Doctoral Dissertation Defenses: Performing Ambiguity Between Ceremony and Assessment

ARJEN VAN DER HEIDE, ALIX RUFAS & ALEXANDRA SUPPER

Technology & Society Studies, Maastricht University, Maastricht, The Netherlands

ABSTRACT  Dissertation defenses are ambiguous affairs, which mark both the end of a long process of doctoral education and the inauguration of a doctoral candidate into a body of experts. At Maastricht University (and other Dutch universities), the decision to award a doctoral degree is made on the basis of the written dissertation well before the defense, which makes the ambiguous status of the event between examination and celebration especially evident. Nevertheless, participants attach importance to the event because it impacts the reputation of individual researchers, as well as that of research groups and of the host-university itself. Taking a Goffmanian perspective on the event as a performance, it becomes clear that the ambiguity in the definition between celebration and assessment is contained within the script that details how the performance should be conducted. In this script, participants’ role is unclear, providing them the means to act in accordance with their own definition of the event. The ambiguous definition of the event is performed at an individual level but also in team performances, in which participants correct each other when someone’s behavior appears too celebratory. Amidst this ambiguity between celebration and assessment, the university reinforces its own authority to award doctoral degrees, acting as a gate-keeping institution to the academic world.

KEYWORDS: doctoral dissertation defenses, academic culture, performance, academic reputation, socialization into an academic community

Introduction

Of course I knew that in the end you have to defend your dissertation, but how that goes, that it is that official, and... Actually it is just a theater
play when you are on stage. This is what I try to keep in mind—that I cannot fail, that everything is for show.

In order to calm her nerves, Julia, a PhD candidate at Maastricht University, assures herself that her doctoral dissertation defense is just for show. The style in which professors are clothed, the objects that are carried around such as the university mace, as well as the formal way in which participants address each other, all may contribute to the impression that the dissertation defense resembles a theater performance. In the Netherlands, dissertation defenses form the conclusion of three (or more) years of research work, after which the candidates are inaugurated into a body of experts. Interestingly, these doctoral dissertation defenses are more or less ceremonial. At the moment of the defense, the biggest hurdle has already been taken; that is, having the written dissertation approved by an assessment committee. Indeed, it has never happened at Maastricht University that a candidate whose dissertation had been approved, failed during the defense.

Nonetheless, participants such as Julia attach great importance to the event, and candidates are expected to successfully defend their dissertation. But what is there to defend if the decision to award the degree is already made? As we will argue in this paper, this conundrum is the result of the ambiguous definition attached to the event as either a celebration or assessment, maintained by participants. While some consider dissertation defenses to be important moments of assessment, they are considered ceremonial by others. These intuitively contradictory definitions raise a number of questions that we aim to address in this paper. If not decision-making, what is really at stake at dissertation defenses? And considering these stakes, what is the conception that participants have of how they should behave? Moreover, how do participants handle the ambiguity between celebration and assessment in their interactions with each other?

In answering these questions, we will define the dissertation defense as a communicative event that serves multiple functions. It is an event in which the qualities of the candidate are assessed, both formally and informally; a celebratory event that serves as a showcase for the candidate’s skills rather than as an examination; and finally, an instance in which the university presents itself to the public as a legitimate gate-keeping institution for academia and science. Based on Goffman’s (1959) theatrical framework, we focus on the dissertation defense as being a performance that is constituted by a ‘script’. Doing so allows us to closely examine how the different functions of the event relate to one another and how participants, in an attempt to maintain the relations between the different functions, collectively manage the interactions taking place in the event.

In the next section, we outline the conceptual framework of our paper. Subsequently, we explain our methodological approach. The rest of the paper then unfolds in three parts. First we zoom in on the stakes of a dissertation defense, both in terms of decision-making as well as the consequences for the reputation
of each of the participants and groups. Second, we analyze the roles that are to be performed by each of the participants, detailing the ambiguity contained within them. Finally, we take a closer look at the interactions between the participants, in which they take different positions in regards to the definition of the defense.

Doctoral Dissertation Defenses as Communicative Events

In order to create a theoretical framework for our study, we begin with a discussion of literature from the study of (higher) education which allows us to understand the importance of dissertation defenses within the framework of doctoral education. Subsequently, we explore literature on performances to outline our own approach of studying doctoral dissertation defenses as communicative events.

The Role of Dissertation Defenses

The history of the ‘doctor of philosophy’ degree can be traced back to the seventeenth century and was originally based on an oral examination. These disputations still bear semblance to what we witness at dissertation defenses today. The requirement for a written dissertation appeared in eighteenth century Prussia under the spell of the rationalizing tendencies associated with the Enlightenment. Since then, doctoral candidates had ‘to demonstrate technical competence rather than artistic genius or creativity’ (Clark, 2006, p. 212). The model now practiced in the Netherlands, which entails both a written dissertation and a public defense, was first seen in the early nineteenth century at the University of Berlin. Yet, the decision to grant a doctorate rests on the written dissertation—at least in the Netherlands—and indicates a privileging of the written work over the oral.

There is also a practical side to the privileged status of the written work, as it can more easily be circulated, which potentially increases its impact beyond the day of the defense. Consequently, in many countries, including the Netherlands, the written dissertation has become the most important factor for setting the reputation of the PhD candidate. As Isaac et al. (1992) show on the basis of a survey amongst American faculty staff, the quality of a dissertation and subsequent publication in a prestigious outlet also influences the reputation of the doctoral adviser and the department, since ‘external accreditation teams commonly examine recent dissertations as part of a program evaluation’ (p. 242).

However, as Ferrales and Fine (2005) argue, ‘reputation work’ plays an important role in the entire trajectory of PhD training; throughout the multi-year process leading up to the submission of the dissertation and its defense, PhD students are continuously engaged in managing their own reputation. Thus, the reputation of doctoral candidates is not set exclusively by their dissertations, but constructed in the process of doctoral education—a process which also involves a group culture with shared traditions among cohorts of graduate
students, and a transformation of identity from ‘student’ to ‘scholar’ (Ferrales and Fine, 2005).

