Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions. Methodological Challenges for Gender Studies in Science and Technology

Tanja Paulitz, Susanne Kink & Bianca Prietl

Abstract: On the basis of an empirical example, we offer in this article a methodological discussion of the challenges and pitfalls gender studies scholars face when analyzing how gender norms are attributed to epistemic cultures in science and engineering. Faced with actors who claim neutrality and objectivity for themselves and their work, the challenge is to analyze gender norms that are mostly *implicit* without reifying gender differences. Committed to the goal of opening this black box, we propose an *analytical strategy* for qualitative empirical research to unveil these subtle, highly normalized, discursive practices of attributing gender norms to the epistemic subjects, objects and activities in science and engineering, and exemplify it with reference to our own empirical study. By comparing the patterns of distinction with respect to epistemic boundaries and to gender differentiations, it is possible to trace connections between the symbolic gender order and epistemic cultures within the data. The allegedly neutral scientist as well as the engineering scholar is then shown to be the *androcentric construction* of a masculine coded epistemic subject.

Table of Contents

1. Introduction

Objectivity and neutrality are important and mostly unquestioned ideals in science and engineering albeit they have been discussed within the new sociology of scientific knowledge as well as gender studies. In the field of science and engineering itself, however, the general epistemological claim to generate value-free knowledge independent from the context or person of its production is common as, among others, our empirical data will demonstrate. While this epistemological position of the objective and neutral (natural) sciences has even

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

been confirmed by the early sociology of knowledge (MANNHEIM, 1952 [1929]: pp.233f.), it has come under scrutiny not only within the new sociology of scientific knowledge (BLOOR, 1976; COLLINS & PINCH, 1982; HACKING, 1983; KNORR-CETINA, 1999; KNORR CETINA & MULKAY, 1983; LATOUR & WOOLGAR, 1986 [1979], LYNCH, 1993; PICKERING, 1992; for a reflexive critique on constructivism in science and technology studies see also KNUUTTILA, 2002) but also within the feminist critique of science (CODE, 1981; FOX KELLER, 1985; HARAWAY, 1988; HARDING, 1986). Feminist critique of science has, for instance, analyzed metaphors or stereotypes used in scientific accounts or scientific narratives in order to show how the supposedly neutral scientific knowledge does incorporate gendered knowledge (HARAWAY; 1989; MARTIN; 1991). Gender studies scholarship in science and engineering has shown how science and engineering are highly gendered areas of social practice, not only at the structural level of gender segregation but also when it comes to academic working cultures and identity constructions (BEAUFAŸS, 2004; BEAUFAŸS & KRAIS, 2005; ENGLER, 2001; GILBERT, 2009; HEINTZ, MERZ & SCHUMACHER, 2004; KAHLERT, 2013; TRAWEEK, 1988; WAJCMAN, 1991). Recently, the epistemologies, epistemic cultures and the corresponding subject of knowledge have been shown to be gender coded as well (DASTON, 2003; LUCHT, 2004; PAULITZ, 2012a; SINGER, 2005). [1]

For gender studies scholars this situation gives rise to the methodological challenge of how to analyze the gender norms underlying the epistemic cultures of science and engineering. Specifically, when studying gender norms attributed to epistemic cultures of science and engineering, gender studies scholars may very likely be confronted—as we have been—with informants who present themselves, their work and practices of knowledge production as completely objective and neutral, i.e., separated and independent from gender—or any other social category, for that matter. However, considering that the field under investigation is highly segregated by gender, significant and not the least trivial methodological questions arise: How to study the gender norms underlying (and presumably reproducing gender segregation in) scientific and engineering cultures, when the actors themselves strictly claim neutrality? How to unveil the symbolic gendering of science and engineering when linkages with gender either remain silent or are decisively denied? And, how to reconstruct the supposedly subtle and implicit forms of gender construction in science and engineering without reproducing gender differences by the very means of gender research? [2]

This methodological challenge does not solely arise when analyzing science and engineering but touches a longstanding methodological discussion in gender studies, including an intense critical reflection of its own research methodologies and epistemologies[1] (for an overview on current discussions see among others ALTHOFF, BERESWILL & RIEGRAF, 2000; BERESWILL & LIEBSCH, 2013;

---

1 For a more general debate on reflexivity and subjectivity in the process of qualitative research, that is on the "impact of personal and situational influences on their research work and its results" (BREUER, MRUCK & ROTH, 2002, §1), see BERGER, 2015; BOTT, 2010; as well the special issues on "Subjectivity and Reflexivity in Qualitative Research" I & II in *FQS* (MRUCK, ROTH & BREUER, 2002; ROTH, BREUER & MRUCK, 2003).

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

BUCHEN, HELFFERICH & MAIER, 2004; CANCIAN, 1992; KRÜGER 1999; NAGY HESSE-BIBER, 2012). [3]

Ever since gender has been theorized as an *analytical category* that needs to be considered as a significant structuring principle for social inequality (DÖLLING, 1999; SCOTT, 1986, 2010), gender research focuses on the dynamic aspect of gender, i.e., on the practices of gender differentiation and, thus, the processes of constructing gender and gender(ed) inequalities. Instead of assuming (presumably preexisting) differences between men and women, gender studies for the most part take a reflexive stance towards their analytical category— gender. This means that gendered structures, materializations and symbolisms are recognized as existing in society while being conceptualized as results of social and cultural processes of gender construction. With respect to empirical gender research and methodological approaches, there are at least two challenges that go along with this perspective discussed in the corresponding literature as the "problem of reification" (DEGELE, 2008; GILDEMEISTER, 2004) and the problem of studying gender as a "self-evident given fact" (orig. "das fraglos Gegeben[e]," BEHNKE & MEUSER, 1999, p.52). The former is concerned with the danger of reifying the socially constructed gender difference by means of gender studies research itself. As KELLE (1999) has put it, gender studies scholars risk to confirm gender differences, for instance, by naively predefining men and women within their research design. Thus, by setting what should be the object of their research as a premise, they tend to reproduce gender differences. With gender being inherent to the structure and organization of our society, it tends to be a self-evident given fact for the members of society which they hardly ever reflect upon and talk even less about. Hence the question of how to empirically trace something that actors in the empirical field do rarely make explicit but that rather remains silent and implicit. This latter methodological challenge seems to be even more acute when it comes to science and engineering, which strongly support ideals of neutrality and objectivity as characteristics of reliable knowledge (production) in modern society. [4]

Situated within the tradition of constructivist approaches in feminist science and technology studies as well as gender studies, this article aims at opening the "black box" of such social processes by which gender norms are attributed to epistemic cultures of science and engineering. We pursue this goal by proposing an analytical strategy developed in the course of our own empirical research on science and engineering knowledge cultures (PAULITZ, KINK & PRIETL, 2015). With this article we, thus, contribute to the methodological discussion of analyzing implicit forms of gendering. This methodological proposal is thereby strongly grounded in our own empirical research, with the help of which we will therefore also exemplify our approach. To put it more precisely, our goal is to reconstruct the subtle and implicit forms of attributing gender norms and ideas to practices, objects and subjects in scientific and engineering cultures. Focusing on the symbolic level, we do not understand the attribution of gender as the classification of a person as male or female within social interaction as it has been conceptualized in the theoretical approaches of "doing gender" by KESSLER and McKENNA (1978). Instead, we look at the discursive construction

