Forms of Articulating Epistemic Critique: the Necessity and Virtue of Internal Skepticism in Academia

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Abstract

For many years now, there has been a vivid debate on contemporary forms of articulating epistemic critique, especially concerning the peer review mechanism but also dealing with fund mechanisms and, in some cases, focusing on book reviews. As reviews become more frequent and continue to exert considerable influence on the political landscape of academia, it is increasingly apparent that a fundamental understanding of the internal structure of articulating epistemic critique long overdue. Against this background, the aim of this article is to put forward two arguments. First, we argue these forms of articulating critique should be distinguished in regard to their distinctive characteristics and respective relations to academia as a whole. In doing so, we construct a research heuristic based on two dimensions, the opportunity to participate and the opportunity to react. Second, in response to an ongoing debate in Critical Policy Studies we conducted a small explorative empirical case study about on how scientific critique is articulated in book reviews. Besides providing a new overall perspective on how to categorize these forms of critique we found notable differences corresponding to the varied characteristics of the publication process in two disciplines (sociology/chemistry). We identified three dimensions as central for determining the quality of the expressed critique. As these differences might be related with underlying types of scientific communication, we finally argue that there is a necessity to take a closer look at how configurations of the different forms of scientific critique should be analysed and to address these in their full scope as 'cultures of critique'.

Keywords: epistemic culture, critique, institutionalized scepticism, book review, chemistry, sociology

Forms of and Changes in Epistemic Critique

Within the last 20 years the system of articulating critique within science has undergone fundamental changes. These changes are mainly related to debates about the political reorganization of science, the call for output evaluation of science for allocating resources, the flaws of peer review under the influence of economic or political interests (as the 'Climategate' case indicates, wherein climate scientists involved in IPCC suppressed information) or the critique articulated by scientists themselves who are concerned about the changes in peer-review processes that are currently taking place. In 2013 the Nobel laureate Randy Schekman announced that he would no longer publish his work in the highly ranked journals "Nature" and "Science".[1] He explained his decision by criticizing the strategy of these journals to look for the most impressive stories rather than the scientifically most important ones. According to him, this orientation would diminish the importance of epistemic critique and lower the quality of scientific work. This announcement is only one exposed example of an ongoing process. This is the process of criticizing and reorganizing forms of epistemic critique itself. Cases in point are the debates about useful indicators (cf. Bornmann & Marx, 2013) or transparent systems, like open peer-reviewing (cf. Harnad, 1979; Lee, 2012). These debates are correspond to and in some cases are provoked by the problematic side-effects of the peer-review process or the call for transdisciplinary forms of knowledge production. Forms as well as boundary-conditions of articulation of epistemic critique become visible as central parameters which, however, are currently in flux.

'Organized skepticism' (Merton, 1938, 1942) is certainly an indispensable asset for amassing and consolidating a shared stock of knowledge, which is essential for research communities. As the debates on re-organizing peer review impressively indicate, there are changes taking place with regard to the forms and functions of this way of critique articulation. Nevertheless, even though peer review is the most exposed form of articulating critique (cp. Chubin & Hackett, 1990; Lee et al., 2013; Luukkonen, 2012), it is important to look at the whole picture of critique articulation within science in order to analyze the ongoing changes. Here, we can observe an important lag and one-sidedness of the scientific debate as it mainly focuses on peer review. In light of these circumstances, we would like to put the argument forward that an analysis of the changes within the system of 'organized skepticism' has to take a closer look at the different ways that epistemic critique is articulated and it has to interpret these as a complex set, taking the ways they might interact with each other into account as well. The aim of this article cannot be to offer a comprehensive answer to this question but to suggest a starting point for research and discussion. We will attempt to do this by exploring two arguments. First, we systematically specify forms of epistemic critique. Second, we will offer empirical proof of relevance by examining book reviews as one important but not widely discussed form of articulating critique.

Within this context, in a first step, we develop a typology of forms of critique by taking into account two analytical dimensions: the opportunity to participate and the opportunity to react. In this sense, we will outline our suggestion for systematizing phenomena of epistemic critique by relating them to different *forms* of critique. Second, we will take a closer look on book reviews as a specific form of critique. After some pointed conceptual considerations of relevant dimensions and criteria for this specific form of articulating epistemic critique, we will present the findings of an explorative empirical study on book reviews in German chemistry and sociology. Finally, we argue that the differences uncovered here may point to more basic distinctions between 'cultures of critique' which should be addressed by further research.