Indeed, the three-or-more year program that present-day candidates have to complete before acquiring the PhD degree can be characterized as the ‘process of becoming a scholar’ (Baker and Pifer, 2011, p. 12). Through a process that includes formal as well as informal forms of socialization (Austin and McDaniels, 2006), doctoral students gradually develop an identity as independent scholars. Doctoral students are not only ‘being socialized into a profession and into an academic discipline (…), [t]hey are also being socialized into the accomplishment of particular kinds of work’ (Delamont and Atkinson, 2001, p. 87). Unlike bachelor and master students who operate inside a ‘protective cocoon’ in which they are asked to tackle problems that are ‘pre-defined’ and ‘solvable’, doctoral students have to face the messiness of research practice. Learning to cope with the ensuing ‘reality-shock’ is an important part of doctoral training and research (Delamont and Atkinson, 2001).

The award of the doctorate, then, marks the PhD candidate as having mastered the messiness of research practice; it acts as ‘a badge of legitimate membership’ in an academic community (Delamont et al., 2000, p. 34). Such an academic community, which is a particular instance of a ‘community of practice’, is bound together by a set of shared ‘practices, routines, rituals, artefacts, symbols, conventions, stories, and histories’ (Wenger, 1998, p. 6). These communities, according to Wenger, are organized primarily around a core-set of shared practices and the improvement thereof through a collective process of learning. Rituals and symbolic artefacts help to inculcate in its members a sense of belonging to the community:

Rituals connect local practices and identities to other locations across time and space … by cultivating the sense of others doing or having done the same thing and … by channeling an investment of the self into standardized activities, discourses, and styles. (p. 183)

The many rituals and symbolic artifacts involved in doctoral defenses, too, might be considered to strengthen the sense of belonging to a community of scholars. For a PhD candidate, then, the doctoral dissertation defense marks a ‘rite of passage to becoming a licensed and authorized member of the academy’ (Morley et al., 2002, p. 266; also see Jackson and Tinkler, 2001, p. 361). In order to really understand how dissertation defenses take their role in the process of becoming a scholar, however, we study them as performances.

Theatrical Performances

In studying dissertation defenses as performances, we draw on Goffman’s (1959) canonical theatrical framework, in which he defines performances as ‘all the
activity of an individual which occurs during a period marked by his continuous presence before a particular set of observers and which has some influence on the observers’ (p. 32). However, performances are not solely acts of self-expression, since they also serve ‘to express the characteristics of the task that is performed’ (Goffman, 1959, p. 83). In fact, Goffman argues that social performances are constituted by three elements: the performers, the audience and the setting; and they abide to a ‘script’: a ‘pre-established pattern of action’ according to which the characters interact with each other. Deviations from this script, such as through unmeant gestures or faux pas, can create ‘performative disruptions’, leading to a ‘discrediting or contradicting the definition of the situation that is being maintained’ (p. 231).

Goffman’s theatrical metaphor has inspired studies of performances in many different contexts, and has been influential in studies of the construction and maintenance of scientific credibility (Hilgartner, 2000; Morus, 2010; Castán Broto, 2011). Goffman’s (1959) concepts of ‘impression management’ and ‘team performances’ have proven particularly useful for understanding how different individuals and institutions can work together to create impressions of credibility, trustworthiness and authority, as Hilgartner (2000) has shown in his study of scientific advisory communication. More recently, Morgan and Baert (2015) have studied how two teams of actors in an academic conflict each engaged in impression management to give legitimacy to their side; by bringing particular arguments to the table, but also by trying to restrict (or enlarge) the size of the audience, or by making the tone of the debate more (or less) serious.

Morgan and Baert’s (2015) study also indicates the importance of material objects and settings: an important strategy of impression management involved staging a debate in a historical building which radiated ‘the dramatic effect of a courtroom or parliamentary house’ (p. 45). Spatial structures, such as buildings and material objects, shape performances by providing structures and patterns that contextualize the setting in a wider spatial and material context (Knoblauch, 2013). Additionally, the material setting also has implications for ‘the distribution of talk and the turn-taking mechanism’ (Rendle-Short, 2006, p. 3); for instance, rows of chairs which are arranged to face a single speaker invite a different form of interaction than a circular arrangement.

Next to the architectural setting, ‘stage-props’ are used in performances to designate specific elements of the institutional setting (Goffman, 1959). During dissertation defenses at Maastricht University, many of the material stage-props evoke historical traditions. However, since Maastricht University is a young university, founded in 1976, these traditions can be regarded as having been invented. Following Hobsbawm (1983), ‘invented tradition’ refers to ‘a set of practices, normally governed by overtly or tacitly accepted rules and of a ritual or symbolic nature, which seek to inculcate certain values and norms of behavior by repetition, which automatically implies continuity with the past’ (p. 1). Traditions at dissertation defenses seem to valorize Maastricht University as a legitimate university
by reproducing traditions that regulate dissertation defenses at much older Dutch universities.

Next to these traditional objects, modern objects such as microphones or beamers serve a more direct functional purpose in dissertation defenses. As studies of powerpoint presentations have argued, this format is best understood not just as an interplay between text and images or a technical set-up involving software and hardware, but as a communicative event: ‘a communicative action by a presenter, attended by an audience, involving technologies, such as a computer screen, a projector, or a slide, as well as activities performed in relation to both audiences and technologies’ (Knoblauch, 2013, p. 3). Following these footsteps, our paper treats doctoral dissertation defenses as communicative events involving the interplay of, among others, performance teams, audiences, ceremonial gowns, computer screens and powerpoint slides.

However, our analysis departs from the existing literature on performances in one significant way, as we study a case where the performance serves to uphold an ambiguous definition of the situation. In contrast, much of the existing literature on performance—starting with Goffman (1959)—has been concerned with how performance teams work together to project a single, shared, unambiguous definition of the situation. For instance, Svetlova (2012) has focused on the front-stage of how financial analysts strive to maintain the impression of a ‘scientifically justified and unambiguous definition of the situation’ (p. 157) by downplaying uncertainties in public; while Castán Broto (2011) has shown how heterogeneous environmental science research teams negotiate such a single definition on the back-stage. There is room for multiple definitions of the situation only, it appears, when competing definitions are brought forward by opposing teams (Morgan and Baert, 2015).

In our analysis, building upon the framework sketched above, we study dissertation defenses as communicative events; more specifically, we understand them as team performances, in which different actors collaboratively engage in impression management. However, the performance teams that we study do not strive to maintain one single, unambiguous definition of the situation; nor do different actors have different competing definitions that they each seek to impose. Instead, as we will show, the performance team works together to maintain the ambiguity of the situation.