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

of gender norms and ideas about masculinity and femininity as part of the symbolic gender order (BUTLER, 1990) and reconstruct the ways in which they are intertwined with understandings of academic practice and knowledge production within epistemic cultures of science and engineering. Following KNORR CETINA (2005), the term *epistemic* cultures refers to social "practices, arrangements, and mechanism [...] of creating and warranting knowledge" (p.67). Taking a discourse theoretical stance towards epistemic cultures we thereby understand and focus on the discursive practices that constitute an area of research, its object and subject of knowledge. In this article our focus lies on the discursive construction of the epistemic subject, i.e., the question of who is understood as a subject producing knowledge within science and engineering. [5]

The article will be structured as follows: In Section 2 we will describe the theoretical and empirical framework of our research that forms the basis for this methodological discussion. Then we will consider possible methodological strategies of dealing with the encountered dominant discourse of neutrality and objectivity, as we have done during the research process (Section 3). In the main part, we will propose and exemplify an analytical strategy to cope with the encountered challenges (Section 4). Finally, we will give a brief conclusion (Section 5). [6]

2. Studying the Gendered Epistemic Subject in Science and Engineering

Compared to other aspects of science and engineering, their respective epistemic cultures are still relatively little explored in gender studies or feminist science and technology studies. Generally, the existing research hints at the fact that gender norms are not only intertwined with everyday work practices and social interactions, but also with knowledge traditions as well as with the constitution of the respective epistemic subject. Recent work within the history of science has for instance shown that the cultural concept of the scientist, that is the "scientific persona" (DASTON, 2003), is itself a historically contingent idea that is embedded within the gender order of its time (see also ALGAZI, 2010, 2012). When it comes to engineering, it is also historically oriented studies which have reconstructed the engineer as a variable, flexible and contingently male-coded construction (OLDENZIEL, 1999; PAULITZ, 2012a; ZACHMANN, 2004). Recent work has furthermore pointed out that the cultural conception of the scientist and the engineer differs not only in time, but also with respect to various disciplinary areas within science and engineering (GILBERT, 2009; HEINTZ et al., 2004; PAULITZ et al., 2015; PAULITZ & PRIETL, 2013). Following this strand of research, we are generally interested in the images of the scientist or engineer and their co-construction with gender norms in diverse areas and sub-disciplines of academia, especially the natural sciences and engineering. [7]

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

2.1 Theoretical perspectives on studying the gendered epistemic subject

In order to study the gendered epistemic subject of science and engineering, we primarily draw on concepts developed within science and technology studies, feminist epistemologies and discourse theory. While the focus of this article lies on the methodological discussion of how to study the processes of gendering the epistemic subject of science and engineering, the theoretical perspectives informing this endeavor are detailed in PAULITZ (2012a, 2012b). In a nutshell, we are taking DASTON's (2003) idea of the "scientific persona" as a cultural category that frames the experiences and perceptions of scientists and engineers as a starting point. This means that we do not look at concrete men and women in academia but analyze the *image of the scientist or the engineer*—that is, the ideas of who is understood to be a scientist or engineer. Framing this idea with reference to the discourse theoretical approach developed by PAULITZ (2012a, 2012b) in her studies on masculinity constructions in epistemic cultures of engineering, this image of the scientist or engineer is theoretically conceptualized as a specific *subject position,* which is the result of discursive practices of distinction. As discursive practices of distinction these are not understood as intentional, but largely as references to epistemic norms by actors within academia as part of a cultural practice of positioning. This theoretical approach extends the concept of "boundary-work" (GIERYN, 1999, p.4; see also GIERYN, 1994), which is primarily concerned with the boundaries between science and non-science, by applying it to the study of epistemic boundaries *within* the field of academia. Further following the concept of co-production of gender and the subject of knowledge production, as it has been developed within critical feminist epistemologies (SINGER, 2005, p.58), we consider that the discursively drawn epistemic boundaries are intertwined with symbolic gender norms. Thus, we analyze the constructions of the *gendered* subject of science and engineering by focusing on the discursive practices of distinction that actors in the respective field make with respect to gender as well as to their own epistemologies. In doing so, we employ a relational perspective to our topic, regarding actors as discursively referring to a variable set of categories in order to make these distinctions. Consequently, we are interested in the ways and forms of how boundaries are drawn within academia and in how these boundaries are intertwined with the symbolic gender order. [8]

2.2 Empirical approach towards studying the gendered epistemic subject

The theoretical perspectives outlined above were empirically implemented within two larger qualitative interview-studies that aimed at learning more about the epistemic cultures in science and engineering at Austrian (technical) universities. It is this research that forms the basis for the methodological discussion at hand. Being interested in differentiations within the social field of academia, we have studied a broader range of sub-domains or *areas*, as we propose to call them, *within* engineering and the natural sciences such as engineering mechanics, electrical drive engineering, biotechnology and analytical chemistry. The process of sampling combined an approach based on theoretical preassumptions about relevant structural features of the field with the strategy of "theoretical sampling"

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

(GLASER & STRAUSS, 1967). Initially starting with the systematic approach, our sampling aimed at varying the cases studied according to two characteristics: firstly, the distinction between fundamental and applied research areas (or, alternatively considered, theory versus practice orientation) and, secondly, the degree of institutionalization, i.e., the distinction between traditional and only recently established areas. Consequently, our sample spans a broad variety of engineering and scientific areas ranging from traditional fundamental domains such as engineering mechanics to newly developing practice-oriented areas such as biomedical engineering. Within these areas, scholars were selected for interviews. Consistent with our theoretical approach, we chose to predominantly interview professors or team leaders in order to gather the discursive (self-) constructions of those representatives of the field who have a certain standing in their scientific community, who—as one could say—have "made their career" and, therefore, can legitimately claim to be in the position of speaking for their respective area of research and study. In later stages of the process of data collection and on the basis of the first findings, the strategy of theoretical sampling was used for extending the sample. In total, our data basis consists of 48 qualitative semi-structured interviews (BOCK, 1992; LEGARD, KEEGAN & WARD, 2003), each of 60 to 120 minutes in length. 14 of the interviews were conducted with women scientists or engineers. The design of the interview guide was mostly oriented towards two types of the qualitative interview: the focused interview (MERTON & KENDALL, 1979 [1945/46]) and the problem-centered interview (WITZEL, 2000). Both interview types were adopted with predominant respect to a non-directional open manner of conducting the interview while at the same time allowing for focusing on a particular topic, namely, the academic practices and (self-) conceptions of the interviewee. [9]

Generally, the interview type was chosen for combining structure with flexibility and, thus, for comparability while at the same time fostering the interviewees' own wording and meaning (LEGARD et al., 2003, pp.141). The interview guide continuously aimed at producing narrative accounts by the interviewees, i.e., on a content-level, the guide encouraged the interviewees to describe their own research position, their area of work, and their image of the ideal scientist or engineer. Thus, questions broached the issue of our interviewees' occupational career, daily work routines, research practices as well as the qualities and skills needed in their area of research. Additionally, some questions invited interviewees to reflect upon their research team, to describe who counts as a promising team member, someone they think worth being promoted. Furthermore, all interviewees were asked to position themselves and their area of research within the broader field of academia, stimulating them to draw crucial boundaries and/or to find relevant similarities with other domains. Following the postulate of openness in qualitative research, it was completely up to the interviewees to articulate significant boundaries, to produce criteria for demarcation and, thus, to present their own relevance ranking. [10]

This is especially important for the category of gender: Concerned about imposing "gender" as a relevant category of social distinction on our interviewees' professional self-understanding and thereby encouraging the reproduction of

