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## **The Reality of Experts and the Imagined Lay Person**

Published in: *Acta Sociologica*, Vol. 46, no. 2, 2003, 150-165

Once scholars start to think about knowledge society, at one point in their analysis they have to leave the realms of purely academic interactions among scientists in the production of knowledge. Conceptions of lay persons then come to the fore.

Unfortunately, these are so far less subject to scholarly scrutiny. The focus is usually on knowledge, or to be more precise, scientific knowledge, with an odd confidence that this knowledge will do in the context of application, once it has been accomplished. Lay people are of interest for the social sciences either as a public that needs and wants to be introduced to science proper. This is the approach in the traditional literature on Public Understanding of Science (PUS). Or, in a gesture of critique of PUS, the life world and thought-styles of the lay people themselves are put into focus. However both of these views consider “real” flesh and blood lay people as the main objectives of their analysis.

Let us begin our argument with an undemanding observation: In a knowledge society experts are to provide expertise, i.e. scientifically sound information about the facts, recommendations on feasible solutions, and guidance in a world that is ever more entangled with technologies. This implies a gradual shift from a scientific world to a shared world that people live in. Moreover, it entails that the experts have conceptions of the persons they should assist in their coping with the world. Conversely, between

experts and lay persons there is a division of labour that is based on an epistemic asymmetry: The experts are supposed to be knowledgeable and the lay persons are ignorant, accordingly.

Our aim is to show how the above observation about expertise that seems so undemanding at first glance turns out to be a thoroughly demanding setting for the experts after close inspection. The problem that we address in this paper can be summarised as follows: The epistemic divide makes experts and lay persons live in different worlds regarding what they think this very world is. If the experts want to assist lay people in their actions then such differences have to be taken notice of by the experts. They also have to estimate what the others may think about what has a bearing on the interaction and what not. The conceptions of the lay persons that the experts have, therefore, affect how feasible interactions are framed. Consequently, expertise has to cope with two conflicts: The experts have to preserve the epistemic asymmetry, which is the basis for the epistemic division of labour. Still, they have to form their advice in a way that the lay persons can grasp and use in their own world. Thus, a feasible advice has to bridge the epistemic gap between experts and lay persons. In order to successfully bridge this gap experts need to establish credibility and trust, which we are going to analyse in terms of Hirschman's classification exit, voice and loyalty (Hirschman 1970). Lay persons may select among these reaction, and these reactions in turn are anticipated by the experts.

In this article we focus on the experts. We analyse their conceptions of lay people, which we call "imagined lay persons". „Imagined lay persons“ here are concepts of lay people as they are manifest in the products and actions of experts, which we came across in our case studies on the production of socially robust knowledge. Imagined lay persons need not be explicit. Nor need they have any resemblance with real lay

people. Rather, imagined lay persons are functional constructs in expertise. In the remainder of the article we shall use the acronym “ILP” to refer to these imagined lay persons.

The article starts with a discussion of some of the current diagnosis of the relation between science and the public. Then we illustrate conceptualisations of lay people by reference to what is known as public understanding of science (PUS). The second part is devoted to fully explore the notion of ILP. We rely on four different case studies, all situated at the borders between science and other fields, and we introduce factors that structure ILP: The function of expertise as an epistemic object and media of interaction, the epistemic and ontological constraints for ILP’s interactions framed by the experts, and the way in which ILPs are addressed and assembled.

### **Conceptions of lay persons**

The discussions around the knowledge society have focused among other things on the relation between science and its publics. Related to these discussions the focus of science studies has shifted from the context of discovery of scientific knowledge to the context of application. Among other authors such as Nico Stehr (see his suggestive outline in Stehr 1994) this shift was analysed by Gibbons et al. (1994) and Nowotny et al. (2001). These scholars try to shed light on the collaboration between scientists, professionals and lay people by a closer look at the forms of division of labour and teamwork in knowledge production.

### **Knowledge production beyond academia**

In *The New Production of Knowledge* Gibbons et al. conceive of lay persons – in general “those that have been seen as traditionally outside of the scientific and technological system” – as now “active agents in the definition and solution of

problems as well as in the evaluation of performance” (1994: 7). They recognise “the need for greater social accountability” and claim “that individuals themselves cannot function effectively without reflecting – trying to operate from the standpoint of – all actors involved.”(ibidem). In *Re-Thinking Science* Nowotny et al. (2001) hold, that “individual scientists are now much freer to co-operate with individuals from other groups and to transgress established institutional and group boundaries”, which is due to responses to the “ubiquitous ‘user’” (Nowotny et al. 2001: 103). They claim that “[p]utting the people back into science” has to be accomplished in a “socially robust” manner (2001: 197).

This turns out far more difficult for the accountable scientists when the principal may not interact directly with the expert. As we shall explain below in more detail, what the scientists rely on in such a type of research<sup>1</sup> that is carried out for the lay person, is a more or less made up conception of the kind of lay person they consider as their principal. Note that this implies that the scientists may make up the voices of those they so carefully aspire to follow. The lay person as a conception in that design process is as much an artefact of the knowledge production as is the more technical part of the solution proposed (on this topic see also: Woolgar 1991, or Akrich 1995 and Callon 1995). Besides, the widespread reference to the supposed user has been criticised as an imaginary creature within research, especially where programmes were intended to bring the lay person as potential user into science (see Rip & Sclove 2000).

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<sup>1</sup> Mediated research in this text means research that is performed through medias of interaction on its way to the users. See the chapter „media of interaction“ below for a more in-depth discussion of this issue.

## **The place of people in contextualised knowledge production**

Nowotny et al. (2001: 247) examine “the public space in which ‘science meets the public’, and in which the public ‘speaks back’ to science”, and they describe this public space as a new form of *agora*. In this space the potent principal, who commissions experts to provide scientific expertise, manage to engage directly with the scientists. On the other hand, those who only are being considered depend upon the imagination of the scientists for the articulation of their demands. Accordingly, it is not the general public that “‘speaks back’ to science” directly. The well educated and socially potent persons may not exhaust all the features of lay persons that one should think of, when one wants to produce socially robust knowledge for the context of application. Consequently, if scientists are to pay more attention to the people in the *agora*, they need to know who their peoples are. “Greater attention to what the people ‘really’ need and want presupposes the ability and the political will to act accordingly.” (Nowotny et al. 2001: 204). Yet, simply to have the ability and the will to do so on the part of the experts will not suffice once the communication is not granted by direct exchange.

