

Achieving societal and academic impacts of research: A comparison of networks, values, and strategies

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Abstract

Science policymakers and funding agencies are increasingly interested in the societal impact of research. In practice, this means that, when applying for funding, researchers have to justify the academic impact (e.g. publications and conferences) and the societal impact (e.g. influence on policy and practice) of their proposed research. This paper aims to find out how these requirements relate by comparing two ethnographic case studies of research in health care and health assessment that aim to combine both forms of impact. I analyze the networks, values, and strategies in both research groups, and show that achieving societal and academic impacts are different research practices. Hence, I argue that academic and societal impacts should not simply be added up as requirements for research funding or academic career development but should be understood and appreciated on their own terms.

Key words: research impact; social relevance; ethnographic research; good science; social studies of science; research integrity.

1. Introduction

In the last decades, science has become increasingly competitive and output focused. This is probably due to a decrease in the share of governmental funding and the introduction of businesslike models in science policy in many European countries and the USA (Auranen and Nieminen 2010; Bornmann 2012). Scientists have to account for their research activities, for example, by defending their research plans and the expected impact of their research in proposals that are reviewed and funded by external organizations. As a result, the question, what research impact is, has become an important topic for research organizations and science policymakers. This is also reflected in the academic literature. According to Web of Knowledge, for example, there was a doubling in papers on the topic of research impact in the past 5 years and an almost tenfold increase in the past 15 years.¹ In these papers, researchers not only discuss the value of traditional indicators for academic impact (e.g. citations), but also urge to include impacts of societal relevance (e.g. policy advice) and discuss how to evaluate both forms of impact (Bornmann 2013; Hicks et al. 2015; Hirsch 2005). Accordingly, research institutions and science policymakers typically encourage scientists to achieve both forms of impact with their research. Hence, the question what it practically means to combine both forms of impact has become urgent. This paper explores how societal and academic impacts relate, not by focusing on the outcomes or evaluation of research but by studying the activities to achieve these forms of impact with two ethnographic case studies.

2. Academic and societal impacts

Research impact has long been seen as a strictly academic concern—measurable with academic indicators such as a number of papers and citations (e.g. Hirsch 2005). Only since recently, it has been argued that research impact should also include societally relevant forms of impact (Bornmann 2012; Dance 2013; Weijden van der et al. 2012). One example of an initiative to change (and improve) the evaluation of research is the widely shared and signed San Francisco Declaration on Research Assessment, first developed in 2012. DORA (2018) advises academic institutions and funding agencies: ‘in addition to research publications, [and] consider a broad range of impact measures including qualitative indicators of research impact, such as influence on policy and practice’. In practice, this means that the quest for societal relevance emerged as an additional requirement for researchers. Most research proposal formats encourage to describe the envisioned impact of the research in terms of publications and invited lectures and the societal relevance of the project. Impact is, for example, specified as scientific impact, societal impact, and output.² Researchers can also be asked to write a 750-word text on ‘Knowledge Utilization’ by answering questions like: ‘Which contribution can the research make to society and/or to other scientific areas?’³ This demonstrates that researchers are nowadays asked to extend their academic qualities with societal qualities.

Researchers are used to framing their work in terms of academic output, but what societal impact precisely entails is less clear to many of them (de Jong et al. 2016). Funding agencies and reviewers also appear to have different

criteria for what societal impact means (Meirmans et al. 2019; Lauronen 2020). Societal impact is sometimes measured in outcomes such as books, media performances, or directly consumable or marketable products (Bornmann 2012). Other proposed impact measurements of societal impact can be ‘productive interactions’ with stakeholders, contribution to policy or practice, or disseminating knowledge to other fields or the media (Morton 2015; Spaapen and van Drooge 2011; Viana-Lora and Nel-lo-andreu 2021). How this focus on societal impact influences or relates to academic quality is another concern that is addressed (Ramos-Vielba et al. 2018; Weijden van der et al. 2012). Less addressed in the literature, however, is what criteria and logics are actually at play in these research evaluation studies (Williams 2020), let alone in the research practices to achieve societal and academic impact themselves. Moreover, most qualitative research on research impact is based on interviews, while ethnographic studies are less common in this field.

This paper examines the relation between societal and academic impacts, not by focusing on the outcomes or evaluation of research, nor by studying the ideas of researchers or stakeholders with structured interviews or questionnaires, but by ethnographically studying the practices to achieve these two forms of impact. While Williams (2020) asked what values are attributed or created according to the logics of different ‘power fields’ in research evaluation such as science, media, or politics, I focused on the research practices themselves and studied what actors are involved in the research networks, what values these actors embraced, and what strategies were needed to achieve societal and academic impact.

I followed the daily practices of a research group in rehabilitation medicine that aimed to improve the organization of health care and of a research group in Medical Technology Assessment (MTA) that aimed to develop a tool to measure patients’ quality of life.⁴ Both project teams aimed for academic and societal impacts, but the studied practices in the health care project were more focused on societal impact (solve societal problems, reach broader audiences, and non-academic collaborations), while the observed practices to develop the measuring instrument were mainly targeted at academic impact (publications, methods, and results). This offered the opportunity to carefully analyze and compare what networks, values, and strategies were used to achieve societal and academic impacts.

3. Studying research in practice

From September 2017 to May 2018, I conducted ethnographic fieldwork to study the daily research practices in two medical research projects (see Appendix for an overview of the case studies).⁵ The first project was a transdisciplinary action research that aimed to improve health care for patients by developing a new coaching approach.⁶ The other was a methodological project that aimed to develop a measuring instrument (an app) that patients or caregivers can use to measure patients’ quality of life. These specific case studies were selected because they were comparable—both were studies in health research, and aimed to combine academic and societal impact—but also because they were typical, using quite different methods and results (action research versus developing a measuring tool).⁷ In both settings, I started with

an interview with the project leaders (Alice and Peter) and I attended research meetings with the project team, interactions with stakeholders, project or unit celebrations, and presentations to colleagues. I also had access to some email conversations and relevant documents. In between these meetings, I had many conversations with project team members or stakeholders.