**Method**

This paper is based on ethnographic observations gathered during PhD dissertation defenses at Maastricht University, interviews with participants who played different roles during the observed defenses, as well as some supplemental material from the archive of Maastricht University. An ethnographic method suited our aim to understand the practices of PhD dissertation defenses in relation to academic culture (with all its particularities), and to follow Clifford Geertz’s
suggestion that, to understand ‘what science is’, one should start by looking at ‘what the practitioners of it do’ (Geertz, 1973, p. 5). At the same time, interviewing participants who had been involved in the interactions we observed allowed us to probe deeper into the meanings associated with these practices.

Our observations were conducted over the course of November 2014, during which we observed 13 dissertation defenses, amounting to a total sum of 16 hours of observation. We focused on the two faculties that had the largest number of dissertation defenses at Maastricht University during that month: the Faculty of Health, Medicine and Life Sciences (FHML) and the Maastricht Graduate School of Governance (MGSoG). The decision to focus solely on these two faculties was made to capture possible disciplinary differences (an angle that, however, in the end did not prove fruitful for the analysis). We observed six defenses from MGSoG and seven from FHML. Typically, we only attended the first of the two hours of each defense because this was the part where the performance of the candidate was most explicit, and where the ambiguity of the situation as either celebration or assessment was clearly pronounced; in the second hour, consisting of congratulatory speeches, this ambiguity has already been resolved in favor of a celebration of the candidate’s achievements. However, we stayed for the two full hours at three defenses to understand the ceremony as whole. During each defense, we took notes based on a list of pertinent elements we made in advance. Following Emerson et al. (2011) and in order to keep record of as many observations as possible, we turned our jotted notes into full ethnographic fieldnotes immediately after each defense. The decision not to make and analyze audiovisual recordings of the observed interactions was primarily a pragmatic one, as the ethnographic fieldnotes already presented a dense set of materials to work with.

Next to 16 hours of participant observation, we conducted 11 interviews with participants involved in the observed defenses, including 4 PhD candidates (in the weeks immediately preceding or following their own defense), 5 senior scholars with extensive experience as supervisors and as members of assessment committees, a beadle and a theater teacher who helps doctoral candidates to prepare for the defense. Each interview was recorded and transcribed. For confidentiality reasons, we anonymized the names of the interviewees.

Once we had gathered full ethnographic fieldnotes from the thirteen defenses as well as the transcripts from the interviews, we proceeded to code all of it with open coding. Open codes allowed us to capture parts of ‘the literal essence of the data’ (Rivas, 2012, p. 370) and remain as close as possible to our empirical findings. During and after our open coding, we noted down a series of recurring themes which gave place to refined codes that we consequently classified into categories. This echoed the zigzag approach suggested by Rivas (2012) in coding and analyzing qualitative data. Additionally, while open-coding, we also applied deductive codes taken from the literature.
The Dissertation Defense and Its Stakes

Similar to a theater play, defenses at Maastricht University unfold according to a pre-established pattern of action, or script. The event starts when the beadle, dressed in the gown of the university and carrying the ceremonial mace, enters the room in which the audience (usually primarily composed of family, friends and colleagues of the PhD candidate) is already assembled. After she has requested the audience to stand up, the candidate, his or her assistants and the corona enter the room in cortège following the beadle. The corona is the body of experts that consists of the pro-rector, the supervisory team, members of the assessment committee and occasionally some additional opponents. The majority of the corona members wear the official gown and hats of their university, indicating their rank of university professors.

After the corona has been seated and the beadle has left the room, the ceremony starts. At Maastricht University, dissertation ceremonies consist of four parts. In the first part, the candidate has to give an overview of the dissertation in a 15-minute presentation, usually aided by powerpoint. This part is often referred to as the lay-talk, as it is directed towards a lay audience and not at the experts, who have already read the dissertation—although, unlike at some other Dutch universities, they are nonetheless present during this talk. In the second part, the experts take turns in asking questions to the candidate in order to test his or her ability to defend the dissertation. This part of the defense lasts 45 minutes and concludes when the beadle enters the room and declares ‘hora est!’ The opponents and supervisors then leave the room to deliberate on the quality of the defense; as soon as they have left (or, sometimes, after the technician responsible for the working of the microphones and projection tapped the microphone), the audience breaks into applause and starts congratulating the candidate. The experts—headed by the beadle—re-enter for the final part of the defense, the laudation. One of the supervisors presents the diploma and gives a speech, in which the candidate is praised for his or her achievements.

Decision-making at Dissertation Defenses?

As this description of the event already indicates, for all practical intents and purposes, the decision to award the candidate with a doctorate has already been made before the defense. The university’s ‘Regulation governing the attainment of doctoral degrees’ officially states that the committee deliberates on ‘whether or not to award the degree of Doctor’. Nevertheless, the script that is circulated before the defense and which contains the official phrasing to be used during the ceremony does not prepare for the eventuality that the committee might decide against granting the doctorate (Maastricht University, 2013). Doctoral candidates, supervisors and opponents alike enter the ceremony with an expectation that a doctoral degree will be awarded at the end; the biggest hurdle towards getting a degree is thus not
the defense, but the decision (usually made months in advance) to admit the candidate to the defense in the first place, which is based on a careful reading of the written dissertation by the reading committee.

In this sense, doctoral defense ceremonies at Maastricht University—and in the Netherlands more generally4—differ considerably in their character from, for instance, the *viva voce* in the British university system, where the possibility of failure on the day of the defense is always present, albeit with varying degrees of possibility depending both on the institution and the disciplinary background of the committee (Tinkler and Jackson, 2000; Morley et al., 2002). Unlike the British viva, the Dutch defense takes place in public rather than behind closed doors; both the defense itself and the subsequent award of the doctoral degree are thus witnessed by an audience.

Contrary to the decision to award a doctorate at all, the decision to do so with the distinction of ‘cum laude’ may be made on the day of the defense. While the procedure leading up to a cum laude distinction has to be set in motion months in advance, based on the quality of the written dissertation, the final decision is made through a written vote after the defense (Maastricht University, 2013) for which the quality of the defense is a factor:

If the defense is completely a disaster then you still can say ‘okay, it was a very good thesis but the defense was so bad you can’t [give a cum laude] because everyone will then think those professors are crazy’. So that is then decided after the defense, during the deliberations. (Professor Green)

Making the decision after the defense seems to be a safety mechanism to avoid damage inflicted on the reputation of the university or research field, rather than to incorporate an accurate assessment of the defense into the decision-making. The impression that the university awards ‘cum laude’ distinctions too easily has to be avoided, as their rarity is itself a point of pride—note, for instance, Professor Mustard’s assertion: ‘I have never been at a thesis defense in Maastricht where a cum laude was even on the table. In my field it happens only very rarely.’ The decision-making related to cum laude thus suggests the importance of reputation in the process of doctoral dissertation defenses.

