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**Better Stories about Science?**

Notes on Productive Interdisciplinarity in the Study of Science and Narrative

1. Interdisciplinarity and Literary Studies – Practical Approaches

My contribution will address aspects of 'Literature and Science Studies' as interdisciplinary practice, and its focus will be on practical aspects. I shall present considerations that have made it possible to articulate research perspectives of interdisciplinary relevance, as a basis for building collaborative projects that not only involve researchers from several disciplinary backgrounds, but also integrate practitioners from non-academic areas of discursive practice. I will at times refer to theoretical positions and methodological reflections that are useful for illustrating ways of conceptualising and operationalising interdisciplinary research perspectives, but without implying that other theoretical positions or methodological choices are not workable or legitimate. And I will conclude by offering a selective engagement with Rita Felski's *Uses of Literature* (2008) in order to exemplify ways in which interdisciplinary practices can lead not only to critical reflections, but also to innovative accounts of conceptions and practices that are key to our own discipline of literary scholarship. Indeed, it is part of my argument that one major incentive for devising productive instances of interdisciplinarity might lie in their disciplinary benefit – interdisciplinary as a way of obtaining greater clarity both on the cultural status and functions of the materials that we study, and of the disciplinary practices that we implement.

What I will present, then, is in no way a finished and static recipe book, but rather reflections on what has worked in particular instances and situations and could serve as points of departure that would need to be developed further and adapted to new instances and situations. It is a question of identifying the contributions that literary scholarship can uniquely make in contexts where the research objectives go beyond the disciplinary priorities which are generally defined in literary studies, and at the same time gaining new research angles that speak to these disciplinary positions. How can we develop research perspectives where a detailed and differentiated literary analysis becomes 'relevant,' as we highlight how literary narratives offer complex critical engagements with issues that are virulent in other public or academic discourses, and with the ways in which these issues are represented and addressed in those settings? And how, in turn, can such engagements feed back into our own critical and scholarly practice, refining and sharpening its focus as well as broadening and deepening its analytical scope?

My remarks are informed by my experience as a member of the research group *Fiction Meets Science* (FMS; see www.fictionmeetsscience.org), which has been funded by the Volkswagen Foundation since 2013, in a funding format designed, among other things, to promote interdisciplinary collaboration as a way of highlighting the potentials of the
A significant orientation of literary studies is towards humanities, including literature and literary studies, for engaging with the 'grand societal challenges.' It is true, as some might fear, that with such an orientation one encounters the risk of a 'utilitarian' reductionism – the risk of reducing literature to ulterior purposes, and harnessing it to perform functions which are determined by extraliterary demands. After all, science communication, too, has had its 'narrative turn' (see Dahlström 2014). But it is precisely by resisting the idea that literary narrative could simply serve the purpose of more effectively communicating contents that might equally well be communicated by other means that the distinct literary potentials can be tapped. As long as the focus of attention is on the specific literary strategies, as the means by which the texts engage with topics, issues and challenges, the effect will not be the subsuming of a literary text in a social message, but rather the opening up of perspectives and angles that are differentiated, complex and perhaps paradoxical – and that are not easily available or achievable by way of the extraliterary discourses connected to given issues. The fundamental premise for this has been an understanding of literary scholarship as a discipline willing to exhibit and to build on its strengths, at the same time as it takes seriously other discourses as well as its own.

At the risk of appearing a little schematic, it will also be useful to point out at the outset that there are two fundamentally distinct kinds of interdisciplinary practice in literary studies. The field of 'literature and science studies' has its own version of a 'two cultures' gap. There have been, on the one hand, those who employ concepts and approaches adopted from the natural sciences in order to address problems which pose themselves in the humanities. Examples include neuroscience and cognitive narratology (see Miall 2006; Zunshine 2006) or 'literary Darwinism,' which applies evolutionary theory to literary and cultural studies (see Carroll 2004; Eibl 2004; Gottschall 2013; Vanderbeke and Cooke 2019; see also Vanderbeke and Müller in this special issue). On the other hand, there are those who draw on approaches and methods evolved in literary studies and the humanities, in order to analyse and question cultural representations of science. It is this latter orientation which has been fundamental for the work in Fiction Meets Science, and with which the following reflections align themselves.

Having said this, my interest is not in pursuing a controversy between the two approaches. I am sympathetic to the various critiques which have been formulated in relation to approaches importing scientific concepts in order to address the problems posed in the humanities (incisively presented, for instance, by Kelleter 2007). But instead of foregrounding intradisciplinary debates, I am interested here in the contributions literary scholarship can make to questions of social and cultural relevance beyond the limits of literary studies. As will emerge, I consider the toolkit of structural and critical textual analysis as the basis for bringing out the potential meanings generated through literary narratives; and I suggest that the functions and potentials of literary narratives thus analysed can be most productively established in connection with the wider methodological context of discourse analysis.