The notes that I made during the meetings, together with the documents and interview transcripts, form the material that was analyzed for this paper.⁸ I analyzed this material (using AtlasTI 8.0) by studying the observed meetings and events as practices of care. Studying scientific practices as practices of care is inspired by Science and Technology Studies (STS) scholars who aimed to find out what good health care is (Mol 2002, 2008; Pols 2004). Instead of making judgments about what care practices are or work best, these scholars studied the norms and values, or the logics, of the practitioners, patients, used technologies, etc., in various health care settings. By articulating the (conflicting) norms, values, or logics in these practices, Pols (2015) and others demonstrated that it is possible to show a(n) (intra)normativity based on the values in the field and hence to find out how good care is, or could be, achieved in the specific situation. Since recently, the notion of care has also entered other fields of STS to study how normative values and logics are or could be involved, for example, in bioscience, chemistry, or soil science (e.g. Kerr and Garforth 2016; Myers 2008; Puig de la Bellacasa 2015).

Inspired by these care studies, I aimed to find out how the researchers in the health care and health assessment projects ‘cared’ about good science in the sense of societal and/or academic impact. For this, I basically focused on the following: who cares; about what; and how. To find out ‘who cares’ I studied the socio-material networks of the two research projects.⁹ Taking social and material actors into account was important because research is clearly not produced by humans only—statistical programs, models, papers, graphs, etc., can have very important and normative roles as well. For example, a statistical program can define if a result is significant; a graph shows if a tendency is normal, etc. To understand ‘what’ these actors care about I studied the values involved in their acts or phrasings (e.g. what do they see as important or good). Next, to understand ‘how’ these actors or networks cared for academic and/or societal impact, I studied what strategies they used to achieve these forms of impact.

Comparing these networks, values, and strategies made it possible to study the differences in the activities to achieve societal and academic impacts and to connect these to some analytical concepts in STS. As I will show, achieving societal and academic impacts exhibit some dissimilarities that can be summarized as different forms of *Boundary work* (e.g. Burri 2008; Gieryn 1983). While activities to achieve societal impact were primarily focused on bridging boundaries by making connections to other fields and actors, activities to achieve academic impact were targeted on demarcating boundaries by accentuating divisions with other theories or fields of knowledge. Another difference concerned practices that could be phrased as *Knowledge translation*—activities to disseminate knowledge to other fields (e.g. Latour 2005; Michael 2017). In order to achieve societal impact, researchers needed to adapt to other cultures or fields to explain or promote their knowledge while achieving academic impact was especially practiced by emphasizing the novelty

and differences in regard to other fields (or publics). Another difference that resulted from my analysis could be summarized as a difference in *Research scope*. I noticed and will show that achieving societal impact was more focused on the complexity of the (actual) situation while achieving academic impact aimed to reduce or simplify this complexity, for example, with models or statistics (e.g. Law and Mol 2002). Finally, I noticed a difference in regard to *Forms of knowledge*—explanations that refer to explicable or inexplicable forms of knowledge (Collins 2010). It was striking that achieving societal impact was often explained with tacit or intuitive forms of knowledge, while to achieve academic impact, it seemed important to emphasize the logic of an argument.

In the next sections, I will first describe my analysis of the networks (4), values (5), and strategies (6) of both research groups. Next, I compare the practices to achieve societal and academic impacts and show that these exhibit some dissimilarities in regard to boundary work, knowledge translation, research scope, and forms of knowledge (7). Finally, in (8), I reflect on the fact that funders generally ask to combine both forms of impact and do some further suggestions on how to take the differences highlighted by my analysis into account.

4. Networks

4.1 Network to improve health care

The health care project proposal was developed and submitted in 2017 by Alice, a senior researcher in rehabilitation medicine, in close collaboration with Layla, an assistant professor in social geography. In a previous project, Alice and Layla had developed a social geographical approach for patient care, which they wanted to elaborate in this project. The research team furthermore included Babette, a social scientist who has developed an integrated methodology to encourage and evaluate shared learning in societal relevant research; and Rob, a professor in active aging who was also the official lead applicant of the project. During the official project term, from May 2018 till Dec 2019, a junior researcher (Lucy), a former patient who now works as an experience expert (Eva), and a process manager (Monika) were also part of the project. The health care study was divided into three experimental fields: rehabilitation care, elderly care, and community care. In these fields, 15 health care workers with different backgrounds (physiotherapists, visiting nurses, etc.) were trained to use the social geographical perspective developed by Alice and Layla in their coaching of patients. In addition, around seven managers of the organizations helped to facilitate the research as experimental field leaders.

All these project members and stakeholders participated actively in project events (meetings or trainings). More indirect actors, who were nevertheless important, were the patients. They did not actually participate in the project events but were present in the form of case studies of successful or unsuccessful coaching, as interview participants in the qualitative action research, and they were represented by Eva, the experience expert, who voiced the perspective of patients. So, although patients were not physically around in the project meetings, they were involved in multiple ways (case studies, interviews, and Eva).

Besides people, materials and images were also involved. Especially important was the social geographical perspective of the coaching strategy. It was represented with a

variety of pictures, schemes, or summaries in presentations or documents. This perspective was not only visualized to be explained but also to be used: for example, in the form of a ‘working frame’—a scheme about past, present, and future situations for patients, or in graphics that health care workers made about the situation of their patients. Another important tool in the health care project was a marker-drawn flower that summarized all problems the health care workers had brought up at the start of the project: it was repeatedly used in trainings and meetings to visualize the problems of the health care workers that were solved or still had to be solved.

The health care project did not only involve a diversity of researchers, stakeholders, patients (case studies), and some materials, it also extended to a variety of places. Besides collaborating by email or phone, the researchers and stakeholders often met in person. These meetings took place all over the city: in offices of health care organizations or the municipality; various faculty buildings (medical science, social geography, management, and business); and some catering establishments or lecturing rooms. That is, typical for the socio-material network in this health care project was that it was broad, not only socially (researchers, health care workers, managers, and ‘patients’) and materially (visualizations of problems and theories) but also spatially. It expanded to, and ultimately connected, a variety of places.