Articulating Epistemic Critique in Academia

Drawing from the considerations presented above, we would like to outline our case for a systematized approach to studying the differences between scientific cultures of critique. In order to do this, we will now introduce two ideal type distinctions. The first basic distinction, regarding

Table 1. Forms of practicing critique according to participation and reaction potential (each exemplified by one typical situation).

		Opportunity to participate	
		Low (non-public)	High (public)
Opportunity to react	Low (non-reactive)	*Referee system*	*Book reviews*
	High (reciprocal-reactive)	*Informal exchange*	*Debate*

the modalities of critical comments in scientific contexts, is rooted in the assumption that there is some set of rules that determines the *opportunity to participate* in critique. We know of forms of public criticism, which offer a higher chance of participation, as well as forms of non-public criticism, where possibilities for participation are often very limited. The criteria-conditional parameters of the participation dimension can be regarded as consisting of the terms 'public' and 'non-public'.

The second basic difference refers to the *opportunity to react* which is afforded to criticized scientists in their respective settings. The reaction opportunities dimension describes the range of possibilities for a criticized author to participate in the debate or – conversely – the likelihood with which he will be excluded from it. The rules of whether and how to react can be highly formalized and restricted. This is the case with peer reviewed publications, peer reviewed grant applications and book reviews. Rules however can also be more open, resembling – in its form and structure – everyday practices. Examples are less explicit (and therefore more informal) commentaries. We can therefore distinguish between forms of non-reactive critique and forms of reciprocal-reactive critique.

Based on these two fundamental distinctions and their respective dichotomous values, we can create a contingency table (Table 1). It serves as a heuristic to cover the different modes of commenting in a scientific context. All these forms of articulation – although they may serve other functions as well – are selection mechanisms for the production of scientific knowledge and therefore carry out a memory function as well as an orientation function (cf. Gläser, 2006).

First, we turn our attention to those forms of critique that leave only little chances for the criticized party to react. Located in the protected space of non-public articulation of scientific skepticism with only very little chances to react, we find a number of assessment and evaluation processes which fit the definition of *(unpublished or prepublication) peer review*. Peer review is seen as the 'gold standard' of critique, because the anonymous interaction is presumed to create a high level of objectivity, balance and comprehensiveness in articulating critique (though even here, social order is more complex than is implied; see Laudel, 2006). High (i.e., public) participation opportunity and low reaction opportunity form the defining characteristics for the genre of (*post publication) book reviews*. Reviewer and reviewee are aware of each other, resulting in a higher inner complexity of the social practice of critique, made evident by a variety of styles and gestures expressed in comments or critique.

Second, we take a closer look at those forms of articulating critique that imply a reciprocal-reactive option for criticized persons. This represents the essential situation of articulating critique while addressing the respondent who is invited to react, what can be described as public scientific *debate*. Such a situation allows for both high chances to participate in critique as well as high opportunity to react to it. One widespread form is the discussion following presentations at scientific conferences. In addition to questions of comprehension, this offers the chance for supplemental comments or remarks which further one's own profile or position. *Informal exchange* is the final combination of different levels of opportunity to participate and react presented in table 1. This includes conversations held in confidence at conferences, privately voiced critique regarding presentations as well as the common practice to ask 'critical friends' for their comments and feedback. This informal commenting practice is difficult to grasp empirically since this method of articulating skepticism is non-public.