In this context, it may be well at the outset to profess my sense that in order to develop productive forms of interdisciplinary collaboration, our discipline would benefit from de-emphasising notions of discourse analysis as a 'post-structuralist' approach. Such notions can still occasionally be encountered: discourse analysis as
linked to a resigned acceptance of a 'cultural relativism' reducing everything to the status of 'social construct;' to an abandonment of any access to 'reality itself;' to a 'postmodern anything goes' and a corresponding assumption that 'all discourses are the same,' that there will no longer be any basis for assessing the validity or accuracy of statements. In short, it would be well to abandon any lingering notions of discourse analysis as akin to an 'entropy of meaning.'

Instead, it would be profitable, if only as a thought experiment at first, to come to think of discourse analysis as a rigorous method. In fact, discourse analysis might far more properly be understood as an equivalent to what is called 'scientific method:' discourse analysis as an **exact method in the humanities**. It is no coincidence that prior to his classification as a post-structuralist, Foucault was defined, and attacked, as a positivist (see Le Bon 1967), and that, in contrast to that other label, he went on to adopt the label of positivism for his own approach (see Foucault 1972, 234). Discourse analysis bases its descriptions only on data which is objectively given, data that exists in documents, in material settings and so on. Discourse analysis excludes not only 'appeals to common sense' or positions derived from what, supposedly, 'everyone knows.' It also rules out assumptions about what 'may or must have existed' as long as there is no direct evidence. By doing so, it positions itself against the traditional conventions for writing the history of ideas, and against more idealistic ways of writing history generally. It may, for this reason, sometimes appear counter-intuitive, as when it disapproves of invocations of purported self-evidence, as found in arguments which claim, for instance, that a certain phenomenon has always existed although the word for it only emerged at a certain point in history.

In relation to science, however, discourse analysis does not place itself in contradiction to science. It does not advocate a scepticism or a 'postmodern relativism' of the kind sometimes associated, rightly or wrongly, with the field of 'science studies' (see Latour 2004, 227). It could never plausibly deny that certain sciences employ certain methods and reach certain results. It may, of course, based on the documented evidence, historicise discourses of science. And it will historicise them differently than would be the case in more idealistic varieties of writing history. But as an exact method, discourse analysis can provide the basis for the description of the specific conceptions, problems, characteristics, subject positions, and conditions of existence defining each discourse. It invites us to focus on "the reality of discourse" (Foucault 1972, 227), on what is objectively given, both in the diverse and evolving range of documents, including all forms of mediated materials, and in the diverse and evolving range of settings and establishments in which these exist or through which they may pass. It offers a basis, in other words, for recognising the specificity and distinctiveness of each discourse – a basis for recognising the relationship in which different discourses may stand towards each other, as well as the ways in which specific versions of themes, concepts, and issues may be interchanged among different discourses. In combination with the techniques of structural textual analysis, it provides the basis for an analysis of the discursive grid within which the interdiscursive elements in literary narratives (see

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1 See, e.g., Foucault (1972, 227-230) for a contraposition of the history of discourse against "the traditional history of ideas" (230).
Link and Link-Heer (1990) are positioned, as well as of the specificity of the critical angles made available from these positions. It is for these reasons that I consider discourse analysis as a productive approach for conceptualising interdisciplinary collaboration.

2. Notes on Disciplinary Premises and Interdisciplinary Designs

Admittedly, in the context of *Fiction Meets Science* (FMS), the successful practice of interdisciplinary cooperation has also confirmed the widespread experience concerning the higher cost and investment required for interdisciplinary cooperation – it took more time, required longer discussions, and took longer to appear in print. But even though success is not always guaranteed and can be temporary, it also produces results that could not have been achieved through exclusively literary analysis. Successful examples are included in the volume *Under the Literary Microscope* (Farzin, Gaines, and Haynes 2021).

One important premise has been our insistence on disciplinary specificity and our recognition of disciplinary difference. Some of the disciplinary scepticism which is in evidence in the wider debates about interdisciplinarity (and referenced in other contributions to this special issue) might indeed be true to misguided expectations in this respect. But interdisciplinary cooperation will not lead to the overall fusion of several disciplines, and it cannot be expected to lead to an immediate overhauling of the disciplinary landscape of contemporary university structures, and the establishment of some master-'interdiscipline.' Instead, it remains a matter of devising appropriate interdisciplinary designs on a case-by-case basis. It can lead to the establishment of more or less formalised interdisciplinary constellations, which require some kind of locally appropriate and flexible institutional support. Indeed, its continuance, re-assemblage and recombination remain contingent on the dynamics generated by the evolving disciplinary research concerns which a group identifies for itself.²