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

gender differences, we employed several counter-strategies throughout the entire interview situation. Firstly, we presented ourselves as sociologists generally interested in the professional practices of our interviewees. Although some interviewees might have checked us out online, the interviews rather suggest that the majority of them perceived the interview as dealing with their work and research. However, the specific and, certainly, symptomatic gender structure of the interview setting—in most cases a young female researcher interviewing an older and well-established male scientist—called for a constant awareness for its potential effect on the data production (see for a reflexive discussion on this issue BEHNKE & MEUSER, 1999; BROOM, HAND & TOVEY, 2009; KOSYGINA, 2005; LISIAK, 2015; MALLI & SACKL-SHARIF, 2015). Secondly, the sequence of questions in the interview guide was composed in order to avoid addressing the gender issue explicitly right from the start. Only in a later stage of the interview was the issue raised by the interviewer, though only as one of a broader range of several societal issues. Thus, in that stage every interviewee was invited to talk about the impact of *new information and communication technologies, of globalization and migration, and of women's emancipation and their increasing labor participation on their area of work.* Apart from these questions, it was up to them to address social categories such as gender and to link these categories with professional images and epistemic boundaries. [11]

All interviews were digitally recorded and fully transcribed in a word-by-word manner, taking note of peculiarities but not of dialect and intonation (DITTMAR, 2009) as our analysis was focused on the level of content. The process of data analysis itself was technically supported by the use of MaxQDA primarily for coding. [12]

The data analysis draws generally, and as further specified below, on major guidelines of grounded theory methodology (GTM), developed by GLASER and STRAUSS (1967) and advanced by STRAUSS and CORBIN (1990). As GTM aims at generating new theories, our analysis basically sought to reconstruct the dominant ideas about the gendered "scientific persona" (for the theoretical outcomes, see PAULITZ et al., 2015). In this article, however, the main emphasis is placed on the specific and gender related *methodological challenges* encountered in the process of data analysis and how we dealt with them. [13]

Specifically, the data analysis used basic "methodological tools" (CHARMAZ, 2016, §38) of GTM such as open and selective coding and memo writing (besides theoretical sampling as already mentioned above), considering GTM as a research style which can be implemented in connection with different social theories[2]. While using these tools, we followed a discourse-theoretical adaption of GTM as developed in feminist research, taking up a constructivist stance such as in PAULITZ (2005, pp.75) and as previously suggested by GUTIÉRREZ RODRÍGUEZ (1999, pp.65). More in detail, such an adaption neglects the coding paradigm developed by STRAUSS (1987), which reflects a strong action

---

2   Further extensions and theoretical and epistemological reworking of the methodological strategies of GTM have been developed, for instance, by CHARMAZ (2006) or KELLER (2005, pp. 269-271). Both approaches are not followed here.

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

theoretical and interactionist perspective. In contrast, coding concentrates on the level of cultural knowledge, i.e., on the discursive patterns of understanding, demarcating and, thus, framing of the interviewees' academic culture and professional self. In that sense, the issues the interviewees bring up at all are of particular interest as well as the distinctions they make, the problems they address and the ways these problems were structured and dealt with. Furthermore, in the course of the analysis, a closer look was taken at the blank spaces in the interviewees' problematizations and interpretations in order to also trace the absent as a symptomatic component of how the discursive practices of distinction are regulated and how the space of what can be said and thought looks like.[3] In the course of analyzing the accounts of our interviewees in such a way, a rigorous claim for (gender) neutrality and objectivity became visible in the data forming a certain methodological challenge which clearly called for an appropriate analytical strategy. [14]

3. The Dominant Claim for (Gender) Neutrality in the Field of Science and Engineering

When it came to analyzing the interviews, one finding struck us at first glance: Interviewees talked about everything but gender. Except for some informants, to whom we will come back later, most of our interviewees did not make use of popular gender stereotypes when talking about their work and describing their area of research. But why did we expect gender to be present? Research on popular images of science and the scientist shows that these popularized scientific myths are highly gendered, with objectivity and heroism being associated with masculinity (e.g., ORESKES, 1996). In contrast to these popular images of science, no one described his or her scientific endeavor as a matter of "real men," insinuated that he or she could not imagine a woman being his or her successor or mentioned experiences of direct—gender based—discrimination. Gender as a category of distinction seemed to be largely absent and, accordingly, no relevant criterion for drawing boundaries and raising demarcations. [15]

In fact, not only were gender stereotypes largely absent in professional descriptions and images, some of our interviewees decidedly presented their research as absolutely neutral, and therefore also distinctly gender-*neutral*. In correspondence with the widely recognized epistemic status of science as completely independent from the individual, any kind of external influence was strongly objected to. The following statement[4] of a professor in engineering mechanics arguing against the influence of globalization on his area, is exemplary for this neutrality claim: "But these fundamentals of mechanics, they are—I would say—not really subject to any temporary fashion flows" (TeWi_11:

---

3 For additional details on the underlying approach for analyzing academic discourses of science and engineering, following recent feminist science studies, see also PAULITZ (2012a, pp. 88-98). For addressing the absent in empirical discourse analytical research from a gender perspective, see TUIDER (2015).

4 Empirical quotes have been translated from German to English for this article, but are given in their original version in footnotes in order to make the translation process more transparent.

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

411-412[5])[6]. The same interviewee also argues explicitly for the gender-neutrality of the mechanical fundamentals and, thus, marks his object of research as absolutely independent from the person and sex of the researcher: "The fundamentals of mechanics are completely gender-neutral [...] that is, for the fundamentals of mechanics it is completely irrelevant [laughing] whether it is a man or a woman doing it" (TeWi_11: 447-456)[7]. As our interviewees did not connect ideas about gender with their professional descriptions, the resulting professional images appeared not to be gendered at first glance. Even where there was a reference to the gender issue, informants programmatically de-gendered their scientific endeavor. [16]

Considering the obviously emphasized separateness between gender and professional issues, it is especially interesting what informants answered when being asked about the relevance of women's emancipation and labor participation for their own area of research. Taking a closer look at these passages in the interviews, it quickly became very clear that our interviewees responded to our question in a specific manner that constituted a certain pattern of response. Instead of referring to the mentioned topics of gender relations, they made rather global statements on gender-equality concerns. As if it was a keyword, the term "women" seemed to trigger elements of a general public discourse on women's underrepresentation in science and engineering. Analyzing the respective answers more closely, we found a presumably arbitrary mixture of gender-equality politics, problems concerning their implementation and everyday knowledge about women. When it comes to the political campaigns—which have been implemented at every Austrian university throughout recent years—directed at recruiting women as students and promoting their scientific careers, especially in engineering and science domains, many interviewees referred to their own institutional experiences made in that context. Furthermore, it became clear that our informants were very well aware of the structural gender inequalities in their respective working environments as they were of the possible danger of being politically incorrect when it comes to talking about "women." At some points in our interviews, the latter became very explicit as the following quote from a professor in construction engineering indicates: "I am a man, one need to be cautious when talking to a woman about this issue, because it is often misunderstood" (TeWi_08: 481-482)[8]. This quote with its reference to the interview setting as well as to the insecurity concerning statements on "women" already indicates what our empirical findings show: naively and/or overtly presented gender stereotypes are not to be expected when studying higher education and academia. Considering the imminent discursive context of such statements, it seems reasonable to

---

5 To ensure traceability, we labeled our interviews as follows: TeWi/NaWi = field of science (TeWi for engineering, NaWi for natural sciences), 11 = interview number, 411-412 = line numbers within the interview transcript.

6 Original quote: "Aber diese mechanische Grundlagen, die sind – würde ich einmal sagen – nicht wirklich so Modeströmungen stark unterworfen" (TeWi_11: 411-412).