The experts are faced with a structural problem in the interaction with the lay persons: They have to integrate the lay persons and users standpoint without having access to the ‘real exemplars’. Where there is no direct face-to-face contact with the lay persons as principals, the interaction becomes dependent upon the way people are conceptualised in the knowledge produced by the scientists.

The place of people in our knowledge becomes the cornerstone of mediated interactions with the lay persons, once scientists cannot rely on face-to-face communications only, but when they need to be guided by conceptions of lay persons. Nowotny (1999: 255-260) argues that one has to consider what she calls the “the

place of people in our knowledge”. But the *agora* of conceptualised persons works different from face-to-face communication. Accordingly Nowotny asks (1999: 256): “Do people appear as passive subjects or as active agents? Are they represented at the micro-level or the macro-level?” Such questions allow to analyse the voices of the lay persons that do not enter an *agora* as real individuals but as conceptions in the mind of the scientists.

It is one of our basic assumptions that the interactions of experts and lay persons are structured by the place ascribed to the latter in the models and theories of the experts. Such a place is delineated by the competences credited to the lay actors, which are not only epistemic but also, for instance, economical or political. In research for the context of application it is a fundamental requirement to anticipate possible motives that lay people may express to contest and challenge the experts’ solutions. As we will show later, such anticipation does not only bring the people into science but the lines of arguments are demarcated by means of the conceptions of lay persons and the competences that are ascribed to them. Moreover, the possible means are outlined on which the lay persons may dispute the experts’ advice.

When the experts imagine the position of the lay persons in their expertise, they settle the ILPs competences. The experts are not only the inventor of technical solutions and organisational procedures they are also the originator of the ILPs. This role of the expert as lay maker is often ignored, either because the experts rely on the seemingly natural curiosity of the lay persons, or because it is not the predominant constituent of the scientific expertise, when the experts rely on common sense stereotypes of the lay persons.

## **Lay persons in the public understanding of science**

Until now, it is in research programmes on the public understanding of science where functions and roles of lay person were critically discussed. The discussion concentrated on the following three issues: The concept of the "lay person" as curious by nature, the epistemic authority of the experts and third, the dependence of the experts' credibility on the lay persons' trust.

According to the standard model the acquisition of scientific knowledge is driven by curiosity, when the public is confronted with "a world of learning about which they would like to know more." (Durant et al. 1989: 11). The standard model was soon criticised by Brian Wynne as a deficit model as to the competences to deal with science, which were ascribed to the lay persons (Wynne 1991). As Mike Michael (1996: 107) put it: "The fact that these approaches [to the public understanding of science] ignore issues concerning the reflexivity and identity of lay people, suggests their underpinning model of the individual is fundamentally mechanistic." This is to say, the problem of putting scientific advice into operation in the context of application is considered as directed in just one way from knowledgeable science to ignorance.

Concerning the social aspects of interaction with science these approaches are not only highly simplistic and assume a sort of 'tabula rasa'-mind with the lay person. Moreover they reveal the hegemonic assumptions of the "dominant view of popularization" – as Stephen Hilgartner put it, which "grants scientists broad authority to determine which simplifications are 'appropriate'" (Hilgartner 1990: 520). This view is still predominant among scientists and experts and makes the epistemic division of labour between scientists and lay persons appear almost natural. It stimulates many conceptions of lay persons that experts assume in their interactions

with these epistemic aliens. They hope to surmount the epistemic differences by alluding to the sheer natural or logical power of their arguments as well as the practicality of their artefacts.

The picture is more enriched, once other levels of interaction between lay persons and science come into view. Brian Wynne (1991: 120) distinguishes “three levels of public understanding of science: its intellectual contents, its research methods, and its organizational forms of ownership and control.” The dominant view concentrates on the first level and separates the other two levels as being obviously just a necessary condition of good science, which is not, though, to be shared or discussed with the general public. Against such a restricted conception of the lay person and her competences, Wynne calls attention to the evidence that “the third level may be as important as the first. Indeed, given that [...] the social basis of trust and credibility is a crucial (yet largely neglected) question affecting public uptake of science, neglect of any public discussion of the third factor undermines attempts to improve the other two. One could say that what is often treated as public misunderstanding of science (in the first sense) may actually be public understanding of science (in the third sense)” (ibidem). In our case studies we found evidence that the experts try to delimit the discussion on the first level, when they inform about the scientific findings. Here their epistemic authority is strong because the reality that is dealt with is scientific. Conversely, they seal their advice from critique on the other two levels, when they have to provide standardised procedures or classifications that have an impact on social interactions in a world that is shared.

## Competence, ignorance and division of labour

The ignorance of the general public vis-à-vis many scientific facts usually strengthens the expert authority on scientific issues. Yet, careful analysis of such ignorance of lay persons shows that “discourses of ignorance not only constitute a means of understanding and explaining one’s lack of knowledge, [but that] they also signify and reflect the perceived social relations between science and lay person, between self and expert.” (Michael 1996: 112). If one takes into account the aspects of social relations that are shaped by competence and ignorance one finds that “people are defining domains of authority for different kinds of knowledge in relation to themselves, hence articulating (at least in part) social identity.” (Michael 1996: 114). Ignorance is then a mark of the authority of the lay person who draws the boundaries of knowledge for her own context of application.

Thus, only when reducing interactions on the very scientific content, ignorance signals incompetence. In spite of that, on the level of social co-operation actively chosen “‘ignorance’ or deficit is no longer a state, but a positive choice.” (Michael 1996: 120). Mike Michael remarks “that ‘ignorance’, as a corollary of the division of labour, implies a social and practical functionality and a collaborative relationship with science.” (ibidem).<sup>2</sup> Hence we are back in the *agora*. But now knowledge is not only contested but also actively ignored because it is considered not to be the business of the lay person to know about all these scientific facts. For such an audience a

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<sup>2</sup> Division of labour is one of three status in Michaels text, which may explain ignorance. The other two are: Mental constitution and deliberate choice. The later gives rise to a political or moral challenge of the experts authority. See the second part of the paper.

conception of the lay person as curious and eager to know all about science – as the deficit model assumes - is simply inadequate. Ignorance (which defies the deficit model) should be explained not only by the non-scientific mind or as an indication of the public's lack of interest, but it may also be due to a co-operative attitude with science (see the explanatory variables in table 5.1 in Michael 1996: 122)<sup>3</sup>. In our case studies we encountered the corresponding attempt on the expert's side to anticipate such reactions of the lay persons, which implied that the experts take into account other competences of the lay people apart of their more or less having a scientific mind.