A brief look at these different forms and forums of critique is enough to gain the impression that the thorough study of these forms constitutes a research program in and of itself. Regarding some aspects of forms of critique, a substantial body of research literature already exists, especially on peer review procedures (e.g., c.f. Hirschauer, 2010; Bornmann, 2011; Lamont & Huutoniemi, 2011; Lee et al., 2013; Squazzoni et al., 2013). Within this debate the exposed as well the somewhat contested role of peer reviews is addressed and it points on the ongoing changes and side-effects as peer review e.g., is heavily expanded due to political needs. Accordingly, this system depends on a complex, large-scale cooperation process, which is sensitive to forms, motivations and institutional contexts. Interestingly, in the course of this debate not only the search for productive forms for re-organizing peer review is expanding but also the differences between scientific communities are addressed. In contrast to this lively and multifaceted debate, the scientific attention to other forms of critique is at its beginning (e.g., cf. Kriwy et al., 2012). We would argue that with regard to the overall understanding of critique and scientific work this situation is unsatisfactory. For this reason, we suppose that a sufficient understanding of critique is only possible by taking into account the interplay of the different forms of and arenas for articulation of critique. Therefore, the debate about re-organizing peer review would profit from a more thorough view on other forms. In this context, we took a first step in this direction by analyzing book reviews.

Exploratory Analysis of Book Reviews: Sociology and Chemistry

With regard to form and function of book reviews, there was an interesting short debate in the journal "Critical Policy Studies". Heiminio Martins (2010) was the one to start the debate by taking a closer look at book reviews, concluding that the negative tone of critical comments – paired with the lack of opportunity to respond to criticism – is wholly unproductive. He argued that reviews are reduced to serving as mere weapons in academic 'wars' for status and recognition and should be regulated by institutionalized procedures (Martins, 2010). There are two reactions to Martins' suggestions in the same volume. Richards (2010) insists critical engagement, both positive and negative, cannot be separated from science and must, indeed, be welcomed. He argues that every academic has not only already been at the receiving end of negative reviews, but that they are also able to accept and understand criticism in its proper context (Richards, 2010). Finally, Mandell and Coulter (2010) invoke empirical arguments and criticize that Martins neither provides appropriate data nor clear definitions for his objections. Their own small-scale, ad-hoc study including 91 review articles in U.S. sociology journals concludes that very disrespectful or unfair reviews would appear to be quite rare in any case (Mandell & Coulter, 2010). Both of the aforementioned articles criticize the suggestions made by Martins, while nevertheless calling for more research on the subject of academic review to expand the limited data on this topic.

From our perspective, two aspects appear to be essential in order to continue this debate. First, empirical data concerning academic book reviews must be systematically expanded. Second, the analysis of book reviewing must be approached from a more comprehensive point of view on the subject, i.e., in the greater context of peer critique in academia, since book reviews are simply one specific form of articulating criticism. Keeping the discussion initiated by Martins (2010) in mind, we will begin with a two-step analysis of the practice of book reviewing. To offer a contrasted view, we take two distinct disciplines into account. Sociology and Chemistry each use systematically different forms of publication; whereas in sociology books play a major role, the standard publications in chemistry are research articles (Fleck, 1981; Alexander von Humboldt Stiftung, 2009). Therefore, we should expect to find significant differences in the articulation of critique in book reviews. First, we will outline book reviews as a genre of organized internal skepticism within science and put forward a suggestion for its systematization. By doing so, we refer to specific findings from a short explorative qualitative analysis. Secondly, we will present the findings of our own small-scale empirical survey.

Categorizing Reviews as a Genre of Epistemic Critique

The rise of scientific journals led to the establishment of a general practice: New publications were to be read and evaluated by a member of the respective scientific community and a summary of their assessments had to be published. The benefit of these early reviews was not so much a well-founded critical appraisal, but rather the summary and consolidation of a steadily increasing number of publications and the circulation of their central ideas in compressed form. The art of detailed summary can therefore be seen as an early reaction to the rapid growth in production, documentation, and distribution of scientific information (cf. Burke, 1997). Some quite informative insight into the history of book reviews can be found in Johann Christoph Greiling's treatise, '*Einige vorläufige Gedanken zu einer Theorie der Recensionen*' ('Some preliminary thoughts toward a theory of reviews'), published in 1797 in the *Philosophisches Journal* and inspired by Immanuel Kant (Urban, 2004). It offers a first definition of the genre, but does not distinguish between literary and scientific reviews.