4.2 Network to develop the measuring instrument

The leader of the project to develop the measuring instrument was Peter, an associate professor and the head of an MTA unit of epidemiology. The aim of this project was to develop a measurement tool (an app) that patients or their caregivers can use to measure their quality of life. The instrument is especially meant to be used in clinical and research settings, and it was developed by Peter in collaboration with two senior researchers (Tanja and Kate) and a postdoc (Gabriel) from the MTA unit, and two researchers (Rick and Valery) from a European food industry that also finances the project. The development of the measuring instrument had started with interviews with patients and physicians (mostly done by Gabriel). The responses were then translated into questionnaires for the general population and administered by a national research company. The technological development of the app was conducted by a company in Eastern Europe.

When I started to observe the research activities in this project, the project was in the final stage—which meant that Gabriel still had 8 months left from his 3 years postdoc position. The studies were done, the data were collected, the app was in development, and the team was in a stage of focusing on writing papers. The research team (Peter, Tanja, Kate, and Gabriel) had meetings at least once a week, and the communication with the food industry (Western Europe), the app developer (Eastern Europe), and the research company (other side of the country) went by phone or video calling.

The project to develop the measuring instrument was part of MTA, which was part of epidemiology, and part of a research collaboration that involved members of MTA and economy. And since Peter was the head of MTA and the research collaboration with the economics, the measuring instrument was also centrally discussed in these groups. The meetings with the project team, other MTA members, epidemiologists, and the economists all took place in academic offices or rooms, and most of them within the epidemiology

building. Moreover, the meetings with the companies from abroad also took place in the academic offices, since these were all virtual.

In the discussions and presentations of the research team, (statistical) results in the form of tables or graphs, and pictures and online prototypes of the app were dominant aspects. The results were often discussed ('It is lovely data', 'What about these p -values?'; 'We have problems with the figures. They were too good to be true'.); and their logic reviewed ('This is not logical.', 'Interaction is messed up', and 'the fuzziness is between level 2 and 3'). The prototype of the app was often discussed in regard to the clarity of its formulations ('[What is] the difference between nearly blind and almost blind?') and its technical possibilities ('I think it won't fit on the screen').

More indirect, but nevertheless important actors in the network to develop this measuring instrument were academic peers. The research team regularly discussed their results or made decisions with the work of other researchers in their field in mind. For example, they calculated the value of the health states in their instrument with regard to death because 'all economists do it'.¹⁰ They did so, even though they actually called it 'offending and ridiculous' to make such calculations. Peers were also involved in the form of potential reviewers or respondents at conferences. (Peter: 'With methodological papers peers always start badgering: this is not good, you haven't thought about that; you haven't referred to this publication...') That is, the network to develop the measuring instrument was both social (researchers, industry, and companies) and material (presentations of the app and results), but also international and virtual (online connections and peers).

Both the health care and the measuring instrument research teams collaborated with or related to colleagues from different disciplines; they worked with stakeholders; they used theoretical frames to involve real-world complexities; and they connected to different places. However, there were also differences: the network to improve health care was more diverse and local, while the network of the measuring instrument was more international and virtual. Also interesting were the indirect actors in the form of patients and peers; the health care team involved society, while the measuring instrument team involved academia in this way. These differences indicate that the focus and hence the values in both projects might also differ. Hence, the next section concentrates on the values—what was seen as important or good—of the identified actors in the two networks.

5. Values

5.1 Values in the health care network

The health care research team (Alice, Rob, Layla, Babette, Eva, Monika, and Lucy) was very outspoken in their motivation to improve health care: they wanted to make health care 'smarter, more efficient, and more humane'. Project leader Alice designed the proposal, brought everyone together, and organized most of the meetings. In conversations with me she called herself a 'boundary worker'; someone who is 'always looking for connections'. In the project team meetings, this form of boundary work, making connections, was clearly present. The team did not only involve different people from different disciplines and institutes but also integrated theoretical perspectives and terminology from different fields. Looking for connections, socially and theoretically, was seen as something good.

One aspect that was very important in this looking for connections, and in the project as a whole, was the social-geographical concept. This concept was developed by Alice and Layla, and represented a crossover of their (social and geographical) theoretical ideas. On the one hand, this concept represented the academic (social and geographical) justification of the project; on the other hand, it was seen as the 'vehicle', 'binding framework', 'umbrella', or 'red thread' that gave all the researchers, managers of organizations, health care workers, and finally patients a shared perspective and approach.

The health care workers and managers of the health care organizations shared the ideal to improve health care, and they were also enthusiastic about the specific academic (social-geographical) approach. However, there were also some struggles. The health care workers who had to be trained with the new academic perspective were cooperative, but sometimes they also made remarks that they had already been doing this for years, that the training reminded them of earlier trainings, or that their organization had tried this before. That is, in a certain sense, they also seemed to feel that their individual value was not sufficiently appreciated (health care worker: 'I also want to use my own experience. Listen to me, too.'). Moreover, the research project took only 1.5 years, and the health care workers became increasingly nervous toward the end of the project because, in their opinion, the new approach had not really grounded yet. (Monika: 'I noticed that they especially wanted to talk about 'how to continue'. They are afraid to get stuck.'). According to the project team, this was especially due to the managers of the organizations who had to be convinced that the project was more than 'just a project' or 'a pilot' that would have no follow-up. Hence, they put the continuation of the project ideas on the research agenda as 'securing' ('How do we get it in the DNA of the organizations?').

During the project, the research team was especially focused on concrete products, such as a training script for the health care workers, the organization of an event, a clear illustration of a theoretical concept, or an article in a (national) trade magazine. Especially for Alice, these types of products were seen as more important than peer-reviewed publications in international journals or presentations at conferences. In general, the team was more focused on the process and relevance of their work than on the results of their research. This striving for improvement, the willingness to make connections with other parts of science/society, and the focus on concrete products, processes, and continuation are values that especially focused on societal impact.