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² A remark on the side that may, however, be worth bearing in mind in discussions on disciplinarity and interdisciplinarity: If the success of interdisciplinary collaborative research sometimes appears more temporary than lasting, this may well be an effect of the absence of more permanent institutional structures for interdisciplinary practice. After all, the structures of our own discipline of English Studies might well be considered as a case of ‘internal interdisciplinarity’ – not only with regard to the specific ensembles of linguistics, cultural and literary studies, and didactics which our institutes are generally composed of, but also with regard to a remarkable disciplinary plurality which each of these components reveals on closer inspection. In the field of linguistics, for instance, certain sociolinguistic approaches appear to be fairly close to cultural studies and critical discourse analysis, while psycholinguistic research designs may display a strong affinity to the neurosciences. Still, the range of diverse and sometimes incompatible conceptions and approaches is accepted as part of our current disciplinary makeup. A similarly divergent range of disciplinary practices may be found in literary studies as well as in cultural studies. Arguably, what provides disciplinary continuity and identity in this situation is not any kind of ‘inner coherence’ (as in older paradigms of studying national literatures and the languages in which they are written). It is rather the fact that the discipline exists in the form of a substantial number of academic institutions – which we may conceive of as its ‘external conditions of existence’ (Foucault...
In the case of FMS, the flexible institutional support was supplied by the VolkswagenStiftung, which has been funding the literary and sociological projects, on the one hand, and by the Hanse-Wissenschaftskolleg, which has been funding the novelist fellowships and interdisciplinary workshops of the larger FMS group, on the other. This larger setup involves novelists and scientists as well as sociologists and literary scholars, and continues to play the role of a space in which research settings and project designs involving perspectives from the humanities, the sciences, and the creative arts can interact and co-evolve. The dynamics and evolving constellations in the group of participating researchers remain an ongoing feature of such concerns. The composition of the FMS group – involving writers, literary scholars, sociologists, and scientists placed in various forms of interaction – remains, to our knowledge, unique (in contrast to a range of projects and formats bringing together two or three among these four groups). In this setting, we have been able to devise innovative and productive formats, as for instance the workshops which we branded as "Experimental Encounters." These involve scientists, literary scholars, and sociologists discussing and analysing a given science novel, each from their several perspectives and in the presence of the novelist who may choose to join in the discussion of their text at any point. A further step, one that Fiction Meets Science still has to take, is that of defining research problems which would allow scientists to join this interdisciplinary setup with projects of their own.

While this goal has not yet been realised, it is still possible, on the basis of the experience in the Fiction Meets Science research group through two phases of funding (2013-2017; 2018-2022), to abstract some fundamental requirements which have so far laid the ground for our joint research design. It remains to be seen how far these may serve as a basis for interdisciplinary collaboration among literary scholars – and humanities scholars more generally – on the one hand and scientists on the other. These fundamental requirements can be briefly listed as follows:

1. Matching conceptions of the object of study
2. Matching problems
3. Matching expertise (i.e. matching analytical procedures and knowledge bases)
4. Matching objectives

The term 'matching' in this context is deliberately chosen in contradistinction to 'identical.' In interdisciplinary work, the definition of matching research objects,
research problems, expertise, and objectives can never mean that these could or should be 'identical.' Instead, being specific to each discipline, they will necessarily be different from each other. But in a viable research design, they will be 'complementary' rather than mutually exclusive. The members of the Fiction Meets Science group have each brought their own disciplinary frameworks and they are looking for results and returns that are relevant within these. At the same time, the group at several points came to an agreement about the distribution and complementary arrangement of problems, expertise, methods, conceptions of the object of study, and objectives. And it has been sensitive to those dimensions of its work which have a potential of becoming relevant beyond the confines of each disciplinary perspective.

The initial core of the project was a set of matching research objects which we designated as 'science novels' – novels which contain representations of science and scientists, by way of representing scientific concepts, research practices and research settings, but also different assemblages of private, social, or political dimensions of the lives of scientists, of their work and of its potential consequences and effects. In the first phase of our project work, we set out to observe the ways in which stories were generated; we analysed their textual structures and narrative strategies; we examined the ways in which these textual structures and strategies allow the stories to engage with themes and problems virulent in the cultural and discursive contexts in which they are set; and we examined the potentials of resonance for different texts, i.e. the communications to which they gave rise among different groups of recipients. In other words, we formulated a spectrum of research problems, with the complementary objectives of contributing to literary scholarship, to sociological research, as well as addressing, from our several disciplinary vantage points, aspects of the overarching debates about public perceptions and public communication about the sciences. In our cooperations literary scholars demonstrated close reading and textual analysis, while sociologists adapted methods of qualitative content analysis, and both placed themselves within a wider discourse-analytical framework, adapted partly from the seminal works of Michel Foucault (1972; on this point see also Kirchhofer 1997) as well as through the 'sociology of knowledge approach to discourse' (SKAD; see Keller 2011; Keller, Hornidge, and Schünemann 2018).³