7 Original quote: "Die Grundlagen der Mechanik, die sind vollkommen geschlechtsneutral oder ich meine, jemand der den Schwerpunktsatz anwendet […] also für die Grundlagen der Mechanik ist das vollkommen irrelevant (lachend), ob es Mann oder Frau macht" (TeWi_11: 447-456).

8 Original quote: "Ich bin ein Mann, man muss vorsichtig sein wenn man einer Frau gegenüber über das spricht, weil es oft falsch verstanden wird" (TeWi_08: 481-482).

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

suggest that this reluctance is also an effect of currently running gender equality politics that are especially directed at male-dominated domains in higher education, such as science and engineering. Apparently, these politics not only have an impact on the structural level of recruiting for positions, boards and committees, but also on the level of dominant discursive patterns that reflect contradictory experiences with institutional politics and increased awareness of gender as a delicate issue to talk about. [17]

So far it can be summarized that the science and engineering scholars who participated in this study made very few explicit remarks on the gender category, and they hardly ever linked gender to professional images. Thus, the overall finding clearly is that, at least for the participants in this study, gender obviously does *not* serve as an easygoing symbolic resource in defining and positioning science and engineering. For us, as gender studies scholars, this raises the question of what this means for studying the gender norms underlying epistemic cultures of science and engineering. Are we to assume that the respective professions and activities are as objective and (gender) neutral as informants in the field claim? Or, are science and engineering currently gendered in a more subtle and implicit way? And if so, how can we generate and analyze empirical data that allows for tracing these forms of gendering science and engineering? [18]

Trying to make possible subtle forms of gendering science and engineering epistemic cultures stick, we turn to the aforementioned exceptions in our sample. Interestingly, some of the interviewed women did refer to gender on their own account. Taking a constructivist gender theoretical approach as we certainly do, it does not seem to be a fruitful approach to contrast men's and women's professional (self-) descriptions in an essentialist and difference-theoretical manner. Interpreting gender differences that way would not only reify the gender dichotomy, but would also presuppose a congruency and linearity between sex and gender as well as a stable binary gender system, both of which have been suspended within constructivist gender theory from the 1990s onwards (cf. BUTLER, 1990; GILDEMEISTER & WETTERER, 1992). Comparatively reviewing our interview material according to GTM, however, suggested that women scholars do partly refer to their experiences as "women" when talking about their career. Taking a closer look at these passages, we found that the women scholars in our study labeled their area as a "men's field" or talked about disadvantages of being a woman in such an environment. A woman mathematician for instance alluded to gender when explaining career options in her area of research: "Generally, chances are very low. But if you are a woman, you almost have no chance at all" (NaWi_11: 107-108).[9] As this quotation shows, discriminatory experiences remain indeed only hinted at, but nevertheless seem to be in place in spite of all claims for gender neutrality. Indeed, this quotation reflects on gender primarily in terms of career options and equal opportunities. When it comes to the very professional accounts, to descriptions of their own epistemic culture and area of research—as regards content—the women in our sample again develop very similar conceptions as their male colleagues. Thus,

---

9   Original quote: "Und man halt eigentlich vom Haus aus sehr wenig Chance und als Frau eben quasi überhaupt keine Chance" (NaWi_11: 107-108).

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

they certainly do not produce any kind of (allegedly "female") counter-narrative, but equally embark on the general discourse of professional objectivity and neutrality. It is these very similar accounts on professional ideas that present all of our informants as actors within the same social field with its own historically established rules of discursive practice. Even though women scholars do not produce "other" professional narrations and equally claim (gender) neutrality for their field of study, their statements on gender inequalities hint at the fact that gender norms nevertheless are attributed to science and engineering. If this is the case, we are called to develop the appropriate analytical means to identify and empirically reconstruct these subtle forms of gendering science and engineering. [19]

To summarize up until now, we are faced with continuous claims for (gender) neutrality, a lack of explicit linkages between professional descriptions and ideas about gender as well as counter-narratives by women as the marginalized social group in the academic field of science and engineering. At this point, gender studies scholars might be tempted to refer to common cultural stereotypes in their analysis such as the equation: technology = masculine (OLDENZIEL, 1999) in order to deal with the gender aspect in science and engineering. However, as WAJCMAN (1991) has already convincingly noted, such an approach involves, among others, the danger of "adopting an essentialist position that sees technology as inherently patriarchal" (p.25) and, thus, again of reifying gender differences, this time on the grounds of cultural stereotypes. Taking this criticism methodologically into account, we strike another path by analytically dealing with the very linkages that *do* exist between the symbolic gender order and epistemic cultures in the data itself, even if they are rather *implicit*. Consequently, we strive for a methodological approach that allows for both, to unveil implicit connections between the gender category and epistemological issues in science and engineering and to give evidence for them on the basis of the empirical data at hand. Following the strategy of constant comparison proposed in GTM (cf. STRAUSS & CORBIN, 1990), we have therefore developed an analytical strategy for reconstructing the ways that gender norms are implied in academic (self-) conceptions and fundamental cultural orientations of what a discipline is "really" about. In the following, we will detail this analytical strategy with the help of two examples. [20]

4. Comparing Patterns of Distinction: an Analytical Strategy for Reconstructing Implicit Gender Norms in Science and Engineering

In a nutshell, we propose to compare patterns of distinction with regard to professional descriptions on the one hand and with regard to statements on gender on the other hand. This means that we take a very close look at those interview passages in which professional self-descriptions are produced and at those passages in which the issue of gender is explicitly raised. We thereby focus on *how* actors tell the story of their field, that is, on the *patterns of professional narration*, and then check these against the *patterns of gender differentiation* in the same interview. In doing so, it is the social distinctions and epistemological differentiations made that are compared on a *content* level. In order to detect and

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

trace the similarities with which these allegedly separated issues are treated, we apply this comparative strategy within one interview at a time. In other words, the analysis is directed at the criteria referred to and the arguments brought forward when the relevant epistemic practices and gender differentiations are described. Approaching our data this way, we can find corresponding patterns of narration in almost every interview. [21]

Arguing that such correspondences are neither coincidental nor irrelevant, we propose that they most likely hint at the latent connections between the epistemic culture and the symbolic gender order in the empirical field. Even though these links remain implicit in a regular reading of the interview, emerging at anything but neighboring interview passages, they definitely exist not only within the empirical data, but within single interviews. Employing this strategy makes it possible to reconstruct gender norms underlying professional self-descriptions, although they may be not intended by the interviewees. Additionally, we can show how epistemic cultures differ within the broader span of scientific and engineering areas and are gendered in diverse ways. In other words, there is *not one* single mode of attributing gender norms to epistemic cultures but multiple forms of gendering engineering and science and their epistemic subject. The full bandwidth of diversity studied with the help of this analytical strategy has been published in more detail in PAULITZ et al., 2015). For this article we will concentrate on illustrating the analytical strategy by presenting two empirical examples. The step-by-step reconstruction of the proposed methodological approach will track down the implicit intertwining of professional images on the one hand and ideas about gender on the other. [22]

4.1 (In-) Compatibility of life course and career path as a way of gendering the sciences

Peter[10] is a professor in fundamentals of chemistry. For an academic career in his area of research, he considers three things as indispensable: *internationality*, *mobility* and *availability*. Internationality is not only framed as one of the central characteristics of academic research as a whole—as when he states that "[a]cademic research has always been international, has always been global, because knowledge does not know national borders" (NaWi_06: 355-356)[11]—it is also what he aspires for his own research unit: "we want to do international research on an utmost top level and therefore a specific type of personality is needed" (NaWi_06: 170-171)[12]. In the latter quote he already denotes the idea that for the envisioned form of professional scientific activity a "specific type of personality is needed," in other words, not everyone is seen as adept to achieve in it. As the following examples from the interview with Peter show, he

---

10 To ensure anonymity we gave our interview partners fictitious first names which are only indicative of their gender.

11 Original quote: "Akademische Forschung war immer international, war immer global, weil Erkenntnisse kennen keine Nationalgrenzen" (NaWi_06: 355-356).