However, as could already be noticed in the small struggles—or slightly different values—between the research team and the health care workers, societal impact was not the only form of impact that was pursued. Academic impact was also seen as important, and in this project (and stage), this was especially advocated by Rob. He was the formal lead applicant of the research, although he had no experience with qualitative action research. His background was in evidence-based medicine, and in the health care project also, he was looking for evidence. Alice and Layla repeatedly tried to convince him that it is 'hard to base this with evidence' because they cannot 'measure' patients' wellbeing, but only at the end of the project, Rob concede this ('we would love to measure the effect, but we are not that far yet'). The reason why Rob was nevertheless interested in the health care project was that

it was ‘at the edge of science. This is what we don’t understand,’ and ‘a major difference’ with what other researchers are doing. And although Rob had no experience so far with the specific research, he cared for the project team with his academic focus. He brought in relevant research contacts, for example, from management and business, and he initiated and encouraged new funding opportunities for PhD positions.

The academic values represented by Rob—the focus on evidence, increasing knowledge, and finding research facilities—were especially in favor of Layla, who was in a tenure track system for which she had to bring in money and publications, and supervise PhD students. Layla had previously been successful in publishing about qualitative research and the theoretical perspective in the project was based on her social geographical background knowledge. Moreover, when Layla’s career took a jump because she succeeded in getting several grants in a short period, she also became the academic justification for research collaborations in the health care project. (Alice: ‘I offer you a carrot: Layla just got 1.5 million euros – that is all about these concepts.’) That is, Layla was a crucial element in this research project because she represented and connected the academic and societal values. In an interview, she said, for example: ‘By doing theoretically novel things you can gain more relevant societal insights’ and ‘I see it as a social responsibility (...) that my research will not just end up in a file drawer or something.’

5.2 Values in the measuring instrument network

The measuring instrument was developed by Peter and his research team (Gabriel, Kate, and Tanja), in collaboration with the food industry, and with help of an app developer and research company. It also involved a variety of numbers and graphs, technical programs, app prototypes, and (virtual or real) academic settings. All these actions and interactions resulted in a tool that was ‘patient-centered’, ‘user friendly’, and ‘state of the art’, according to the website that promotes the tool: patient-centered, because the items of the questionnaire and tool are defined by interviewing patients, and because the app is designed to be used by patients; user-friendly, because it is a relatively simple app; state of the art, because the methods extend generally accepted methods in the field. In the practices to develop the tool, however, the values that I encountered were more diverse and often they were more focused on achieving academic than societal impact.

For example, for Peter and his academic team, a central value in the project was that the measuring instrument was new and different. (Peter: ‘I did one step further, I developed something, something new’; ‘my measuring method is very different’; ‘Real scientists discover and create. The rest is bulk.’) This focus on new and different was related to other (not so new or different) methods or publications, so it indicated a competition with other researchers in the field. For their partners from the food industry, however, this academic competition seemed less relevant. (Rick to Peter: ‘Actually, you struggle against economists. It is the story of your life.’) Instead, the partners of the food industry mainly seemed to guard the planning of the project (‘When can we expect a first draft?’).

Moreover, in contrast to the health care team that had a shared ideal to improve health care, the shared intentions regarding the measuring instrument did not become completely obvious to me. When I asked why the food

industry funded the measuring instrument project, Peter first answered: ‘I don’t know’. Then, he explained that they wanted to measure health differences in relation to their products (e.g. proof that their supplements are useful), and he added: ‘I told them: I don’t think I will find these differences so easily with my measurement method.’ Tanja also said, in relation to a proposed study of the food industry: ‘they are really not going to find any differences there’. That is, making a difference seemed more important for the research team than for the food industry.

Other important topics for the research team were the results. Often these were discussed in relation to numbers and graphs that had to be simple, explainable, and logical. (‘Simple solutions are the best’; ‘the numbers should be as logical as possible’) Results were related to logic but also to another central value in this project: evidence. Strong evidence was important for all team members, also because it made publishing easier. Output, in the form of publications, was not only important for the academic team but also for the industry involved. However, for the industry, a publication was a publication, whereas, for the academic team, a publication had to be a publication in a *good* journal. Together, they were looking for journals that allowed for quick publications—efficiency was important for the industrial and academic members—but when the food industry suggested an online open-access journal, Peter explained: ‘that is a q2 journal.’, and Tanja added: ‘we don’t get points for q2.’¹¹

Results and output were related to academic values such as impact factor (q1), publishing (fast) and also to authorship (first is the best, last is the second best). While the food industry did not really seem to be concerned about the sequence of the authors, this was different in the academic team. Kate and Tanja, for example, suggested to swap their names on the second and third positions a couple of times, and Gabriel discussed his last author position on one of the papers: ‘I basically did everything. (...) I want to be the first author.’ Normally, Peter left these discussions about author order to the others, but in the situation of Gabriel—he (Peter) was the first author of the paper and he answered: ‘You can try it – send it today, and if you impress me, you are the first author.’

Peter’s reply (send it today) not only showed that first authorship was important but also indicated another value that was especially embraced by Peter: working hard. When Gabriel continued the discussion and said: ‘But I did all the programming. I did all the work.’, Peter answered: ‘You do all the work? You leave the building at 5!’ For Peter, working hard and efficiently was an important working ethos. In my observations, he was always very busy and had meeting after meeting. Hence, he also expected hard and efficient work from his team. Gabriel, in particular, was speeded up sometimes:

‘How many hours do you need to make changes in a paper with comments? [...] this is not very complicated; how many hours? No more than 5 hours. Or you are not working efficiently. Or you are replacing sentences with old sentences’.

Working efficiently was related to publishing fast—a value that all project members shared. During my fieldwork, the

research team worked on four different papers simultaneously, of which three were in progress and one under review. In their meetings, the status of papers, the order of the authors, and the impact factor of journals were recurring themes. Every week, they started with a discussion about the status of the submitted article, and they continued with a discussion about all other papers (one by one—the papers essentially dictated the agenda). And toward the end of the project, they became increasingly annoyed by the slow peer-review process that hindered this speed of publication. (Peter: ‘they should be triggered to speed up’, ‘We will send an email [that] we will [otherwise] withdraw’).