Such further competences are mostly due to the social or even legal organisation of the people who get in touch with knowledge production that stems either directly from the sciences or is built into technological innovations. The social position and the social power that, for instance, consumers or producers can draw upon in a functionally differentiated society carries some epistemological weight. Such social arrangements shape what Boltanski and Thévenot (1999: 361) call the “*régime of justification*” and the corresponding “*régime of justice*”. Such régimes do change what is epistemologically relevant for policy decisions concerning science and technology in general, as well as communal evaluations of environmental development or individual choice confronted with technological products in particular. In our research we recognised that the conceptions of lay persons which scientists and experts adopt

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<sup>3</sup> We do not claim that such curious public does not exist. Still such a public is not curious by nature but exist only in very specific settings. Typically the audience involves itself voluntarily in these settings and is ready to accept a highly didactic, asymmetric setup.

are reflecting such regimes. Moreover the expertise is sometimes constructed in a way that diminishes the power of the lay persons to dispute experts advice.

### **Experts, controversy and imagined lay people**

Let us summarise the main findings from the above survey of some of the literature on the interaction of experts with lay persons: First, experts who design solutions for the context of application have to include the concerned lay persons. Second, the lay persons may be included in a face-to-face interaction as well as on a less material level as concepts of the user. Third, the experts include the lay persons by a (often implicit) conception of the lay person they consider representative. We designate these conceptions as ILP. Fourth, the standard model of the ILP is that of the ignorant lay person that is curious and eager to know all about science. This so-called deficit model of the ILP concentrates on the scientific content of knowledge and precludes the social context of the interaction with science and technology.

It should be clear by now that the ILP is not a sociologically comprehensive representation of lay people but rather an action in the knowledge production which ascribes epistemic and functional competences to lay persons. As artefacts of such action, the ILP is as much instrumental for the solution as the apparatus or scientific advice. Therefore, the qualities of our ILPs are purely functional, not essential. This approach allows getting to a point of abstraction that is instructive concerning the very constitution of *imagined lay* persons in relation to normal persons.

The remainder of this article will be devoted to explore different aspects of the ILP. We will discuss these aspects by using the findings of our four case studies. After a short outline of these case studies, we discuss several variables influencing the design of the ILP: Expertise as an epistemic object and media of interaction, the framing of

constraints for ILP's interactions by the experts, and whether ILPs are imagined as individuals or rather as collectives.

Our case studies cover a broad range of fields: from the regulation of genetically modified organisms over science centres to different cases of environmental expertise, once in private firms and once in interdisciplinary university research. However, they do not only differ in their very content but also in their level of controversy. Some take place in a rather didactic atmosphere of learning, others in a hotly debated field. Hence the case studies can be situated on a continuum of different levels of perceived controversy. Since ILPs are functional for the experts in order to prevent or deal with controversies, the perceived level of controversy is central for our case studies.

Experts are often aware of which competences are functionally ascribed to the lay persons in order to anticipate possible controversy. When they aim at anticipating the kind of possible controversies, the lay persons and their competences as imagined by the experts become part and parcel of scientific expertise. In the production of knowledge the corresponding precautions lead to an integrated shielding against potential clashes. Such shielding is achieved by letting people entering science tied in a strict arrangement of possible counter arguments and reactions towards scientific advice.

## **The case studies**

The four case studies deal with fields of knowledge production that involve actors outside the realm of academic science. Although we use the case studies in this text in a rather anecdotal way to illustrate our theoretical frame, the categories below were developed based on the empirical findings in the case studies. Our aim is to comprehend the function of the ILP. Methodologically we did not derive the

conceptions of ILPs from the protagonists of our case studies directly by *asking* them of their view on the lay persons they were addressing. Rather we derived this view from interpreting their framing with their writings, the scientific methods they use and the factual constraints they impose on the lay persons. In all the cases we analysed written documents, and interviewed the respective protagonists. In the first and the last case study, the analysis was further enriched through fieldwork.

The first case is a study on the representation of technological and engineering knowledge in science centres or exhibitions situated either within companies or in research institutions. The general purpose of this case study is to analyse the way in which science is conceptualised in such centres and with what technologies and methods it is shown to the public. Here, lay persons are repeatedly present as visitors of the museums. Direct contact with visitors entering the science centres is an important aim of the centres. Although the concept of communication serves to build bridges to the outside world, by doing so the institutions tend to reorganise multiple heterogeneities of scientific objects, social actors and research agendas. The science centres in this case study are not part of ongoing controversies. Their aim is to inform their public and thus establish trust in science. In case of controversial issues, such as nuclear energy research, they try to avoid to mention the controversial aspects. This is succeeded through concentrating on the technical details of research and thus to diverting from the controversial contents.

The next two case studies both treat of environmental issues.

One of them is about large transdisciplinary research programmes in the environmental sciences. The study focuses on the interaction of different disciplines in these programmes and how they interact with an audience outside of science. Lay persons here are any people who form an audience of the several projects of these

programmes. These may be persons from the administration, members of certain professions or a general audience.

We considered for this articles two particular projects:

One of these projects deals with a large project on climate research. Here lay persons were asked to participate in so-called ‘focus-groups’ to enrich and value the scientists’ results with some practical and political context. Lay persons should first learn about the scientific results and then be able to give an informed statement about them.

Unfortunately the lay people were not only interested in the scientific results but in the political opinion of the scientists too. Here, a very complex issue is at stake which is less controversial in terms of science itself but in its potential political consequences. Experts do not want to shield the scientific contents against lay people (because it is assumed to be difficult anyway) but they want to teach the lay people the “right” facts to de-politicise the issue.

