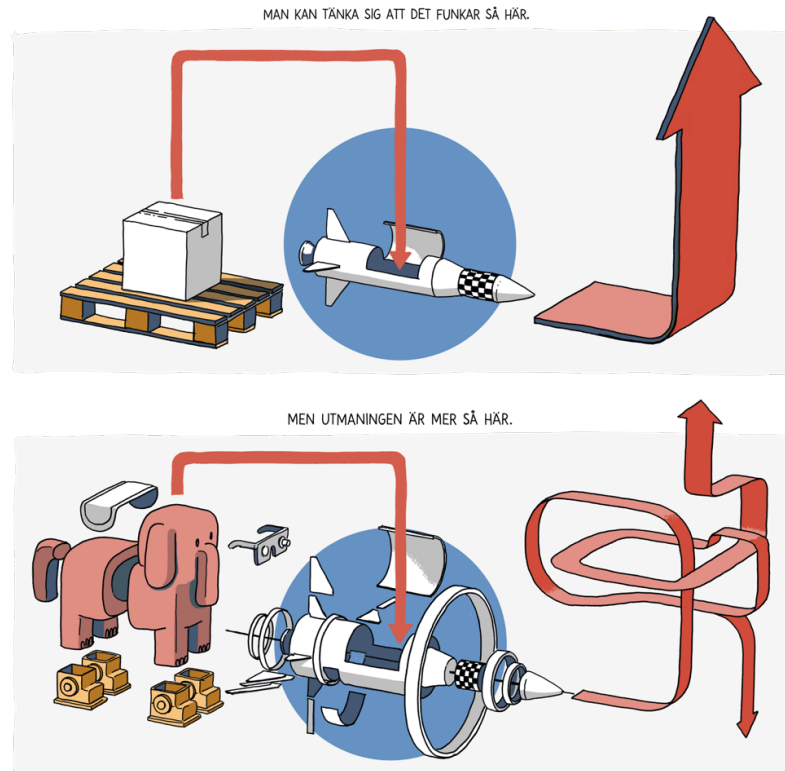


Figure 4. The comic art “Challenges” was developed as one of several research comics for describing the transdisciplinary work process of developing a satellite. A comic art with an overview of the process was combined with this and other research comics to describe contextual factors influencing and challenging the process. This specific research comic illustrates the number of factors that needs to fit and coincide, to make a launch of the satellite possible.

A pedagogical tool for understanding science communication in a mediatized society

The meeting between science and art offers a way to embrace the differences between the media logic and the scientific logic. When acknowledging both the need to attract the publics’ attention (the media logic) and adhere to scientific principles (the scientific logic), it becomes necessary to open up for dialogue and communicate the processes behind scientific results, i.e. scientific work and methods [Jonsson, 2019; Jonsson & Grafström, 2021]. The deficit model, where researchers communicate research results *to* the public [Simis, Madden, Cacciatore & Yeo, 2016; Trench, 2008], is insufficient.

When reflecting on our experiences [cf. Cunliffe, 2002, 2003] we have realized that the science-art lens can serve as a framework — pedagogical tool — for how to *understand* science communication through the two competing logics. In this essay we develop our reflections in Jonsson and Grafström [2021] on the promises of the meeting between science and art — as means for *clarification*, *conceptualization* and *communicating with an open end* — and link it to the literature on science communication in a mediatized society and the challenges with the two opposing logics of media and science. In Table 2 we summarize how the preferences of each logic can be understood through a science-art lens and as a way to overcome the well-known tensions of the opposing logics. We define these preferences as ‘interrelation’, ‘visualization’ and ‘publicification’. Below we exemplify and explain these in more detail.

Table 2. A framework — pedagogical tool — for how research comics, as an example of a science-art lens, can be understood as means for communicating through the media logic and the scientific logic.