Working hard, efficiency, and publishing fast are values that were also clearly present in the MTA group that Peter chaired, and in the epidemiology department, this group was part of. In MTA meetings, for example, the focus was on ‘projects, publications, courses, grants, conferences’, as could be read in the monthly research agenda. In epidemiology, all celebrations that I attended started with the successes in terms of publications and new employees or promotions. This makes it difficult to distinguish whether these values were specific to the agenda of the team members or were part of their institutional environment. In the course of their project, for example, the research team became increasingly confused about all the papers they were working on (‘Which paper?’, ‘I just had that paper’, ‘I mix them up’, ‘I will never work on four papers simultaneously again’). And in an interview and a later conversation, Peter told me that actually he did not really care about H-indexes (Hirsch 2005). He explained that he had so many publications because he was good in statistics and had always helped others to get articles published. This was good for his H-index, but in his opinion, most of these publications were actually ‘rubbish’. For Peter, the few articles and a book about his measurement instrument were the most important publications of all of his 150 papers, but to his annoyance, there were almost no references to these, yet.

To summarize, I encountered several values in the development of the measuring instrument, but where it was relatively clear who valued what in the health care project, this was more ambivalent in the development of the measuring instrument. For example, the aims of the food industry were hardly discussed or simply ignored; the need to publish fast and work efficiently was clearly expressed but was also part of the broader academic environment; and the societal purpose of this tool was not very clear in the conversations of the project team, while it was clear on the website that promotes the tool (patient-centered; user-friendly). Moreover, my analysis of values showed what was articulated as important or good per the research team, which does not necessarily say something about its (non) occurrence in the other project. For example, Alice also often sighed that she worked so hard—but this was not something she appreciated (‘I cannot work day and night; I already do!’), and the health care team also expressed efficiency as important, but especially in relation to making (efficient) connections.

My analysis of the values made clear, however, that the focus in the health care project was mainly oriented toward societal impact, while the focus on the development of the measuring instrument especially concerned academic impact. This difference became also visible with an automatic word count produced with Atlas.ti of my notes on all meetings in both cases studies: in the health care team, the word ‘people’

emerged as the first meaningful word (after words like the, that, I, and, etc.); in the measuring instrument team, the word ‘paper’ was the first meaningful word. A comparable contrast was articulated in my interviews. While Layla said about her work in the health care project that she: ‘wouldn’t want to do something that has no societal relevance’, Peter criticized the scientific system because: ‘[Nowadays] everything has to be societally relevant, and funding is only given to science that follows the standard’.

6. Strategies

6.1 Strategies to improve health care

The health care team and the measuring instrument team both aimed to achieve societal impact (improve health care and develop a patient-centered app) and academic impact (PhD students and publications). However, my analysis of their networks and values showed that the health care team was more focused on societal impact and the measurement instrument team on academic impact. This made it relevant to compare the efforts of both research teams to achieve these kinds of impact. What strategies did they use to achieve societal and/or academic impact?

In the health care project, networking in the form of bridging was a crucial aspect. It was necessary to get all different parties (e.g. health care organizations) involved and motivated. Instead of staying within the boundaries of a discipline, this research had evolved from interdisciplinary (collaboration with different disciplines) to transdisciplinary (collaboration with non-academic institutions). Moreover, as stated, Alice also literally called herself a boundary worker: someone who connects theories from different disciplines and uses these to intervene in society. She described herself as someone who is always looking for connections; not only between people but also between disciplines and theories.

To connect to the world of health care organizations, social science, medical science, social geography, business, etc., it seemed important to speak, or adapt to, these different languages. For example, the patients in the health care research were named differently across the settings. The health care team preferred to talk about the ‘afflicted’, but in clinical settings, they adapted this to ‘patients’, with health care organizations to ‘clients’, in a research setting to ‘participants’, and with the municipality, ‘citizens’ was the general term. In some settings, people talked about care (medical doctors), health care (organizations), well-being (economists), or support (municipality/experience experts). All network parties used different technical terms that were gradually also integrated in the conversations of the research team, such as kitchen table conversations (municipality), proms (economists), or value-based health care (Rob). And the team also involved several theoretical concepts from these different disciplines or organizations.

In these different settings, people used different terms, but they also had different cultures. When I joined Alice to a meeting with a neurologist, for example, Alice did not knock on the professor’s door immediately—as she did with other academics—but checked in with the secretary because ‘everything is a bit more hierarchical here’. And when we then had to wait for about 15 minutes, she whispered that this was ‘part of the game’. Moreover, the academic world in general differed very much from the world of health care.

Academic events generally take the form of a conference with lectures and discussions, but the events that I attended with health care workers involved all kinds of other activities. As the process manager, Monika explained it: ‘they can’t sit still’. Alice and Layla did their best to adapt to this non-academic culture. In a discussion with the project team about a meeting with the health care workers, Alice, for example, said: ‘[Monika] wants to do something nice, with Lego or so. (...) Nothing for me, but I will participate.’, and when Alice and I ended up in an Energy dance, with a Mexican wave, at a health care symposium, she hissed ‘I hate this’ to me—but some months later, she asked all participants to make a Mexican wave during one of their events. That is, to connect to different parties, adaptation (of terminology or culture) appeared to be an important strategy.

This adaptation and bridging were not related to a form of knowledge that was clearly explained. Alice told me that she used her intuition to make the ‘right’ connections. She organized many meetings with people from institutions or research groups to see if she could collaborate. To decide beforehand, if a meeting would be useful, she relied on her intuition, or as she sometimes called it ‘tacit knowledge’.¹² This intuition was not only important in organizing and attending useful meetings but also in combining theories. Alice: ‘It is very intuitive I have to say. All of a sudden, you feel you can do something with a theoretical frame.’ When the project team gave a presentation to their funding organization, one of the funder’s representatives asked Layla and Alice how they decided to collaborate together. And when they explained that their collaboration was somewhat coincidental, but worked out very well, the representative answered: ‘This demonstrates that [action research] works very different than (...) [laboratory work]. It is much more experimental.’ Afterward, Alice said in a project meeting: ‘it is not only coincidence, because then you would never see each other again. Something comes into being. It also has to do with intuition’.