It is remarkable that at this early stage already Greiling (1797) criticized the lack of rules for giving reviews and formulates general review principles which can be interpreted as an attempt to standardize the genre. Greiling's code of standards consists of several guidelines, e.g., he emphasizes the public nature of reviews as a definitive characteristic of the genre. Accordingly, the assessment and appraisal of any published work should therefore also be made available to the public. Also, the review should only refer to the actual work in question and not to the author personally. These and other aspects together should allow the reviewer to act as the 'voice of science' and bound to the high ethical standard of this duty (Urban, 2004: 22). Additionally, Greiling required that the reviewer should not merely summarize the debated work, but offer a competent appraisal of 'objective and universal status' (Urban, 2004: 21). Greiling further specified the style or tone of a review: It should be noble and dignified. Expressions such as 'mannered presentation', or 'nobility and certainty' are contrasted by manners of speech to be avoided such as a 'derisive', 'haughty', or 'arrogant' tone, 'wanton criticism', or 'surliness, rudeness, or rowdiness' (Greiling, cited in Urban, 2004: 23). In short: Critique was regarded to be created "completely free of influence, taking no heed of external circumstances" (Urban, 2004: 19), to involve objective, careful analysis and to lead to a mannered presentation *and* evaluation of content. Reviews were seen as an instrument of critical scrutiny in the spirit of the Enlightenment.

There is little research on review criticism until yet in the sociology of science,[2] but inspiration comes from the analysis of evaluating systems in science. In their article on the structure and functions of the referee system Harriet Zuckerman and Robert K. Merton (1971) touch the topic of book reviewing, which can be seen as analogous to judging the acceptability of scientific manuscripts in the publishing process. After analyzing data from the archive of *The Physical Review* they inquired the influence of aspects of the academic social structure – like status differences – on the number of rejections for a submitted paper. Beyond motivational arguments that may inform a critic the functional analysis shows structural effects and determinations on the formation of critique as a specific form of selection. The referee-system evaluates the quality of role-performance in the social system of scientific discourse and so the review critic, but his or her judgment has additional functions. Because of its visibility the book review is itself a scientific statement that provides a summary and evaluation of the reading experience for others.

Looking at the whole picture, we first have to consider on the object side – or the form side respectively – of the expressed critique as it is represented in Martins' portrayal of a deficient review system which is very much in line with Greiling's thoughts. Secondly, this form-perspective is to be aligned and systematically connected to a Merton-inspired perspective of structural influences on the process of articulating critique. Against this background, we propose to put forward three dimensions of review-based critique that outline the full spectrum of critique in review practice. In doing so, we refer to the findings of an explorative qualitative investigation based on interpretative analysis of six book reviews respectively in a sociological and a chemists' review

journal. The interpretative work was carried out in reference to hermeneutic methods that lead to typification (e.g., cf. Reichertz, 2004).

The first dimension represents skepticism regarding scientific content. As this type of skepticism is based on scientific criteria that are considered to be legitimate in discourse, it can be treated as expressing a *criteria-conditional* dimension of criticism. A critique may be identified as *criteria-conditional* if the underlying criteria for its valuating statements have been disclosed and accepted. The most important criteria – which also were represented in the corpus of the book-reviews analyzed – are:

(1) *Progress*: To what extent does the reviewed work represent an innovation or progress for the discipline to which it refers?
(2) *Compatibility*: To what extent does the reviewed work take previous works of other scientists into account and is consistent with their findings?
(3) *Comprehensiveness*: Is the author able to completely examine his subject or to narrow it down and completely examine the defined segment?
(4) *Rigor and plausibility*: Are the arguments developed sensibly and described comprehensibly (theory, methodology, and method)?
(5) *Formal aspects*: Does the written form of the author's reasoning meet an informed reader's expectations (editing, material layout etc.)?

These aspects may be understood as criteria-conditional sub-dimensions. They serve as evaluating criteria in a positive (praise) or negative (rebuke) way. Using these criteria, even unfavorable critique is considered to be constructive and must be accepted as such by the criticized party.

