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RESEARCH-IN-BRIEF

Forschungspolitik in einer medialisierten Konstellation von Politik, Wissenschaft und Medien

Science Policy in Mediatized Constellations of Politics, Science, and Media

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Zusammenfassung: Dieser Beitrag präsentiert den theoretischen Hintergrund, das analytische Konzept und das Forschungsdesign eines Projektes über die Governance wissenschaftlicher Forschung in medialisierten Konstellationen. Die Studie konzentriert sich dabei auf die Rolle von Massenkommunikation in der deutschen Forschungspolitik. Die forschungsleitenden Fragen sind: Wie beobachten sich Politik und Forschung gegenseitig über Massenmedien? Welche Einflüsse hat diese wechselseitige Beobachtung? Und wie unterscheiden sich hierbei die Fachkulturen Geistes- und Sozialwissenschaften, Lebenswissenschaften, Naturwissenschaften und Ingenieurwissenschaften? Bezogen auf diese Fragen entwickeln wir ein Theoriekonzept das „Governance" als Modus inter-systemischer Interaktion begreift, welcher sowohl von Dynamiken auf der Ebene individueller und kollektiver Akteure als auch von sozialen Strukturen geprägt wird und außerdem davon ausgeht, dass diese Governance-Konstellation medialisiert ist. Hierauf aufbauend diskutieren wir unser analytisches Konzept und stellen kurz das Forschungsdesign der Studie dar.

Schlagwörter: Governance von Forschung; Medialisierung von Forschungspolitik; Forschungsförderung; Fachkulturen

Abstract: This paper presents the theoretical background, analytical concept, and brief outline of the research design of a project about the governance of scientific research in a mediatized governance constellation. Our study focuses on the role of mass communication in the process of science policy regarding scientific research in Germany. The guiding research questions are: How do politics and sciences observe each other via mass media? How do such observations influence decision-making? And what differences exist concerning diverse scientific traditions (i.e. humanities/social sciences, life sciences, natural sciences, engineering sciences)? Those questions will be addressed considering a theoretical perspective that conceives "governance" as an inter-systemic relationship, which can be explained as the outcome of dynamics between individual and collective actors and their actions on the one hand and social structures on the other and that further integrates the concept of "mediatization". Based on this, we deduce an analytical concept for empirical research and briefly outline our research design.

Keywords: Governance of scientific research; mediatization of science policy; funding of research; scientific traditions

1 This paper is based on a presentation at the 61st annual conference of the International Communication Association (ICA) from May 26th to May 30th 2011 in Boston, Massachusetts.

This paper presents the theoretical background and brief outline of the research design of a project about the governance of scientific research in a mediatized governance constellation. Our study focuses on the role of mass communication in the process of science policy regarding scientific research in Germany. The guiding research questions are: How do politics and science observe each other via mass media? How do such observations influence decision-making? And what differences exist concerning diverse scientific traditions (i.e. humanities/social sciences, life sciences, natural sciences, engineering sciences)? The project started in August 2010 and will be finished by July 2013. It is part of an interdisciplinary network of projects about new governance of science, which aims at providing scientific support for political problems.

Below, we will introduce our theoretical perspective that conceives "governance" as an inter-systemic relationship, which can be explained as the outcome of dynamics between individual and collective actors and their actions on the one hand and social structures on the other (cf. Schimank, 2010) and that further integrates the concept of "mediatization" (cf. Marcinkowski & Steiner, 2009; Meyen, 2009). We conclude by briefly outlining the research design.