Media logic	Science-art lens	Scientific logic
Simplification	Interrelation <i>clarification</i>	Complexification
Standardization	Visualization <i>conceptualization</i>	Multifacetication
Popularization	Publicification <i>communicating with an open end</i>	Peerification

Interrelation

When working together and interpreting both written words and the unwritten ones, captured in the comics, opportunities to *clarify* the researcher’s arguments emerge [Jonsson & Grafström, 2021]. This can play an important role when working with finalizing the results, and finding ways to communicate, but also when group members (different experts) need to collaborate. Working with describing our own research but also other researchers’ work (assigned to developed research comics that translates their research) has pushed us to be clearer and more explicit. It has also added a new dimension to our and other researchers’ understanding. This is reflected not only when writing but also that when making the first sketches for the research comics; it is obvious that in some cases there are aspects that the comics did not capture at first sight — perhaps since they were hidden in the academic jargon or even overseen, taken for granted, in academic writing [cf. Grafström & Jonsson, 2020; Gross, 2014]. In other cases, it was the opposite, and the first sketches (made by the comic artist) captured aspects that were not ‘heard’ or ‘seen’ by us researchers when discussing the research. In that sense, the collaborative work — through the science-art lens — made and helped us communicate a message that allows both for simplicity and complexity. As stressed by, for example, Krupinska [2016] and Rodgers, Green and McGown [2000] the process with working with sketches can be described as a search process, to develop inner ‘images’ and make them more explicit so that they can become an object for reflections and considerations. It is a process and a tool for analyzing and synthesizing, and for having the courage to choose and formulate concepts. It also resonates with Forde’s [2021] argument that drawings can be used as a process of observing and means for opening up for interpretation. For an example, see Figure 5 that illustrates the translation of researcher Alexandre Dubois’ findings about ‘translocal practices and proximities in short quality food chains at the periphery’. This was an example of a translation that added new dimensions to his work [e.g. Dubois, 2018, 2019], as discussed in joint Zoom (recorded) meetings.

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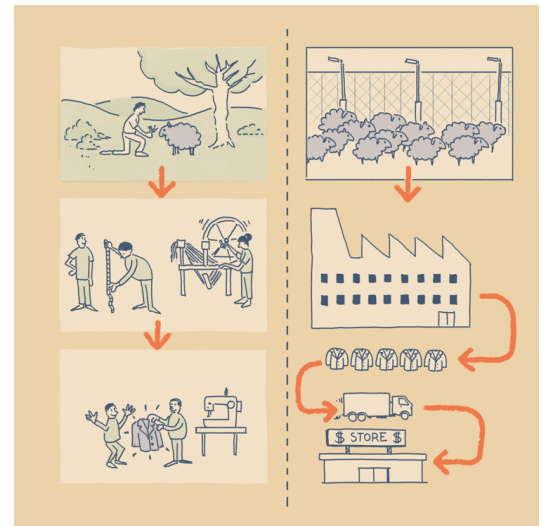
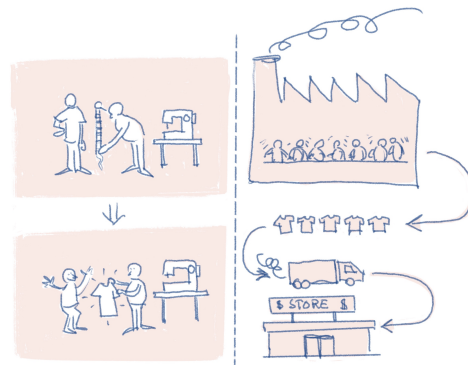


Figure 5. After discussing the first draft of “Master production vs Mass production” with Alexandre Dubois it was developed to also include illustrations of the raw material — in this case wool — so that we could link it to another comic art with the ambition to remind the recipient/consumer that the wool provider is in fact a sheep and not a fabrication. Additional aspects to one of the central concepts of Dubois’ research — proximity — was added when working together.

