Ulrike Felt
Maximilian Fochler

# *Re-ordering Epistemic Living Spaces:* On the Tacit Governance Effects of the Public Communication of Science

October 2010


preprint
sTs
2010

Department of Social Studies of Science
University of Vienna

*Please cite this paper in the following way:*
Felt, Ulrike, and Fochler, Maximilian (2010). Re-ordering Epistemic Living Spaces: On the Tacit Governance Effects of the Public Communication of Science. Department of Social Studies of Science, University of Vienna, October 2010. Accepted for publication in Weingart P. et al. (eds.): The 'Medialisation' of Science. Theoretical Reflections and Empirical Investigations. *Yearbook of the Sociology of the Sciences*. Dordrecht: Kluewer.

*Address for correspondence:*
Ulrike Felt
Department of Social Studies of Science
University of Vienna
Universitätsstraße 7, Stg. II, 6. Stock (NIG)
A-1010 Vienna, Austria
T: ++43 1 4277 49611
E-Mail: ulrike.felt@univie.ac.at

http://sciencestudies.univie.ac.at

[version 3/ 07102011]

# *Re-ordering Epistemic Living Spaces*

## On the Tacit Governance Effects of the Public Communication of Science[i]

***Ulrike Felt and Maximilian Fochler***

In 2008 *Science* featured an article entitled "Interactions with mass media" with the following teaser: "A survey reveals that media contacts of scientists in top R&D countries are more frequent and smooth than was previously thought". Stressing their astonishment and satisfaction, the authors – a consortium of researchers from Germany, France, the UK, the US and Japan – further report that "the scientists most involved in these interactions tend to be scientifically productive, have leadership roles, and […] perceive the interactions to have more positive than negative outcomes." (Peters et al. 2008: 205) Apparently the often repeated saying that scientists and journalists are "like oil and water" no longer holds. Neither does the long-held opinion that too much media presence harms the reputation of scientists. This, the study suggests, is valid "across the five countries, the basic patterns [being] surprisingly similar. The functional necessity of public science communication may be a global phenomenon in democratic knowledge societies." (op.cit.: 205)

Indeed, in recent years academic scientists have been increasingly trained to talk to journalists and write press releases, they are asked to speak in schools, and science weeks, festivals or nights are organised to allow 'ordinary citizens' to get in touch with 'their' scientists. FameLabs are staged for young researchers to showcase their talent as infotainers and prizes have been established to reward excellent communicators. Examples of an increased public presence of scientists are numerous. Beyond these communication activities aimed at broader publics we find a flurry of other efforts such as glossy brochures, annual reports, web pages, video clips, and many other professionally produced media, which are directed at selected communities of potential funders, supporters or collaborators, but also used for recruiting purposes.

Thus science is no longer only performed at the lab bench, but needs to be staged in an ever-increasing variety of places and contexts. A possible reason for this could be the growing competition for public attention at a time when pictures and stories about science and technology proliferate. Another reason could be the need to rehearse and thus stabilise certain foundational narratives to assure an unquestioned position of authority for science and technology in a world where publics are no longer seen as unconditional admirers of science, but much more as potential dissenters. (Felt, Wynne et al. 2007; Felt and Fochler 2010)

A broad body of literature has dealt with these phenomena, in particular analysing the presence of science and scientists in classical media and the representations of research and of being a researcher that they create. (e.g. LaFollette 1990; Nelkin 1994). Weingart's (1998) concept of a "medialisation of science" characterizes science as in-

creasingly media-oriented, and addresses the consequences this has for the public perception of science. Developing this notion further, Rödder (2009) points at the need to analytically differentiate between two dimensions of medialisation: one "characterizes a phenomenon on the level of media content [that] can be regarded as part of the changing environmental framework of science" (op.cit.: 453); the other hints at structural changes within science, meaning "that scientific institutions as well as scientists increasingly orientate themselves towards public and media attention rather than the truth." (op.cit.: 454)

This paper focuses on the second dimension, because little reflection has been offered so far on how the proliferation of media formats and contexts in which communication takes place affect research and scientific practice. Other than the initial proponents of medialisation (Weingart 1998; Rödder 2009), we do not situate our analysis on the level of systems and their changing dynamics. For example, we are not asking whether media orientation is replacing truth as the functional code of the science system. Rather, our approach starts from a person-centred perspective, and asks what consequences the proliferation of communication activities and of media representations of research has for academic scientists and their ways of living and working in research. How does scientists' increasing engagement in communication activities feed back into research and influence their identities and practices as scientists? How do these communication activities affect the social and symbolic orders that define what it means to do research today? And how do they both tacitly govern research environments as well as researchers' self-understanding? By starting from these questions about how researchers' ways of living and working in science are affected by medialisation on a micro-level we aim to work towards conclusions about the more systemic effects of medialisation, both in science as well as in its relation to other societal actors and systems.

Our aim in analysing these questions is to grasp the plurality of contexts and formats in which academic scientists orient themselves towards public attention. Our starting hypothesis is that medialisation does not only take place in relation to the classical mass media, but that the ongoing process of classical medialisation as described by Weingart (1998) has spawned a number of heterogeneous contexts which are governed by similar logics, but do not immediately relate to the mass media. Although they may not be directly reported by the media, the glossy brochures and accounts produced by scientists and scientific institutions, along with instances of more direct public engagement, such as when a life science department invites pupils to learn about 'doing real science' in a visitors' lab, are thought and designed in such a way that they could (and should) attract public attention. They are at least partially governed by the logics of the media, and hence need to be understood as sites where medialisation takes place. Our working definition of medialisation is thus broader than that of many other contributions in this volume.

We will start by addressing some of the more recent debates on the changing relations between science and society and introduce the key-concept of epistemic living spaces (Felt 2009). This will help us to reflect on the articulations between wider societal changes and the way they impact the social and epistemic lives of researchers. After presenting the empirical research that serves as the basis for this article, we will elaborate our findings. In the first part of our empirical section, we will analyse life sci-

entists' accounts of the role medialised interactions play in their professional lives. In the second, we will ask which tacit governance effects medialisation has on the development of research fields and on the career imaginations and decisions of young scientists. In conclusion we will reflect on the ways in which medialisation processes affect the symbolic and social orders of contemporary research and the role they have come to play in tacitly governing research, while critically pointing to the fact that this role is disconnected from any responsibility.

## Eroding Demarcations between Science and Society and the Consequence for Research(ers)

From a macro perspective, several key contributions have argued that the cultures, practices and contexts in which research is done have significantly changed over the last decades – be it due to a progressive intertwining of academia, industry and the state (Etzkowitz and Leydesdorff 2000), or to a new relation between science and society in which knowledge is more often produced and validated in contexts influenced by extra-scientific rationales (Nowotny et al. 2001). Though these approaches vary in their emphases, they all point at a convergence of different societal spheres and rationales, and at the dynamic erosion and re-definition of boundaries previously thought to be stable.