1 Theoretical Framework

In summary, science policy cannot be satisfactorily described as a one-way process of regulation. Instead, we refer to the concept of governance which allows us to analyze science policy as a complex and interrelated social process involving diverse social systems (cf. Benz, Lütz, Schimank, & Simonis, 2007a; Jansen, 2007; Puppis, 2010). The concept of governance also takes into account actions of different stakeholders with varying intentions (keyword: actor constellations) as well as the structural level of such constellations (keyword: actor-structure dynamics) (cf. Schimank, 2007a; Schimank, 2007b; Schimank, 2007c). Furthermore, we examine the governance of science from the perspective of communication science and assume that the governance of science is mediatized (cf. Cohen, Tsfati, & Sheafer, 2008; Marcinkowski & Pfetsch, 2009; Meyen, 2009; Tsfati, Cohen, & Gunther, 2010). We therefore suggest understanding the relation between politics and science as a "mediatized governance constellation". In short, this means that mass communication plays an important role for scientific and political actors who use mass communication in order to observe and influence each other; that those actors adapt to media logic in order to optimize their chances of influencing each other; and that media and journalistic actors have to be regarded as parts of this constellation. It is also suggested that media affect the way decision makers in politics and science evaluate specific issues, e.g. how politicians assess stem cell research as well as the demand for regulation or funding of stem cell research (cf. Böcking, 2009) or nanotechnology (cf. Ho, Scheufele, & Corley, 2010). The importance of mass communication in this constellation lies in the benefits that the media system provides for other systems (cf. Blöbaum, 1994; Blöbaum, 2004; Marcinkowski & Steiner, 2009) and because social actors believe that mass communication influences other actors

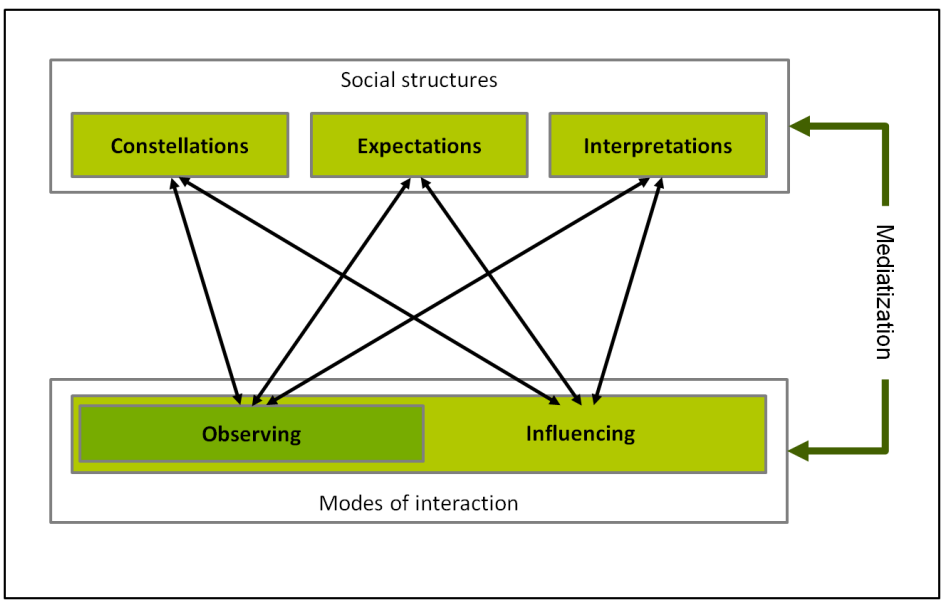
and therefore adapt accordingly (cf. Gunther & Storey, 2003, p. 199).

1.1 Basic theoretical concepts

Our perspective on science policy in Germany is mainly characterized by theories of governance, social systems, and actor-structure dynamics as well as the concept of mediatization. An essential part of our analysis is the attempt to mediate between theoretical positions of individual or collective *actions* on the one hand and social systems and *structures* on the other and to research consequences of *mediatization* on both levels (cf. figure 1).

The concept of *governance* offers a way to analyze both relations between social systems and interrelations of individual as well as institutional actors. The perspective of governance focuses on different forms of co-ordination, mutual influences, and the combination of those (cf. Benz, Lütz, Schimank, & Simonis, 2007b, pp. 15-16; Kastrinos, 2010, p. 298; Schimank, 2007a) and understands the process of regulation as "a multistakeholder process with actors drawn from market and civil society institutions as well as from government" (Crozier, 2007, p. 3). Even though the concept leaves behind former, more linear perspectives such as cybernetics or regulation, it still implies that the political system is able to mold social reality by influencing other social systems – in our case the system of science. However, sociology, communication science, and political science discuss controversially how and to which degree the political system is able to do so.

