

## Doctoral Education in a Successful Ecological Niche:

### A Qualitative Exploratory Case Study of the Relationship between the Microclimate and Doctoral Students' Learning to Become a Researcher

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#### Abstract

Scholarly communities are dependent on and often measured by their ability to attract and develop doctoral students. Recent literature suggests that most scholarly communities entail ecological niches in which the doctoral students learn the codes and practices of research. In this article, we explore the microclimate in an ecological niche of doctoral education. Based on a theoretical definition of microclimate as the emotional atmosphere that ties group members together and affects their actions, we conducted a case study that aimed to describe the key features of the microclimate in a successful ecological niche of doctoral education, and the ways in which the microclimate support the doctoral students' learning. The methods we applied in the case study were based on short-term ethnographic fieldwork. The results reveal four key features of the emotional atmosphere in the microclimate: mutual appreciation, balancing seriousness and humor, desire, and ambition. These features constitute the shared emotionality that sets the scene for the microclimate, and affects and guides the doctoral students' daily practices. Furthermore, the results indicate that the microclimate supports successful doctoral education because it: 1) fleshes out the professional attitude that is necessary for becoming a successful researcher in the department, 2) shapes and adapts the doctoral students' desires to grasp and identify with the department's practices, and 3) provides the doctoral students with access to flow zones that drive their education. These results may suggest practical implications for fostering and cultivating successful ecological niches in medical education at doctoral level.

**Keywords:** Microclimate, Doctoral students, Ecological niche, Doctoral education, Atmosphere, Medical education, Supervision

#### 1. Introduction

Today, scholarly communities such as universities are dependent on and often measured by their ability to attract and develop doctoral students. Metaphorically speaking, doctoral students are the indispensable fuel in the academic engine. For a community reliant on scientific advances and accumulation of new knowledge, no issue could be more important than the maintenance and development of the 'ecological niches' (Simonton, 1999) that support talented young researchers and educate doctoral students. According to Bowles (Bowles, 2000), ecological niches are 'human-made environments which are both varied and persistent across generations' (p. 149). These niches are created by and sensitive to human activities and cultural innovations, and they are 'constructed niches' (Lalande, Odling-Smee, & Feldman, 2000). They are the result of the social environment and interpersonal relationships between students, supervisors and other academic staff, and, most interestingly, they are characterized by a particular microclimate (Louis, Holdsworth, Anderson, & Campbell, 2007). Most scholarly communities entail ecological niches in which the doctoral students learn the codes and practices of research (Humphrey, 2012). Whilst research on doctoral supervision is increasing (DiMino & Risler, 2012; Gatfield, 2005; Green & Bowden, 2012; Mainhard, van der Rijst, van Tartwijk, & Wubbels, 2009; Nordentoft, Thomsen, & Wichmann-Hansen, 2013), it could be argued that these studies may not reflect the features of the microclimate in ecological niches of doctoral education.

In this article, we will explore the microclimate in a particular ecological niche of doctoral education: a successful department in a university hospital that has a high reputation and high performance rates in terms of numbers of doctoral students and academic papers. We will begin the article with a brief overview of the recent literature on

microclimate in doctoral education. We will then continue to describe the theoretical concept of microclimate, after which we will describe the method of the qualitative case study presented in this article. Finally, we will present and discuss the results pertaining to four features of the microclimate in successful doctoral education: mutual appreciation, balancing seriousness and humor, desire, and ambition.

### *1.1 Microclimate and the ecological niches of doctoral education*

Recently, a few studies have suggested that being a doctoral student, learning to conduct a research project, and becoming a researcher is a social affair (Green & Bowden, 2012; Humphrey, 2012; Kyvik & Olsen, 2013; Pyhältö & Keskinen, 2012). According to these studies, the ecological niches that are available for doctoral students influence the completion of the PhD project. In addition, Louis et al. (Louis et al., 2007) and Walsh (Walsh, 2010) suggest that the ecological niches in doctoral education and especially the microclimate of these niches most likely influence the doctoral student's burgeoning career as a researcher. In a study on research group microclimate, Walsh (2010) describes a model with a continuum from the most to the least cohesive microclimate: inclusive, structured, granular, and fragmented microclimate. Walsh developed the model of group microclimate from qualitative analysis of the subjective accounts of a small group of overseas PhD students in the UK in science and engineering disciplines, and she concluded that doctoral students in groups with an inclusive microclimate reported fewer problems. Despite the promising results of Walsh's study, the author does not provide a clearer definition of microclimate as a theoretical concept. Thus, further research on microclimate in doctoral education would need to be based on a more thorough conceptualization of microclimate.