The other project deals with a cleanup operation in a village. Here different measures to clean up former waste deposits were developed, among them the use of GMO. The inhabitants of the village were seen as partners and several information presentations were organised. At a certain point, some social scientists should conduct an opinion poll on the degree of scientific knowledge among the public. However, this opinion poll was suppressed by the project leaders arguing that the opinion poll itself would undermine the legitimacy of the project. In this project, controversy should be avoided by including lay people as much as possible into the project. But unfortunately some of the experts feared that a certain way of inclusion, the opinion poll, would raise a controversy itself.

The other case study in the field of environmental issues deals with a project of environmental consultancies. For this paper we consider a project on river

engineering, where an expertise had to be written in order to single out certain parts of a river that should be used for aquatic and ecological improvement. Here, lay persons were the inhabitants of the land surrounding the river, and the problem was that some of the measures would flood the territory thus affecting these persons in their very existence. The experts monetarised the different measures and translated the problem. This is a typical case where a possible controversy would be launched by the expertise itself since its results would lead to a destruction of property.

The last case study deals with the regulation of genetically modified organisms (GMO). Here the general purpose is to analyse processes of regulation and how they are managed between science, politics, law, commerce and the public. Lay persons in this case are primarily potential consumers of genetically modified food (GM food) and from a more remote perspective they are citizens who demand and legitimate the regulation and the policy frame. The lay people are regularly identified as an aggregate, be it through consumers demand (sometimes backed up with opinion-polls) or in ballots. Thus the lay persons constitute an aggregate of systemically assigned competences, which is distinguished from the rather amorphous bundle that constitutes the genuine actions and competences of the real persons. In this last case study controversy is notoriously high including long-term disputes between scientific experts as well as in the political arena.

### **Imagined functionally differentiated lay persons**

A crucial quality of ILPs is, that there are imagined functionally differentiated lay persons. This means that lay persons are rather seldom imagined as actors who have the full range of possible actions at their disposal (being capable of throwing stones, protesting physically, writing to officials, buying products, doing community work,

helping to build a dam and so on). Rather they are inhabitants of a certain functionally differentiated part of society. An ILP usually can only protest or buy products or help building a dam, but not all of these functions together. Thus ILPs have only limited competences. The part of society they inhabit is a very sober abstraction motivated by a particular functional perspective on the abounding real world. For instance, the ILP may be without any expert knowledge about engineering issues whereas in the real world some of the alleged “lay persons” may be trained engineers. Obviously this is due to the fact that ILPs are collectives whose composition is usually not known. The part of society that is inhabited by ILPs is rather a small part of society that is defined along what Niklas Luhmann would define as a subsystem of society with its adherent code or in Pierre Bourdieu’s language: a field. These parts of society may be science, economy, sports, law, politics, religion, and family. Sociologists usually focus on the norms or habitudes governing such fields. Conversely, our aim is to know more about what epistemic competences are assigned to lay persons by the experts and how these epistemic competences relate to other competences the lay persons may hold. This leads to the question how ILPs are turned into functionally differentiated lay people. For this we have to consider two aspects: the *functional sphere* of the lay maker and the *methods and theories* that are used to construct the expertise and the lay person. The functional sphere of the lay maker has to be taken into account, since it may restrict their view on the relevant constituents of the problem. Let us give an example, from our case study on GMO-regulation: A state administrator imagines lay people as carriers of free choice between the two options concerning GM food: to buy or not to buy. The ILP is first of all an economic subject, i.e. the consumer, who is backed up by a political subject, i.e. the lay person as citizen. Both these subjects are carriers of rights and much less an epistemic subject. So the administrator has to provide a

regulation that grants the option of choice between conventional and GM food. But this is not a distinction like the one between apples and pears as there is no well accepted, culturally embedded demarcation between the former. As a result the administrators constitute a difference that makes sense for them and for their ILPs.<sup>4</sup> Accordingly, the epistemic framing of the issue is crucial for the expertise; and since such expertise entails the ILP, it is substantial for the competences allotted to the people. Take again the case of GMO-regulation. The administration in Switzerland – as most such competent agencies – is basically a public health administration that also has to secure the healthiness of food. They stick to medical conceptions of food and people and they adopt a biophysical approach to the world they are to regulate (see Jasanoff 2000). The epistemic frame is therefore restricted to nutrition facts and does not deal with meals and dishes and many further social aspects of food and cooking. Nevertheless this need not be so. The lay-maker may be a person that is able to broaden her constructions and to keep with our case, bureaucrats may conceptualise lay persons as epistemic subjects as well who have knowledge about the constitution of GM food that is not covered by the biophysical approach.<sup>5</sup> The legal frame together

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<sup>4</sup> For the legal aspects see Kohler & Maranta (1999); for an interpretation of the knowledge that strengthens this regulation see Maranta & Pohl (2001).

<sup>5</sup> The consideration of the chain of production, is a point in our case here. For negative labelling (i.e. for labels that claim a product free of genetical modification) the chain of production has become a further criterion (besides the threshold), which reflects that what a food is can not be reduced to the substantial ingredients only. Nevertheless, all these considerations are condensed into a label on the product suitable for economically free choice. There is no arguing about the correct framing

with the professionalisation of the administrators provides the routines based on which the normative and the cognitive complexities are reduced.

We may contrast this view with the example of the environmental professionals where the routines for reduction of complexities are still developing: We can observe that they conceived the lay people primarily as subjects who have to be paid for their land loss. In the case on river engineering studied, it was assumed, that the only interest of the landowners was in monetary compensation. But we cannot explain this view by arguing that the whole project is set up in the field of economy. Neither can we argue that it is an economist who dealt with the project, since it was a whole range of professionals with different trainings who worked on that project, from geographers to different kinds of engineers, but no trained economist. They chose the method of monetarisation, since they considered it as the most universal way of comparing the different items (ecological restoration, aquatic restoration and the interests of citizens) in the project. This method was further facilitated through the fact that a whole series of places had to be analysed and compared and that very little knowledge about these places was available.