12 Original quote: "Wir wollen hier internationale Forschung auf absolutem Topniveau machen und das braucht einen bestimmten Persönlichkeitstyp" (NaWi_06: 170-171).

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

discursively develops a professional norm that is centered on ideals of mobility and availability. [23]

Explaining the requirements for being professionally successful in his area of research, he states:

> "That is a matter of 100 percent engagement. There is no half-time research possible. That is why I am skeptical, when it comes to some kind of part time academic research. There simply are no part-time publications or part-time findings. In such a way you can probably contribute a little piece of the puzzle within a bigger group, but nothing proper of your own" (NaWi_06: 85-89)[13]. [24]

And also when talking about the young academics in his area of research, it is commitment he ponders upon: "Especially young people, who still have to learn a lot and have a long road to go, here, engagement is an important indicator and only people who really make a good effort, will have considerable success" (NaWi_06: 79-81)[14]. This engagement is later again connected to expectations of career mobility and, thus, the demand: "And then you do your first post-doc, hopefully abroad" (NaWi_06: 184-185)[15]. [25]

To sum up, when talking about the scientific activity in his research area and the figure of the scientist, Peter depicts the ideal of an internationally successful, mobile and always available epistemic subject. As the cited quotes also show, gender does not play any explicit role in his considerations. Does that mean that the described image of the scientist is gender neutral? [26]

In order to dig a bit deeper and answer this question, we compare the above reconstructed professional ideals with Peter's answers to our question on women's emancipation and labor participation. He thereby negates any changes within his area of research resulting from women's increased engagement in the public sphere:

> "In [...] [my research areas] we have always had high proportions of women among our student population. We have a high proportion of women on the PhD-level, but this radically decreases and approaches zero when it comes to female professors" (NaWi_06: 368-371)[16]. [27]

---

13 Original quote: "Aber da ist das eine 100 prozentige Engagementangelegenheit. Dafür gibt es keine Halbtagsforscher. Deshalb bin ich auch sehr skeptisch in der akademischen Forschung, wenn es darum geht hier Art [...] Teilzeit etwas zu machen. Es gibt eben keine Teilzeitpublikationen und keine Teilzeiterkenntnisse, das ist. Da kann man vielleicht dann ein kleines Mosaiksteinchen in einer größeren Gruppe beitragen, aber selber wird da nichts mehr" (NaWi_06: 85-89).

14 Original quote: "Gerade bei jungen Personen, die müssen noch viel lernen, die müssen noch einen weiten Weg zurücklegen. Und da ist sicher Engagement ein wichtiger Gradmesser und nur Leute, die halt wirklich das Engagement zeigen, die haben dann auch sichtbar Erfolg" (NaWi_06: 79-81).

15 Original quote: "Dann macht man Post Doc eins, hoffentlich im Ausland" (NaWi_06: 184-185).

16 Original quote: "Wir haben immer schon in der [...]biologie einen sehr hohen Frauenanteil im Bereich der Studierenden gehabt. Wir haben einen sehr hohen Frauenanteil im Bereich der Dissertantinnen und der nimmt dann radikal ab und geht bei den Professorinnen in unserem

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

Asked for his opinion on this observed vertical gender segregation, he explains that for women "the way from post-doc to professorship is harder," because of problems concerning work-life reconciliation and scientific mobility:

> "I see a certain reservation of women when it comes to working abroad, that is, following this bumpy road to success. Often the time of starting a family coincides. [...] Then a big break occurs. Then they have a partner, who has certain professional needs of his own and then women often give in. And giving-in in our area—that is, in academic research, in our laboratory, where it is about doing top research—this means being knocked-out" (NaWi_06: 391-397)[17]. [28]

What can be learned from this comparison? At first glance, a pretended neutral image of the international, highly mobile and available scientist is presented at the core of the respective epistemic culture, which does not explicitly and purposefully exclude anybody. At a second glance, however, the comparison of the patterns of narration indicates that the professional conception of the ideal scientist implies a subtle and tacit gender code. The example shows that the normative image of the scientist is intertwined with references to gender on the level of content; when Peter calls for unlimited commitment to research on the one hand and addresses the problem of restricted commitment because of work-family-reconciliation on the other hand—noteworthy, the restricted commitment following the starting of a family by women. In denying women the motivation to follow "this bumpy road to success," when asked about gender, it becomes clear that there is an implicit gender norm behind the presumably neutral image of the successful scientist which is certainly not female. Reversely, we interpret the respective epistemic subject to be based on a certain symbolic norm of scientific masculinity. [29]

4.2 The gendering of interest as the core requirement for an engineering scholar

Thomas is a professor in fundamentals of electrical engineering. In describing the work in his area of research he calls for a certain form of intrinsic motivation evoked by a distinct interest, which is detached from any direct forms of usage but declaredly originates in the scholar him- or herself. Thus, it is this abstract *interest* in theoretical research that he puts forward as the core requirement for an engineering scholar: "I think, in academic research one should have the ability of asking questions that have not directly been posed in practice, but questions, let us say, out of curiosity" (TeWi_01: 123-125)[18]. [30]

Bereich auf Null" (NaWi_06_ 368-371).

17 Original quote: "[...]ich sehe dann doch eine gewisse Zurückhaltung der Frauen, wenn es darum geht, ins Ausland zu gehen, also diesen steinigen Weg weiter zu beschreiten. Da kommt dann oft die Zeit der Familiengründung dazu. [...] Dann kommt der große Bruch. Dann haben sie einen Partner, der Partner hat auch gewisse berufliche Bedürfnisse und dann geben die Frauen sehr oft nach. Und das nachgeben heißt in unserem Bereich – also im akademischen Forschungsbereich, in unserem Labor, wo es darum geht, Topforschung zu machen – heißt das knock out" (NaWi_06: 391-397).

18 Original quote: "Ich meine, bei der universitären Forschung soll man auch in der Lage sein, Fragen zu stellen, die nicht unmittelbar in der Praxis aufgestellt worden sind, sondern irgendwelche Fragen, sagen wir, aus Neugier"(TeWi_01: 123-125).

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

This specific form of interest becomes a major factor of recruitment and, thus, turns from a mere self-concept into a normative idea about what the profession really is about and what is expected of a future engineering scholar, when Thomas talks about students in his area of study: "Actually the interest, the interest is the most important (thing) when studying. That one somehow has this eagerness of knowledge. That is important" (TeWi_01: 291-293)[19]. [31]

Throughout the interview, Thomas depicts the normative ideal of an engineering scholar who is driven by "pure" interest. He thereby does not make any allusion to the gender category and, thus, produces a presumably gender neutral image of the engineer as epistemic subject. Interestingly enough, the issue of "interest" indeed reappears in Thomas' answers to our question on the relevancies of women's emancipation for his area of research. Referring to everyday knowledge about gender differences, he ponders on how women are (dis-) interested in technology:

> "However, supposedly it is not accidental that women do have less interest in technical jobs" (TeWi_01: 383-384).