Visualization

Our method opens up for opportunities to *conceptualize* ideas at an early stage, or to articulate knowledge that is of tacit nature to the researcher such as describing the process of doing scientific work [Jonsson & Grafström, 2021]. By visualizing a concept or a process offers opportunities to open up the researchers ‘black box’ for how knowledge is developed and talked about Jonsson et al. [2022], which can be understood as means to improve science literacy [cf. Paisley, 1998]. Trumbo [2005, p. 267] describes visualization and ‘visual literacy’ as a construct that includes “visual thinking, visual learning and visual communication”. A visualization of the process offers *per se* a tool to talk about preunderstandings and the taken for granted principles, values and norms within the scientific logic. This was exemplified in one of our illustrated abstracts, illustrating how knowledge collaboration involving stakeholders with different epistemological and ontological understandings. It was described in the scientific article, but also mirrored in the process of translating and transforming the research comic. Figure 6 illustrates early sketches for the research comic ‘Multiple directions’, that communicates the understanding of what constitutes knowledge in a collaboration process is not always clear — yet often taken for granted — and illustrates the need for communicating the scientific mindset and use of different scientific methods. When developing this specific research comic, the tension between standardization and multifacetization became apparent, which perhaps can be explained by the challenges with working with the specific article: in hindsight, it became obvious that we — three researchers — had different understandings of ‘knowledge’. While we in the article share research results emphasizing the need for discussion about different understandings of knowledge and that diversity is a prerequisite for collaboration, we failed to communicate our own understandings at the same time as we strived for consensus to be able to finish the article. The core message of the

article became clearer when working with this research comic, and the comic artist's sketches and idea about the different stakeholders on a joint (collaborative) bike actually facilitated the communication process amongst us researchers [cf. Forde, 2021; Krupinska, 2016; Rodgers et al., 2000].



Figure 6. Early sketches of ‘Multiple directions’ that illustrate the process of developing and visualizing the core message of a scientific article [Jonsson, Grafström & Klintman, 2022].

Publicification

Informed by the warning flags with far-reaching attempts to popularize science (media logic) and the dangers of only communicating within the scientific community (scientific logic), i.e. by either contributing to knowledge resistance or falling into victims of it [cf. Brechensbauer, Grafström, Jonsson & Klintman, 2019b; Klintman, 2021]. motivates us explore different forms and formats for how to communicate with a science-art lens. We want to open up for communicating *with* society and not only *to* society, following the critique about the deficit model. With the ambition to *communicate with an open end* [Jonsson & Grafström, 2021], we are interested in reaching a broader audience, not only the ‘interested public’ and other ‘peers’, and open up for a dialogue and curiosity about science. By engaging in various attempts to communicate our method, and results of it, we are pleased that we have attracted the interest of others. While it needs to be further researched we have noticed (using statistics on social media) that our research comics have reached a broader audience. We have also noticed that researchers from other disciplines as well as other stakeholders (such as an authority, magazines and non-profit organizations) have shown an interest in collaborating with us (as described and exemplified above). In all cases, and that perhaps explains the

interest, the research comics that we develop can be communicated at various platforms and through various media channels, including social media, and are adjusted to meet different purposes. In some cases, we have compiled the research comics in a master document, but with the possibility to use the comics in different media channels with the purpose to reach different audiences. For an illustration of how our research comics can be used for different purposes — reaching both a broader audience and other peers/researchers — see Figure 7.