In the framework of co-evolution, science is characterized as being increasingly contextualized by societal rationales. This is considered the main process changing research cultures and practices. While in the literature context is mostly thought of in terms of different social groups or market structures, in our argument the proliferating public images and narratives of science, as well as the equally proliferating spaces in which scientists and publics interact, also need to be considered as contextualising scientific knowledge production. In their communication activities beyond the scientific community, researchers can be shown to constantly engage in boundary work, both tearing down and simultaneously re-erecting boundaries between science and society (Felt and Stöckelova 2009).

While macro-diagnoses such as those by Nowotny and co-authors or Etzkowitz and Leydesdorff are much rehearsed, surprisingly little work has been done to empirically address how these changes affect the actual cultures and practices of research, and how researchers perceive their work and their own identity. In our perspective, this is a major lacuna, because, paraphrasing Jasanoff (2004), the ways in which researchers live and situate themselves in society at large, in particular epistemic cultures and in concrete institutional and social settings, is inseparable from the kinds of knowledge they produce. Epistemic and social orders are always co-produced, and the multiplication of interactions with the media and the growing attentiveness of research(ers) towards media representations are major factors influencing the processes in which this co-production takes place in contemporary research.

To address this, we will use the notion of "epistemic living spaces" (Felt 2009). By epistemic living space, we mean researchers' individual or collective perceptions and narrative re-constructions of the structures, contexts, rationales, actors and values which mould, guide and delimit their potential actions, both in what they aim to know

as well as in how they act in social contexts in science and beyond. This concept directs our attention to the efforts of researchers to stabilise, extend or protect the space they occupy socially and epistemologically, as well as institutionally. It resonates with Knorr-Cetina's notion of epistemic cultures, which aims to analyse the "knowledge machineries of contemporary sciences" (Knorr-Cetina 1999: 3), and their technical, symbolic and social dimensions. However, we do not intend to re-construct and map stable cultural assemblages and their differences, but instead we focus on individual and collectivised perceptions in order to analyze the changes, heterogeneities and fluidities in today's research landscape, and to link individual and collective experiences to more global systemic changes. Hence, elements which are less important for studying tightly-bound epistemic cultures are key for understanding more fluid epistemic living spaces and how they are transformed by the framing of research in policy discourses, the societal imaginaries which influence research, and the manifold normative symbolic regimes which govern contemporary research practices. The concept thus allows us to address the inextricable interdependence of epistemic practices, institutional rationales, individual biographical decisions, and political frameworks, which characterises the lived experiential realities of researchers today. One particularly salient example for this interdependence is the rise of New Public Management in scientific institutions. This ideology sets out to introduce corporate management techniques into academic institutions, to reform the efficiency of decision-making in public institutions by basing decisions on 'objective', quantitative criteria, and to make these institutions more favourable to policy-makers and the general public. Medialisation is strongly linked to these institutional changes, as, for example, academic PR departments increasingly shift to selling science in a corporate model of public relations (cf. Peters, this volume), and as scientists' media contact is monitored and quantified as an indicator of societal impact.

Epistemic living spaces can be characterised along at least five dimensions: an epistemic, a spatial/material, a temporal, a symbolic, and a social dimension. While making a distinction between these five dimensions makes sense for analytical purposes, at the same time they are inextricably intertwined.

The first and most central dimension of epistemic living spaces is their epistemic structure. They are framed by specific assumptions about which kinds of research questions are central, how knowledge should be produced, and which properties and procedures constitute good knowledge. As opposed to the many other human practices besides science that involve the production and use of knowledge, producing knowledge is seen as the prime aim by the actors populating the epistemic living spaces called academic research, and hence reflecting on the guiding values, means, and methods of their knowledge production is perceived to be of key importance in these spaces. One crucial axis of recent change in research cultures that is related to this, for example, is whether researchers see the purpose of their work as following mainly academic curiosity, or whether contexts of application matter more in how they frame and answer their research questions (Hakala 2009; Nowotny et al. 2001).

The second dimension is the spatial/material dimension. On the one hand it points to how research work is enabled or constrained by material artefacts such as technologies or the more or less convenient spatial and architectural arrangements in which everyday work is done (Felt et al. 2010b). On the other hand, it also addresses

the simultaneously geographic and symbolic maps researchers use to orient themselves. This implies that we need to analyse researchers' ideas of proximity and distance to what they perceive as central nodes in the system, as well as their 'tacit geography', which informs how they understand their own place within this system (cf. Felt and Stöckelova 2009). For example, while the development of scientific careers and interaction with peers is often seen as international[ii] in scale, making mobility a prerequisite for scientific careers, in individual career decisions this has to be reconciled with more localised rationales, be they those of specific institutions or of the individuals' private relations.

Third, the temporal dimension addresses (1) the perceived tempo of academic work (2) the relation of research work (most often organized into projects) to other time regimes, such as the rhythm of institutional evaluations or of private lives and (3) the different forms of time which play out in academic work (Garforth and Cervinkova 2009). For the latter, recent studies (Yliyoki and Mäntylä 2003) highlight that the perceived time pressure in research work is strongly linked to a shift in the relation between different categories of time. As project research increasingly constitutes the *modus operandi* of academic work, "timeless time", i.e. time which is not a priori dedicated to a specific task becomes a scarce and precious resource in relation to time units already dedicated to the production of a specific output.

The fourth dimension, the symbolic dimension, is of specific relevance to this paper, as it touches on the values and modes of ordering seen as crucial in governing research work, and the related virtues and qualities expected of the individual researcher (Shapin 2009). In recent years a range of powerful normative distinctions and values around notions such as excellence, mobility and accountability have emerged, which play a central role in guiding both researchers' epistemic practices and their career decisions (Felt and Stöckelova 2009). For example, the rituals of academic audit (Power 1997; Strathern 2000) lead researchers to conceptualise their output in terms of units, such as publications, which can be counted and should be maximised. In relation to this, other aspects of academic work such as support or articulation work (e.g. work needed to set up interdisciplinary collaboration) that are not as easily translated into quantifiable outputs, are increasingly devalued and hence less attractive for researchers to pursue.

Fifth, the social dimension scrutinises which forms of togetherness researchers imagine as specific to their epistemic living spaces. On the one hand this relates to which forms of collaborative knowledge production exist. On the other hand, sociality is also about expectations for other individuals and groups who share the epistemic living space, for example, whether and in which moments these others are perceived as peers or competitors. And it is always linked to the question whether or not they are sharing the same perception of the values and symbolic modes of ordering characteristic of a particular epistemic living space – for instance whether they buy into the audit and quantification logic, or whether they see themselves committed to pursuing other goals.