More generally, we conclude that ILPs cross over from other spheres of actions into the design of appropriate solutions that experts are to invent. Yet, the ILP is neither identical with the code or the range of action accessible to the lay person in her original sphere of action (e.g. consumers choose or citizens vote), nor is it identical

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with the consumers but the simple yes or no response by them (in fact this position is held presently by the supermarkets and retailers that do not want genetically modified products on the shelves as a consequence of the generally negative consumer attitude to such products). For more details see Maranta & Pohl (2001: 109-111)

with any real person and the capacities she actually has. The Luhmannian code does not tell the experts which aspects of the objects – as a problem or as possible instruments for its solution – are epistemically relevant to the lay people. As we shall argue in the following, the alleged relevance is derived predominantly from the media of interaction.

## **Media of interaction**

Experts cannot set up ILPs without having a concept about how to communicate with lay people. And in order to communicate, one needs media. Media of interaction, as we understand them here, are coordinators of interactions.<sup>6</sup> Through the epistemic control of these media the asymmetry between the expert and the lay people is sustained. Our approach implies that we do not want to categorise media along their hardware components, such as television or newspapers but along their capacity to turn lay people into different kinds of lay persons. The three types of media that we want to distinguish are characterised by their capacity to coordinate the actions of ILPs, and especially to restrict them.

First, there is the well-known medium of *face-to-face interaction*, which we already discussed above. Obviously, with face-to-face interactions alone, the lay persons are hardly turned into abstractions at all. Here all the senses are involved and all different kinds of reactions from both actors are possible. Thus the lay status has to be sustained either with other media or through ongoing accomplishments, to use the language of ethnomethodology (Garfinkel 1967). But even such ongoing

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<sup>6</sup> The term is taken from Jochen Hörisch, though he himself dates this definition of media back to Ovid (Hörisch 2001: 65).

accomplishments are highly structured and reconstruct the expert lay boundary always anew. In the case of the exhibitions in scientific institutions, where guided tours are held by researchers face-to-face interactions occur frequently. Still these are highly standardised and formalised. Most of the visits to the museum follow a fixed course of events. After an introductory talk of the guide about the institute, they will listen to an account of the researcher's group's activities. Subsequently a film is shown to the visitors and after that they are allowed to stroll through the science centre. Then they get a planned break with coffee and confectionery. Finally they are guided into a research lab. This sequence of interactions is always the same and specifies in detail at which point questions may be asked.

Our second category is „*information objects*“. They provide one-way information from the experts to the lay persons. Typical examples here are objects in an exhibition, but also newspaper articles, leaflets or “frequently-asked-questions” pages on websites. Here, the information is an offer to supposedly curious lay persons who want or should want to know something. „Information objects“ may not allow direct answers but they are usually displayed in a public space. The experts do not assume any fixed attitude or epistemic view of the lay people concerning the information object at the start of the interaction. Yet, what they aim at is that the heterogeneous epistemic views of the lay people should converge on the scientifically sound view. And last, the third category we define as „*classifying objects*“.<sup>7</sup> These objects are designed by the experts to provoke planned articulations of lay persons. Thus, the very framing of these objects, which the lay persons may engage with, structures the

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<sup>7</sup> Classification has been widely discussed in recent social science literature (see for example Bowker & Star 1999).

possible reactions that make sense and seem rational (from the experts point of view). A good case in point are opinion-polls or votes, where those who conduct the polls are not interested in arguments, but only in very short answers from a set of predefined categories. Here the lay status is inscribed into these classifying objects, since the objects presume that all other knowledge of the lay person is unnecessary for a given task. Note, however, that the viable reactions may cover the whole range from positive acceptance to negative refusal - like in a ballot or with regard to consumers' choice in the case of buying or not buying GM food. The epistemic control of the experts over the design of the classifying objects does not affect the very choice of the lay person but it delimits first the available options and second, as we shall explain below, it marks out potential reasons one may put forward while pondering how to decide.

Note that there is a division of labour between the classifying objects and the information objects. The classifying objects represent the neutral, objective classifications, which do not force people in making their choice. On the other hand, the information objects instruct about the reality of the world that in the end may change the way the lay persons act in the world. Note moreover that it may be the very same object that is once represented as a classifying object and once as an information object. The difference between the two is therefore functional, and they appear to be diverse only due to different settings. To give an example: The labels for GM food guarantee the consumers' free choice between this food and conventional one. Still, many 'real' consumers may have odd epistemic assumptions about their difference and the meaning of the label. There is nothing with the label – as a classifying object – that tries to teach the lay person. On leaflets about GM food – now as an information object – such food is presented as biophysically different. Here

the lay person is invited to epistemically adjust to the view of the experts and the administration on such matters.

However, such a didactic intention may fail. Since the very same object may work functionally different, the experts can not take for granted that the chosen object fulfils its intended purpose. Classifying objects, thought to give people a choice may turn out to inform them about the very possibility of an option and may set off criticism.<sup>8</sup> In the project on contaminated soil, two different sites were used to explore remediation technologies: At the first site plants should extract heavy metal from soil and at the second micro-organisms were introduced to eat-up a crude-oil contamination. When at the first site the inhabitants of the village were informed about the project and the contaminated soil, a heated discussion evolved about whether or not the governmental soil-agency had hidden a harmful situation to the public for years. Later, a group of social scientists should conduct an opinion poll at the second site, asking amongst others whether GM micro-organisms would be an acceptable remediation technology.

From the point of view of the social scientists, obviously, the opinion poll was intended as a classifying object. Bearing in mind the dispute at the first site, the opinion poll was suppressed by the agency as well as by some involved project leaders. Both feared, that the poll would cause another dispute. They considered the poll as an information object. The question about the GMO would inform them about

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<sup>8</sup> For an analysis of how surveys create „opinions“ in respondents see the analysis of Bourdieu (1984: 411ff.) or the monograph of Keller (2001). See also Bruno Latour's concept of „action-at-a-distance“ for a more materialist reformulation of the same point (Latour 1987).

this possibility and perhaps make them believe, that such organisms were already in use.

## **Imagined furniture**

Information objects call for epistemic adjustment whereas classifying objects embody the standards and norms people share. The assumption here is that people usually act within an environment that constrains their actions. Media of interaction are such constraints, which are primarily in the hands of experts. Many other things may constrain interactions as well: Persons have real things at their disposal with which they can achieve something or make others do something. This view has been along with sociology for a long time. Recently it was made prominent through the so-called Actor-Network Theories in science studies (Bruno Latour and Michel Callon) and in general social theory through Laurent Thévenot, from whom we take the term „*furniture*“ (Thévenot, 2001: 53; see also Latour, 1995). The furniture outlines the constraints that are to be dealt with.