Figure 1: Concept to analyze interactions between systems within the governance constellation of science policy, structural influences, and consequences of mediatization regarding the modes of interaction and social structures



Source: Schimank, 2010, p. 214

Social systems are considered to be self-referential and autonomous in principle and can be distinguished according to their exclusive functionality for society (cf. Luhmann, 1997, pp. 743-749). From this perspective, direct inter-systemic influence does not seem possible. Yet, we argue that social systems are structurally coupled – even though the extent to which the systems are coupled may differ (cf. Luhmann, 1997, p. 92-120; Schimank, 2007d, p. 152). In all cases, however, attempts to influence a certain system are usually perceived and dealt with internally as irritations. Therefore, even though inter-systemic influences may be intentional, their effects are mostly not intended (cf. Schimank, 2010, p. 197). Researching inter-systemic coupling and its effects has become part of the social sciences. One example of one social system provoking changes in other social systems is the widespread adaptation to economic principles (keyword: economization) (Schimank, 2007d, p. 149). Other examples include the establishment of legal departments in economic or media organizations that reflect the influence of the legal system, or the integration of research departments in companies, resembling the influence of the scientific system. The system of science makes no exception. For example, universities have to follow political decisions (e.g. Bachelor/Masters reform in Germany), curricula have to meet certain legal demands (e.g. constitutional rights, study regulations), and appeals procedures also depend on how much money universities and institutes can afford to spend. Furthermore, sensitive issues such as stem cell research, nanotechnology, genetic engineering, or climate change may influence or irritate other social systems, too (cf. Besley & Shanahan, 2005; Ho, Scheufele, & Corley, 2010; Horst, 2008; Reis, 2008; Salter & Salter, 2010; Stewart, Dickerson, & Hotchkiss, 2009).

The concept of *actor-structure dynamics* (cf. Schimank, 2005a) can explain the coupling of social systems as interplay of actions that are conducted by different actors of diverse social systems. Three modes of action seem especially relevant: Observations represent the basic mode of action and are the precondition for any kind of influences, and negotiations are based on both observations and mutual influences (cf. Schimank, 2007b). All three modes of action lead to dynamics that may result in changes or adaptations on the structural level. This affects the structure of constellations ["Konstellationsstrukturen"] (e.g. hierarchical structure of actors), different forms of expectational structures ["Erwartungsstrukturen"] (e.g. institutionalized normative standards), and interpretive structures ["Deutungsstrukturen"] (e.g. the codes that regulate and characterize social systems) (cf. Schimank, 2007b, pp. 125-127).

As stated above, we analyze science policy in *mediatized* governance constellations. The basic premise of mediatization is that the need for mass communication as a way to mediate information across social systems increases in modern societies (keyword: media society) (cf. Hjavard, 2008; Livingstone, 2009; Lundby, 2009, pp. 1f.; Mazzoleni, 2008b). This leads to "accommodation" (Schulz, 2004, pp. 89f.) to mass media logic (cf. Altheide & Snow, 1979). Therefore, research about mediatization is usually concerned with the process of social change and assumes that this process is – at least

partly – influenced by mass communication. The majority of studies in the field of mediatization therefore concentrate on the *process of mediatization* and on changes within certain social systems (e.g. politics, science, economy, etc.) over time. Such research seems to be most promising when implying longitudinal designs (cf. Meyen, 2009, pp. 35f.).

However, the study at hand takes a different approach. We regard the mediatization of modern societies as a basic condition of science policy. This assumption is suggested by various studies about the mediatization of politics (cf. e.g. Donges, 2008; Kepplinger, 2002; Mazzoleni & Schulz, 1999; Mazzoleni, 2008a; Schulz, 2006; Spörer-Wagner & Marcinkowski, 2010; Vowe, 2006) and science (cf. e.g. Maeseele, 2007; Peters, Heinrichs, Jung, Kallfass, & Petersen, 2008; Schäfer, 2007; Schäfer, 2008; Weingart, 2001, pp. 244ff.; Weingart, 2003, pp. 113ff.), both of which constitute the essential social systems regarding science policy. This starting point yields consequences for our research design. Instead of focusing on *process*, we are rather interested in the *consequences of mediatization* within a certain field of action: science policy.