This need for an unarticulated form of knowledge (intuition), these forms of adaptation (terminology, culture), and these involvements of so many (transdisciplinary) parties already indicate that the health care project is rather complex. Indeed, this was also repeatedly expressed by the researchers involved: ‘This is so complex’, ‘this project is so complex’, and ‘this question is so complex’. However, instead of being discouraged by the complexities in their work, the team involved them in their project. For instance, Alice gave a presentation entitled: ‘Handling complexities in [healthcare] research’, and she explained her work as ‘I study the complexity of problems’. In an interview, also Layla explained what complexity meant for her work:

‘To work with this target group brings me new insights in my field. These patients are a sort of extreme target group. Things become enlarged because the problems are so complex. Normally we work with healthy people, huh? Because these vulnerable people are so hard to approach, etc. But I see it as an added value.’

That is, working with complexities was not a hindrance but a strategy in this project. Complexities were tamed with concepts, schemes, and visualizations (e.g. of the coaching perspective, the situation of a patient, or the problems that have to be solved), but they were also handled by involving

many different people with different backgrounds, ideas, and concepts.

6.2 Strategies to develop the measuring instrument

To develop the measuring instrument, on the other hand, something as complex as the quality of life in patient groups was measured with a method and tool of which the simplicity was especially emphasized: ‘a simple analysis’, ‘a simple tool’. Seen from their papers, flyers, and research proposal, this simplicity is related to usability: ‘a simple and attractive app’, ‘a simple and practical index’, as well as to credibility: ‘a very simple and credible measuring instrument’. In their presentations and MTA meetings, it also became clear that simplification was a strategy to explain an argument. When Peter gave feedback to a PhD student, he, for example, advised: ‘The good thing is to limit yourself. A simple story, with simple lines.’ That is, simplification was used as a strategy to translate the methods of the measuring instrument to another environment—of potential users, or peers.

To reduce complex problems to simple questions, methods, and tools, the team used a form of explication that had to be transferable. Indeed, one of the ‘problems’ with the measuring instrument was that not all peers immediately accepted the new method:

‘When you say, this would be better and it has benefits, [some people] answer: “No. Somewhere there must be a mistake. Otherwise we wouldn’t be working with this old method for forty years, would we? That is not possible”.’ (Peter).

Therefore, the explication of the argument was very important. Moreover, the explication had to be logical: ‘numbers should be as logical as possible’, ‘a logical order’, and ‘logical co-efficiency’. Logic reasoning was important to justify the simplicity of the tool and the results. So, while the health care team explained some of their decisions with intuition, the measuring instrument team especially referred to logic.

‘I thought “this is not correct, this can be done better”. And then I got an idea (...). So, I started to read but couldn’t find anything. Then I talked to people – no one could help me. (...) And then, at a certain moment, I found it. And it appeared to be really simple. (...) So simple that you think: of course! And then it is just a matter of working out the formula (...) and then it is as logic as can be.’ (Peter)

In contrast to intuition, logic is articulable—but only for peers and other academics in the field.¹³ This means that these peers or academics are also important to justify the logic or simplicity of the results. For this, publishing peer-reviewed papers (in high-quality journals) is a clear approach. This could explain why the research team was so focused on papers in ‘good’ (q1) international journals, while the food industry was less interested in the classification of the journal; also, why Alice often chose to publish in national trade magazines where people cared about her work instead of in international peer-reviewed journals. The food industry and the health care team were less focused on academic justification.

To justify their measuring instrument, the project team also put much effort into boundary work: but not so much by bridging or making connections (as the health care team

did), but by emphasizing differences with other disciplines or methods. That is, their boundary work especially consisted of making demarcations. Their measuring instrument, for example, was promoted as a ‘new method’, and it was compared with other existing methods (‘a better method’, ‘forget the past’) in publications and on a website. Also, the research team often discussed other measuring instruments and papers and emphasized that they wanted to do it differently. (‘When we want to do it, we have to do it differently.’) They, for example, contrasted themselves with economists (‘this is what health economists always do’, ‘standard health economists use these coefficients. We don’t use that.’, ‘economists are very normative’); with health scientists (‘[they] know about everything nothing’); with their colleagues and methods from epidemiology (‘more is not possible in the life of an epidemiologist’, ‘as soon as people say: we have a data set, you know that you don’t have to continue’). That is, although the measuring instrument team also adapted to other actors and systems, for example, with their calculations of health states in regard to death (like all economists do), and their eagerness to publish—they especially put efforts in demarcating themselves from other disciplines or methods.

7. Achieving societal or academic impact: a comparison

The health care team and the measuring instrument team both aimed to achieve societal and academic impact. However, in the health care project meetings, the focus was mainly on the first and in the measuring instrument meetings on the latter. Comparing the networks, values, and strategies used in these projects showed some dissimilarities in the practices to achieving these different forms of impact. In the health care project, societal impact was mainly achieved by *bridging* boundaries and making connections with other fields and theories—Alice called herself a boundary worker, the social-geographical concept was seen as a ‘binding framework’, trainings, events, or trade publications were seen as output, and most meetings were face-to-face and often took place outside of their university building. The measuring instrument team, on the other hand, was more focused on *demarcating* their work from other methods and disciplines: they especially emphasized the novelty of their work, opposed peer reviewers and colleagues, and their contacts were often international and virtual, which means that these meetings mostly took place within the boundaries of their university building. Bridging and demarcating are both practices of a boundary work but in a different direction. ‘Boundary Work’ is a theoretical concept from science studies that refers to the construction of a boundary (making a distinction) between different forms of science, or between science and non-science (Burri 2008; Gieryn 1983). It also refers to boundary objects, which are ‘objects’ (e.g. an illustration of a theory; an item in a museum), that are flexible enough to adapt to different viewpoints while developing and maintaining coherence across (or bridge) social worlds (e.g. Star and Griesemer 1989).¹⁴ This means that boundary work is both about making distinctions and about making connections. Emphasizing the difference between science and non-science, good science and bad science, old science and new science, or between theories is important to achieve academic impact (publications in Q1 journals, citations, and conferences), while to achieve societal

impact, it is necessary to connect with broader audiences such as lay public, science policymakers, or other scientific fields. Output (or objects) such as a training script, trade magazine article, or illustration can help to create coherence across these worlds.