> "I do not exactly know why the image of technology is not that positive for women, that is, less positive than for men" (TeWi_01: 403-404)[20]. [32]

Again, comparing these quotes, one can see the similarity in the patterns of narration once with respect to describing the own profession and once with respect to describing women. Even if the informant does not himself connect both aspects, nor offer any explanation on the correlating arguments, there is an apparent link between the presumably neutral interest and the mentioned gender norm of women being indifferent toward technology. The connecting element is the question of having or not having the required (cognitive) interest. Putting quotes that are actually far-flung in the interview next to each other in order to tell the full story, one can see that the very intrinsic interest is assigned to men rather than to women. What does that mean for our question of the symbolic gendering of the engineering scholar, when interest as the repeatedly confirmed normative core of the engineer is something that women are regarded to be lacking? We argue that this hints at the fact that there is an implicit gender norm implied in the presumably neutral image of the profession. Thus, the epistemic subject in engineering is certainly not female, but is rather to be understood as based on a certain form of masculinity. While distinctly claimed to be neutral, it is a male gender norm that forms the constitutive part of the professional image of the engineering scholar. [33]

---

19 Original quote: "Eigentlich das Interesse, das ist das Wichtige beim Studium. Dass man irgendwie diese Wissensbegierde hat. Das ist wichtig" (TeWi_01: 291-293).

20 Original quote: "Aber wahrscheinlich ist es nicht zufällig, dass Frauen weniger Interesse an technischen Berufen haben" (TeWi_01: 383-384).

"Ich weiß nicht genau warum, das Bild der Technik für Frauen nicht so positiv ist also weniger positiv ist als für Männer" (TeWi_01: 403-404).

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

5. Conclusions

In this article we have argued that the symbolic gendering of science and engineering rarely occurs in an explicit manner today, facing gender studies scholars with the challenge of tracking down and reconstructing the more subtle and implicit forms of attributing gender norms to epistemic cultures. This challenge is not in the least trivial when researchers, on the one hand, have to be aware of not getting caught in the trap of reifying gender differences by means of their own research and, on the other hand, strive for giving evidence for something that is not explicit. Against this background, we have proposed an analytical strategy that allows for detecting and reconstructing links between the professional and gender, that is the epistemic culture in science and engineering and the symbolic gender order, which are grounded within the empirical data. Although there may be different approaches that have been shown to be fruitful by other feminist science and technology studies' scholars, the proposed analytical strategy that has been developed in struggling with our own empirical data, has already proven to be helpful in an array of cases where gender was not readily talked about (see also PRIETL, 2016). It could further open an empirical pathway to subtle forms of gendering also in other areas claiming neutrality such as expert cultures in politics or economy. [34]

As the exemplification of this analytical strategy on the basis of two empirical cases has shown, it is centered on the comparison of patterns of narration in the relevant passages within one interview at a time. In other words, the analysis focuses on comparing the criteria and categories referred to in order to draw epistemic and gender boundaries. We argue that correspondences in these patterns of distinction, which can then be reconstructed in the course of the qualitative data analysis, are neither coincidental nor irrelevant, but hint at an *implicit* connection between gender and the epistemic cultures. By tracing these linkages, one can find evidence for the implicit gendering of science and engineering *in the data, despite* explicit claims for neutrality. Thus, this article seeks to contribute to learning more about the rather unintendedly conveyed cultural gender norms as they can be found in the self-understandings and professional images of engineering and science but might also be of relevance in other social contexts where political discourses of gender equality, professional norms of neutrality and other discursive norms render addressing gender issues illegitimate. [35]

Concluding, the reconstructed images of the engineering scholar or the scientist can then be interpreted as androcentric constructions of the epistemic subject. In other words, engineering and scientific "personae" are presented as universal human, while their masculinity remains unmarked. This androcentric construction is concordant with the dominant claim for objectivity and neutrality in the field of academia. As such, the absence of ostensible relations between ideas about gender and professional descriptions allows both men and women to claim neutrality. Consequently, it is only understandable that women scientists do not produce counter-narratives, which would probably mark their position in academia as gendered. [36]

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

Acknowledgments

References

Algazi, Gadi (2010). Habitus, familia und forma vitae. In Frank Rexroth (Ed.), *Beiträge zur Kulturgeschichteder Gelehrten im späten Mittelalter* (pp.185-217). Ostfildern: Thorbecke Verlag.

Algazi, Gadi (2012). Küche und Studierzimmer: Vormoderne Ökonomien von Wissenschaft und Geschlecht. Talk at the symposium "*Akademische Wissenskulturen und soziale Praxis*," December 13-15, 2012, Graz, Austria.

Althoff, Martina; Bereswill, Mechthild & Riegraf, Birgit (Eds.) (2000). *Feministische Methodologien und Methoden. Traditionen, Konzepte, Erörterungen*. Opladen: Leske + Budrich.

Beaufaÿs, Sandra (2004). Wissenschaftler und ihre alltägliche Praxis: Ein Einblick in die Geschlechterordnung des wissenschaftlichen Feldes. Fo*rum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *5*(2), Art. 10, http://nbn-resolving.de/urn:nbn:de:0114-fqs0402109 [Accessed: September 4, 2015].

Beaufaÿs, Sandra & Krais, Beate (2005).Doing Science – Doing Gender. Die Produktion von WissenschaftlerInnen und die Reproduktion von Machtverhältnissen im wissenschaftlichen Feld. *Feministische Studien*, *1*, 82-99.

Behnke, Cornelia & Meuser, Michael (1999). *Geschlechterforschung und qualitative Methoden*. Opladen: Leske + Budrich.

Bereswill, Mechthild & Liebsch, Katharina (Eds.) (2013). *Geschlecht (re)konstruieren. Zur methodologischen und methodischen Produktivität der Frauen- und Geschlechterforschung*. Münster: Westfälisches Dampfboot.

Berger, Roni (2015). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research*, *15*(2), 219-234.

Bloor, David (1976). *Knowledge and social imagery*. Henley: Routledge.

Bock, Marlene (1992). Das halbstrukturierte-leitfadenorientierte Tiefeninterview. In Jürgen H.P. Hoffmeyer-Zlotnik (Ed.), *Analyse verbaler Daten. Über den Umgang mit qualitativen Daten* (pp.90-109). Opladen: Westdeutscher Verlag.

Bott, Esther (2010). Favourites and others: reflexivity and the shaping of subjectivities and data in qualitative research. *Qualitative Research*, *10*(2), 159-173.

Breuer, Franz; Mruck, Katja & Roth, Wolff-Michael (2002). Subjectivity and reflexivity: An introduction. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *3*(3), Art. 9, http://nbn-resolving.de/urn:nbn:de:0114-fqs020393 [Accessed: November 15, 2015].

Broom, Alex; Hand, Kelly & Tovey, Philip (2009). The role of gender environment and individual biography in shaping qualitative interview data. *International Journal of Social Research Methodology*, *12*(1), 51-65.

Buchen, Sylvia; Helfferich, Cornelia & Maier, Maja S. (Eds.) (2004).*Gender methodologisch. Empirische Forschung in der Informationsgesellschaft vor neuen Herausforderungen*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Butler, Judith (1990).*Gendertrouble*. New York: Routledge.

Cancian, Francesca M. (1992). Feminist science: Methodologies that challenge inequality. *Gender & Society*, *6*(4), 623-642.

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

Charmaz, Kathy (2006). *Constructing grounded theory. A practical guide through qualitative analysis*. London: Sage.