The above categorization of different forms of “media of interaction” is obviously part of the furniture. It is a kind of furniture that belongs to the experts as far as the epistemic control is with them.

But there exists other furniture that is controlled by lay people. Thus, we could expect ILPs to be imagined as lay people that are equipped with furniture. Real lay people obviously are surrounded by an enormous amount of furniture, as is easily visible once you look around the place where you are reading this article: the text in your hand, the pencil, the diary, the lunch-bag, the gift you bought for a friend, the car you used to drive at the office, the room you are sitting in itself, etc.

Rather amazingly the ILPs of our case studies are hardly equipped at all. For instance, the way GM food is legally defined does not take much notice of the reality of food as meals and social events or the cook's knowledge of preparing a delicious dish. Yet, to do otherwise would turn the abstract objects into something far too complex to remain feasible for the engineers or the regulators. Similarly, the visitors in the science centre are but equipped with their innate curiosity for facts and their natural rationality to grasp them. Here, lay persons seem to be poor in furniture. Why is this so? Why do experts imagine lay persons with such reduced amounts of furniture?

A crucial point is that furniture of lay people constrains the experts. Therefore, the amount of furniture that the ILP is equipped with determines the feasibility of the model that experts provide. Consequently the imagined furniture is a self-constraining feature of the expertise. Yet, the experts are not free in the way they equip ILPs. They have to consider the burden of proof imposed on their model. The model is not checked against reality but it is tested in the social setting in which the model has to work, and the experts have to anticipate reactions in advance when formulating their model. To illustrate this point, we refer to the case of the river engineers. In this case the strongest obstacle to a feasible modelling of possible solutions is the possession of land and houses. The experts believe that they have to introduce land and houses, since to ignore it would possibly lead to strong reactions, so they fear, among the affected people. They know that this furniture provides countless opportunities for emotional attachment and bureaucratic procedures, which complicates the use of ILPs. To overcome some of the unwanted constraints, the river engineers substitute the possession of land by money which is a very abstract furniture that allows to cope with property rights. Accordingly, if not necessary as in the above case, experts avoid furnishing the ILP beyond the minimal amount of standardised or naturalised

furniture. Consequently, for the experts to succeed it seems necessary to get rid of much of the furniture that the real people are equipped with, and the struggle over the right classifying objects with the corresponding information objects is a struggle over what (i.e. things, competences or reasons) the lay persons may or may not possess. The three examples just mentioned – i.e. GM food labels, the visitors in the science centre and the owners of houses and land – illustrate that the degree of furniture varies with the ILP and the social setting. Consumers and visitors are equally scarcely equipped. The experts imagine in both cases a reduced furniture. Still the cases are quite different if one considers the way in which the ILPs are addressed.

### **Assembling lay persons**

The ILPs as addressee are assembled in different forms. These forms relate to the function of the expertise and whether it is presented as an information object or a classifying object. We discern three ways in which ILPs are assembled:

1. *Individualised* ILPs. These ILPs are addressed as individuals. Typically this happens through information objects. For instance such ILPs may be the visitors of a science centre – or the reader of *Scientific American*. The assumptions about individualised ILPs are quite specific, since the experts assume certain motivations and interests that drive ILPs to engage with the information object. The expertise displayed is an offer to lay persons with which they may or may not engage individually. The experts may assume that the amount and variance among their ILPs is low. But the matter is not whether they are right about their audience, but whether the package they make up finds its audience after all.

2. *Representative* ILPs. This is a special kind of ILP that comes in the form of participants of experiments, for example medical testing, or in a nowadays

fashionable form, as participants of participatory processes such as in our example from climate research. As representative ILPs they are usually subject to a whole series of predefining knowledge processes by means of information objects. Whereas individualised ILPs are only loosely structured, representative ILPs are usually very clearly defined and their role is very much prewritten. Think for instance of the script of consensus conferences that assigns a clear role to the representative lay people in relation to the experts (see Klepsch 1995: 7). Consequently, in participatory processes, certain participants are assumed to represent a certain part of society and thus they are imagined to be like a typical specimen of this part of society (a peasant neighbour of a GMO-research field should play the role of the peasant neighbour fearing about his field, and not the role of the pharmaceutical companies PR-person). At this stage they are no longer addressed with information objects, now they judge expertise that functions as classifying objects. Note how precarious such representation may turn out to be. Since the participants are somehow to represent the real social world, the engagement with the experts' world is not a playful one but often a mutual reaction to some obligation that experts as well as the invitees deem to have. Thus, such invitations are as much an offer as the response to a societal obligation.

3. *Generalised* ILPs. Generalised ILPs are addressed as an aggregate, such as “the public” or “the people living at the riverside”. This public often consists of private persons that for instance state administrators have to take into account but without intruding into their privacy. The administrators have to do their duty and structure actions by regulations. For that purpose they have to think of the lay people in very general terms because justice should be done to all in equal terms but without interference into the private furniture of the people. The generalised ILPs,

consequently, are more than the other ILPs pure results of the lay makers concepts and theories. They are less able to pronounce their will in a self-defined language but are restricted to their status as consumers or citizens. As such they are mostly reduced to a range of simple actions by way of classifying objects, such as saying yes or no. The only way to make the ILPs more transparent would be to make some investigation into the structure of the generalised ILPs. This would mean that the duty to formulate ILPs and their furniture adequately may collide with the duty not to interfere with the privacy of these people. For instance, in the case of the river engineering, where ILPs are supposed to own the land and get compensation money, one might as well expect the experts to interview the involved people directly and get to know far better their emotional attachments to their land and houses or their readiness to contest the officials and all the other furniture these people in fact possess. But such mapping is not just highly complex and time consuming but it also contradicts the experts' duty.