*Reputation*

One of the professors we interviewed concluded that ‘there is nothing at stake’ during the dissertation defense: ‘That is just a ceremony and it is completely unimportant’ (Professor Mustard). Although this may be true for the official decision-making, most of our interviewees did think that something was at stake nonetheless. Indeed, the dissertation defense is an affair to which most participants attach great importance. Moreover, during the defense itself, it is generally appreciated when people show that they take it seriously:
Well I think that adhering to the formalities is part of the procedure and I personally always appreciate if people do so. It should not become an informal discussion. And it’s good if everyone sticks to their role in that, including the candidate. (Professor Grey)

Following Wenger (1998), adhering to the symbolic formalities and assigned roles helps constitute a sense of belonging to a particular community. However, the strict formalities and roles also serve another function: they inform the participants that even though the event is celebratory when it comes to decision-making, they should nevertheless take it seriously. The candidate and other participants should show that belonging to this community of practice is a serious affair in which the reputation of the participants is involved in similar ways as with the written dissertation.

The extent to which dissertation defenses have consequences for the academic reputation of a candidate was a matter of disagreement between our interviewees. While some argued in line with the findings of Isaac et al. (1992) that the candidate’s reputation within the research community is based on the quality of the written dissertation, others argued that the defense also plays a role—at least, as Professor Grey stressed, in some cases:

I would say that this is a little asymmetrical. If you do not so very well it’s quite rare that it’s held against you. In the sense that people understand and accept that sometimes people are nervous and this can affect the performance during the defense. On the other hand you also have candidates who do better than expected. There is one candidate from which I did not expect that much during the defense and he actually performed quite well and some members in the committee had re-adjusted their opinion of him.

However, performances in dissertation defenses do not reflect only on the individual candidate. In the public event of the dissertation defense, doctoral candidates represent not only themselves, but also a specific department or research group within which they have conducted their research. As Doctor Plum noted, ‘there are no lonely researchers’. Thus, in assessing the quality of a defense, ‘you are not only giving an ordeal about the quality of the candidate, you are also giving an ordeal about the whole team that supported the candidate to perform the study and on the point of the thesis’. In this sense, the quality of the dissertation defense influences in varying degrees the relative reputation of a research group compared to others.

The dissertation defense also plays a role on a larger level than the relative reputations of the research group. The reputation of the university hosting the defense as well as the reputation of science as a legitimate institution in society is performed in teams. First, it can be argued that scholars from the hosting institution perform reputation together with the visiting scholars that take part in the
supervisory committee. Second, as there is an audience present, dissertation defenses can be seen to contribute in legitimizing the societal role of the university. However, similar to other forms of reputation at stake, badly performed dissertation defenses may damage the reputation of the university as an institution. As Professor Green notes: ‘also for the public being there, it’s not a good sign if there are too many defenses of minor quality’. This suggests that academics engaging in complex discussions valorizes the university, but only if it is done well; bad performances may cause members of the public to raise their eyebrows. Dissertation defenses not only bear potential impact on the reputation of the candidate, then, but also on that of supervisors and opponents, of departments, and finally that of the institute of science as a whole.

Sticking close to the rules and regulations of the event is not only a way to show that you take the event seriously, as professor Grey noted, but also a form of reputation work. Dr Plum states:

Well, I think it’s a way to give some specific features to the ceremony. You must pay some respect to the candidate, to the scientific group that has supported the candidate. Of course sometimes it’s also a bit like a eh . . . eh . . . a show . . . And Maastricht is different from Utrecht and Utrecht is different from Leiden. So it’s not eh . . . eh . . . a show that is all over the world the same. I think maybe, because we are a young university, maybe because we want to strengthen the idea that research and science research is an important issue, we are a bit more stiff than some other universities.

Comparing Maastricht to other Dutch universities, Dr Plum suggests that strict compliance with rules and regulations helps to stress the importance of the work done at the relatively young university. In an attempt to reassure the university’s position, scholars attach great importance to the strict enactment of what might be called invented traditions (Hobsbawm, 1983), those symbolic artifacts, rituals and practices that have been ‘invented’ to give the impression of a shared history. The enactment of these traditions in a team performance that contains ‘traditional artifacts’ such as the university mace and the clothing, aims to endow the university with legitimacy. The ambiguity between celebration and assessment can thus be explained by the importance attached to the event by the participants, who, with the help of props and invented traditions, try to manage the effect of the event on their own reputation as well as that of the research group and university they belong to—and even of the institution of science as a whole.

Performing Roles

The ambiguous definition of the dissertation defense between celebration and assessment is also inscribed within the scripts that inform the performances. According to
Goffman (1959) people behave in accordance with an implicit script for events, based on an understanding of how to behave appropriately. The interactions in dissertation defenses are, however, not only based on implicit scripts, but are also partly dictated by an explicit script, outlined in the promotion regulations, which, importantly, contain the very ambiguity described in the previous section. The script dictates that in the deliberations, ‘the members of the Supervisory Committee will pass their judgement on the research underlying the degree, on the dissertation and on the defence’ after which ‘the committee decides whether or not to award the degree of Doctor’ (Maastricht University, 2013, p. 19). This particular phrasing suggests that the outcome of the dissertation defense is uncertain. Yet, the script does not contain instructions in case the outcome of the deliberations is negative, therewith simultaneously implying the possibility and the non-possibility of failure. In the rest of this section, we will show how this ambiguity is further contained within the roles, both of the candidate and of the performance teams.

**The Candidate’s Performance in the Lay-talk**

Candidates defending their thesis at Maastricht University face two major tasks: giving a ‘lay-talk’ and defending their thesis. The role of the candidate is thus both to explain their work to lay-people, and to engage in an expert discussion with their future peers. These tasks differ substantially and candidates face the challenge to give a performance that satisfies the needs of both, while remaining sensitive to the ambiguous definition of the event. However, candidates have a great deal of discretion in how to perform the lay-talk, for which candidates are instructed to ‘give a summary of his/her dissertation in 10–15 minutes (possibly with the use of projection slides)’ to the assembled audience, usually consisting primarily of colleagues, family and friends (Maastricht University, 2013, p. 19). The lay-talk is aimed at the audience, and formally does not impact scholars’ opinions on the candidate, which suggests that it serves to fulfil a celebratory function. But, as Dr Plum notes:

> It is important that you are able to formulate your conclusions in such a way that people can understand what you are talking about. It’s not part of the way we are talking afterwards about the candidate but eh, well, it’s important to see if the candidate is able to make clear to normal people, what is the result and the importance of his research.