Charmaz, Kathy & Keller, Reiner (2016). A personal journey with grounded theory methodology. Kathy Charmaz in conversation With Reiner Keller. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *17*(1), Art. 16, http://nbn-resolving.de/urn:nbn:de:0114-fqs1601165. [Accessed, September 4, 2016].

Code, Lorraine B. (1981). Is the sex of the knower epistemologically significant? *Methaphilosophy*, *12*(3&4), 267-276.

Collins, Harry M. & Pinch, Trevor (1982). *Frames of meaning: The social construction of extraordinary science*. London: Routledge.

Daston, Lorraine (2003). Die wissenschaftliche Persona. Arbeit und Berufung. In Theresa Wobbe (Ed.), *Zwischen Vorderbühne und Hinterbühne* (pp.109-136). Bielefeld: transcript Verlag.

Degele, Nina (2008). *Gender/Queer Studies: eine Einführung*. Paderborn: W. Fink Verlag.

Dittmar, Norbert (2009). *Transkription. Ein Leitfaden mit Aufgaben für Studenten, Forscher und Laien*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Dölling, Irene (1999). "Geschlecht" – eine analytische Kategorie mit Perspektive in den Sozialwissenschaften? *Potsdamer Studien zur Frauen- und Geschlechterforschung*, *3*(1), 18-27.

Engler, Steffani (2001). *In Einsamkeit und Freiheit? Zur Konstruktion der wissenschaftlichen Persönlichkeit auf dem Weg zur Professur*. Konstanz: UVK.

Fox Keller, Evelyn (1985). *Reflections on gender and science*. New Haven, CN: Yale University Press.

Gieryn, Thomas (1994). Boundaries of science. In Sheila Jasanoff, Gerald E. Markle, James C. Petersen & Trevor Pinch (Eds.),*Handbook of science and technology studies* (pp.167-188). London: MIT Press.

Gieryn, Thomas (1999). *Cultural boundaries of science. Credibility on the line*. Chicago, IL: University of Chicago Press.

Gilbert, Anne-Francoise (2009). Disciplinary cultures in mechanical engineering and materials science. Gendered/gendering practices? *Equal Opportunities International*, *28*(1), 24-35.

Gildemeister, Regine (2004). Geschlechterdifferenz – Geschlechterdifferenzierung: Beispiele und Folgen eines Blickwechsels in der empirischen Forschung. In Sylvia Buchen, Cornelia Helferich & Maja S. Maier (Eds.), *Gender methodologisch. Empirische Forschung in der Informationsgesellschaft vor neuen Herausforderungen* (pp.27-45). Wiesbaden: VS Verlag für Sozialwissenschaften.

Gildemeister, Regine & Wetterer, Angelika (1992). Wie Geschlechter gemacht werden. Die soziale Konstruktion der Zwei-Geschlechtlichkeit und ihre Reifizierung in der Frauenforschung. In Gudrun-Axeli Knapp (Ed.), *Traditionen Brüche. Entwicklungen feministischer Theorie* (pp.201-254). Freiburg: Kore Verlag.

Glaser, Barney G. & Strauss, Anselm L. (1967).*The discovery of grounded theory*. New York: Aldine.

Guitierrez Rodriguez, Encarnacion (1999). *Intellektuelle Migrantinnen – Subjektivitäten im Zeitalter von Globalisierung. Eine postkoloniale dekonstruktive Analyse von Biographien im Spannungsverhältnis von Ethnisierung und Vergeschlechtlichung*. Opladen: Westdeutscher Verlag.

Hacking, Ian (1983).*Representing and Intervening*. Cambridge: Cambridge University Press.

Haraway, Donna (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, *14*(3), 575-599.

Haraway, Donna (1989). *Primate visions. Gender, race, and nature in the world of modern science*. New York: Routledge.

Harding, Sandra (1986). *The science question in feminism*. Ithaca, NY: Cornell University Press.

Heintz, Bettina; Merz, Martina & Schumacher, Christina (2004). *Wissenschaft, die Grenzen schafft. Geschlechterunterschiede im disziplinären Vergleich*. Bielefeld: transcript Verlag.

Kahlert, Heike (2013).*Riskante Karrieren. Wissenschaftlicher Nachwuchs im Spiegel der Forschung.* Leverkusen: Verlag B. Budrich.

Kelle, Helga (1999). Geschlechterunterschiede oder Geschlechterunterscheidung? Methodologische Reflexion eines ethnographischen Forschungsprozesses. In Bettina Dausien,

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

Martina Hermann, Mechthild Oechsle, Christian Schmerl & Marlene Stein-Hilbers (Eds.), *Erkenntnisprojekt Geschlecht* (pp.304-324). Opladen: Leske + Budrich.

Keller, Reiner (2005). *Wissenssoziologische Diskursanalyse. Grundlegung eines Forschungsprogramms.* Wiesbaden: VS.

Kessler, Suzanne J. & McKenna, Wendy (1978). *Gender. An ethnomethodological approach*. New York: University of Chicago Press.

Knorr-Cetina, Karin (1999). *Epistemic cultures. How the science make knowledge*. Cambridge, MA: Harvard University Press.

Knorr Cetina, Karin (2005). Culture in global knowledge societies: Knowledge cultures and epistemic cultures. In Marc D. Jacobs & Nancy Weiss Hanrahn (Eds.), *The Blackwell companion to the sociology of culture* (pp.67-79). Malden, MA: Blackwell Publishing.

Knorr-Cetina, Karin & Mulkay, Michael (Eds.) (1983). *Science observed. Perspectives on the social study of science*. London: Sage.

Knuuttila, Tarja (2002). Signing for reflexivity: Constructionist rhetorics and its reflexive critique in science and technology studies. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *3*(3), Art. 15, http://nbn-resolving.de/urn:nbn:de:0114-fqs0203152 [Accessed: November 15, 2015].

Kosygina, Larisa V. (2005). Doing gender in research: Reflection on experience in field. *The Qualitative Report, 10*(1), 87-95, http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1859&context=tqr [Accessed: July 7, 2016].

Krüger, Helga (1999). Geschlecht – eine schwierige Kategorie. Methodisch-methodologische Fragen der "gender"-Sensibilität in der Forschung. In Aylâ Neusel & Angelika Wetterer (Eds.), *Vielfältige Verschiedenheiten* (pp.35-60). Frankfurt/M.: Campus Verlag.

Latour, Bruno & Woolgar, Steve (1986 [1979]). *Laboratory life: The social construction of scientific facts*. Princeton, NJ: Princeton University Press.

Legard, Robin; Keegan, Jill & Ward, Kit (2003). In-depth interviews. In Jane Ritchie & Jane Lewis (Eds.), *Qualitative research practice* (pp.139-169). London: Sage.

Lisiak, Agata A. (2015). Fieldwork and fashion: Gendered and classed performances in research sites. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *16*(2), Art. 14, http://nbn-resolving.de/urn:nbn:de:0114-fqs1502146 [Accessed: September 4, 2015].

Lucht, Petra (2004). *Zur Herstellung epistemischer Autorität. Eine wissenssoziologische Studie über die Physik an einer Elite-Universität in den USA*. Herbolzheim: Centaurus Verlag.

Lynch, Michael (1993). *Scientific practice and ordinary action*. Cambridge: Cambridge University Press.

Malli, Gerlinde & Sackl-Sharif, Susanne (2015). Researching one's own field. Interaction dynamics and methodological challenges in the context of higher education research. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *16*(1), Art. 11, http://nbn-resolving.de/urn:nbn:de:0114-fqs1501111 [Accessed: September 4, 2015].