### **Stabilising the loyalty of the imagined lay persons**

Obviously differentiating, furnishing and assembling together result in a complex matrix that constrains the range of actions available to ILPs. In order to achieve an improved understanding of this matrix, we discern three different types of reactions of the ILPs regarding expertise. Our classification is derived from Hirschman: Exit, voice and loyalty (Hirschman 1970). The three terms originally define the possibilities of actors in case of dissent in political organisations such as parties and unions. '*Exit*' means that actors leave a frame of actions, that is, in Hirschman's examples, leave an organisation. To '*voice*' means to make ones dissent public and therefore stay inside the frame of action, trying to change the frame or the direction of collective action.

,*Loyalty*' finally, means that actors neither exit nor voice their dissent but follow the ways of the organisation. Obviously, we are not dealing here with members of organisations. Rather the ILPs, from the point of view of the experts, accept or reject a specific frame.

We return here to the discussion of lay people in PUS, and we see that the deficit model has ILPs in mind that are loyal. Every instance of ,voice' or ,exit' is derided as irrational and deviant, a malfunction of the educational system. This conception of loyalty is backed up by a naturalisation of human rationality and its subordination to the scientific mind as the role model of rationality. However, once this deficit model is given up, two questions arise: One examines whether there are other forms of lay expertise one has to take into account.<sup>9</sup> The second one raises the issue how loyalty is established after all if it is not warranted by nature. We want to address this second issue.

We claim that different forms of expertise, which we distinguished as information objects and classifying objects, relate oppositely to the frame that experts propose. Information objects are to produce loyalty whereas classifying objects presuppose such loyalty. Remember that information objects usually appeal to individualised ILPs and classifying objects address generalised ILPs. Consequently, we find two types of ILPs: The individualised ILP come across expertise that is presented as information objects. This encounter is designed to establish familiarity with science and technology, and the expertise attempts to facilitate learning about scientific findings. In short: Expertise for individualised ILPs aims at producing loyalty with lay

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<sup>9</sup> This question has been studied extensively (see the various contributions in Irwin & Wynne 1996)

persons. The generalised ILP, on the other hand, come upon classifying objects, which are to stabilise procedures and norms. The expertise is to facilitate interactions in social settings that are mostly independent from scientific expertise. The expertise must not be imposed on the lay persons' privacy, which implies that loyalty is not enforced. Rather experts depend on the loyalty available. So, expertise for generalised ILPs presupposes loyalty. Representative ILPs again are first introduced to the experts' findings, which are presented as information objects. They usually have to pass a rite of loyalty before they may judge the classifying objects. For example, in settings such as focus groups, previously accomplished loyalty and the adequacy of learning by the offered information objects are tested.

In all our cases, the experts consider the loyalty as the key aspect of ILPs. The difference concerns the level of loyalty that is assumed. All lay makers basically believe – according to the deficit model – that lay persons must be loyal to the experts' frame. Yet, the experts know that this loyalty does not simply come about, rather it has to be arranged. As a consequence loyalty has to be produced in settings such as the science centre. Since the thrust of expertise is to sustain loyalty, they have to cope with ILPs that may exit or voice. These two reactions undermine credibility and trust, and may nourish unwanted controversies. The perceived level of controversy therefore is decisive for the presupposed loyalty. There may be no heated public debates concentrating on the issue. For the experts, the issue then appears to be no public issue at all. The lack of loyalty in such cases has to be established by information objects that have to leave the ivory tower and make contact with the public sphere. Conversely, the perceived level of controversy may be high and focussed on the frame of the experts. As long as the experts need not think of ILPs this need not bother the experts (think of military research for example). Yet, if the

experts can not part with the public, like in commercialisation of GMO or in the case of the river engineers, they have to integrate ILPs in their expertise. To do so, they address the generalised ILPs with classifying objects.

The dilemma that emerges when experts have to tackle highly controversial issues is disentangled in two ways: First, by the division of labour between the information object and the classifying objects, which we already mentioned when discussing the media of interactions. Remember that labels for GM food as classifying objects do not teach the lay person, they only fix an option. Second, experts rely on focus groups, consensus conferences and the like to test their expertise in controlled social settings.

The experts design an experimental setting with representative ILPs. Such participatory knowledge production has been notorious with environmental research or with GMOs. In such settings the experts try to stabilise loyalty with the lay persons. Especially in the two cases of the environmental programme we can detect a certain disappointment if they do not. Moreover, the social setting of expertise and of the interactions marginalise 'voicy' ILPs.

Finally, we can refine our analysis by asking what kind of ILP the experts fear. We find that if the ILPs are generalised and addressed by classifying objects, then the experts fear 'voice'. Yet, one may wonder why the experts would fear that the lay person might voice as long as that voice is under their scientific control. To voice against the experts may imply that lay persons are going to draw on other competences than those ascribed to them in the frame of the experts. They may, on the contrary, introduce their social or legal powers into the controversy. That does not only mean trouble for the scientific experts but a shift to another sphere in which they have no exclusive authority. To exit means not to abandon the project but to resort to other means for negotiation and to shift to another frame the actors are supposed to be

loyal to. On the other hand, as soon as they are representative or even individualised, nothing is feared more by the experts than exit. Under such circumstances to exit means really to abandon the project as offered by the scientific experts.

### **Forms of discourse**

In the last section we outlined the risk for the experts that ILPs may exit, or that they may voice by using their social or legal powers. Experts, we said furthermore, consider the loyalty as the key aspect of ILPs. We now resume the three levels in which interactions between experts and lay persons occur that Brian Wynne distinguishes (Wynne 1991: 120). According to this distinction this loyalty is rather epistemic because it concentrates on the content of expertise. Thus one has to seek more reliable information if expectations fail to be met, and experts opt for epistemic stabilisation. Yet, in a society one may also opt for normative stabilisation.