Also focusing on the relationship between doctoral education and climate, Louis et al. (2007) define four climate indicators in a quantitative survey study on the effects of work group size and organizational climate in research teams including graduate students and postdoctoral fellows in three disciplines: computer science, chemical engineering, and life science. The four diverging microclimate indicators are: 1) collaboration, 2) competition, 3) openness, and 4) individualism. The authors conclude that the microclimate indicators of the local setting matter; for example, graduate students and postdoctoral fellows who find themselves in a successful context that includes openness and high levels of productivity and expertise 'have a leg up in their trajectories toward becoming successful scientists' (Louis et al., 2007, p. 329). Moreover, this study suggests that discipline makes a difference; that is, microclimates most likely vary from discipline to discipline, and from field to field. However, Louis and colleagues only vaguely define the concept of organizational climate in their article, so it would be necessary to explore the concept in greater depth in order to develop this area of research.

To the best of our knowledge, these two studies (Louis et al., 2007; Walsh, 2010) are fairly singular instances of sociological explorations of the microclimate related to doctoral education. Although neither of the two studies offers theoretically sound definitions of the concept of microclimate, they provide rare but highly interesting examples of ways in which doctoral education is interwoven in an ecological niche and how the microclimate in a particular ecological niche affects the doctoral student's development as a researcher. Thus far, only a few studies (including the two mentioned above) have been conducted in this field of research, even though the establishment of ecological niches with microclimates that support talented young researchers and educate doctoral students may be an urgent agenda in today's scholarly communities. Of course, it could be argued that we overestimate the significance of microclimate as a determining factor in doctoral education. However, looking into the vast literature on organizational culture and climate, and the well-established knowledge on the relationship between climate and work situations that makes us more or less comfortable or productive (see, for example, Ashkanasy, Wilderom, & Peterson, 2011), we believe that microclimates in doctoral education are worth studying in order to provide the optimal ecological niches for doctoral students' learning.

### *1.2 Aim and research question*

The aim of this article is to provide a theoretically based definition of microclimate and apply this concept in an explorative and qualitative case study of the microclimate in an ecological niche of doctoral education. The case is a successful department at a Danish university hospital that educates doctoral students. Our research questions are: Which features describe the microclimate in successful doctoral education and in which ways does the microclimate support the doctoral students' learning?

The case study concerns the supervisor-doctoral student interpersonal relationship and social practices such as research seminars and peer learning situations.

## **2. Theory**

In the following section we will develop a sociological understanding of the concept of microclimate.

### 2.1 Microclimate as shared emotionality

The concept of microclimate is usually applied in biology and climatology to describe a local atmospheric zone where the climatic conditions, such as temperature, atmospheric pressure, and moisture, differ from the surrounding area. The microclimate distinguishes itself by generating a different *feel* than neighboring climates. As already mentioned, the concept of microclimate is also applied to describe the way the interpersonal relationship within research groups makes group members feel (Walsh, 2010) or constitutes a shared *mood* within the group (Jacobsen, 2001). Hence we define the concept of microclimate as *an emotional atmosphere and shared emotionality existing between members of a research environment, which ties the members together and affects their actions*. Our definition begins with the following three premises about emotionality based on the works of the sociologists Crossley and Bourdieu:

#### 2.1.1 Emotions are context-dependent behavior

Emotions are interwoven in our being-in-the-world (Crossley, 2001, p. 85), which means that emotionality is not a superfluous and insignificant layer wrapped around our perception, thought, and action. Instead, emotionality is integrated in and a constant aspect of the way we relate to and orient ourselves in the world (ibid.). The way we feel in a particular situation is immediately shaped by and shapes how we perceive and respond to the situation. Consequently, it is reductionist to regard emotions simply as inner realities. They exist in our attitude and the way we act (Crossley, 2001, p. 84). Accordingly our emotions exist for others as behavior, which leads us to our second premise.