Since individual actions influence structural developments as well as vice versa (cf. Bourdieu, 1984; Giddens, 2008; Hjavard, 2008; Schimank, 2010), consequences of mediatization may manifest themselves on the structural level as well as the level of interactions. On the structural level, any social system – to a certain degree – may adapt to journalistic requirements because the unique service of establishing public attention becomes increasingly important in modern societies (cf. Marcinkowski & Steiner, 2009, pp. 11f.). Thus, mediatization can affect the evolvement of structures that increase social systems' abilities to efficiently and strategically cope with their environments. According to Uwe Schimank, such structures regulate *constellations* of actors, formal and informal (normative) *expectations*, and *interpretations* of social reality (cf. Schimank, 2010, pp. 204ff.). Taking "constellations" into account, we are interested in the actor constellation that results from the system of research funding in Germany and in characteristics of this constellation that are related to mass communication. The term "expectations" refers to normative structures – such as professional roles or institutionalized moral standards – that might also be characterized by mass communication and journalism. With "interpretations", Schimank summarizes the "core" of social systems that regulates their functioning (cf. Schimank, 2005a, pp. 39ff.). Examples are so called systemic codes or professional ideologies.

Considering the level of interactions, mediatization implies that political and scientific actors mutually observe each other mainly via mass communication, and individual as well as collective actors adapt to the requirements of mass media (keyword: media logic) (cf. Spörer-Wagner & Marcinkowski, 2010, p. 9) for strategic purposes. Mediatization on this level describes 'second level media effects' (cf. Meyen, 2009, pp. 23f.) or the "influence of presumed media influence" (Cohen, Tsfati, & Sheafer, 2008, p. 331; Tsfati, Cohen, & Gunther, 2011, p. 143). Another facet of mediatization on the level of interactions can be seen in the fact that "*publicity* becomes important as an alterna-

tive power source" (Spörer-Wagner & Marcinkowski, 2010, p. 8) for involved actors. We therefore are especially interested in how (individual and collective) actors observe and influence each other using mass communication – even though this distinction is analytical and the boundaries between *observing* and *influencing* seem to be rather fluid in everyday life, for example when actors adapt their public appearances according to media logic in order to strategically frame the observations of other stakeholders. Furthermore, because of the role of mass communication in this context, journalistic actors have to be regarded as a relevant group of stakeholders within the governance constellation of science policy, too.

This interest of research leads us to the analytical categories summarized in figure 2 and a cross-sectional research design consisting of a content analysis and semi-standardized interviews of decision-makers from the field of science policy.

1.2 Science policy in mediatized governance constellations

Research about science policy in mediatized governance constellations has to take into account national particularities. This can be realized by compara-

Figure 2: Analytical categories and guiding questions

Level of interactions

- Observations
  - What are the different stakeholders within the governance constellation able to learn about each other, when observing media coverage about science and science policy? (e.g. actors, issues, funding instruments, scientific cultures, actions, attempts of mutual influences, logic of media coverage about scientific research and science policy)
  - How are the stakeholders within the governance constellation observing each other via mass media?
- Influences
  - How are the stakeholders within the governance constellation influencing each other via mass media?

Structural level

- Constellations
  - How is the actor constellation of science policy represented in media coverage about science policy?
  - How is media coverage about science policy influencing the structures of the actor constellation of science policy?
- Expectations
  - What are normative structures presented in media coverage about science policy?
  - How is media coverage about science policy influencing the normative structures of the different stakeholders within the governance constellation?
- Interpretations
  - How is the functioning of scientific research and science policy represented in media coverage?
  - How is media coverage about science policy and scientific research influencing the functioning of science and science policy?