This last argument points to a crucial specificity in individual perceptions of epistemic living spaces: the different degrees to which the perception of the actual epistemic living space corresponds with one's own normative expectations about life and work in this space. Our hypothesis is that the rapid changes the research system is

currently undergoing create frictions and dissonances between normative ideals and perceived realities, which can be voiced in different rhetorical forms, such as 'not feeling at home' or an academic nostalgia for the 'good old times' (Ylijoki 2005). This again points to two specific kinds of work academic researchers have to engage in. The first is orientation work, which refers to the activity of making sense of the shape, the boundaries and the central logics governing their own epistemic living space. Second, there is the boundary work researchers engage in to re-shape their epistemic living space to fit better with their own expectations, or to resist shifts and changes that are perceived as negative. As we intend to show and discuss, medial representations of science play a crucial role in actually shaping epistemic living spaces, as well as orientation and boundary work.

## Material and Methods

Our empirical argument draws on data collected in a number of projects conducted in Austria between 2001 and 2010. Broadly speaking, these projects fall in two categories. On the one hand, we are building on several projects concerned with the relations of sciences and their publics, and in particular, with how scientists experience science/public interactions. On the other hand, a major part of our arguments derives from intense fieldwork in two projects on the changing research cultures and practices in the life sciences. We will briefly describe each project category.

Concerning science/public relations, our argument first draws on three evaluations of science communication events we carried out in the early 2000s. The evaluation of both the 2001[iii] and 2002[iv] Austrian science weeks and of the "Discourse day on genetic diagnosis" in 2002[v] were all projects which involved both participant observation as well as an elaborate collection of qualitative data in the form of interviews and focus groups with participating scientists and members of the publics. Secondly, we will draw on data from the project "Let's talk about GOLD. Analysing the interactions between genome research(ers) and the public as a learning process"[vi]. The key methodological feature of this project was a series of six whole-day Round Table discussions between scientists working on a genome research project and 14 members of the public, on the topic of the ethical and societal dimensions of this project and genome research in general. The media was a recurrent theme in these discussions, and one Round Table was explicitly devoted to discussing "science and the media". Besides the transcripts of the Round Table discussions, we will refer to interviews conducted with all participants before and after the series of Round Tables.

The second category of projects we are drawing on was concerned with changing research cultures and practices in the life sciences, and in particular with how societal rationales such as ethical considerations, public debates or media logics influence these changes. The European project "Knowing – Knowledge, Institutions and Gender. An East-West Comparative Study"[vii] compared the research cultures in molecular biology and sociology in five European countries. For this paper, we are mainly referring to interviews and focus groups conducted with molecular biologists in Austria. The project "Living Changes in the Life Sciences. Tracing the Ethical and Social within Scientific Practice and Work Culture"[viii] developed an innovative interview method called the "reflexive peer-to-peer interview"[ix]. In more than fifty qualitative interviews of two to

three hours, we explored how life scientists narrate the relationships between biographical, epistemic and institutional rationales in their personal biographies. Science-society relations and the relation of scientists to the media were a part of these interviews. The scientists interviewed covered all career stages from PhD students to full professors, as well as the major research areas in the life science landscape in Austria.

We thus draw on material resulting from nearly ten years of research on the life sciences and on science/society relations in Austria. Besides more formally recorded data, our dense personal experiences and observations in working with life scientists in these and in other project contexts are another important resource for our arguments. We have been involved in one of the largest genome research consortia in Austria as ELSA/social science partners for more than five years, and our co-operative work with some of the scientists included in the focus groups, Round Tables and interviews date back considerably before this. Hence, virtually all of the arguments that we illustrate with single quotes can and have been cross-validated in other interviews or more informal contexts.

## Tracing Medialisation

### Keeping Society Close but Outside— Scientists' Narratives on Sciences' Strategic Use of the Media

For most scientists we talked with in our fieldwork, the idea that scientists should communicate with the public had become almost self-evident. Rather, a crucial question for them concerned what is to be gained by communicating to whom. Here, society and policy were often described as separate communication partners, with the latter unsurprisingly attributed with considerably more emphasis than the former. Particularly for resource-intensive fields such as the life sciences, attracting media attention was perceived as central, because policy attention was thought of as following at the media's heels. Senior scientists talked about medialised stories about research as particularly useful for securing the resources distributed through policy, as policy makers would be able to use the promises made in these narratives to justify their actions more persuasively than other arguments offered by scientists.

> *If I say, I will create a centre for molecular medicine and will use 80 million Euro – then you have to argue that it will have an immediate impact on society, because otherwise no politician will stand in front […] and cut the green ribbon. If I say that I want an institute for basic research in order to have my tranquillity and publish two Cell papers every year – that will not get anything off the ground. (lab leader, male)*

From another perspective, making arguments about the immediate impact of research in the media was also seen as fulfilling science's need to be accountable for how it uses societal resources. In this context, the media was not only conceptualised as an arena to convince policy to provide resources; it was also seen as a possible ally in protecting science from the downside of policy logics, such as the assumption that immediate impact is the only criteria for deciding how research benefits society. If politicians are as oriented towards direct societal benefits as imagined in the quote, then they may just as quickly decide that societal resources should not be spent on

basic research at all – a debate, which has been constantly going on in Austria in recent years. Hence, a number of scientists we talked to argued that science needs to use the media to foster a different image, one which is not as dependent on promises of short-term applicability. Consider the following quote, in which a scientist sums up a small group discussion between several researchers on science and the media:

> *I find it essential that research is recognized as a cultural good. [This] means that it is not merely utility which is at the centre of considerations, that the question of what can be practically achieved does not come up immediately. (project manager, female)*

Hence, slightly paradoxically, the media was seen both as a means to instrumentalise policy and as a potential ally to protect science from policy, as keeping policy 'close but outside'. Similar patterns can be identified in how scientists talk about the role of the media in negotiating science's wider relation to society. On the one hand, the media is seen as a space to win societal support like in the 'science as a cultural good' argument. However, it was also conceptualised as an arena where precautionary measures are necessary to avoid societal conflict on potentially controversial issues.

> *Especially in our case, when it is about genetic research, it is important to also deliver arguments to a wider public to shape their opinion. There was an initiative in Switzerland. They wanted to ban [animal] experiments. This was debated broadly, and many scientists went out into the public and initiated debates on TV, radio, everywhere, Nobel Prize winners, what have you; and they tried to convey the importance of such a decision. And that's why the decision has turned out positively for science. Something similar should also happen in Austria. (lab leader, male)*

To achieve this science-friendly coverage, two factors were seen as crucial: on the one hand, the involvement of respected senior scientists in this kind of media work is necessary. But on the other hand, 'scientising' the media is of high strategic importance. This means influencing science journalists, science journalism training, or at best encouraging people with training in the life sciences to become science journalists themselves[x]. Particularly this last option was seen as a very promising way to assure an adequate 'understanding' of the life sciences and their needs in the media.