Mannheim, Karl (1952 [1929]). Wissenssoziologie. In Karl Mannheim, *Ideologie und Utopie* (pp.227-267). Frankfurt/M: Vittorio Klostermann.

Martin, Emily (1991). The egg and the sperm: How science has constructed a romance based on stereotypical male-female roles. *Signs*, *16*(3), 485-501.

Merton, Robert K. & Kendall, Patricia L. (1979 [1945/46]). Das fokussierte Interview. In Christel Hopf & Elmar Weingarten (Eds.), *Qualitative Sozialforschung* (pp.171-204). Stuttgart: Klett-Cotta.

Mruck, Katja; Roth, Wolff-Michael & Breuer, Franz (Eds.) (2002). Subjectivity and reflexivity in qualitative research I. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *3*(3), http://www.qualitative-research.net/index.php/fqs/issue/view/21 [Accessed: November 15, 2015].

Nagy Hesse-Biber, Sharlene (Ed.) (2012). *Handbook of feminist research. Theory and praxis* (2nd ed.). Los Angeles, CA: Sage.

Oldenziel, Ruth (1999). *Making technology masculine. Men, women and modern machines in America 1870-1945*. Amsterdam: Amsterdam University Press.

Oreskes, Naomi (1996). Objectivity or heroism? On the invisibility of women in science. OSIRIS, *11*, 87-113.

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

Paulitz, Tanja (2012a). *Mann und Maschine. Eine genealogische Wissenssoziologie des Ingenieurs und der modernen Technikwissenschaften, 1850-1930*. Bielefeld: transript Verlag.

Paulitz, Tanja (2012b). "Hegemoniale Männlichkeiten" als narrative Distinktionspraxis im Wissenschaftsspiel. *Österreichische Zeitschrift für Soziologie*, *37*(1), 45-64.

Paulitz, Tanja (2005). *Netzsubjektivität/en. Konstruktion von Vernetzung als Technologien des Selbst*. Münster: Westfälisches Dampfboot.

Paulitz, Tanja & Prietl, Bianca (2013). Spielarten von Männlichkeit in den "Weltbildern" technikwissenschaftlicher Fachgebiete. *Informatik-Spektrum*, *36*(3), 300-308.

Paulitz, Tanja; Kink, Susanne & Prietl, Bianca (2015). Fachliche Distinktion und Geschlechterunterscheidung in Technik- und Naturwissenschaften. Grundlagen- und anwendungsorientierte Wissenskulturen im Vergleich. In Tanja Paulitz, Barbara Hey, Susanne Kink & Bianca Prietl (Eds.), *Geschlechterforschung zu natur-, technik- und geisteswissenschaftlichen Fächern* (pp.207-225). Münster: Westfälisches Dampfboot.

Pickering, Andrew (Ed.) (1992). *Science as practice and culture.* Chicago, IL: University of Chicago Press.

Prietl, Bianca (2016). Der Ingenieur als technisch kompetenter und sozial versierter Manager. Vergeschlechtlichte Konturen eines Berufsbildes. *Berliner Debatte Initial, 27*(1), 58-69.

Roth, Wolff-Michael; Breuer, Franz & Mruck, Katja (Eds.) (2003). Subjectivity and reflexivity in qualitative research II. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *4*(2), http://www.qualitative-research.net/index.php/fqs/issue/view/18 [Accessed: November 15, 2015].

Scott, Joan W. (1986). Gender: A useful category of historical analysis? *The American Historical Review*, *91*(5), 1053-1075.

Scott, Joan W. (2010). Gender: Still a useful category of analysis? *Diogenes*, *57*(1), 7-14.

Singer, Mona (2005). *Geteilte Wahrheit. Feministische Epistemologie, Wissenssoziologie und Cultural Studies*. Wien: Löcker Verlag.

Strauss, Anselm L. (1987). *Qualitative analysis for social scientists.* Cambridge: Cambridge University Press.

Strauss, Anselm & Corbin, Juliet (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. London: Sage.

Traweek, Sharon (1988). *Beamtimes and lifetimes. The world of high energy physicists*. Cambridge, MA: Harvard University Press.

Tuider, Elisabeth (2015). Dem Abwesenden, den Löchern und Rissen empirisch nachgehen: Vorschlag zu einer dekonstruktivistisch diskursanalytischen Intersektionalitätsanalyse. In Mechthild Bereswill (Ed.), *Intersektionalität und Forschungspraxis* (pp.172-191). Münster: Verlag Westfälisches Dampfboot.

Wajcman, Judy (1991). *Feminism confronts technology.* Cambridge: Polity Press.

Witzel, Andreas (2000). The problem-centered interview. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *1*(1), Art. 22, http://nbn-resolving.de/urn:nbn:de:0114-fqs0001228 [Accessed: September 4, 2016]

Zachmann, Karin (2004). *Mobilisierung der Frauen. Technik, Geschlecht und Kalter Krieg in der DDR*. Frankfurt/M.: Campus Verlag.

FQS 17(3), Art. 13, Tanja Paulitz, Susanne Kink & Bianca Prietl:
Analytical Strategy for Dealing with Neutrality Claims and Implicit Masculinity Constructions.
Methodological Challenges for Gender Studies in Science and Technology

Authors

Tanja PAULITZ, Prof. Dr., is a social and cultural scientist. She is professor for sociology of knowledge and culture at the Department of Sociology at Technische Universität Darmstadt. Her research and teaching is located in the area of cultural sociology, gender studies, and qualitative methodologies of empirical research focusing on gender, technology, epistemic cultures and professions in science and engineering. Special emphasis is placed on questions of competing masculinities, discursive practices of boundary work, historical and contemporary studies on academic cultures and on the gendered coproduction of technology and modernity.

Contact:

Tanja Paulitz, Prof. Dr.

Department of Sociology
Technical University of Darmstadt
Landwehrstr. 48a/50, 64293 Darmstadt
Germany

E-mail: paulitz@ifs.tu-darmstadt.de
URL: https://www.ifs.tu-darmstadt.de/index.php?id=soziologie

Susanne KINK, MA, is a university assistant at the Department of Sociology at University of Graz (research area: sociology of gender & gender studies). Currently she is working on her PhD project with the working title "Gendered Cultures in Natural Sciences: The Co-Construction of Disciplinary Culture and Gender in Chemistry and Geology." Her research and teaching interests are in the fields of sociology of gender, science studies and research of higher education (gender focus), feminist and queer science and technology studies, qualitative methods, sociology of technology and queer theory. Since 2013 she is in the board of the section "Feminist Theory and Gender Studies" of the Austrian Society for Sociology.

Contact:

Susanne Kink, MA

Department of Sociology
Karl-Franzens-Universtität Graz
Universitätsstraße 15/G3, 8010 Graz
Austria

Tel.: +43 (0)316 380-7084

E-mail: susanne.kink@uni-graz.at
URL: http://soziologie.uni-graz.at/de/geschlechtersoziologie/geschlechtersoziologie/team/susanne-kink/

Bianca PRIETL is a scientific assistant at the Department of Sociology at Technische Universität Darmstadt (research area: sociology of knowledge and culture). Her research and teaching areas comprise among others feminist theory, gender studies on work and organization, science and technology studies, engineering studies, and qualitative social research. She has recently finished her PhD-thesis on the gendered construction of engineering in the field of renewable energies.

Contact:

Bianca Prietl, MA

Department of Socioloy
Technische Universität Darmstadt
Landwehrstr. 48a/50, 64293 Darmstadt
Germany

E-mail: prietl@ifs.tu-darmstadt.de
URL: https://www.ifs.tu-darmstadt.de/index.php?id=soziologie

Citation