Mediatization

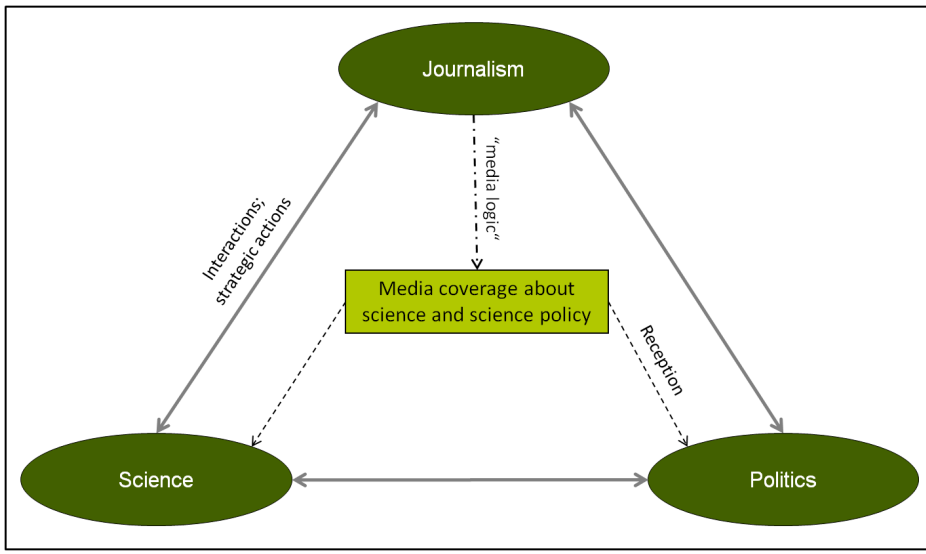
- What are different stakeholders perceiving as the logic of media coverage about scientific research and science policy?
- What changes within the governance constellation are different stakeholders connecting to mediatization?

tive studies or by in-depth analyses of single countries. This study researches science policy in Germany and considers national particularities with regard to the media system (e.g. dual broadcasting system), the systems of politics (e.g. legal system regulating the freedom of research; division of responsibilities for science funding between state and federal political institutions), and science (e.g. university structures). Recent developments within the German higher education system offer genuine research opportunities as well as an increased political demand for such research. Traditionally, the German "Humboldtian" higher education system is characterized by the combination of state funding and regulation on the one hand and "constitutional guarantees of the 'freedom of teaching and research'" (Schimank, 2005b) on the other, which results in relatively low institutional and relatively high individual autonomy (cf. Schubert & Schmoch, 2010, p. 246). Recently, this system has been subject to reforms that lead towards increased heteronomy (cf. Schimank, 2005b). This includes processes of standardization (keywords: Bologna Process, European Higher Education Area), the changeover to a Bachelor/Master structure, the implementation of (external) evaluation, and incentive funding (cf. Auranen & Nieminen, 2010; Schimank, 2005b). Policy-makers thereby intend to increase the efficiency, competitiveness and relevance of scientific institutions. It is likely that scientific actors – who until now have been (and probably still are) characterized by their relative autonomy compared to actors from other social systems – do not always consider such changes as improvements but also develop defensive strategies to deal with perceived attacks against their scientific freedom. The role of mass communication in this constellation seems diverse. On the one hand, access to journalism and mass communication can be seen as a potential source of autonomy of science because journalism may provide certain benefits for the scientific system (e.g. public legitimization). On the other hand, this may also lead to an increase of heteronomy (e.g. adaption to media logic). But either way, mass communication increases public access to science policy issues and is thereby relevant for the governance of scientific research (cf. Maeseele, 2007, p. 1; Woolley, 1998).

The main stakeholders considering the governance of scientific research obviously are connected to the social systems of politics and science. However, inter-systemic communication not only takes place directly but can also be accomplished via mass communication. Therefore, due to our aims of research and the theoretical approach of "mediatized governance constellations" mentioned above, we also consider the journalistic system as a relevant part of the constellation. Furthermore, each social system seems to provide interfaces to improve the efficiency of communication with others. Figure 3 offers an illustration of what we aim to analyze as "mediatized governance constellation of science policy regarding scientific research".