³ These observations yield a second footnote on conceptions of disciplinarity as they become apparent in the process of interdisciplinary work. Disciplines may be defined by identifying their range of 'received' objects of study, analytical procedures and relevant expertise, as well as by their 'received' range of plausible objectives and of problems that may be accepted as relevant. As indicated in the previous footnote, this does not mean that disciplines are homogeneous entities with shared objects of study, shared expertise and procedures of analysis, common research problems and common objectives. Rather, the elements which make up the characteristic range of 'received' problems, procedures, objects, and objectives in a discipline may be highly divergent one from the other. In addition, this recognised disciplinary range is dynamic rather than static. It is not volatile, but it is open to continued renegotiation – a historically evolving consensus based neither on homogeneity nor on harmony, but on a dynamically revised agreement about which of these problems etc. will be recognised (however reluctantly) as acceptable for controversy and debate. As an instance of the obsolescence and abandonment of research problems and analytical conventions,
Among the literary projects, the rigorous structural analysis of a given set of science novels formed the basis of a description of their thematic structure. Relying on the narratological toolkit as it has evolved in literary studies since the mid-twentieth century, and including its inflections in addressing narratives outside literary fiction, the analysis is thus enabled to identify the structural features and textual strategies through which the novels can shape their readers' perspectives on the themes they address. At the same time, the analysis becomes capable of connecting up to a broader discourse-analytical framework which yields insights into the settings and parameters of the wider discursive presence of particular themes, conceptions, or conflicts. By analysing the ways in which their specific textual structures are linked to specific thematic dimensions in the novels, it becomes possible not only to address the novels' interdiscursive dimensions but also — adopting a phrase Michel Foucault employs in his *Archaeology of Knowledge* — to identify specific points of attack (see 1972, 190; 195) afforded or adopted by the novels. In other words, it becomes possible to identify not only the issues, debates, and target groups at which the stories are 'aimed' or directed, but also the specific thematic or ethical perspectives on these which the stories are structurally preconfigured to generate.

3. Better Stories about Science? Working with the Inter- and Meta-Discursive Dimensions of Narrative Fiction

The overarching research interest guiding the Fiction Meets Science group could be summed up as the interest in 'Better Stories about Science.' The project even has a branch designed to contribute to the production of better stories about science. This is a novelist fellowship programme, allowing writers to spend time at the Hanse-Wissenschaftskolleg (Institute for Advanced Study) and liaise with research institutes and laboratories in the region as participant observers, as well as allowing them to engage with the projects run by the FMS team. In addition, dedicated subprojects accompanied, observed, and evaluated that process by way of structured interviews with the writers.

But the main point of departure has been the observation, from a discourse-analytical perspective, of a sustained and powerful demand for better stories about science. The public demand for stories about science continued and continues to be strong, and it is articulated on many levels, in many forms, and from a wide range of
different subject positions (cf., e.g., Alpert 2008). At the same time, there was and is evidence of an ongoing dissatisfaction with the kinds of stories that are circulated.

The FMS project group was among those who noted that literary fiction, since the 1990s, had begun to produce stories about science in unprecedented numbers. It posited, sometimes implicitly, sometimes explicitly, that literary fiction might have the power to produce such 'better stories about science' – that the stories told in fictional narratives might hold insights and enable perspectives which would, along the way, result in allowing readers to develop more differentiated, more complex as well as sometimes more informed 'understandings' and 'engagements' with science, presenting not merely the rewards and incentives but also, and prominently, the practical and financial pressures and obstacles, the mixtures of teamwork and competition found in laboratories and research institutes, the multiple demands and expectations on the part of different parts of the public, of funders, politicians, and media, and the complexities of keeping all this concealed or getting it communicated as the situations might require. The idea was that the special properties of the novel, instead of being reduced to the purposes of science communication, might have the effect of enabling communication about science with a difference (see Gaines et al. 2013; see also Kirchhofer and Auguscik 2017; and Kirchhofer and Roxburgh 2016).

It became clear in the process that contemporary 'science novels' take their positions in a larger discursive constellation already brimming with narratives of all sorts and descriptions, and continually producing more stories about science. Some among these types of narratives can already look back on a considerable tradition: stories circulating in popular culture and popular narratives; filmic stories about science; stories told in popular science books; science stories reported in journalistic media; narratives produced by historians of science, or in the context of science studies; as well as, and by no means least, narratives used in science, by scientists themselves. And the range of science narratives is expanding. Around the same time that the 'literary science novel' started to establish itself, science communication itself experienced its 'narrative turn' (see Dahlstrom 2014; see also ElShafie, Sumida, and Lutton 2018; Jones and Crow 2017), and narratives in the sciences themselves started to become an object of analysis (see Morgan and Wise 2017).