Within academia, we encountered a quite coherent vision of who should interact with the media, and who does not need to do so. Doing this kind of boundary work was conceptualised as the senior scientists' task, in order to assure that their junior colleagues can „just do science". Playing the media game in the public eye and hence, at least rhetorically, buying into it was seen as necessary pre-condition for achieving the resources to do „science as usual" on the back-stage.

## Press-Packaging my Science? Why and how Life Scientists relate their Work to the Media

When life scientists talked about their work, their projects and their careers in the different fieldwork settings that we analyzed, the media was a recurring theme. For making a successful academic career, the media, and in particular scientists' ability to skilfully deal with them, was seen as crucial. Consider the following quote from a post-

doc researcher in response to the question of what aspect of scientific careers has changed most compared to previous generations:

> *I suppose […] that it is increasingly important to also sell yourself to the outside. On the web or anything else, newspapers, […] to really show off. Probably this also existed in the past, but I suspect to a lesser extent. (post-doc, male)*

Successfully dealing with the media requires skills, which have also become of key importance in other aspects of scientific careers, as the interviewee goes on to explain. For him, this is mainly about being able to construct and tell a convincing story in order to capture the interest of the audience, and to be able to do so succinctly, in both writing and in speech. Whether one is chatting with a potential collaborator or employer, giving a scientific presentation, or talking to a local newspaper, in the end it is all about being able to deliver short and exciting tales about one's work and its outcomes.

Most scientists we talked to would not see as clear connections between the different contexts where scientists have to communicate effectively as this particular post-doc. However, his story points to an increasingly important form of talking and thinking about one's work we found in many narrations, and which we label "press-packaging research": to communicate one's research in a brief form adapted to and attractive for a specific public. The example given also suggests that the contexts in which these skills are required have multiplied and go beyond the classical instances of science/media interactions. Offering a press-packaged version of one's research is seen as crucial in competing for attention in very different situations.

Being a good "press-packager" was also seen as likely to foster an individual's chances of receiving funding, in particular in the context of excellence-programmes, which distribute large amounts of money and hence are also reported on in the media. A researcher who had won one of the most prestigious prizes in Austria, which is awarded for basic research on the senior post-doc level, commented that in his view the projects of all individuals who received this prize shared a focus on potential applications, and hence could be easily 'sold' to the public by the funding agency, even though the scientists situated themselves in the basic science realm. He argues that the fields that are more likely to be funded are those that one *„can sell to the wider public as exciting, I believe. Well, I can imagine, that this plays a role, when [funding] choices are made". (lab leader, male)* This argument points to the ambivalent perception of the funding process that many of our more senior interviewees in particular shared. On the one hand, they saw the funding process as an arena for performing internal academic competences, as the decision would ultimately be based on the opinion of peers. On the other hand, as the quote implies, research funders were also seen as needing to legitimize their funding to the public, particularly with regard to their most prestigious prizes and programs. Hence, presenting one's research not only to one's peers, but also at least indirectly to wider audiences was seen as crucial for succeeding in the funding game[xi]. In quotes such as these, two different kinds of news value seem to be relevant to the decision of which projects to fund: the news value of the specific project or publication within science and the news value of its presentation to a wider public in terms of societal relevance (cf. Weingart, this volume). An interesting line of further inquiry would be to empirically study how these two kinds of news values are related and negotiated in the actual decision making processes and, following from

this, how far funding institutions inhabit a hybrid position between science and other societal rationales.

For the purposes of this paper, scrutinising the rhetorical form of press-packaging has high analytic salience. In a wider context, scientists' attempts to align their work with particular societal concerns have been analysed as part of an "economy of promises" (Felt, Wynne et al. 2007), in which promises of applicability themselves become the central currency. This is nicely illustrated by a senior researcher as he talks about how he presents his work in grants and to wider publics. Here he points at the form these promises need to take within a medialised logic:

> *I have come to understand from my experience with journalism that you only are allowed to say two sentences: 'Here we do xx-research.' is the first. But this does not thrill anybody. So you need to have a second one: that in doing this, you found a solution for this problem; then it is cool. (lab leader, male)*

Scientists assumed that to be reported on by the media, they would have to position their work as crucially contributing to a certain societal issue, if not directly solving that very problem. The brevity required by the medium and its temporal logics amplifies the problem. In the further context of the quote, the scientist goes on to argue that his relation to the media would be much more satisfactory if he was given more time and space to actually explain in how far and in which precise ways his discovery contributes to addressing an issue, and in how far it does not. These other modalities, however, are sacrificed for the sake of the brevity that is required by media communication, leaving just the decontextualised and unqualified promise – and a scientist who is ready to make this promise to foster his research and career. This points to a general ambivalence scientists are facing: on the one hand, being successfully represented in the media is tantamount to having a large number of media citations. On the other hand, this quantity comes at the price of what is seen as quality, as most of this coverage tends to be (too) short.

As the general thesis of an "economy of promises" (Felt, Wynne et al. 2007) suggests, promissory logics are by no means exclusive to science/media interactions. As press-packaging is also seen as crucial for achieving funding, similar rationales govern the process of grant writing, as the same scholar argues:

> *Everybody writes, and so do I, as first sentence in the [grant application]: 'metabolic diseases is a major burden on humanity'. As if, with my grant, if I manage to get it through, I would solve that problem. [laughs] But of course it's actually not like that. (lab leader, male)*

This quote points to a particular image of scientific practice and its relation to societal problems that is characteristic of press-packaging-practices more broadly: in factual statements such as this, a direct linear relation between societal problem and scientific practice is established, leaving no room for any complexities, uncertainties, or alternative constructions of problems and solution. This also renders the modalities of this form of statements particularly hard to 'unpack' for their respective recipients.

While most senior scientists we talked to, in particular, would agree to the basic tenet that relating one's work to particular societal expectations is part and parcel of playing the 'funding game' today, quite a number of them expressed concern that

these promises, by their very definition, create unrealistic public expectations about the potential and the speed with which science can address societal needs. While there is worry that this 'promise bubble' might burst and negatively affect the public image of science, scientists in our interviews hardly ever reflected on a second type of expectation that might be generated by these promises. It seems more than likely that the rehearsal of these promises in doing boundary work also affects scientists' orientation work, and hence also changes the perceptions and expectations of the scientists themselves, or others working in the institutional spaces created by successful promises.