Another difference that came up in my analysis of the research practices in both projects, and that relates to this boundary work, is that the health care team *adapted* to other languages, cultures, and theories—they, for example, used different concepts in different settings (e.g. patients, citizens, and clients), did their best to include social activities in their academic events (e.g. the Mexican wave), visited stakeholders at their sites, and they made use of a combination of theories from a variety of fields (e.g. the social-geographical perspective). In the measuring instrument team, I did not see such forms of adaptation. The research team, and especially Peter, occasionally emphasized the difference between their work and that of others (‘my measuring method is very different’; ‘Real scientists discover and create. The rest is bulk’). *Adaptation* and *differentiation* are both strategies to convince others (stakeholders and peers), or make them interested, in your theories, methods, or other work. It could be phrased as practices of ‘Knowledge Translation’—turning your knowledge into other people’s knowledge by making connections and (or) establishing differences (Latour 2005; Michael 2017; Mol 2002). My analysis showed that knowledge was translated to other social worlds by adapting to these languages, cultures, and theories while convincing academic peers was especially done by emphasizing the novelty and differences of your work.

Also interesting was that the health care researchers emphasized the *complexities* in their work, while the measuring instrument team especially articulated its *simplicities*. The focus on complexities or simplicities can be understood as a different ‘Research Scope’, in the sense that it suggests a zooming in or a zooming out of the actual problem. The health care team decided to ‘study’ or ‘deal with’ complexities. Instead of working with healthy people, they took an ‘extreme target group’ because it allowed for new insights. Working with complexities was not seen as a negative consequence of their societal work, it was a strategy. The measuring instrument on the other hand aimed to simplify a rather complex question (what is quality of life) with a variety of methods, graphs, and tools (‘a simple analysis’ and ‘a simple tool’). This simplification of a complex problem, however, should not (simply) be seen as a reduction: it was also a strategy to improve (‘Simple solutions are the best’) and to convince potential users or peers (‘So simple that you think: of course!’). That is, to work with problems in society, researchers have to deal with its often unpredictable complexities (e.g. patients’ problems, different interests of stakeholders, and political involvement), while academic impact is perhaps best achieved by simplifying real-world complexities with predictable models and numbers. Interestingly, the fact that the health care team and the measuring instrument team do not only ‘have to’ deal with these complexities or simplicities but use it as strategies for new insights or improvements shows that the relation between simplicities and complexities is not a very simple one (see also Law and Mol 2002).

Another interesting, but not plain, distinction was the accentuation of a different form of knowledge. The health care researchers often explained that they used their *intuition*, for example, to connect different societal and interdisciplinary

actors or theories, while the measuring instrument team emphasized that theories and models had to be *logical*. These explanations can be seen as different ‘Forms of Knowledge’ (e.g. Collins 2010). Intuition might be necessary to make connections or deal with complexities, but it is a ‘tacit’ form of knowledge that is hard to explain. Logic, on the other hand, is related to knowledge or reasoning that is explicable and probably works better to convince academic peers, and hence to achieve academic impact. However, suggesting that societal impact benefits from intuition while academic impact is based on logical reasoning is too simplistic and seems to encourage a value judgment. As many social studies of laboratory work have demonstrated, scientific work is often based on tacit forms of knowledge (Cohn 2008; Myers 2008; Peterson 2016).

My analysis of the networks, values, and strategies to achieve societal and academic impact showed some interesting dissimilarities in regard to boundary work (bridging and demarcation), knowledge translation (adaptation and differentiation), research scope (complexity and simplicity), and forms of knowledge (intuition and logic). However, it is also important to emphasize that these binaries are not so simple (Law and Mol 2002). Since both research teams aimed to achieve both forms of impact, all these dissimilarities could also be observed within the research teams. For instance, Rob, the researcher who mainly focused on academic impact in the health care team, especially emphasized the difference and novelty of the health care project (‘a major difference with what this discipline is doing’). The health care team also used models and simplifications to convince their partners and approach their problems. In the academic setting, the health care team also demarcated their work, for example, from evidence-based medicine or toward other action researchers. And surely, the theories and models that were used by the health care team are also logical and explicable. In the measuring instrument project, on the other hand, there was also adaptation; the team, for example, adapted their tests and ideas to the technical possibilities and design of the app (e.g. layout and colors of the text). Peter’s search for a better methodology also started somewhat intuitively (‘at a certain moment, I found it’), and the measurement team also made connections, for example, with the food industry. Their discussions and explanations of the numbers and figures were not simple but very complex, and the knowledge translation of their research with many publications and high-impact journals was partly also a result of papers they themselves did not see as new and different, but as ‘rubbish’ (Peter). That is to say, the dissimilarities that I found in regard to boundary work, knowledge translation, research scope, and forms of knowledge are also related and should not be understood as a clear division between the two research projects.

This makes it relevant to find out how these different practices were negotiated in these research projects. As shown, both research teams created networks with actors (e.g. experience expert, food industry, and researchers with different backgrounds) that represented different societal and academic values. Dealing with and collaborating between these different actors and values required some strategies such as adapting to different languages and cultures; simplifying complex problems with models or theories; specifying the differences between their academic work and other academic theories; connecting to different audiences, etc. Surely, not everyone

was good in all these activities. Gabriel, for example, was very good in computer models and statistics, but according to Peter, not a very efficient writer; the food industry brought in money and would help to bring the app into use, and the app developer and research company did some technical and practical jobs, but they were not part of the data analysis. In the health care project, the experience expert was very good in representing clients, but not part of the research team; Rob had no experience with action research, but had relevant research contacts and initiated new PhD positions. Alice was more focused on concrete products, while for Layla, academic publications were also important. Moreover, while both research teams aimed to combine both forms of impact, this paper showed that they focused mainly on one of these forms, at least, when strictly regarding the official project duration. When the projects and my observations were finished, the health care team had several academic publications still in the planning and were starting some new PhD projects, and the measuring instrument was not really in use yet, but this was still the intention. This all means that some of the project members continued working on their societal and/or academic aims when the project had officially ended.

8. Conclusion

Science policymakers and funding agencies are increasingly interested in the societal impact of research, and they often ask researchers to specify the academic and societal impacts of their work. In this paper, I have analyzed how the activities to achieve both forms of impact relate by studying the research practices of two research teams that aim to combine these forms of impact. My analysis of their networks, values, and strategies showed that the practices to achieve academic and societal impacts exhibit some dissimilarities with regard to boundary work (bridging and demarcation), knowledge translation (adaptation and differentiation), research scope (on complexity or simplicity), and forms of knowledge (intuition and logic).