In contrast to the purely content-related style of critique, a second dimension of academic criticism can be identified: *affectual* or emotional critique. This includes not only the reaction toward the reviewed work, but also the reaction toward the reviewed author himself. Affectual critique is mainly expressed through tone. Empirically, this dimension can be made visible by analyzing evaluative-emotional semantics. With regard to this, not only did we find in our analysis expressions between exalted praise and harsh rebukes within a continuum of acceptance–neutrality–rejection, but more interestingly sarcasm or irony. These evaluative semantics can be referred to as affectual because they use language to contour and sharpen critique by means of specific emotional connotations. We found criteria-conditional arguments presented very strongly as well as very weakly regarding their affectual nuances or 'spin'.[3] By contrasting chemistry and sociology it was instructive to see that the overall tone of critiques was quite different, in many cases a 'warm welcome' in chemistry contrasted with a broad and nuanced spectrum of affectual articulations in sociology. Nevertheless, it has proven difficult to assess the affectual dimension of a review, i.e., to reach a conclusive and convincing verdict about its 'tone' or degree of politeness, on the basis of statements of approval or disapproval contained within it.

The third dimension, *relational* critique, cannot always be found within the text itself, at least not entirely. For some reviews, it is possible to conclude the author's presumable, underlying motives from their inherent information, often in the form of paratext (Genette, 2010): e.g., by taking into account the author's gender, status, organizational affiliation or affinity to a certain school of thought. This can only be uncovered by searching beyond the original text. The relational dimension stands in sharp contrast to the demand for a neutral position that is solely dedicated to the interests of the scientific community. In light of a growing acceptance of strategic behavior in scientific contexts, this aspect of manipulative critique – which has traditionally essentially been considered taboo – is expected to become more relevant for analysis. Previous analyses provide the following considerations:

- Convergence/divergence of *segmented* positions: reviewing works that match one's own research interests can raise attention for a particular field. Conversely, distancing oneself from other work and drawing boundaries of opposition opens up the opportunity to sharpen the contours and visibility of one's own profile in a debate and weaken opposed

positions (mainstream effect vs minority strategy).

- Convergence/divergence of *stratifying* positions: the positional relation between reviewer and reviewee can inform certain tendencies of critique; e.g. when a 'master' reviews a 'novice', an 'established scholar' reviews an 'outsider'/'newcomer', or when a 'renowned' scientist reviews another, who is 'unrenowned'. In case of status equality, this can also indicate efforts to cooperate with or distinguish oneself from other researchers or theoretical approaches (positional power).[4]
- Convergence/divergence of *ascriptive* characteristics: relational preferences resulting from ascriptive characteristics such as gender or nationality. This category would ideally not be of any relevance in scientific contexts that actually address content irrespective of the personal qualities of the contributor. However, denying the existence of ascribed characteristics is not an option if the eradication of *de facto* inequalities and disparities that exist in academic practice is to remain a goal.[5]

Differences Between the Review Systems of Chemistry and Sociology

In our preliminary qualitative and quantitative empirical study, we investigated book reviews. We analyzed the selected material itself hermeneutically, but we also used easily accessible context information in order to address positional considerations. The text material was sampled from one renowned German journal of each discipline: the review sections of five volumes of the prominent journals *Kölner Zeitschrift für Soziologie und Sozialpsychologie* (KZfSS) and *Zeitschrift für Angewandte Chemie* (AC). This resulted in a data set of 230 sociological and 331 chemistry texts. A quantitative analysis was carried out for the whole data set, whereas the hermeneutical analysis and interpretation focused on six sociological and six chemistry texts. This analysis was conducted by a team of qualitative data interpreters. Results were complemented and supported by four expert interviews with reviewers or scientists that take part in the review system, two each in the fields of sociology and chemistry. Even within this limited range, this interdisciplinary comparison provided a fertile basis for the formulation of several hypotheses.

Apparently, a review sample from five volumes of one sociological and one chemical journal respectively is neither representative nor complete. Nevertheless even this precursory, exploratory approach led to the insight: There are significant differences between disciplines that matches with some aspects of our relational dimension of review critique. First, it is noticeable that the observed values seem to be much more heterogeneous for the field of sociology than for the field of chemistry. This suggests that review practices in chemistry – at least for the journal in question – follow clearer rules than in sociology.