## Their Stories about Us and Our Stories about Ourselves. Researchers' Perception of their Work between Media Narratives and Everyday Practice

In this section, we will explore the relation between scientists' perception of the relation between their everyday work practice happening back-stage and medialised representations of this very work performed on the front-stage. In our fieldwork, quite a number of life scientists complained that the media, as well as press-packaged stories produced e.g. by institutional public relations offices, would very often misrepresent the temporalities of scientific work. In particular, interviewees believed that the media focused its reporting on what scientists themselves perceived as long term goals that are not within their direct influence (such as curing a specific disease). Researchers argued that the concrete discoveries that they themselves saw as important breakthroughs were considered as much less important in constituting 'news value'. Of course, top publications in journals such as *Science, Nature* or *Cell* would be reported on, but in these contexts the reporting also stressed the long term goal rather than actually explaining what was discovered; and it suggested that this particular discovery would be a much larger step towards these long term aims than the scientists themselves would argue. Hence, the temporal pathways researchers conceptualised for themselves were seen as being shrunk in media reporting, with long term goals turning into short term aims for which a breakthrough is imminent, and in which their 'real' short term aims were of little interest or relevance. Consider the following quote from a scientist referring to her negotiations with a TV channel about whether they would cover a recent *Science* publication: "*If we would have claimed to have found 'the gene for x', and that hence x wouldn't be something to worry about anymore, then they would have done the feature right away." (project manager, female)*

Later, she goes on to explain that it's not that she would object to talking about any application of her research in principle, but instead she would like to stress that "*possibly there isn't an immediate application in months, years or even decades; but rather that there's a long time horizon, and that basic science is necessary to achieve important changes also later on." (project manager, female)*

Researchers often expressed that they felt uneasy about this type of reporting, because it completely bypasses the complex translation logics of a basic science discovery into societal applications, and hence raises false societal expectations about how and most of all how quickly science can contribute to solving societal problems. In relation to this argument, we witness an interesting contradiction: the mode of reporting criticised here of course follows precisely the same rationale scientists themselves employed in the press-packaging practices analysed in the preceding section.

At another point in the very same discussion that the quotes are taken from, the very same scientist employed this type of argument to justify her own work to the citizens present. From an analytic point of view, this shows how deeply medialised rationales have entered scientific practices, and that they, as in this case, create tensions between scientists' self-perception of their work and its medialised representation, which also includes self-representation.

However, it was not only the temporal dimension of scientific work in relation to societal aims that was seen as misrepresented. Scientific practice itself and the nature of everyday work in science was seen as distorted in such medialised accounts. From scientists' perspective, several crucial aspects of scientific practice were made invisible. First, they criticized the media's nearly exclusive focus on success in science. Comparing science to sports, they argued that the public was only interested in "*highlights and gold medals*" *(lab leader, male),* but not in the hard path which leads to these successes and particularly not in the many experiments and attempts which turn out to be unsuccessful. Second, the media featured labs "*where it goes boom, where it is loud and smoky*" *(project manager, female)* rather than the often-boring everyday routines of life science work, misrepresenting the majority of scientific practice. In particular, researchers were critical of the media's, and also their own press-office's propensity to consciously omit any aspect of research which might be controversial in the public sphere, such as whether experiments used transgenic animals. In a discussion with citizens on science and the media, a senior researcher half-jokingly suggested having a TV-reality show on science – "*then we would have time for all those stories which aren't told" (lab leader, male)*. In fact, the group of citizens he was talking with had just rejected a tour of the public labs that are usually shown to visiting school classes, and asked to see the places where "real work" is done.

This again leads us to an interesting contradiction. Researchers criticized the media for not representing scientific practice as they see it, and instead omitting the tiring and routine aspects of scientific work and presenting research work as if it will always quite quickly lead to successful results, without any uncertainties involved. Possibly the very same researchers, however, as directors of their respective departments or even institutions, would play important roles in designing 'open labs' to fascinate pupils and invite them to choose a career in science. Currently, in the Austrian as well as in other European contexts, these open labs are only a small part of a burgeoning culture of public initiatives created to interest young people in choosing science as a career by producing glossy brochures about science or by offering summer internships in laboratories. However, the image of science presented in these brochures, or in the 'open lab' strongly resembles the one criticized by the researchers above. Here, science is also portrayed as fascinating and colourful; and of course the 'open lab'-experiments may be completed within a few hours, and are successful by default – in order not to 'bore' pupils with the exigencies of actual lab work. When these pupils decide to go into science they will probably realise quickly how different the reality of research actually is.

In this section, we have tried to sketch the deeply ambivalent relationship between media representations of scientific practice, scientists' self-perception of this very practice, and the medialised representations of their own practice that scientists produce in different contexts. In a nutshell, our argument is that consciously or uncon-

sciously, scientists re-produce the very same things they criticize as misleading representations in the media when they produce their own medialised accounts of their practice. This may be at least part of the reason why most of the life scientists that we talked to saw dealing with the media and engaging in medialising their own work as deeply troubling, despite the fact that they also saw it as 'part of the game' of being a successful scientist today. However, also in line with this ambivalence, playing this game too successfully was often also seen as some form of treason, such as in the frequently expressed opinion that highly visible scientists in the media were actually rather mediocre, and engage in media activities to compensate for their lack of scientific skills.

> *And often there's the argument, I always see that guy on TV, he must be a pretty good scientist. Even though he's doing some kind of crap, and just able to sell himself well. Of course, one doesn't foster one's own reputation by doing that. (project manager, female)*

## Tacit Governance Effects of the Medialisation of Science

Most life scientists we talked to strongly objected to the idea that the media in any way impinges on how they do their research. In their argument, media work is boundary work done on the front stage, while the backstage activities of actual research remains untouched by media logics and rationales. Already in the preceding sections, we have argued that this distinction only holds rhetorically, and that medialised ways of thinking and presenting their work have become deeply entrenched in research cultures and practices at least in the life sciences, but most likely in research more generally. In this section, we will discuss two issues for which the tacit governance effects of the medialisation of science are particularly strong: (1) the development of research fields, in our case in the life sciences in Austria and (2) the career imaginations and decisions of young scientists.

### The Impact of Media and Societal Framings on the Development of Research Fields in the Austrian Life Sciences

The Austrian media coverage of the life sciences is highly polarised. After some initially more heated discussions about red biotechnology in the 1990s, today the coverage of medical biotechnology and related life science research is uncontroversial, in comparison to other countries. Much of the reporting buys into the "economy of promises" (Felt, Wynne et. al 2007) outlined earlier and reports breakthroughs together with their projected social benefits. For green biotechnology, nearly the reverse is true. From the 1990s onwards, any agricultural or food-related use of biotechnology has been deeply controversial, with media coverage and especially public opinion being predominantly negative. There were intense protests against field experiments involving genetically modified plants in the 1990s, as well as a very successful petition to parliament in 1997 – whose central slogans were "No food from the gene laboratory" and "No field trials involving genetically modified organisms". Today, the slogan "gene-free Austria" has permeated deep into everyday culture, and the label "gene-technology free" may be found on many agricultural products in every supermarket.