In Dr Plum’s view, science is something which can and should be adequately explained to a wider public and the lay-talk allows opponents to informally assess the candidate’s skills in doing so. In their preparations for the lay-talk, some candidates struggle ‘to find the right balance’, as they want to make the talk comprehensible, but at the same time not too simple, Julia explained. ‘You
don’t want people sitting in the audience to think, “What this person has been doing in the past four years, I could have done as well.” Additionally, candidates are aware of the opponents’ presence during the lay-talk. They generally address the expert panel several times during the lay-talk by looking at them.

The styles in which candidates perform their lay-talk vary substantially, which becomes especially clear in their use of powerpoint slides. Some candidates use the slides in a way that evokes the disclosure of evidence giving a certain ‘realness’ to that which is said (Knoblauch, 2013), while others use the slides primarily to make the talk attractive by invoking a ‘visual narrative’. Although we suspected these differences to be related to the different ways in which certain epistemic cultures relate to their objects of interest (Knorr Cetina, 2009), we did not detect systematic differences between the two faculties. Yet, differences between candidates persisted. Michael, a former doctoral candidate in medicine, explains how the use of powerpoint was different in his lay-talk compared to his usual presentations.

This time I really did not put any text on the slides. Usually it is very easy to put your text on the slides in bullet points, such that you can read it out more or less. But on the other hand, I thought it to be a better idea not just to put text on the slides, but to tell a narrative and to make it as visual as possible.

In his day-to-day work, powerpoint presentations serve to facilitate efficient communication. In the dissertation defense, Michael put more effort in making the slides and wanted to tell a strong visual narrative. Others, however, see the use of images as a trade-off for seriousness. Jens, a former PhD student at MSGoG, used to giving powerpoint presentations in educational settings, said the following about using images in his presentation.

Normally I [use] a lot. But this time I won’t because this is a very serious affair. So here I’ll worry about the font size, the contrast between the color of the text and the background … That’s about it. Otherwise, I usually think about what image will go on each slide and how an image might help … How much text to put in there … So yeah … normally I would spend much more time on the aesthetics of it, because most of my presentations are about teaching. So when teaching a group of people I’ve got to get a point across. So … in those cases I try to make it more entertaining, funny, etc. … so I’ll put a picture from a movie … All of that is out of the question now.

In contrast to Michael, who wants to present a fluent visual narrative, highlighting the need to transmit complex narratives in a rhetorically appealing form, Jens wants to give a ‘serious’ presentation, avoiding excessive use of images and give an impression of seriousness and efficiency. As the lay-talk is embedded within the larger event of the dissertation defense in which candidates have to
defend their work while being scrutinized by (future) peers, the task to explain their work to laymen is interpreted differently. Some want to retain some seriousness in the face of their future academic peers, while others prefer to make their presentation enjoyable and appealing to the lay audience. Nonetheless, nearly all candidates try to make the lay-talk fairly comprehensible; but at the same time, they cannot ignore the fact that experts are also present during this talk, and thus want to avoid looking bad by oversimplifying their research. Candidates seek a balance between comprehensibility and doing justice to the complexity of their work and in this balancing act between celebration (which suggests the work is already finished and only has to be shared with an audience) and assessment (which suggests that the final decision still has to be made about the academic adequacy of the work), the lay-talk provides candidates with a discretionary space in which they can set the definition of the event to either of the two (ideal-type) views.

Team Performances

Performances at doctoral dissertation defenses are never shaped only by the doctoral candidate, but also by various other actors, such as the opponents and the audience, as well as by material settings and artifacts. The manner in which different actors contribute to these team performances shifts in the course of the hour-long ceremony, as the organization of the patterns of interaction shift from a form of monologic talk towards a dialogue between multiple participants. This shift is facilitated by the material setting of the defense, in which the audience is seated on an upward-sloping stand, facing both the PhD candidate and the large projection screen hanging above and behind him or her; while the corona is positioned behind desks in two, slightly bent, rows on both sides of the PhD candidate. During the lay-talk, the audience thus gets the best view of the candidate and the projection, while the corona is positioned behind the large projection screen hanging above and behind him or her; while the corona is positioned behind desks in two, slightly bent, rows on both sides of the PhD candidate. During the lay-talk, the audience thus gets the best view of the candidate and the projection, while the corona gets a more restricted sideways view onto the scene. During the remaining 45 minutes, however, the positioning suggests that the audience is rarely directly addressed, as the projection screens are turned off and the PhD candidate primarily takes turns engaging in a face-to-face conversation with different members of the corona, whose positioning creates a distinction between those within and those outside of the semi-circular arrangement. In other words, the material set-up facilitates a shift from what Knoblauch (2013, p. 163) calls a ‘conference-type’ setting during the lay-talk (in which the corona is positioned as incidental onlookers), to a ‘meeting-type setting’ during the rest of the defense (in which the audience is positioned as incidental onlookers).

The changing role of the audience in the course of the ceremony is heralded not just by a shifting material arrangement, but also by a shifting academic tone. For instance, Michael reflects on the response of the audience at his dissertation defense:

They thought it was impressive, yes. The whole ceremony around it of course. They thought the lay-talk was very clear, which was the intention.
Well, then 45 minutes of questions, that was . . . Yeah . . . Some people could follow it more easily than others. It depends on what they studied and what their background is.

As the reaction of Michael’s audience demonstrates, some members of the audience struggle to follow the actual defense. Whereas in the first part, the candidate aims to find common ground with the audience, in the second part, the divide between the lay audience and the experts on stage is sharpened through the use of jargon by candidate and the supervisory committee. The team of performers on stage, who now and then generously reach out to the audience by making jokes and witty remarks, are then collectively enacted as experts, and the audience as a lay audience. This shift in the mode of participation of the audience suggests that in dissertation defenses, science is enacted as something which is complex enough to leave in the hands of experts, but of which the findings can be adequately communicated to a lay audience.