Furthermore, we found noticeable differences between the disciplines regarding the variation of reviewers' level of qualification (table 2) as well as reviewers' and reviewees' gender (table 3):

The disciplinary comparison reveals clear differences between sociology and chemistry for all qualification levels (stratified positions). Recent graduates (and to a lesser extent postdocs) far more often write reviews in sociology than in chemistry. This suggests that it is uncommon in the field of chemistry to write reviews at this qualification level. This finding appears to be inverted among professors. Particularly conspicuous is the difference among full professors. Our sample

Table 2. Distribution of reviewers according to academic qualification and discipline.

		Disciplinary affiliation (percent)	
		Sociology (n = 230)	**Chemistry (n = 331)**
Level of qualification	Graduate (Master's degree or equivalent)	13,7	1,0
	Postdoc (PhD)	26,9	16,6
	Assistant/Associate professor (Habilitation)	8,8	10,9
	Full professor	48,0	66,5
	Emeritus	2,6	5,1
	Total	**100**	**100**

Table 3. Distribution (in percent) of reviewers regarding gender and disciplinary affiliation.

		Disciplinary affiliation (percent)	
		Sociology (n = 230)	**Chemistry (n = 331)**
Gender	Male	71,6	92,6
	Female	28,4	7,4
	Total	**100**	**100**

therefore suggests that reviewing is practiced by different groups in sociology and chemistry: The field of sociology shows a more or less even distribution of review activities for all qualification levels, whereas in the field of chemistry, reviewing seems to be mainly practiced by (full) professors.

Regarding the subject matter of reviews, our data clearly shows that monographs/books written by graduate students are reviewed with a disproportionate frequency; the same is true for textbooks written by professors, which are also overrepresented. Textbooks and edited volumes published by postdoc researchers as well as monographs by professors are, by contrast, underrepresented.[6]

The second difference that would support discipline-specific cultures of critique is a noticeable gender effect (ascriptive characteristics): In general women are highly underrepresented among reviewers (in total, only about one fifth of all reviewers in sociology and chemistry are female). Further though, there are indications suggesting that gender practices of critique differ between sociology and chemistry (see Table 3). The table shows that the number of female reviewers in sociology accounts for nearly a third of reviewers (28 percent), whereas only about seven percent of the reviewers in chemistry are female.

Based on the assumption that the quality of a review increases with the reviewer's experience and assuming systematic, gender-related differences in the articulation of critique between men and women we can derive some initial conclusions: There do exist distinct disciplinary cultures of critique. These differences become evident when the findings for both disciplines are analyzed separately. All in all, sociology gives a far more heterogeneous impression regarding its review practices than chemistry.

It is evident that in chemistry women with lower level of qualification invest a higher amount of work in writing a review than their male colleagues of 'equal rank' (Pearson .268, $p < .000$). This pattern is less marked in the field of sociology (Pearson -.215, $p < .000$). Additionally, female chemists tend to form review teams more often than female sociologists (Pearson .223, $p < .000$). Further it is noticeable that within sociology men tend to review works written by men more often, and women those written by women (Pearson .213, $p < .012$).[7]

Since our data sample is highly limited in its prospects for generalization, these findings can only serve as a first indication of possible structural differences. An initial impression from the comparison of book reviews in both journals (*KZfSS* and *AC*) is that sociological reviews seem to be considerably more heterogeneous regarding the aspects developed above. First, this is due to the fact that the conditions for reviewing published work differ significantly between the disciplines and the associated, analyzed journals.

Second, there seem to be fundamental disciplinary differences in the importance or role of reviews, reviewed works (books) and reviewer selection. More specifically, sociology is much more a 'book science' than chemistry. In sociology, it is very common to publish research and conference proceedings as well as qualifying texts in book form, whereas chemistry seems mainly limited to textbooks and overviews of the current state of research. Also, the publication of sociological books is often initiated and partly financed by the authors themselves, whereas books in chemistry are mostly commissioned by publishing companies.

Consequently, reviews differ strongly and fundamentally in character: In German sociology, the literary market is a highly contested arena and reviews can serve as an instrument for allocating attention. Additionally, they can become weapons in conflicts between different (theoretical) positions. This struggle is carried out by

assessing criteria-conditional categories and with an occasionally high level of affectual involvement. Regarding the relational dimension, the affinity to certain theoretical and methodological approaches or research institutes are important factors, as are the positional and status differences of reviewer and reviewee.