Most life science researchers both from the red and green field are very critical of this public debate, in particular because it renders "genome researcher" one of the least popular lines of work to mention in a pub or any other informal conversation. Beyond this annoyance, most scientists working in red areas of the life sciences felt mostly untouched by this debate. For people doing research on plants however, it tacitly governs how they think about, how they describe and what they (can) do in their research.

When asked about the direct impact of the 1997 petition on research in this field, senior researchers in plant genomics stressed that this public debate has *"at the very least prevented [this kind of] biotechnology to develop more strongly" (lab leader, male*). In the wake of the protests against field trials, institutions stopped entire lines of research, and even partially dissolved the research groups working on these topics. Today, green biotechnology research in Austria is mostly basic research, and hardly ever dares to rhetorically or actually venture beyond the confined and protected spaces of its laboratories.

But even these basic researchers would argue that Austrian public opinion and discussion still influences and impedes their work. First, getting legal clearance to do even extremely limited field experiments is extremely difficult, especially in comparison to the regulations for the animal experiments that affect researchers working in medical fields. Consider the following quote by a female group leader: *"What an effort, if you want to plant 20 transgenic maize plants, unbelievable, only because we investigate soil bacteria."* Second, in relation to the "economy of promises" that seems so crucial for acquiring funding, plant researchers clearly feel at disadvantage in relation to their colleagues working in the medical domain. Making promises about future applications is seen as pointless, if not dangerous, in a societal context which clearly rejects these applications, however well argued they may be. This deprives an entire research field of one of the most crucial rhetorical resources in the tough competition for institutional funds and grant money.

> *I simply can't argue on the basis of the potential applications of these things, because there is no political support for these applications here. That means we can't do what the basic researchers in the medical field do, which is claim that they have a therapy for XY in five years time. (lab leader, female)*

As this senior researcher goes on to argue, the negative societal image of the field is not only an issue in acquiring financial resources, but it also impedes the social re-production of the field, because it renders it a less attractive career choice for young scientists. Also for the purpose of recruiting good students, the ability to offer possible societal applications is seen as central on the one hand, and on the other hand students are seen as more likely to choose a field they can relate to based on their prior experiences. As public discussion about green biotechnology is predominantly negative, most life science students lack these experiences.

> *Of course, if I can promise my students that they will work on the problem of lung cancer in my lab, […], then that's of course a challenge. If I say it's about raising the salt resistance of plants, then that's far more removed from their personal experiences in the first place. (lab leader, female)*

Finally, press-packaging is a more difficult activity for 'green' life scientists in the Austrian context, not only because they cannot mobilise certain rhetorical resources, but also because they constantly need to avoid sensitive issues and buzzwords when writing or talking about their research. However, not talking about their research to the media is also not an option, because institutions require their researchers to issue press releases and to engage in media activities. Hence, things sometimes go wrong, such as when a project that was using genomic methods to study root development in a common tree in Austria issued a press release and was suddenly attacked for genetically altering the very same tree. *"And then of course I'm at a consortium meeting, and am being attacked for the way we communicate. But the initial press release didn't say that at all." (lab leader, female)*

Hence, whoever has a choice in the Austrian life sciences would rather not touch any topics related to plant genomics. In this respect, „white" biotechnology, life science research on micro-organisms, is an interesting case, because there is no public discussion on it, and because it can potentially relate to the rhetorical domains of both medical and agricultural uses. Not unexpectedly, the researchers we talked to in this field painstakingly sought to avoid any visual or rhetoric reference to agricultural genomics in their arguments.

As we have shown, media framings govern, at least indirectly, the development of research fields in the Austrian life sciences. Due to the controversial public framing, life scientists working on plants describe themselves as being at a disadvantage in relation to their colleagues working in the medical field, which receives very positive societal and media attention. This disadvantage does not only apply to direct contact with the media or societal actors, but can also be seen in the limited repertoire of the arguments they can deploy when applying for funding and also in the difficulty of attracting prospective students.

## On Becoming a Scientist— Media Images and the Career Decisions of Young Scientists

In Austria as in other European contexts, recent years have seen a considerable rise in science communication activities targeted at young people. Against the background of a dense policy discourse lamenting the fact that too few pupils choose lines of study and careers in sciences and engineering, there is a flurry of classical media coverage, brochures, videos and initiatives aimed at drawing young people into science. In the preceding section, we have briefly commented on how "open labs" and other related activities convey a misleading idea of actual scientific practice. Similarly, the glossy brochures, videos and websites produced in the framework of public communication activities may be criticised as favouring some elements of research perceived as attractive, while other issues that may be just as crucial for deciding about future careers are omitted. In our focus groups and interviews, young life science researchers retrospectively comment that they had not been aware of some crucial aspects of a career in the life sciences until well into their postgraduate work. These brochures and activities do not talk about the ever-increasing temporalisation of academic employment and careers, about the intense competition for the few more long-term positions, or about the downsides of the mobility required until well into the post-doc phase[xii]. In our fieldwork, particularly researchers at the post-doc level were very criti-

cal about the fact that even most undergraduate students are not aware of these issues when choosing a PhD, let alone pupils who choose a certain line of study. Consider the following quote from a post-doc focus group: "*I know a lot of people, students, […], that say, they had a totally different perception of what it's like to be a scientist. And if they had known, they would have done something else." (post-doc, female)*

However, medialised representations of science, scientists and scientific careers do not only play a key role in tacitly governing young people's decisions about a career in science. They also play an important role in determining how PhD-students and early post-docs think and talk about academic careers and their own potential future lives in the life sciences. The reason for this is a strong uncertainty about the rules which govern current academic careers, and in particular, which career pathways (if any) exist beyond the 'excellence career', which they know will be possible only for very few. In talking about careers and lives in science, PhD-students and post-docs refer to the medialised representations of scientists available to them, which are nicely characterised by a senior scientist commenting on how these representations have changed from the time when he was a junior scientist:

> *Now there are glossy brochures in which scientists are portrayed. And they are portrayed in a completely different way, they are like pop stars partially, so they have a completely different character than the role models I saw in my youth. (lab leader, male)*

Media representations of scientific careers, both in classical media as well as in the career brochures issued by scientific institutions or funding agencies, tend to depict those „stars" who "have made it", who have won some prestigious prize or achieved a professorship in their mid-thirties. Hence, the biographies told in these contexts are always successful ones, and they are often told to stress particular values perceived as crucial, such as mobility, early independence, or a high publication output. While younger students in particular may see these figures as role models, comparing one's own track record with these accounts becomes a more and more frightening exercise for researchers moving into the post-doc phase. For many in this career stage, these medialised representations embody values and expectations they can or do not want to fulfil anymore.