#### 2.1.2 Emotions arise between interactors

We do not need to think about the other's angry gesture or compare it to gestures of our own in order to grasp its meaning (Crossley, 2001, p. 84). The other's emotions are communicated directly to us and affect us. At the same time, they provoke immediate responses from us, which in turn affect the other. Consequently, an irreducible dynamics kicks in, and the interactors' emotions (and actions) can only be understood by way of this *dynamic whole*. Therefore a microclimate is founded and developed by the way people relate to each other and could therefore be seen as arising *between* people. Over time and continuous interaction, the interactors begin to share ways of perceiving and expressing emotions, which explains why a microclimate can be experienced as a stable quality within ecological niches, and why we can talk about an environment's *mood* (Jacobsen, 2001) or *emotional climate* (Tran, 1998). Even though the microclimate is dialogically founded it does not mean that every employee in a microclimate contributes equally to the shaping of it. Leaders (e.g. research managers, leading professors) often have a significant impact on the microclimate, because their style of leadership is a vehicle in the development and maintenance of direction in work, team spirit, and mutual appreciation despite differences among the employees (Jacobsen, 2001).

#### 2.1.3 Emotions tie groups together

Emotionality is what ties individual group members to the group. This can be illustrated by seeing the group's shared activities as a 'game'<sup>1</sup>. In order to play the group's game, group members must have a *feel* for it and a *desire* to participate. To have a *feel for the game* (Bourdieu, 1990; Crossley, 2005) means that members have an embodied attunement to the group's game. This enables members to immediately grasp and respond to the meaning of game situations. It presupposes a hidden background of taken-for-granted assumptions and know-how.

Group members' desire to play the game may be described by the concept of *illusio* (Bourdieu, 1998; Crossley, 2001; 2005). This concept states that group members' desire to play a particular game depends upon group members' ability to put themselves into the game so that they are taken over by it, and enact a form of "make believe" which involves the systematic failure to recognize that this is what they are doing' (Crossley, 2005, p. 158). This requires group members to develop a deep-seated desire to participate in the 'game' that operates on the most basic pre-reflective level of their agency (Crossley, 2001). In other words, group members must be emotionally engaged in the game, which means that they cannot help become affected by it (as well as affecting it). For example, participation in the game can make heart rates rise and adrenalin pump, and release joy from successes and pain from failures. Without group members' emotional engagement in the form of *illusio* the *dynamic whole* of a group will disintegrate (Crossley, 2005, p. 159), and the members' mutual influence will be reduced. Consequently, the group will lose its nurturing and educational features.

### 3. Method

The study takes the form of short-term ethnographic fieldwork (Musaeus, 2012) grounded in a constructivist paradigm (Kvale, 1995). Our investigatory method is an explorative and qualitative case study, because we want to

understand a real-life phenomenon in depth and such understanding encompasses important contextual conditions (Flyvbjerg, 2011). As Flyvbjerg (2011) emphasizes, ‘The case study produces the type of concrete context-dependent knowledge that research on learning shows to be necessary to allow people to develop from rule-based beginners to virtuoso experts’ (p. 302). Adopting a case study design, we collected data from multiple perspectives (in-depth interviews with doctoral students, supervisors, and research leaders) and from multiple situations (observation of meetings between supervisor and doctoral student, research seminars, and daily work life).

### 3.1 Selection of setting and participants

We used an information-oriented case selection method and identified a ‘paradigmatic case’ that met the purpose to ‘establish a school for the domain that the case concerns’ (Flyvbjerg, 2011, p. 307). The case was within the domain of successful doctoral education in medical education. Our selection criteria were: 1) a high reputation among peers and the public indicates a strong position; 2) high performance, i.e. the department is acknowledged and recognized as producing research on a high international level; 3) access, i.e. the department agree to participate in the study. Consequently, we selected a department at one of the three university hospitals in Denmark. According to extensive analyses made by the independent Danish specialist newspaper on the healthcare sector ‘Dagens Medicin’ [Today’s Medicine] (Boysen, 2012), this particular hospital was appointed as the best hospital in Denmark in 2012. The department in our case study is affiliated to the hospital’s Cancer and Inflammation Center, which includes 14 specialties, and it was among the best specialties. The department publishes frequently in highly estimated journals and senior researchers regularly receive large funds for their research. And most importantly, the department has a more than 10-year-long continuous output of skilled doctoral students. For anonymity reasons we have named the department ‘Spark.’ Based on dialogues with one of the nine professors in the department, we selected the participants for the case study:

Table 1. Participants

Participant (pseudonym)	Position (abbreviated position)	Age	Gender
Anna	Pre-graduate Research Trainee	24	Female
Barbara	Doctoral Student and MD	31	Female
Clara	Doctoral Student and MD	30	Female
Doris	Doctoral Student and MD	37	Female
Eric	Supervisor, Professor, and MD	47	Male
Frank	Supervisor, Part-time lecturer, PhD, and MD	57	Male
Gunnar	Research Manager, Professor, and MD	65	Male

As shown in Table 1, seven participants took part in the case study: one pre-graduate research trainee, three doctoral students, two supervisors, and one research manager.

### 3.2 Data generation

The empirical data has been generated on the basis of nine days of observation (Spradley, 1980) over the course of one month in March–April 2013 and in-depth interviews (Kvale & Brinkmann, 2009) with the seven participants mentioned above. During the observations, this article’s second author was engaged as a ‘passive participant’ (Spradley, 1980, p. 59). This meant he was present at the daily research activities (meetings, supervision sessions, laboratory work, coffee breaks etc.) as a bystander, taking part in several informal conversations with the participants. Field notes were taken at the time, mostly in the form of cues and short sentences, and these were further developed into more detailed descriptions within hours after having made each observation. The notes (20 282 words or 63 double-spaced pages) include descriptions of transpiring events, conversations and social interactions, and reflections based on our definition of microclimate.

For the interviews, we prepared a semi-structured interview guide (Kvale & Brinkmann, 2009) taking point of departure in data from the observations. The purpose of the interviews was to invite the seven participants to elaborate on how they experienced being part of the ecological niche at ‘Spark.’ As with the observations, the interviews were also carried out by the second author, and this gave him actual and shared situations from the observations as a concrete frame of reference during the interviews. The interviews were audiotaped and in total the recordings lasted 12 hours. Each interview was transcribed verbatim by a student worker and reviewed by the second

author.

### 3.3 Data analysis

We analyzed the notes obtained during observations and transcriptions of interviews through theoretical reading (Kvale & Brinkmann, 2009), i.e. the textual data was bounced off against the theoretical framework presented above. As a first step in the analysis we structured the data under three large themes: theme 1) microclimate; theme 2) social practices; theme 3) style of leadership. In this article we report the results from theme 1) microclimate. As a second step we created subthemes based on the relative stability and recurrence of particular observed behaviors and wordings with reference to our theoretical conceptualization of microclimate as shared emotionality. Thus the subthemes emerged in a constant search for similarities and differences in the theoretical reading of data resulting in four mutually exclusive features: 1) mutual appreciation, 2) balancing seriousness and humor, 3) desire, and 4) ambition.

In order to ensure the study's trustworthiness and accuracy, we applied two tools for member check (Shenton, 2004). The participants were offered the opportunity to read the transcripts of their individual interviews and comment on them. We presented our preliminary results to the department at an internal research seminar (approx. 35 participants) where we discussed and verified our interpretation of the data as these were formed during the analyses.

## 4. Results

'Spark' is an integrated and stable department located in two rather small and old-fashioned buildings (A and B) in the middle of the hospital. 'Spark' has 44 employees of which 17 are senior researchers and 16 are doctoral students. The doctoral students are all educated in medicine and on their way to becoming specialists. Their shared offices are placed in building A just 3 minutes' walk from the senior researchers' offices in building B close to the ward, so the researchers, the clinicians, and the doctoral students are closely related in the everyday practice at the hospital. The staff is characterized by continuity, and many of the senior researchers and specialists have been working at 'Spark' for more than 10 years. The overall finding of our observations and interviews is that a particular microclimate is reproduced day after day at 'Spark' and that it affects and guides the employees' daily practices. In the following sections, we describe the four features of the microclimate at 'Spark': mutual appreciation, balancing seriousness and humor, desire, and ambition.