In chemistry though, they lack relevance as an arena for relational conflict. Hence reviews in this field tend to be a sort of 'friendly content summary' that represent relatively subtle self-positioning attempts by the reviewer. These reviews are not very differentiated regarding criteria-conditional aspects, generally have a moderate tone and refer to clear relational contexts, i.e. scientists review peers of equal rank and with similar research interests. As these differences might be explained by the difference between a 'journal science' and a 'book science', a closer look at the overarching setting of forms of critique in different disciplines is needed.

Outline for an Inquiry into 'Cultures of Critique'

These first findings clearly show that a deeper and more differentiated analysis of academic review would overcome the limitations of a debate like the one of Martins and colleagues in 'Critical Policy Studies'. In order to better understand reviews, we consider it necessary to distinguish three dimensions in the relation between reviewer and author. These are interwoven, each referencing the other. This means that the *criteria-conditional*, *affectual*, and *relational* dimensions of critical expression are to be analyzed as complementing aspects of forms of critique. Such analyses lead to a differentiated understanding of academic review as a system of statements. However, from a review-research point of view, understanding book reviews in their entirety is no longer necessarily the immediate goal. Whether a standard form of reviews exists or to what extent it is adhered to is in itself not very enlightening. This kind of assessment depends primarily on the formal specifications of each journal or whether or not the reviewer bases his review on the common form 'intention–summary–assessment–overall appraisal'. In light of Martins' (2010) recommendations toward a more 'civilized' institution of academic review and the rebuffing reactions by Richards (2010) as well as Mandell and Coulter (2010), we would argue for a closer investigation of general forms of epistemic critique before implementing incentives for action.

By looking at the comparison of the disciplines of sociology and chemistry, the divergence seems to be rooted in *systematical* differences. To find out more about these differences it is important to take a closer look at the structure of the practices of critique in relation to the emphasis a specific form is given in the communication infrastructure of a discipline. Therefore, we argue that it might be fruitful to distinguish between different cultures of critique. Such cultures are representing the divergent conditions and requirements for academic practices of articulating epistemic critique related to different disciplines. A systematic analysis of 'cultures of critique' would not only address the four typologically differentiated forms of articulating critique, but especially look at the interplay of these different forms.

The argument for such an analysis of cultures of critique in the sense we propose here refers to social change in academic institutions, which affects how peer comments and quality control are handled and also how far their influence extends. Evaluations that are institutionally required (e.g. for grant allocation or peer-reviewed articles) often lead to direct repercussions for available research funds. The increasing importance of reviews has a direct influence on the social order of epistemic critique. In times of exponential growth and therefore stronger competition for resources within the academic system, academics may react more sensitively to criticism and tempers may be more likely to wear thin.

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Notes

1 Cf. Available at: https://www.theguardian.com/science/2013/dec/09/nobel-winner-boycott-science-journals (accessed 6.1.2017).

2 The case of reviews in medicine was investigated by Andrew D. Oxman and Gordon H. Guyatt (1993), who alleged a shift from authoritative reviews to systematic reviews.

3 The term is derived from the affectual type of rationality as discussed by Max Weber. The reviewer does not act in an affectual manner per se, since his or her formulations have a goal-oriented purpose. However, he or she can intentionally evoke an affectual impression in the sense of focused rhetoric: "Affectually determined behavior is the kind which demands the immediate satisfaction of an impulse, regardless of how sublime or sordid it may be, in order to obtain revenge, sensual gratification, complete surrender to a person or ideal, blissful contemplation, or finally to release emotional tensions." (Weber, 1962: 60; Weber, 1972: 12).

4 Cf. Zuckerman and Merton (1971), who show that there is no effect between referees and submitting authors concerning their relative status within physics, but maybe there is a difference between different epistemic cultures.

5 Cf. the theory of the academic field respectively the theory of practice by Pierre Bourdieu (1990).

6 The Pearson correlation coefficient for the variables 'reviewee qualification' and 'genre of reviewed work' indicated a weak correlation of .236, $p < .001$.

7 For this analysis we filtered results according not only to discipline, but also according to single authorship for both the reviewing and reviewed parties in order to present connections and relationships more clearly.