If the 'science novel' was something of a latecomer to this scene, it is still a highly significant addition. This significance rests, not least, on its distinctive aesthetic profile: literary science narratives, often centred around constellations of complex scientist characters, and largely relying on realistic modes of representation, along with a notable and increasing tendency of incorporating, merging or converging with different fictional genres, as well as an occasional addition of (moderately) postmodern elements. These features allow the science novel not only to engage with complex scientific concepts as well as with virulent issues in science and society, from genetics (e.g. Margaret Atwood's *Oryx and Crake*, 2003; or Simon Mawer's *Mendel's Dwarf*, 1997) to neuroscience (e.g. David Lodge's *Thinks…*, 2001; or Richard Powers's *The Echo Maker*, 2006) to climate change (e.g. Susan M. Gaines's *Carbon Dreams*, 2001; Ian McEwan's *Solar*, 2010; or Barbara Kingsolver's *Flight Behaviour*, 2012). As a closer look at these or many other examples might richly illustrate, these very features also provide the basis for the
fictional representation of the range of public and specialist discourses about science: all the institutional settings, the media, the expert and non-expert players, may find themselves represented in this type of fictional science narratives. This distinctive aesthetic profile implies that science novels are often strongly interdiscursive – picking up, refracting and re-envisioning elements, concepts, and problems which are virulent in one or several other institution-based discourses. It also implies that science novels are often strongly meta-discursive – science novels tend to, more or less selectively, represent the entire range of other discursive settings in which 'science' is practised and in which public or specialist communication about science takes place. All of these features are richly displayed in the novels just referred to and across the spectrum of the contemporary anglophone science novel, from Amitav Ghosh's The Calcutta Chromosome (1995) and The Hungry Tide (2004), Michael Ondaatje's Anil's Ghost (2000) or Hanya Yanagihara's The People in the Trees (2014) to Esi Edugyan's Washington Black (2018) or Jeanette Winterson's Frankissstein (2019).

The interdiscursive and meta-discursive dimension of contemporary science novels allows these novels to become a privileged point of entry into the complex web of contemporary public and specialist discourses on the sciences. These novels address the cultural demand for 'better stories about science' both by critically representing the production and circulation of different kinds of science narratives, by illustrating the power, the effects as well as the shortcomings of different kinds of science narratives, as well as by weaving all these angles into a specific science narrative of their own. And literary scholarship, by applying its analytical tools in order to elucidate textual and thematic structures of its materials and by relating the results of textual analysis to the wider discursive contexts to which the novels relate or refer, has the power to work out these angles and make them available for wider recognition. Interdisciplinary literary scholarship can give wider transparency and currency to the distinctive insights linked to the imaginative engagement of science novels with issues in and around the sciences. And instead of detracting from the quality and specificity of close textual analysis and criticism, it is through these very means that literary scholarship also contributes to a more general recognition of the specific perceptions and critical angles afforded by the novels, in relation to the issues in and around the sciences, which they engage with.

4. Disciplinary Payoffs from Interdisciplinary Frameworks: On 'Recognition' and the Uses and Varieties of Reading and Close Reading

In the remaining part of this contribution, I will focus on an illustration of the benefits which interdisciplinary engagements such as those just outlined can bring for the refinement of core critical and theoretical concepts in our own discipline. For this purpose, I will single out one of the outcomes from our work in the Fiction Meets Science project. As pointed out above, the group pursued the idea that the special properties of the novel, instead of being reduced to the purposes of science communication, might have the effect of enabling communication about science with a difference.

In the course of our research, we identified recognition as a key aspect in the engagements of scientist reviewers and scientist readers with portrayals of science in
The articulation of instances of recognition, on the part of scientist reviewers who offer these for information but also for further reflection and debate, arguably constitutes one characteristic and important mode in which science novels unfold their inter- and meta-discursive potentials. At the same time, it became clear that these forms of recognition still go largely unnoticed outside the scientific community, and do not generally achieve any sustained resonance within it. Moreover, the disciplinary toolkit of literary and cultural studies offers little assistance in theorising and operationalising this concept. One notable exception to this, however, is Rita Felski’s 2008 ‘manifesto’ on *Uses of Literature*, which contains a substantial, if somewhat polemical, engagement with the concept (23-50). A closer look at Felski’s account of recognition as one of the uses of literature can show the merits of her stance, but also brings into view some serious limitations. I point to these in order to illustrate the pitfalls of monodisciplinary conceptions, the disciplinary payoffs from working in interdisciplinary frameworks, along with the still largely untapped potential for interdisciplinary dialogue inherent in the engagement with discourses on literature which take place beyond the boundaries of our discipline.

Allow me to present some further background: This work was done in the context of an interdisciplinary project group within FMS which undertook to explore the ways in which literary science novels might make a difference to perceptions and discussions of science among different kinds of readers. Our joint question was: what kind of resonance are representations of science in fictional narratives capable of creating in different audiences?4 For the literary subproject on the ‘media presence of the contemporary science novel,’ undertaken in collaboration with Anna Auguscik, we assembled what we called ‘public attention profiles’5 for many different science novels, recording and coding the discursive resonance of a given novel, through review articles, interviews with the authors, and many other types of reference, across a spectrum of public media, singling out, for specific attention, the leading review media among the anglophone daily newspapers on the one hand, and the leading science journals, such as *Nature* and *Science* on the other. Those science journals, of course, do not regularly keep track of the literary publishing market as a whole, of prizes or other literary events. But they are very alert to fictional narratives in which aspects of science and scientific practice are addressed, and they regularly review such novels. Our analysis bore on a corpus of around 70 reviews of fiction published in *Nature* since 2000, and drew on a range of reviews from other journals as well, contrasting these with the coverage of the same novels in leading book review sections of the anglophone dailies (such as *The Guardian* or *The New York Times*). In a parallel project, a team of sociologists examined the debates held on a number of science novels as they occurred in different reading groups, differentiated by composition, according to factors such as disciplinary backgrounds or social position.