The core element of science policy regarding research in Germany is funding (cf. Hinze, 2010) – above all financial funding but also structural or ideological funding. Responsibilities are split between the federal and state governments. Funding programs are intended to increase the efficiency,

Figure 3: Illustration of interrelations in the mediatized governance constellation of science policy considering the social systems "politics", "science", and "journalism" as well as the role of media coverage within this constellation



competitiveness or relevance of scientific institutions (cf. Kastrinos, 2010). Other aims of funding mainly concern individual research areas, interdisciplinary co-operations, co-operations of universities and institutions in the private sector, or training of junior scientists (cf. Gläser & Lange, 2007, pp. 444f.). Between political and scientific actors, funding organizations and institutes occupy an important position: They are responsible for evaluating research designs and the appropriateness of funding and thereby mediate between the social systems of politics and science (cf. Gläser & Lange, 2007, p. 445). This becomes even more important because recent developments indicate a trend towards an allocation practice that is based on competition (cf. Kastrinos, 2010, p. 302). Regarding the social system of politics, this study therefore focuses on decision-makers in politics (federal and state level) and funding organizations.

Within the system of science, we focus on three types of institutionalization: universities, non-university research institutes and academic disciplines. Universities are the most popular manifestation of research funding in Germany (cf. Auranen & Nieminen, 2010). Therefore, it is not surprising that a huge amount of governmental funding is addressed directly at universities or is invested in specific funding organizations (e.g. German Research Foundation (DFG)). What is more, the federal government recently initiated the so called "excellence initiative" – a competitive procedure to allocate funding of universities. There seems to be a "general tendency for states to increase the conditionality of their research funding by making more resources dependent on competitive bidding for research projects" (Whitley

& Gläser, 2007, p. 10). The trend towards competitive allocation procedures (cf. Hornbostel & Olbrecht, 2008, p. 55) based on quantity and quality of research seems to constitute structural disadvantages for actors working at universities because they have to split their budget of time between teaching and research (cf. Hornbostel & Olbrecht, 2008, p. 52). Non-university research institutions in Germany developed only after 1945 and now already receive financial resources that amount to about 60 per cent of what is available for research at universities (cf. Hohn, 2010, p. 457). Last but not least, academic disciplines constitute the institutional core of all sciences. From the socialization of young scientists to decisions over funding, the essential processes take place within disciplinary boundaries (cf. Bourdieu, 2004). Scientific disciplines can be distinguished according to their scientific tradition – the German Research Foundation (DFG) differentiates between the traditions of humanities/social sciences, life sciences, natural sciences, and engineering sciences. Considering the study at hand, this implies that we consider decision makers representing different scientific traditions and who work at both universities and non-university research institutes.

Another group of actors that we take a closer look at – since they seem to be relevant in the mediatized constellation of the governance of scientific research – are actors from the journalistic system specializing in science communication or science policy. These specialized roles are of interest for our study because journalists who assume such roles shape the media coverage about science and science policy (cf. Dunwoody, 2008). Bearing in mind that many freelancers work in this field and that definitions of "science journalist" vary, it is rather difficult, however, to identify those journalists (cf. Blöbaum, 2008, p. 248). Science journalists working for national quality media supposedly are the most relevant actors in this constellation because of the media usage of decision makers (cf. Chodura, 2006; Harmgarth, 1997) and because they are relevant regarding intermedia agenda setting (cf. McCombs, 2004, p. 114; Protess & McCombs, 1991). We also include journalistic actors working for regional newspapers that cover regions in which research institutes have established. Media in such areas report differently about science than others (cf. Blöbaum & Görke, 2006). Besides newspapers, we also consider television, radio and online communication as important influences with regard to mediatization and influences on decision makers (cf. Dunwoody, 2008, pp. 22f.; Gurevitch, Coleman, & Blumler, 2009; Maeseele & Desmet, 2009; Merzagora, 2004).

2 Methodological concept

The theoretical concept introduced above leads to a concept of research which includes two methodological steps. The first step focuses on media coverage about scientific research and science policy, the second on the different stakeholders within the governance constellation. Accordingly, we conduct a content analysis and semi-structured interviews.

The content analysis covers the year 2011 and different types of media including national newspapers and news magazines, regional newspapers,

TV news broadcasts and TV science broadcasts, a radio news broadcast and radio science broadcasts as well as an online news website (cf. figure 4).