The ambiguity between assessment and celebration is also contained in the roles of candidates and opponents when they interact with each other in the second part of the ceremony. During the defense, the supervisory committee and the candidate have to convey an impression of expertise. According to Jens, there is no room for candidates to acknowledge that they do not have an answer to a question:

There are sometimes let’s say questions that are really tough. And people don’t have answers to them. The guidelines you get, say ‘if you don’t know the answer to that question, “I don’t know” isn’t an acceptable answer’—so you have to make some comment on it.²

However, professors may not appreciate answers that circumvent the question. Such answering might reflect badly on the reputation of the candidate’s research group or even on the reputation of the hosting university vis-à-vis opponents that are members of different research groups, or different universities. The different reputations at stake in a dissertation defense thus seem to be at cross-purposes when questions are asked to which the candidate has no adequate answer. But also, the double role that opponents play is in tension. On the one hand opponents act as critical peers that have carefully scrutinized the manuscript, while having prepared content-oriented questions on the dissertation. On the other hand, they are also part of a team, be it as a scholar, or as a member of the same research group or university; in asking questions, they also have to perform a variety of reputations at stake.

Managing the Definition of the Event

Up to now we have argued that the stakes of a dissertation defense are ambiguous, oscillating between the dissertation defense as a moment of assessment in which
reputation plays an important role on the one end, and the dissertation defense as a celebratory event on the other. Furthermore, we have argued that this ambiguity is contained within the script of the event, leaving room for how the roles should be interpreted. However, what we have left undiscussed until now is how participants handle this ambiguity in the performance of the dissertation defense. Here, we examine how the performance team cooperates to retain a certain degree of ambiguity between celebration and assessment, for example by navigating between formal and informal styles of interaction, sometimes making humorous remarks, while at other occasions making rather serious comments.

Having a Real Discussion

As argued, the discussion part of the defense consists of a team performance in which candidates and experts work together to manage impressions given by their interactions in the asking and answering of questions. The rules and regulations outlining the dissertation defense contain some indications for how members of the supervisory committee should phrase questions, or ‘present objections’ and states the procedure for deciding the sequence of questions before the defense (Maastricht University, 2013). In asking questions, opponents are requested to avoid ‘any extensive expression of gratitude or appreciation of the dissertation’ (p. 52), which could compromise the serious character of the defense. And as we have seen above, the candidates are expected to answer all questions. In other words, the regulations instruct that the defense should consist of critical questions, but which should nevertheless be answered in one way or another to keep up a certain impression towards the audience.

When asked about the characteristics of a good defense, most of our interviewees suggest that it was important to have a ‘real discussion’ on stage. Professor Green, for instance, contends that the defense shows the candidate’s ability to listen well and ‘get the essence out of each question’. Similarly, Professor Grey sees importance in the ability of a candidate to show that he or she is able to engage in a ‘real discussion’:

Well, I think a really good defense is ( . . . ) a defense by a candidate who shows maturity in her research and is able to put things in a wider context and is also able to engage in a real discussion, and not just in a question-answer. And also to show flexibility in a debate, in issues a little external and beyond what has been discussed in the dissertation. I think that’s what we value most.

The written dissertation shows the technical facility of a candidate, but the defense allows the candidate to show him or herself to be an expert by taking the acquired expertise beyond the scope of the topic of the dissertation. Being able to engage in a real discussion with opponents is a proof of a ‘legitimate membership’ in the academic community (Delamont et al., 2000, p. 34).
At the end of the event, the PhD candidates also receive a literal badge of membership in the academic community: the doctoral certificate, adorned with the wax seal of the university. Curiously for a university which was founded in 1976, this certificate is written entirely in Latin—a choice which suggests the primarily symbolic value of the artifact. Such stage-props afford participants to perform the event as one with great importance, while at the same time marking the expert community as a bounded entity (Wenger, 1998). In Hobsbawm’s (1983) terms, they help to perpetuate the invented traditions which lend the university authoritative power by association with those traditions seen at other, much older, universities. Another example is the mace of Maastricht University, which was gifted to the university by a local organization to signify the university’s identification with the Maas-region (Roymans, 1975; Herwaarden, 1998). The dress-code, too, contributes an impression of authority: while professors wear gowns that signal their position of excellence within the university, those participants who do not possess the rank of professor are required to dress in ‘accordance with the importance the university attaches to this ceremony’ (Maastricht University, 2013). This formulation acknowledges that the event may be interpreted by some as non-important for decision-making, but requests from participants to comply with the (ill-defined) definition of the event given by the university.

The degree in which opponents consider the event important in terms of assessment varies extensively. In some extreme cases, strictness may cause the candidate to be caught off-guard:

When wanting to answer this first (rather aggressive) question, the candidate was silent for a short while, only adding after a few seconds ‘Ehh yeah. Ehh thank you very much...’ And only after this, she made use of the formal formula of answering and addressing a professor ‘Highly esteemed opponent, thank you very much.’

In this instance, the expectations of the candidate and the opponent differ. While the opponent ostensibly takes the defense as an occasion at which the candidate can be tested by means of asking critical questions, the candidate did not expect to receive such tough questions. These differing expectations threaten to induce what Goffman (1959) has called a disruption of the performance in that it briefly seemed as if the candidate was unable to answer the question, challenging the formal definition of the situation set out in the regulations, in that candidates should always give an answer. However, the candidate made an effort to regain control over the disruption, showing a willingness to indeed belong to the expert community (Wenger, 1998). Moreover, being able to successfully handle performative disruptions can be seen as part of the skillset that candidates learn to master during their doctoral dissertation in order to deal with the ‘messiness’ of the research practice and become part of the body of experts (Delamont and Atkinson, 2001). The harshness of the question is part of an informal assessment.
in which the opponents test the capability of the candidate to handle these situations, leaving little room, yet, for praising of the candidate.

_Taking a Lighter Definition_

In our observations, however, it became clear that not all opponents behave according to the formal definition put forward in the regulations, as some opponents showed extensive praising of the candidate’s work. These opponents diverge from the conception of a ‘real-discussion’ and take somewhat lighter stances towards the discussion, allowing the event to be defined in terms determined by the candidate’s preferences. An example of this type of complicity becomes clear when Professor Grey explains that particularly ‘if you are the first one to ask questions, if you are the chair of the assessment committee, you do make some effort to put him or her more at ease. You don’t immediately try to enter a strong discussion’. Despite the expectation of a ‘real’ discussion with the candidate, opponents make a conscious effort to provide the candidate with the opportunity to comfortably enter the discussion, a form of cooperation that blurs the opponents’ roles as examiners as well as peers.