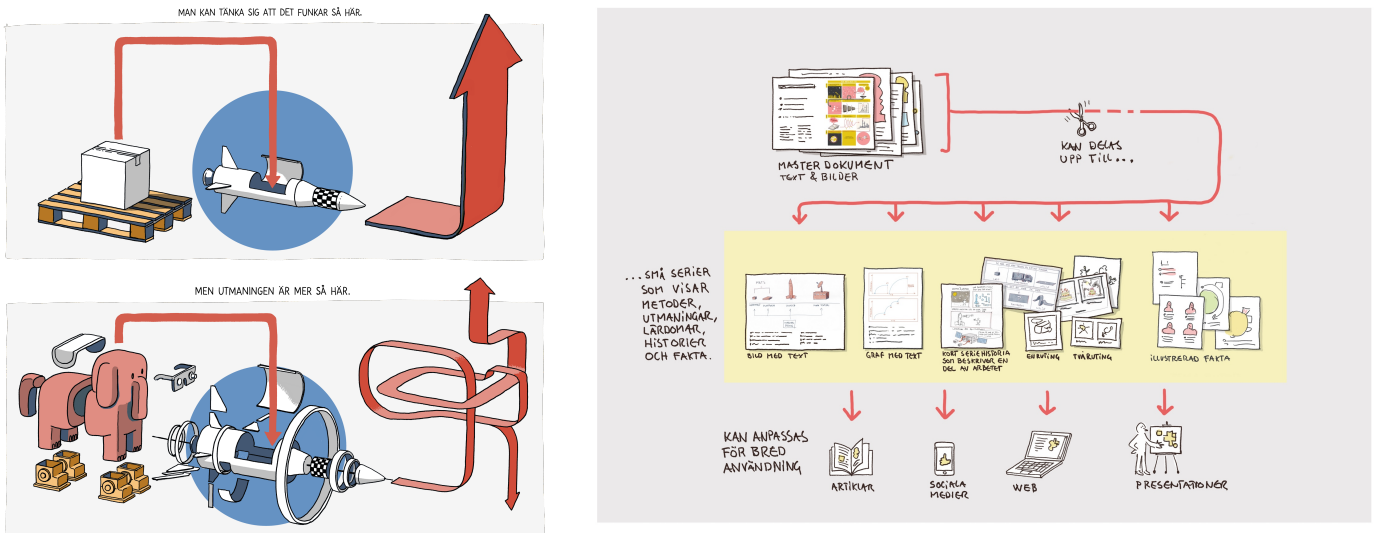


Figure 7. An illustration of how the research comic ‘Challenges’, as part of a master document, can be used in different media channels and adjusted for different purposes.

Concluding remarks: the visible expert

Although it has been acknowledged that researchers need to find new ways to engage with the public such as inviting for dialogue [Guenther & Joubert, 2017; Kupper et al., 2021], or try new forms and formats for communicating science [Jonsson & Grafström, 2021; Treise & Weigold, 2002], it is important to pay attention to and discuss how that may influence, or improve, not only ways of communicating science but also our *understanding* of science communication.

We adhere to Schäfer and Fähnrich [2020], and in this essay we have discussed the meeting between science and art, and in particular comic art, not only as a method for science communication but also a pedagogical tool for how to understand and talk about science communication. Our key argument is that we need to understand the dynamics and conditions of science communication in a mediated society in order to protect and strengthen the scientist’s expert role — and communicate how it differs from other experts such as consultants, influencers and even communication professionals. We illustrate how the science-art lens can be understood as an approach for how to communicate and understand science communication through the two competing logics. By embracing *both* the media logic and the scientific logic offers opportunities to stand out — be visible — in the crowded media landscape without jeopardizing the researcher’s legitimacy.

Based on our experiences, we believe that in order to not only reach out, and compete for public attention, but also to better engage in societal debates and

discussions, we need to rethink and develop our understanding of science communication [cf. Broks, 2017; Bucchi & Trench, 2021; Horst & Michael, 2011; Kupper et al., 2021]. To protect and nurture the expert role — to secure the preferences of a democratic society — it is vital to engage in communication activities that embrace both the media logic and the scientific logic. It is also important to be aware that science communication is, or should be, different from communication (sometimes referred to as ‘strategic communication’ focusing on persuasion and intentional oriented activities, cf. Holtzhausen and Zerfaß [2013]); science communication is as dependent on science as it is of communication, or as noted by Schäfer and Fähnrich [2020, p. 143]:

Science communication can no longer be understood as simply communication *from* scientific communicators but must be regarded as all public communication *about* science and the ethical, social and political issues surrounding it.

In this essay we have reflected on our experiences and discussed how we can understand the meeting between science and art as a lens for understanding science communication through the two opposing logics. Furthermore, we have illustrated how collaboration across professional boundaries can open up for new understandings both about the research that is, or needs to be, communicated but also the role of the logics of media and science in a mediatized society. We believe that the science-art lens can be translated also to other art forms, such as poetry and theatre. However, this, of course, needs to be further research. The many different attempts for how to engage in various creative and artistic collaborations between science and art needs to be complexified, multifaceted and peerified — as communicating science per se is a performative act — as well as communicated through a science-art lens [cf. Davies et al., 2021; Fleerackers et al., 2022].

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


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