In his sociology of law, Niklas Luhmann differentiates two types of expectations with respect to the tension between the adoption to realities and keeping ones expectations constant: cognitive and normative (Luhmann 1987:44). Transformed into a theory of action this means if persons are forced to change their view of the world, they may do this either by changing their view of the world concerning the facts or concerning the norms existing in their world. If nuclear power stations are announced to be safe by the experts, the members of a given society may either adapt cognitively by including this new fact into their worldview or they may keep their worldview that they are not safe and go for a change of the law. This would change the normative frame for those who claimed that they were safe. We can link this idea now to the question of loyalty:

In Hirschman's concept, loyalty meant to be loyal to an organisation. Here we speak of a more cognitive or epistemic idea of loyalty.<sup>10</sup>

With Luhmann, we now differentiate an epistemic form of loyalty from a normative loyalty. To be loyal to the experts means that one is loyal to the imagined furniture that the experts assigned to the ILP. As long as the experts provide such furniture exclusively, the idea of the deficit model holds: Lay persons keep their asymmetrical relationship towards the experts, and they adapt to the changed epistemic circumstances. Like in the science centre, in the case of the climate-project the ILPs are epistemic adaptors: Lay people should be educated to understand the scientific issues behind climate research in order to accept a scientific view of climate change. When the real lay persons asked the experts about their normative-political views about these issues, they were surprised. In the case of GMO-regulation as well as in the case of river engineering, we find that lay persons are imagined as normatively loyal to the epistemic status of the experts. It is not so much that lay persons have to know the harmlessness of each type of GM food that is approved for marketing. Rather, lay persons are expected to be loyal to the very frame in which the assessment of the experts is carried out. The same with the river: It is not so much that lay persons are imagined to accept and understand the calculations which singles out the areas to be flooded but rather the fact that it is good to flood at all. Having in mind

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<sup>10</sup> We prefer the term epistemic to the term cognitive because the term cognitive may include normative ideas, where one holds that normative claims can be rationally, i.e. cognitively, settled. Furthermore the term 'cognitive' suggests a rather individualistic concept of knowledge, whereas the term 'epistemic' may as well allow a social concept of knowledge.

Brian Wynne's third level, i.e. the "organizational forms of ownership and control" (Wynne 1991: 120), it is obvious that such a relationship is also normative. To be normatively loyal to the experts entails that lay persons accept the superiority of the worldview of experts. Nevertheless, there is always the threat that they may not do so and substitute the experts' frame by a political frame.

## **Conclusions**

Experts rely on media of interactions in order to cope with the challenges that the interactions with lay persons may raise. These media allow the experts to embody the interactions into a world that fits their scientific view. We distinguished three media of interaction: Face-to-face interaction, information objects and classifying objects. This distinction provides a conceptual clue by which we differentiate the functions of these interactions: They may operate to inform about scientific findings or to embody the environment of interaction. We argued that experts imagine the lay person, i.e. the ILP, according to these functions. Likewise, we claimed that individualised or generalised involvement of the ILP is a key factor. The selection of the media of interaction and the form of involvement have an impact on the competences and furniture assigned to the ILP. They frame what matters in the interactions and which competences the ILP may have. Such framing occurs within a social setting that the experts control. The ILP may exit the frame, voice against it or remain loyal to it. There are other social settings than the scientific one. In particular, the experts are afraid that the ILP may exit the scientific setting. The ILP can restore to legal and social powers and change the form of discourse as well as the way in which the interaction is stabilised.

These considerations constitute two different types of ILPs: Those ILPs that are addressed by the experts to produce loyalty and those ILPs with whom loyalty must be presupposed.

The first type of ILP can be found in science centres and participatory processes. The aim is to show how the scientists do research or what they have found out. In such a functional setting experts use information objects, the function of which we defined as providing one-way information from experts to lay persons. ILPs are the potential beholder of the information object as individuals, and they are curious by nature – curiosity being the only furniture the ILPs are equipped with. This curiosity is the means by which the experts aim at establishing loyalty. However, as long as the facts presented are not integrated into the ILPs interactions outside of the restricted setting of a museum or the like, this loyalty does not carry far. Although the ILP is in direct contact with the expert world, the epistemic worlds of the lay people and the experts may be coexistent.

The other type of ILP inhabits social settings where persons are aggregates rather than individuals. Experts use classifying objects that frame a structured environment for the ILPs. For instance, they command that the land at the river should be treated as economic goods, or that food really is but nutrition facts. No doubt, the experts know about all the other social or emotional aspects. But individually fitted motives can not count for the experts. The furniture of the ILP is spare but it entails strong epistemic loyalty. Familiar things are represented in a new form, and the classifying objects redefine the things that matter for social interactions. ILPs may resist this imposed epistemic loyalty. They may restore to legal and social powers and change the form of discourse to challenge the solution of the experts.

Based on these types of ILPs, we can differentiate between two forms in which expertise is successful. Information objects work if they elicit curiosity with the individual ILP and gain loyalty. The expertise fails correspondingly when ILPs exit. On the other hand, classifying objects work if the ILP and her furniture are sufficiently adequate. Such expertise fails when there are voices and social or legal powers raised against the expertise. The ILP is demanding for the expert and other actors involved because to put the according expertise to the test is tricky, as the cases with representative ILPs illustrate. It implies that the social settings be broadened and that ILPs are given a voice. This threatens the spare furniture of ILPs. For instance, in the case of the project that dealt with a cleanup operation there was disagreement about whether to carry out an opinion poll or not. This controversy among experts can be explained in these terms.

We set off our argument by stating the experts' problem: How can they maintain the epistemic asymmetry and the corresponding authority, which stabilises the division of labour between experts and lay persons, while, simultaneously, providing expertise that makes sense not only for the experts but also for the lay persons. After the exposition of our argument, we conclude that there is not a single strategy. We argued that experts produce or presuppose loyalty to operate with this gap, and we showed that the strategy involves different types of ILPs as an indispensable aspect of scientific expertise. We discussed how these types correlate with the functional social setting of the interaction and in what way the perceived level of controversy has an impact of the design of the expertise.

We claim that ILPs are indispensable and functional, scientists' advice can never be without sociological and anthropological assumptions. Our conclusion differs from the claim that expertise is value-laden. Expertise as value-laden is focussed on the

internal standards of expertise, and external pressures are corrupting these standards. In opposition, we hold that the sociological and anthropological assumptions that are built into expertise reflect the social setting of the interactions that the experts are asked to assist. The solution to the experts' problem is to rethink the epistemic asymmetry not in terms of knowledge and ignorance but based on a plurality of tasks and competences that people in modern societies are equipped with. In the knowledge society this plurality obliges experts to consider an epistemic pluralism as well as a pluralism of lay persons, be they real or imagined.

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