Our analytic point in writing about this is that the general homogeneity of the pictures of successful researchers serves a normative function by significantly curtailing how junior researchers talk and think about their careers. Certain desires, such as long term positions that do not first require winning a Nobel Prize, or professional biographies which may be better reconciled with the wish of having a stable relationship or even a family, or to continue working in the lab instead of becoming the grant-writing group leader, are perceived as illegitimate from the start under these discursive conditions – and hence our interviewees at times hardly dared to voice them, or implicitly thought that doing so would actually label them as potential drop-outs not worthy of doing good science. Other role models and stories beyond the excellence discourse are mostly missing, and hence junior scientists quite frequently talked about asking themselves, *"Where do the post-docs go, then? So, not everybody can be a professor, but what happens to all the post-docs?" (PhD student, female)*

Medialised representations both in the classical media as well as from within science thus play a crucial role in, and hence tacitly also govern how junior scientists think and decide about their careers. Beyond this, an issue of high analytic salience is that these medialised representations may only achieve tacit governing powers because junior researchers employ them as a form of observing science and its dynamics, which they obviously cannot make sense of from within and in the context of their everyday experiences. The lack of alternative accounts lends the 'standard excellence biography' a particular kind of normative power.

## Discussion and Conclusion

The main aim of this article has been to analyse how medialisation affects research cultures and practices, specifically in the life sciences in Austria. Here, we have understood medialisation in the context of an increasing co-evolution of science and society, and thus as a set of processes in which scientific and societal rationales are increasingly intertwined. Hence, medialisation refers to an ever-increasing coverage of science in the media, as well as to the growing number of contexts in which scientists themselves (or their PR managers) present and re-present their work to the public. Our empirical argument shows that the practices of both the media and scientists share the same logics and forms of representing science, because scientists often tacitly reproduce their perception of media logics as they do 'media work', be it in writing press releases or in doing public engagement in an 'open lab'.

One of our main theoretical arguments in this paper is that an analysis of medialisation which takes the idea of co-evolution seriously should not only consider these new forms of representing science at the science/society interface, but also needs to pay attention to how medialisation actually affects science and society as they co-evolve. In merely studying changes in the public images of science, most work on science in the media focuses exclusively on one side of this co-evolutionary process. Tacitly this approach assumes a linear communication model, in which science is represented to the public, but in which scientists' basic self-understanding as well as the epistemic core of knowledge production remain largely untouched.

Using the concept of epistemic living spaces (Felt 2009), we have attempted to show that the feedback of media representations into science, as well as the very practices researchers engage in to medialise their research, influence and change research cultures and practices, along with how the researchers understand what living in and doing research means to them. Studying these processes is of particular importance, as we assume that the ways in which researchers perceive and inhabit their epistemic living spaces is deeply intertwined with the kinds of knowledge they will produce. Hence, the progressive medialisation of science can be expected to shift both the social and symbolic orders in which research is done, as well as its epistemic orientation. Concretely, we would like to highlight three processes in which this re-ordering of epistemic living spaces takes place.

First, medialisation touches upon the symbolic dimension of researchers' epistemic living spaces. Our results point to a convergence of the ways researchers describe and contextualise their own work and how it is framed by the media. Here, being able to make promises about the future societal relevance of one's own research

plays a crucial role in doing boundary work. In an "economy of promises" these arguments become a central currency in competing for attention in the media, but also in research funding and within science itself. This creates new kinds of images of what doing science and being a scientist means, both in terms of the aims of scientists' epistemic pursuits, as well as in terms of the skills and virtues expected from the scientist as a person. Whether they embrace or reject these new images, researchers have to position themselves with respect to them in their orientation work and when developing their own professional identity. This may have a particularly strong impact on junior researchers, for whom this game of 'press-packaging promises' has become part and parcel of their socialisation into science as they struggle to survive in the project-centred and temporalised logics of current careers in research.

Second, relating again to the symbolic as well as the social dimension of epistemic living spaces, the researchers themselves, and junior researchers in particular, increasingly use media representations of science in orientation work, as a method for observing and making sense of science itself. The junior researchers we talked to in our fieldwork found it particularly hard to make sense of the rationales and dynamics of science, be they connected to careers or epistemic developments, beyond their own very personal and narrow experiences. Also, they lacked any institutionalised spaces of reflexivity within science, which might foster discussions around these questions or in which they may discuss them with their peers. Hence for them, media was a resource for making the meaning of research visible and understandable. In doing so, they of course ran the risk of taking the representation as a substitute for reality. For example, the fact that the media mostly portrays highly successful scientists, whose story complies with all of the normative requirements seen as crucial for scientific careers today, was often taken as an indicator that only these kinds of scientists could successfully remain in science, and hence could trigger processes of self-exclusion. The way media is used as means of observing science thus transforms what being in research means; it interferes with established value systems, forces their reinterpretation, and also creates anxiety. Yet there is also an interesting absence: The media is seen as merely representing science, not as a possible space for re-imaging it in creative and dynamic ways (Felt 2000).

Third, and in close relation to the first two points, medialisation influences how researchers perceive and act towards the temporal dimension of their epistemic living spaces. As we have described, medialised ways of re-presenting and thinking about one's own research lead to a shrunken perception of its temporalities. On the one hand processes and aims which may take very long in actuality are portrayed as imminent and short in media logics. As we have shown, this creates considerable tensions in researchers' self-perception of their practices. On the other hand, medialisation also may impinge on researchers' choice of topics, as epistemic puzzles that might deliver on relevant promises in short time frames could receive preference over more long-term topics.

All arguments we have made so far point to the conclusion that processes of medialisation are an important force tacitly governing contemporary research. Doing research on medialisation not only means analysing the expansion in the number and places where accounts of research are delivered, but it means, most of all, that we need to consider the effects of these expansions on science itself and its relations to

society. Change caused by medialisation needs to be conceptualised as both triggered from the outside by the increasing media representations of science as well as performed from within through the regular rehearsal of public expectations of both scientists and science, its products and its relations to society. Hence medialisation takes place as much from within science as it is imposed by external actors.

However, the governance effects of medialisation practices are hardly ever considered by the central actors involved. In effect, medialised processes and events play an important role in the governance of science. However the respective actors associated with them, be they journalists, university PR-professionals or scientists neither assume nor are asked to take any responsibility for the consequences of their actions. In talking about science/society relations, Nowotny et al. (2001: 259-260) stress that "in an age of intense contextualisation, images of science need to have a strong 'reality content', that is, be closer to actual practices and their rapid changes than the traditional and timeless images." Thus "the gap between images of science and the actual practices should not become too wide". (ibid.) Our account of the effects of medialisation suggests that this normative statement is not only true for societal perceptions of science, but all the more relevant for the epistemic and social development of science itself.