In line with the principles presented above, our matching research question was to find out how reviewers and readers of different disciplinary backgrounds, writing in

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4 See also Auguscik et al. (2021); Fücker et al. (2021).
5 See also Auguscik (2017, 74-79).
different media and for different or partly overlapping audiences, assessed given novels. Which elements did they single out, and how did they respond to the specific representations of science in each text? We began by producing matching readings of the novels, drawing on critical and narratological analysis of textual structures as well as on an adaptation of qualitative content analysis, in order to relate the results of literary textual analysis to the sociological perspective on the representation of science in the texts. Rather than see the outcomes of our interdisciplinary analysis as a prescriptive reading, we took them as establishing a structural and thematic pattern for each novel, that could allow us to compare the perspectives and meanings structurally afforded by the texts with those which the different reviewers and readers actually responded to. On this basis, we went on to analyse what was actually picked up by the different reviewers and readers, and what inflections this was given. In order to position the various reviewers and readers, we relied on a combination of discourse analysis as outlined above, in connection with the 'sociology of knowledge approach to discourse.'

We arrived at a list of possible 'uses of literature' which are in evidence from the ways that science novels are discussed in the books and reviews sections of Nature. These uses include:

- Reading for entertainment, recreation, or for intellectual challenge;
- Reading as incentive to scientific research (both as prefiguration of scientific subjectivities, i.e. as inspiration for becoming a scientist or choosing a certain discipline; and as contributing to turn 'science fiction' into 'science fact');
- Reading for recognition (in the sense of relating one's experience to the fictional narrative, as in recognising representations of scientific concepts as more or less 'accurate,' or in recognising the portrayal of science as realistic, regarding aspects such as scientific practice and institutions, political and economic contexts, or science's difficult relationship with the media and the public);
- Reading for ethical reflection (coming to reflect on ethical aspects of scientific work and its contexts);
- Reading fiction in respect of its potential efficacy as science communication (and critically assessing fictional representations of science according to the degrees to which particular novels were seen to either inform or misinform non-scientist readers).

The spectrum of angles articulated in the sections where science journals deal with literary fiction is thus fairly wide and diverse. It goes far beyond the aspect of classical 'science communication' and, judging from the range of reviews as well as public and media responses to several novels that we examined, we concluded that, in direct comparison, scientist reviewers of fiction were far more "concerned with recognition than with science communication" (Kirchhofer and Auguscik 2017, 28). We noted further that scientist reviewers by no means "invariably look for idealised, affirmative representations of their situations and activities," but that instead they tend to "emphatically welcome realistic descriptions of the difficult and conflicted social and economic frameworks within which scientists often operate." (Kirchhofer and Auguscik...
2017, 28). As a final takeaway, it became clear that literary reviewers have been far slower in picking up such critical perspectives on science in these science novels than scientific reviewers have, and equally, that the wider literary and critical public does not tend to be aware of the critical perspectives formulated by scientist reviewers when they discuss the critical angles on problems, situations, and constellations in scientific practice which they recognise in the fictional representations of science (see again Kirchhofer and Auguscik 2017). And yet, these points when scientist readers and reviewers of science novels are prompted in their discussion of fictional science narratives to address issues, conflicts, and pressures which are raised in the stories but have a far wider virulence, might be uniquely fruitful. At these points the engagement with literary fiction has the potential to become the starting point for open and critical dialogues on and around the sciences, in situations when no other discursive settings are provided for addressing them. And significantly, engaging with scientist reviewers' critical readings of science novels creates the potential for critical exchanges that are not bounded by the specialist/non-specialist divide which haunts the communicative constellations of 'science communication.'

For Felski, recognition, in the form of "the widespread belief that we learn something about ourselves in the act of reading" (2008, 12), is "a common event while reading and a powerful motive for reading" (2008, 26). In Felski's account, therefore, the scope of recognition is far more general in one respect — "recognition pervades practices of reading and interpretation" (2008, 26) and is understood as a feature of all forms of non-scholarly reading which Felski designates as "lay reading" (2008, 12) — and far more limited in another respect — it is understood as a matter of "recogniz[ing] oneself in a book" (2008, 23; my emphasis). Moreover, recognition according to Felski is experienced with suddenness and drama:

While turning a page I am arrested by a compelling description, a constellation of events, a conversation between characters, an interior monologue. Suddenly and without warning, a flash of connection leaps across the gap between text and reader; an affinity or an attunement is brought to light. (2008, 23)