Such forms of cooperation also came to the fore in the defenses that we observed, for instance, when an opponent gave the candidate the choice to answer either a tough or an easy question. This gave the candidate a choice either to perform as a young expert or on the contrary maintain the status of student for a few more minutes, which has implications for the definition of the event as either celebration or assessment. In doing so, the opponent signals that he is prepared to comply with the definition of the situation the candidate prefers, taking a stance as an expert able to ask tough questions but kindly willing to cooperate in a team performance that takes the event as a celebration. When the candidate responded that she rather faced some easy questions, the opponent said: ‘Then I put aside the tough questions’, before posing his questions. The candidate opted to take the event rather for celebratory purposes at the cost of putting down a performance of her own expertise. While leaving the choice to the candidate, the opponent allowed the event to be taken as a celebration, at the same time maintaining the status of experts for the expert body.

_Policing the Team Performance_

The scripted ambiguity of the event poses the challenge of how to maintain this ambiguous definition between celebration and assessment in the performance. Goffman (1959) argues that performance teams tend to avoid public disagreements by fear of embarrassment or inadequate united action; hence, ‘members of the team may be required to postpone taking public stands until the position of the team has been settled’ (p. 91). In dissertation defenses, as we have seen, this position is rather ambiguous, intentionally leaving room for participants to
take a variety of public stands. In some instances, however, these may be con-
sidered by other participants to be too much on either side of the spectrum
between celebration and assessment. Navigating between formal and informal
stances, humorous remarks and more serious ones, they publicly correct each
other, collectively maintaining the ambiguous definition of the situation.

In some instances, for example, opponents may subsequently take opposing
positions. As discussed above, the regulations require candidates to omit ‘exten-
sive expression of gratitude or appreciation of the dissertation’ (Maastricht Uni-
versity, 2013, p. 52). Nevertheless, we observed that usually opponents began
by addressing a candidate with a few kind words, only to clarify that their goal
is not that of congratulating them:

The first opponent started out by giving compliments about the work of the
candidate but soon said: ‘I am not here to give compliments’. He started
asking a question and announced immediately that he had some follow-up
questions. The third expert stated: ‘I’m not here to congratulate you on
your work, I’m here as an opponent and I will ask you a rather mean
question’.

In these examples, we can witness the opponents reprimanding themselves for
potentially overstepping the boundaries of what may be considered appropriate
(not ‘excessive’) expressions of appreciation, and reminding themselves of their
official role as an opponent. By beginning with accolades and then making
clear that this is not the main point of the event, they keep the ambiguity of the
situation between celebration and assessment alive.

Audiences also behave in ways that may run counter to the position taken by
the experts, which on their turn correct this behavior, often via the (pro-)rector.
When the candidate finishes the lay-talk it is expected from the audience not to
applaud, as an applause would mean an acknowledgement of the achievements
of the candidate, while formally this is still open for discussion. In one defense,
the audience did start to applaud directly after the lay-talk, leading the chair of
the corona to correct the audience’s early praises by saying, ‘please, you can
applaud when the show is over’, after which he proceeded to open the discussion.

In another defense, opponents’ remarks implicated a different view on the
future course of events. One of the opponents mentioned, when presenting com-
ments on the dissertation that ‘in 36 minutes you will belong to the body of
experts’, suggesting that the awarding of the degree was a matter of when
rather than if. This is in line with the general conception most of the participants
share, assuming the awarding of a doctorate degree to be a given. However, a later
remark made by another opponent opposed this view, mentioning, in a remarkable
turn of phrase, the ‘possible promotion’ of the candidate. The promotion now
becomes a possibility rather than a given emphasizing the question of if rather
than when.
What we see here are actors correcting their own and others’ view on the performance. Morgan and Baert (2015) have analyzed similar dynamics, arguing that performance teams sometimes compete with each other to steer a performance in one direction or another. Similarly, the corrective actions taken in our examples show a move from a celebratory view on the dissertation defense where nothing really is at stake, towards a position that the promotion is a possibility and that the primary purpose is assessment. But instead of steering towards a single definition of the event, the corrections mystify its formal purposes. The result is the performance of something ambiguous; an event that may be interpreted both as a celebration and an assessment.

**Conclusion**

While performing ambiguity may seem a paradox, dissertation defenses at Maastricht University illustrate its possibility. Goffman (1959) employed the performance metaphor in an attempt to understand how humans adjust their behavior to the requirements of a setting and a particular audience. This perspective has proven popular among sociologists of science interested in the construction of scientific authority (Hilgartner, 2000; Morus, 2010; Castán Broto, 2011). In line with Goffman’s suggestion that performance teams work together to project a single, shared definition of the situation, the accounts of these authors describe performances in which scientists work together to create an impression of unanimity; an impression which is called into question only in cases of scientific controversies in which different sides compete to establish their definition of the situation as the truth (Morgan and Baert, 2015). Based on our study of the team performances in dissertation defenses, we demonstrate that performances can also leave room for ambiguity: rather than projecting a single unambiguous definition of the situation or multiple rivaling conceptions, team members cooperate to maintain a situation which can be interpreted as both assessment and celebration.

Audiences, candidates and experts attach great importance to the dissertation defense as an event, even though it may seem like nothing much is at stake. The decision to award a doctorate is made months in advance based on the written dissertation. As a result, performances at dissertation defenses are designed to be ambiguous: that which is being performed is the possibility to simultaneously interpret the event in different ways, as assessment and as celebration, providing each of the participants a degree of interpretative discretion. By analyzing dissertation defenses as performances, we have shown how this ambiguous definition was contained within the roles of the participants and how the participants handle these roles in practice. Members of the expert panel, for instance, are instructed both to act as critic (explicitly) and as peer (implicit). This ambiguity allows participants to take up a personal conception of the dissertation defense within this spectrum. However, when participants veer too much
towards either end of the spectrum, the ambiguity of the performance is threatened. Candidates handle these situations by correcting each other’s behavior. When one participant shows too much complicity or is too strict, team members reinstate the ambiguous definition by means of making small contradicting remarks.

Thus, we have seen how in the context of science, an institution that thrives on the production of certitude, participants behave in accordance with a definition of the event that is ambiguous and leaves room for being interpreted both as a celebration and as an assessment. This may have implications for the study of performances in other settings as well, where the performance of apparent certainty may in fact also involve the performance of a degree of ambiguity, allowing the event to be interpreted in various ways, depending on who is observing. Think, for example, of the presentation of a controversial policy initiative that is deliberately kept ambiguous to allow disagreeing parties to interpret the policy differently.