### 4.1 Mutual appreciation

In the observations we saw that the employees at 'Spark' generally have an appreciatory attitude toward each other. Anna experienced that people in 'Spark' quickly knew who she was and that she feels this acknowledgement is exemplified when she passes by the research manager Gunnar's office (the door is often open) and he seems to be interested in her project:

...and so he just yells after you. And then you walk in and say hello and talk a little. In this way, they [the senior colleagues] are aware of being in contact with us [the students] all the time. (Anna, pre-graduate research trainee)

The second author was also met by this attitude during his observations at 'Spark.' The employees showed great interest in learning about the reasons for his presence at the department. On the first day of observation he was invited to participate at a private dinner the same evening with doctoral students and a Swiss supplier, who visited the department. The doctoral students describe experiencing a sense of appreciation, because they feel that their ideas and suggestions are being heard by the others in the department. Clara says:

He [the supervisor] appreciates what I say. But he might ask me critical questions if he does not agree with me. But he takes my views very seriously. He doesn't just overrule [...] he is always very receptive to what I have to say. And he is not too proud to say: 'Well, I think you're right. I really think we should do it your way' [...] I think that's a really huge advantage because it means that more ideas are put forward. You brainstorm more and you can lay out ideas that sometimes are stupid, but there could well be a very good idea among them. (Clara, doctoral student)

This suggests that the experienced supervisor's appreciation in the form of receptiveness in relation to the doctoral student's expressed ideas supports the doctoral student's engagement and creativity in her work. The receptiveness seems to create a closer and more confidential relationship between the two, which prompts Clara to express the ideas that come to her mind and be creative despite the two parties' different social positioning at 'Spark.' But appreciation does not seem to be unconditional. Anna clarifies this:

They also expect something of you, but I think that they do it in a way so it is not too much [...]. They are good

at both giving you responsibility, but also back you up [...] So you cannot just sit down and do nothing. Perhaps you have to have the right attitude yourself before this can work. If not, you might feel that you are being pressed hard. If I'm in doubt about something, then it is not uncomfortable to ask for help. And I think that it is because they also have been met by this [appreciative attitude] when they started here. (Anna, pre-graduate research trainee)

The appreciation that the students are met with seems to presuppose that they strive to meet the expectations and responsibility that they are given and vice versa. The quote also indicates that this attitude is taken over and reproduced from generation to generation at 'Spark.' The department's microclimate seems to encourage the students to make use of and help others on a daily basis. The research manager Gunnar explained it in this way: [we need] 'to research by way of each other.'

#### 4.2 *Balancing seriousness and humor*

The microclimate at 'Spark' is also characterized by balancing seriousness and humor. This was illustrated and exemplified at the half-yearly department seminar for all the employees. In keeping with tradition, the research manager Gunnar scheduled an award session right after breakfast where he named the best and the most extraordinary publications produced by the department during the past year. In this part of the seminar the conference room was filled with an excited atmosphere permeated by high expectations and Gunnar started out by awarding prestigious articles with high impact factors. Also, one of the doctoral students was awarded for the best debut. At the end of the award session Gunnar awarded one of the professors for having made 'the scare of the year': an article in the Christmas edition of the *Journal of the Danish Medical Association* (an edition featuring invented and highly amusing 'scientific' articles) on the effect of fried bacon and parsley sauce on gastrointestinal symptoms in healthy veteran footballers. With a clear twinkle in the eye and a liberating smile, Gunnar called this publication 'stupid' and 'idiotic' and everybody laughed at his mischievous comment. In the interview, Gunnar tells why riotousness and humor are important and necessary parts of the daily life at 'Spark':

It is unbearable in a department with many sick patients and a high workload if there is no fun. And we all agree that [humor] is vital if we are to work with the quick-witted mind that we must have [...] So it is very very important. It's something we emphasize. Even when we make mistakes, we will make fun of it. You find this among our doctors in the clinic, our researchers and among our nursing staff. Of course, the trick is to find a balance between having fun at work and being ambitious and taking our professional work extremely seriously. But taking something seriously does not mean that it can't be fun. This is one of those Scandinavian mistakes. It does not have to be cheerless because it is serious. (Gunnar, research manager)

This episode (the writing of the Christmas article and the award) suggests that humor is not insignificant and distracting, but rather enables the employees to do their jobs. Humor helps to break down barriers that could prevent the individual from being fully aware and present in his work. But it is a delicate balance. Doris says:

When the department throws those 'Spark' parties, then people really step on it and drink all night and dance on tables and things like that. And then the day after, we are back in the academic and professional role ... It does not tip over, meaning that we still take each other seriously afterwards. (Doris, doctoral student)

Gunnar's and Doris's narratives about the huge difference and yet essential interdependence between seriousness and humor in the microclimate indicate that the balance between the two moods is an important style of conduct to learn and to reproduce in the department.