The forms of recognition which were in evidence in the fiction-related discourses of scientist reviewers and readers — clearly a very specific, if by no means homogeneous, type of reader — differ significantly from the specifications which Felski posits. The concept occurred in a far more specific way, as a mode of engaging with fictional representations in any aspect that concerned the reader's or reviewer's disciplinary expertise, experience, or self-perception (which latter aspect our sociologist partners categorised under 'role distancing,' see Fücker et al. 2021). Recognition did not form part of any sudden drama of the type Felski evokes. Reviews of fiction in science journals rarely discuss the particular mode and experience of recognition, though they may propose that scientist readers will or will not enjoy the representations of their fictional counterparts, or of the conceptual and practical aspects of their disciplines. Most significantly, 'recognition' is by no means exclusively a matter of readers and reviewers recognising themselves. There certainly are instances of scientist readers 'recognising themselves,' or recognising elements of their own scientific experience in
books. But this does not mean that they invariably "turn[ed] texts into mirrors of [them]selves" (Felski 2008, 26). Instead, such recognition often led to the discussion of situations and aspects of scientific practice which were recognised as familiar or problematic, or both. These might concern, for instance, the ways in which scientific institutions are being operated, the mixtures of teamwork and rivalry that characterise the collaboration within them, the pressures of funding, the hierarchies and the ways in which differentials of gender and power play out in these settings. The particular experience of recognition, then, is of less concern than the issues and situations which scientist readers recognise in the fictional representations on which they can critically reflect without being immediately tied to concrete actual institutions, persons, or cases.

Why do such forms of recognition remain outside the scope of Felski's account? It is easy to account for the fact that she does not explicitly include these by pointing out that of course Felski never proposed to examine the ways in which scientist reviewers discuss science novels. Nevertheless, the categorical exclusion of this wider range of forms of recognition suggests there may be a significant conceptual factor in play as well. Felski's account is based on a foundational contraposition between "academic criticism and lay reading" (2008, 12). Felski is careful to point out that she does not conceive of this as a dichotomy, because "professional critics were once lay readers," and because "the tenets of academic criticism often filter down, via the classroom, to larger audiences" (2008, 12). But "literary theorists patrol the boundaries of their field with considerable alacrity and enthusiasm," (2008, 12) she declares. They distance themselves from all forms of "lay reading," forcing themselves to unlearn, for example, "the idea of recognition: the widespread belief that we learn something about ourselves in the act of reading" (2008, 12).

Felski draws this contraposition from Guillory (2000), and her summary of it bears quoting here, in order to illustrate the point I am about to make.

Scholarly reading [according to Guillory] is [...] a form of work, compensated for by salary and other forms of recognition; it is a disciplinary activity governed by conventions of interpretation and research developed over decades; it espouses vigilance, standing back from the pleasure of reading to encourage critical reflection; it is a communal practice, subject to the judgment of other professional readers. (Felski 2008, 12; original emphasis)

By contrast, "lay reading [...] is a leisure activity, it is shaped by differing conventions of interpretation, it is undertaken voluntarily and for pleasure, and is often a solitary practice" (Felski 2008, 12).

There is little to object to in the description of scholarly reading. I have suggested above that it is useful to recognise the specificity and the institutional location of academic criticism as a disciplinary practice, since such an understanding provides a
basis for appreciating its capabilities, achievements, scope, and validity but also its contexts and limits. The terms in which the third feature is presented appear questionable, however. The term 'vigilance' adds an anticipation of a state of menace to an attitude that might have more properly been described as 'attention to textual detail,' to say nothing about the implication that critical evaluation should be an alternative to the enjoyment of a text. But in terms of a sketch of one's own disciplinary position, this is a plausible start, on the basis of which the specifics that delineate our techniques of analysis and interpretation can be further outlined, for instance, at the outset of some proposed interdisciplinary dialogue in which one participates as a literary scholar.

The difficulty, of which Felski's overgeneralised and overly specific account of 'recognition' as a feature of literary reading is a symptom, lies with the concept of "lay reading." At a very late point in her book, on the final page of her "Conclusion," Felski appears to acknowledge as much, at least by implication: "[T]here is no single fiber that runs through the entire thread of reader response," she states, adding that "[l]iterary theory is still struggling to come to terms with such plurality" (2008, 135). But so, in her book, is Felski, as is shown by her construction of "lay reading" as an alternative (and for all we know as the only alternative on offer) to academic reading.