## Bibliography

Etzkowitz, H. and L. Leydesdorff (2000) The dynamics of innovation: From national systems and "mode 2" to a triple helix of university-industry-government relations. *Research Policy,* 29 (2), 109-123.

Felt, U. (2000) Why should the public "understand" science? A historical perspective on aspects of the public understanding of science. In Dierkes, M. and C. v. Grote. *Between understanding and trust. The public, science and technology*. Amsterdam: Harwood Academic Publishers, 7-38.

Felt, U. (2009) Knowing and living in academic research. In Felt, U. *Knowing and living in academic research: Convergence and heterogeneities in European research cultures*. Prague: Institute of Sociology of the Academy of Sciences of the Czech Republic, 17-39.

Felt, U. and M. Fochler (2010) Machineries for making publics. Inscribing and de-scribing publics in public engagement. *Minerva,* 48 (3), 219-238.

Felt, U., Fochler, M. and R. Müller (2010a) Career and/or biography? Essential tensions in knowing and living in contemporary academic research. *Manuscript*.

Felt, U., Sigl, L. and V. Wöhrer (2010b) Multiple ways of being together alone – A comparative analysis of collective and individual dimensions of academic research in two epistemic fields. Paper submitted to *Science and Public Policy*.

Felt, U. and T. Stöckelová (2009) Modes of ordering and boundaries that matter in academic knowledge production. In Felt, U. *Knowing and living in academic research: Convergence and heterogeneities in European research cultures*. Prague: Institute of Sociology of the Academy of Sciences of the Czech Republic, 41-126.

Felt, U., B. Wynne et al. (2007) Taking European knowledge society seriously. Report to the Expert Group on Science and Governance to the Science. Economy and Society Directorate, Directorate-General for Research. European Commission. Brussels.

Garforth, L. and A. Cervinková (2009) Times and trajectories in academic knowledge production. In Felt, U. *Knowing and living in academic research: Convergence and heterogeneities in European research cultures*. Prague: Institute of Sociology of the Academy of Sciences of the Czech Republic, 129–225.

Hakala, J. (2009) Socialization of junior researchers in new academic research environments: two case studies from Finland. *Studies in Higher Education,* 34 (5), 501-516.

Jasanoff, S. (2004) *States of knowledge. The Co-Production of science and the social order*. London: Routledge.

Knorr-Cetina, K. (1999) *Epistemic cultures. How the sciences make knowledge*. Cambridge/London: Harvard University Press.

LaFollette, M. C. (1990) *Making science our own. Public images of science 1910 – 1955*. Chicago/London: University of Chicago Press.

Nelkin, D. (1994) *Selling science: How the press covers science and technology*. New York: W. H. Freeman.

Nowotny, H., Scott, P. and M. Gibbons (2001) *Re-thinking science. Knowledge and the public in an age of uncertainty*. Cambridge: Polity Press.

Peters, H. P. et al. (2008) Science Communication: Interactions with the mass media. *Science*, 321 (5886), 204-205.

Power, M. (1997) *The audit society. Rituals of verification*. Oxford: Oxford University Press.

Rödder, S. (2009) Reassessing the concept of a medialisation of science. A story from the 'book of life'. *Public Understanding of Science*, 18 (4), 452-463.

Shapin, S. (2008) *The scientific life. A moral history of a late modern vocation*. Chicago: University of Chicago Press.

Strathern, M. (2000) *Audit cultures: Anthropological studies in audit, ethics and the academy*. London: Routledge.

Weingart, P. (1998) Science and the media. *Research Policy*, 27 (9), 869–879.

Ylijoki, O.-H. (2005) Academic nostalgia. A narrative approach to academic work. *Human Relations*, 58 (5), 555–576.

Ylijoki, O.-H. and H. Mäntylä (2003) Conflicting time perspectives in academic work. *Time & Society*, 12 (1), 55-78.

# Endnotes

[i] This paper is based on empirical work done in several research projects – for details please see the section on material and methods. The authors acknowledge the contribution of all colleagues involved in these projects, and would like to thank the editors and reviewers of this volume as well as the participants of the yearbook conference in Bielefeld for their comments and suggestions. We are also grateful to Martha Kenney for the final language editing.

[ii] Even though this supposed globality may often turn out to be a circulation in a sphere comprising Europe and North America.

[iii] Funded by the Austrian Ministry of Research. http://sciencestudies.univie.ac.at/research/completed-projects/scienceweek-2001/?L=2

[iv] Funded by the Austrian ministry of research, the ministry of traffic, innovation and technology, and the Austrian council for research and technological development. http://sciencestudies.univie.ac.at/research/completed-projects/scienceweek-2002/?L=2

[v] Funded by the Austrian genome research programme GEN-AU. http://sciencestudies.univie.ac.at/index.php?id=57585&L=2

[vi] Funded by the Austrian genome research programme GEN-AU as an ELSA project. http://sciencestudies.univie.ac.at/index.php?id=57575&L=2.

[vii] Funded by the European Commission, FP6. http://www.knowing.soc.cas.cz/.

[viii] Funded by the Austrian genome research programme GEN-AU as an ELSA project. http://sciencestudies.univie.ac.at/research/living-changes-in-the-life-sciences/?L=2

[ix] These two to three hour qualitative interviews were structured by different question blocks in which the life scientists we interviewed talked about their personal professional development, about the epistemic directions of their work and how they have changed over time, and the institutional contexts they have worked in. Toward the end of the interview they were asked to give their impression of a series of key terms and catchwords used currently in academia, such as mobility or excellence. During the interview, the interviewer invited the interlocutor to add a reflexive dimension to his or her narration, either by asking him/her to relate the different blocks of the interview – such as epistemic orientations to institutional framings, and/or by asking him/her to compare his/her story to the stories of others, e.g. to prior generations. The interviewer/interviewee "peer to peer"-relationship differed from most other types of qualitative research, as both conversation partners were conceptualized as different types of experts on the issue at hand, as well as colleagues affected by different issues touched upon in the interview (e.g. the pervasiveness of audit logics), albeit in very different disciplinary contexts. This peer-to-peer relation allowed for building trust and to explore the discussed issues in considerable depth, but it also needed to be reflected in analyzing the interviews, in particular with regard to meanings taken for granted by both interviewer and interviewee.

[x] In a related rationale, study programmes in the life sciences at Austrian universities have offered courses and trainings in science communication.

[xi] Depending on the topical structure of public discussions, making these kinds of arguments can be harder for some fields than for others. See also section 4.1 of this paper. Further our argument resonates with the findings reported by Peters, this volume.

[xii] See Felt et al. 2010a for a more detailed discussion of young life scientists' perceptions of academic careers.