For researchers, it might be helpful to take note of these differences when planning or doing their research. In the case studies selected for this paper, combining societal and academic impact was done by mainly focusing on one form of impact. I also showed that both research teams created broad networks with actors with different (academic and societal) values, that different research activities were performed by different actors, and that not all impact was fully achieved during the project duration. This suggests that combining academic and societal impacts is also a negotiation, which will be relevant and possible in some, but perhaps not in all research situations. It would be worthwhile to further explore in what situations researchers could perhaps better focus on one form of impact instead of on both.

Science policymakers and research organizations should also be more aware of the complex practices it takes to achieve societal and academic impacts of research. While they increasingly acknowledge that counting publications and citations is not the best way to evaluate research quality and that societal impact should be rewarded too, it seems that they simply added up both forms of impact as a recipe to calculate research quality without taking the differences in the societal and academic world into account. The result of this was phrased

by Peter as: ‘everything has to be societally relevant, and funding is only given to science that follows the standard’. In other words, although Peter aims to combine both forms of impact, he is also critical about the situation that this is the standard, because it hinders an important academic value and strategy: differentiation. The situation that both projects mainly focused on one sort of impact and that not all research aims were achieved within the project time furthermore suggests that standardly asking to combine academic and societal impact might hinder some other values and strategies that were identified in this paper—such as continuation, dealing with complexities, or making connections. Moreover, perhaps science policymakers and research organizations should also pay attention to the value of ‘working hard’ that was articulated in one of these case studies (‘You leave the building at five’) but objected in the other (‘I cannot work day and night.’).

Hence, instead of asking researchers to describe the societal and academic impact of their proposed research, I suggest that funders could better ask to describe the network, involved values, and intended strategies to achieve societal *and/or* academic impact. This would not only help in the planning and evaluation of the proposed research; it would also articulate the urgency and appreciation of both forms of impact while respecting the differences in the societal and academic world.

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Notes

1. Web of Science gives 73,004 papers in 2021, 36,258 papers in 2017, and 7,708 in 2007 for the topic: research impact (i.e. searches title, abstract, author keywords, and Keywords Plus). Derived from www.webofknowledge.com in January 2022.
2. Pre-proposal form, NWO Open Competition SSH, 2020.
3. Veni grant application full proposal form, 2019.
4. These case studies were part of the research project: ‘Achieving good science. A cross-disciplinary study’ in which Prof. Jeannette Pols, Prof. Amade M’charek, Dr. Sonja Jerak-Zuiderent and the author ethnographically studied research practices across five disciplines (philosophy, mathematics, chemistry, anthropology, and medical science). See <<https://www.zonmw.nl/en/research-and-results/fundamental-research/programmas/programme-detail/fostering-responsible-research-practices/t/goal-of-pillar-3-project-life-cycles/>> and <<https://www.vumc.nl/research/ethiek-recht-humana/onderzoek/goede-wetenschap.htm>> accessed April 2022.
5. That is, most of my observations took place in this period. Since the health care project officially started after this period, I also attended meetings for this project in the 1.5 years after.
6. Action research combines taking action and doing research using critical reflection. Transdisciplinary refers to the collaboration with non-academic stakeholders (i.e. health care professionals). The

project leader explains her approach as a mutual learning and changing process that uses a social geographical theory to improve the rehabilitation process of patients.

7. There are more reasons for this. For example, rehabilitation medicine and epidemiology were open for my observation practices while a clinical research group was more hesitant. Both studies that were selected were quite unusual projects in their department and hence seemed more interesting to follow than, for example, studies with data sets. That is, within the reach of what was possible and practical, this case selection was based on a mix of ‘typical, diverse, extreme, deviant, influential, most similar, and most different cases’ (Seawright and Gerring 2008: 294).
8. All material was analyzed by me, and I regularly discussed my fieldwork and analysis with my colleagues of ‘Achieving good science. A cross-disciplinary study’; all having a background in STS and anthropological/ethnographic research. For reasons of anonymity, I used pseudonyms for all people, and renamed projects, units, and theories mentioned in this paper. I excluded sensitive or private information from quotes, as well as detailed information about locations. Before this paper was published, I shared a draft version of this manuscript with Alice, Peter, and Layla (see further) and I incorporated most of their comments and additions.
9. Studying daily work in terms of a network is inspired by actor-network theory (Latour 2005; Law 1992; Mol 2010; Michael 2017) that proposed to follow actors (not only humans but also technologies, papers, etc.) in their network (of other humans, technologies, etc.).
10. Researchers in this field calculate a health state (or disease burden) as a number on a scale between perfect health (1) and being dead (0), or worse than death (−1).
11. Q stands for a quartile ranking of journals in which Q1 is the 25 per cent highest ranking and Q4 the poorest.
12. Tacit knowledge is a theoretical concept from Science Studies and refers to knowledge that is hard to verbalize—such as learning to ride a bicycle (e.g. Polanyi 1962; Collins 2010).
13. Moreover, this quote also shows that logic is not (or not always) a priori to the research process: it is an argument that has to be developed.
14. To give an example, in natural history, objects such as specimens adapt to different viewpoints of, e.g. biologists, historian, museum sponsors, and amateurs but are robust enough to maintain a common identity, e.g. representing nature (Star and Griesemer 1989).

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Appendix Overview of the case studies

	Health care project	Measuring instrument project
Field	Rehabilitation medicine	Epidemiology/MTA
Project leader	Alice	Peter
Project team	Senior researchers (3), Junior researchers (3)	Senior researchers (3), Postdoc (1)
Aim	Improving health care	Developing a measuring instrument
Methods	Action research	Statistics (based on questionnaires and interviews)
Researchers background	Philosophy, social geography, business, medicine	MTA (methodology, economics)
Products	Training script, improved healthcare system, paper(s)	Peer-reviewed publications (4), App, website
Stakeholders (collaborators)	Health care organizations, municipality, other research fields	Food industry
Duration	1.5 years (and 6 months extension)	3 years (for the postdoc)