Figure 4: Selected media for content analysis

Media	
Print	**News magazines/weeklies:** • Focus • Spiegel • Zeit
	National newspapers: • Frankfurter Allgemeine Zeitung • Süddeutsche Zeitung • taz • Welt
	Local newspapers: • Badische Neueste Nachrichten (Karlsruhe) • Göttinger Tageblatt (Göttingen) • Hamburger Abendblatt (Hamburg) • Kölner Stadtanzeiger (Köln) • Sächsische Zeitung (Dresden) • Tagesspiegel (Berlin) • Thüringer Allgemeine (Ilmenau) • Westfälische Nachrichten (Münster)
TV	**News broadcasts:** • Heute Journal • Tagesthemen
	Science broadcasts: • Abenteuer Wissen bzw. Terra Xpress (ZDF) • nano (3Sat) • Ozon (rbb)
Radio	**News broadcasts:** • Information am Abend
	Science broadcasts: • Campus (SWR2) • Campusmagazin (BR5) • Forschung aktuell (Deutschlandfunk) • Leonardo (WDR5)
Online	**News-Website:** • Spiegel Online

The content analysis consists of a general part including all selected media reports and containing variables such as journalistic style, topic, cause for news coverage, geographical references, disciplines mentioned, associated scientific cultures, societal contexts mentioned, stakeholders, and strategic actions of stakeholders (e.g. criticism, recommendations, demands, protests, assurances, or evaluations) and specific parts concerning reports about science policy, reports that refer to eight selected disciplines, and reports about scientific research in general (cf. Figure 5). Due to our main interest of research about the role of journalism considering the governance of scientific research, we firstly collect data about the media coverage of science policy issues. Considering this, we are – amongst others – especially interested in data about the *network of stakeholders* mentioned in media coverage about science policy and in *instruments of science policy* discussed in the selected reports. Secondly, we analyze media reports that cover one of eight selected disciplines representing either social sciences/humanities, life sciences, natural sciences or engineering sciences. We selected disciplines that all – in their own way – deal with current questions, risks, or problems concerning society: political science and philosophy (social sciences/humanities), virology and agricultural science (life-sciences), food chemistry and geophysics (natural sciences) as well as computer science and resources/recycling (engineering). In this part of the content analysis, we code reports about scientific research and also consider reports about more general topics that contain references to the disciplines mentioned. By this, we will be able to compare media reports about different disciplines and scientific traditions as well as gain information about the public image of the selected disciplines. Exemplary variables in this part are *evaluations* of the selected disciplines or the *functionality* of references to scientific research in mass media re-

ports. In order to be able to contextualize this data, we – thirdly – also code basic characteristics of general reports about scientific research regardless of the associated disciplines (e.g. references to scientific publications, references to applications of research, chances/risks of scientific research, controversity, etc.).

During the second phase of the project we conduct semi-structured interviews with decision-makers from the social systems politics (e.g. national and federal science policy, political parties, funding organizations), science (e.g. universities, research institutes, disciplinary associations), interfaces between politics and science (e.g. political research institutes, German science council), and journalism that are based on first findings. By interviewing political and scientific actors, we aim to find out how they use mass media in order to observe other stakeholders within the governance constellation, whether they adapt their actions to what they observe via mass media, and whether their observations influence decisions. By combining content analysis and interviews, we hope to offer a holistic picture of the role of mass communication within the governance constellation of scientific research in Germany.

Figure 5: Structure of codebook and exemplary variables

Structure of codebook	Exemplary variables
General part	• journalistic style • topic • cause for news coverage • geographical references • Disciplines mentioned • Associated scientific cultures • Societal contexts mentioned • Stakeholders • Strategic actions of stakeholders (e.g. criticism, recommendations, demands, protests, assurances or evaluations) • etc.
Specific part considering reports about *science policy and funding*	• Instruments of science policy • Aims of science policy • Funded disciplines and science cultures • Funding amount • Science policy network • etc.
Specific part considering reports referring to *selected disciplines*	• Evaluation of disciplines • Functionality of scientific references (e.g. provision of data, interpretation of facts, causal attribution, (moral) evaluation, presentation of solutions, scientific forecasts) • etc.
Specific part considering reports about *scientific research*	• References to scientific publications • References to applications of research • Evaluation of scientific research • References to chances/risks of scientific research • Controversity • etc.

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