To question the concept of "lay reading" is not to deny that there will be individual readers for whom reading is a leisure activity, a solitary practice, undertaken voluntarily and for pleasure. But if they respond to the texts they are reading, they will not respond as 'laypersons.' Instead, their responses will be shaped and inflected in various and complex ways by the different traits of the subjectivities that they bring to the texts, and by the roles from which they reflect on the texts. As long as these responses remain silent, they are not available for analysis and engagement, but there are in fact many discursive settings where non-academic readers discuss or make statements about fiction. The spectrum ranges from informal conversations, book clubs, perhaps bookshops, author readings, websites such as goodreads.com, to all sorts of blogs and posts. It includes professional readers who are not literary scholars, but are connected to the publishing industry and concerned with editing or marketing books, as well as the entire range of readers connected to the general, specialist, and trade media in which books are reviewed, advertised, discussed, or reported on, to say nothing about the readers who read books because they have been asked to serve on the jury of a book prize (see e.g. Auguscik 2017). The list could be extended, for instance by including types of reading that are practiced at different levels of our school systems (see e.g. Hunter 1988; 1991). None of these ways of reading are exactly the kind of reading practised by literary scholars. But it is to be expected that they will be sufficiently different from each other to cast serious doubt on the descriptive value of a category such as "lay reading." I am therefore not suggesting that we need to drop everything and study all these readers at once. Rather, I have assembled this no doubt somewhat preliminary list in order to illustrate that the concept of "lay reading" does not begin to adequately cover the varieties of ways of reading and ways of talking about what you have read which exist in connection with literature. I would not wish to rule out the possibility that some of the readers I have mentioned here would also use a concept such as "lay reading," or
that they would have somewhat different concepts of categorising readers and audiences. But this does not imply that when those different audiences read, their respective ways of reading can all be properly labelled as "lay reading." The point is that there is a wide and diverse range of participants in the various settings of our cultural discussion on literature, that some are more permanent participants than others, and that the ways in which they engage and respond to a text will very likely be highly diverse and conditioned by many different factors. "Lay reading" glosses over those specificities – and it does so no doubt in order to make a point.

In fact, there is chiefly one perspective from which the conception of "lay reading" here outlined makes sense – and this is precisely the position from which Felski wishes to distance her readers: the perspective of the professional academic critic, who divides the world of readers into self and other, specialist and non-specialist. From this position it is sufficient to exclude all forms of reading and textual practice that do not currently form part of the received procedures and expertise of the discipline (see footnote 2 above), maintaining the difference between 'system' and 'environment' (see Luhmann 1984). The concept of "lay reading" can therefore be linked to a monodisciplinary outlook which dedifferentiates all other forms of reading by bundling them together under a label such as this.

By contrast, the range of forms of recognition we encountered as a result of engaging with the fiction-related discourses of scientist reviewers of contemporary fiction, are much more specific and much more limited in reach. They form part of a broader mixture of 'uses of literature' which occur in these discursive settings. In contradistinction to the conception laid out by Felski, they also are "communal" (2008, 12) – they are offered to an audience of scientist readers of different disciplinary backgrounds as well as other readers interested in the sciences, and they have the potential to be oriented towards a dialogue about the various issues and aspects that a writer has 'recognised' in a fictional science narrative. Like all literary narratives, they enable engagements with such aspects and issues in ways that are exempt from the connections to concrete factual reference, or to specific persons, places, and institutions actually in existence. As I have argued above, the articulation of such instances of recognition, on the part of scientist reviewers offering them for information but also for further reflection and debate, arguably constitutes a significant mode in which science novels unfold their inter- and meta-discursive potentials. The cross-disciplinary debates that fictional representations can enable also require a capability on the part of us professional readers to enter into dialogues on specific instances where multiple forms of expertise – on textual detail as well as on conceptual dimensions – are joined through the specific qualities of literary narratives.

I have laid out this argument in some detail in order to illustrate the disciplinary incentives in favour of an orientation towards instances of a productive interdisciplinarity such as the ones initiated in the context of the Fiction Meets Science project just outlined. Such projects come at the cost of no longer being able to operate with generalisations of the type we have just encountered – a cost which becomes easier to bear when we consider that such generalisations, however intuitively plausible they may appear to be, will necessarily remain culturally contingent. They involve the additional effort of engaging, both analytically and discursively, with the many diverse and disparate forms and
settings where narratives circulate – and these forms and settings will be different and specific in each new instance of interdisciplinary work. Each instance of an interdisciplinary endeavour thus involves a fresh beginning, a kind of reinvention of interdisciplinary cooperation and interdisciplinary outlooks. Each also holds for us new requirements and opportunities to explicate and re-evaluate the disciplinary premises and outlooks we bring to this cooperation. The questions of what degree of dialogue and exchange can be reached, and which – if any – institutional frameworks will support such dialogue, remain open in each case. As I have tried to illustrate in this contribution, a productive approach to specific forms of interdisciplinary cooperation could combine the ability to 'role distance' by achieving transparency about the various disciplinary positions (their received objects, objectives, procedures, and problems), including one's own, and the willingness to attempt to match these with each other. They are viable options for a conception of a productive interdisciplinarity, one that combines the aim of achieving valuable disciplinary outcomes with the aim of producing results that have the potential to speak to those who are involved in the wider range of settings and practices with which the texts we work on engage.

Works Cited


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