Some questions remain unanswered. Based on our material, for example, it is unclear whether differences between epistemic cultures are also reflected in the ways in which dissertation defenses are performed, leaving this question open for future research. Although our analysis is based on Dutch dissertation defenses and cross-national differences certainly exist, we expect that our argument that dissertation defenses are performances of ambiguity holds in other countries as well. While this ambiguity may be especially apparent in situations where the decision to award the doctorate has been made before the actual defense—as it raises the question of what, then, is at stake—it is also present in educational systems where the decision to award the doctorate is more strongly influenced by the performance during the defense. After all, dissertation defenses always mark a period of transition; an end (to the period of doctoral student and identification as a student) as well as a beginning (as a fully licensed member of an academic community). Amidst this ambiguity, the university reinforces its own authority to award doctoral degrees, acting as a gate-keeping institution to the academic world.

Acknowledgements

We wish to thank members of the Maastricht University Science, Technology and Society research program for their useful comments presented to us in the work in progress meeting. In particular, we are grateful to Anique Hommels, Karin Bijsterveld and Harro van Lente. Finally, we wish to thank the anonymous peer-reviewers and the editors of this journal who provided us with excellent suggestions on an earlier draft of this paper.

Disclosure Statement

No potential conflict of interest was reported by the authors.
Notes

1In accordance with the common Dutch understanding of the term, we understand ‘science’ (‘wetenschap’) to encompass not only the natural sciences, but also the social sciences and humanities (see Wachelder 2003, p. 244f.).
2In the Netherlands during dissertation defenses, candidates select two people to be their assistants, known as ‘paranymphs’ in Dutch. Besides their role in the ceremony, these paranymphs help the candidate with preparing the festivities after the defense.
3The presentation and defense together thus take a predetermined amount of time (one hour), which is quite different from the customs in some other countries, where defenses may last up to several hours (Recski, 2005).
4Much of the procedure described in this article is also true for other Dutch universities, but there are some institutional differences (for instance regarding the status of the lay-talk).
5These guidelines are specific to the MGSoG. We have not come across guidelines that state something similar at the FHML faculty.

References

Austin, A. E. and McDaniels, M. (2006) Preparing the professoriate of the future: Graduate student socialization for faculty roles, in: J. C. Smart (Ed) Higher Education: Handbook of Theory and Research, 21, pp. 397–456 (Dordrecht: Springer).
Baker, V. L. and Pifer, M. J. (2011) The role of relationships in the transition from doctoral student to independent scholar, Studies in Continuing Education, 33(1), pp. 5–17.
Castañ Broto, V. (2011) The performance of environmental science in research teams, Science as Culture, 20(3), pp. 329–348.
Clark, W. (2006) Academic Charisma and the Origins of the Research University (Chicago, IL: University of Chicago Press).
Delamont, S. and Atkinson, P. (2001) Doctoring uncertainty: Mastering craft knowledge, Social Studies of Science, 31(1), pp. 87–107.
Delamont, S., Atkinson, P. and Parry, O. (2000) The Doctoral Experience: Success and Failure in the Graduate School (London: Farmer Press).
Emerson, R. M., Fretz, R. I. and Shaw, L. L. (2011) Writing Ethnographic Fieldnotes (Chicago, IL: University of Chicago Press).
Ferrales, G. and Fine, G. A. (2005) Sociology as a vocation: Reputations and group cultures in graduate school, The American Sociologist, 36(2), pp. 57–75.
Geertz, C. (1973) The Interpretation of Cultures: Selected Essays (New York: Basic books).
Goffman, E. (1959) The Presentation of Self in Everyday Life (New York: Doubleday).
Herwaarden, van J. (Ed) (1998) De pedel geboekstaafd (Rotterdam: Erasmus Universiteit).
Hilgartner, S. (2000) Science on Stage: Expert Advice as Public Drama (Stanford, CA: Stanford University Press).
Hobsbawm, E. (1983) Introduction: Inventing traditions, in: E. Hobsbawm and T. Ranger (Eds) The Invention of Tradition, pp. 1–14 (Cambridge: Cambridge University Press).
Isaac, P. D., Quinlan, S. V., and Walker, M. M. (1992) Faculty perceptions of the doctoral dissertation, The Journal of Higher Education, 63(3), pp. 241–268.
Jackson, C., and Tinkler, P. (2001) Back to basics: A consideration of the purposes of the PhD Viva, Assessment & Evaluation in Higher Education, 26(4), pp. 355–366.
Knoblauch, H. (2013) PowerPoint, Communication, and the Knowledge Society (Cambridge: Cambridge University Press).
Knorr Cetina, K. (2009) Epistemic Cultures: How the Sciences make Knowledge (Cambridge: Harvard University Press).
Maastricht University (2013) *Regulations Governing the Attainment of Doctoral Degrees* (Maastricht: Maastricht University).

Morgan, M., and Baert, P. (2015) *Conflict in the Academy: A Study in the Sociology of Intellectuals* (Basingstoke: Palgrave Macmillan).

Morley, L., Leonard, D., and David, M. (2002) Variations in vivas: Quality and equality in British PhD assessments, *Studies in Higher Education* 27(3), pp. 265–273.

Morus, I. R. (2010) Placing performance, *Isis*, 101(4), pp. 775–778.

Rendle-Short, J. (2006) *The Academic Presentation: Situated Talk in Action* (Aldershot: Ashgate).

Recski, L. (2005) Impersonal engagement in academic spoken discourse: A functional account of dissertation defenses, *English for Specific Purposes*, 24(1), pp. 5–23.

Rivas, C. (2012) Coding qualitative data, in: C. Seale (Ed) *Researching society and culture*, pp. 366–392 (London: Sage).

Roymans, D. (1975) *Beschryving van de keten, pedelstaf en voorzittershamer ontworpen in opdracht van de stichting wetenschappelyk onderwys Limburg ten behoeve van de Ryksuniversiteit Limburg* (Maastricht: Maastricht University Archive).

Svetlova, E. (2012) Talking about the crisis: Performance of forecasting in financial markets, *Culture and Organization*, 18(2), pp. 155–169.

Tinkler, P. and Jackson, C. (2000) Examining the doctorate: Institutional policy and the PhD examination process in Britain, *Studies in Higher Education*, 25(2), pp. 167–180.

Wachelder, J. (2003) Democratizing science: Various routes and visions of Dutch Science Shops, *Science, Technology, & Human Values*, 28(2), pp. 244–273.

Wenger, E. (1998) *Communities of Practice: Learning, Meaning, and Identity* (Cambridge: Cambridge University Press).