#### 4.3 *Desire*

Most observably, the microclimate at 'Spark' is characterized by the fact that research is highly prioritized, valued and desired, or as Gunnar describes it, 'research clings to our wallpaper.' This seems in part to be attributable to the strong desire that drives the research activities in the department. Frank states that doing research is 'like playing' and 'working with research students and doing research add spice to daily life.' Eric expresses a similar attitude when, with a big smile, he tells us about his role as a research supervisor:

I love it! It's the best part of my job. [...] I think it's really exciting that bright and younger colleagues also become enthusiastic about the same research field [...] that my little research field also becomes their field. (Eric, supervisor)

The doctoral students confirm that they feel this desire when interacting with their supervisors. It seems that the research-oriented desire in the microclimate is carried over to the doctoral students through subconscious exchanges. Barbara talks about 'brainwashing' of the doctoral students and the desire as a kind of infection of the whole

department:

You become 'infected' by the desire to do research, which is in the whole department. Even the nurses find it natural to think about patients in the department's research projects. (Barbara, doctoral student)

The desire to do research permeates all professional groups at 'Spark,' and is not only found among those employed in research positions, such as research students, part-time doctors, or professors. As has been emphasized, even the nurses naturally assist the research activities while taking care of their more clinical tasks, as they carry with them small laminated sheets displaying the research projects in progress, and use these sheets to inform and recruit the required patients to different projects. In sum, it appears that the doctoral students become acquainted with and affected by the desire to do research, because it is a natural part of the department's activities and microclimate.

#### 4.4 Ambition

The department cooperates and bears comparisons with the world's best in this particular field of research. For example, we observed a PhD thesis defense with one of the department's doctoral students, and we were told that the opponents were high-profile international personalities within the particular subject area. A few minutes before the defense start, one of the colleagues whispers to us that this setup is a kind of 'testimony' to the fact that the department 'sets the bar high' by picking the best of the best as examiners, and that the department makes an effort to find the opponents that will test the doctoral student the most. This ambitious attitude, exemplified by the PhD thesis defense, seems to a great extent to be promoted by the research manager Gunnar. At the department seminar we observe how he facilitates a more tense and serious atmosphere by presenting the employees with 'the list,' i.e. a ranked and rated list of the researchers' authorships for the last year. In an interview after the seminar, Gunnar reflects on his reasons for showing the employees this list. He tells us that the overall objective of the department is to ensure that 'Spark' produces publications of satisfactory quantity and quality (i.e. that 'Spark' publishes in journals with a high impact factor). Moreover, he perceives the publications made at 'Spark' as the department's main 'currency':

You have to remember that behind the friendly tone and good humor [in the department] we have to run a large and costly research business. And it has one currency – and only one currency. And that is scientific publications. If we do not deliver scientific publications, then we exercise fraud with trusted funds. [...] So it is incredibly important that I, as the research manager, make sure that all the people whose resources I use – personal resources and also financial resources – are converted into this particular currency. (Gunnar, research manager)

All the interviewed participants say that Gunnar commands respect and recognition, and that they fully acknowledge and value the clear-cut prioritization of a growing production of high-quality publications. Therefore one's position on 'the list' influences the individual researcher's feelings of belonging and performing well. The doctoral students say that they feel that an eye is kept on them and their publication rates. They indicate that they are being paced to publish. In an interview after the seminar Clara talks about how 'the list' affects her:

Even though I get annoyed with this, it motivates me. And I am like 'well, I have to get something published!' [...] Gunnar has his own way [...] but basically what he is saying is right. It's completely true that if you have some data or material, then it needs to be published. [...]. You will never get anything out of something that stays in your freezer or on your computer [...]. This is very typical of Gunnar. Sometimes he is too honest and maybe too direct or his way of saying things is not very pedagogical. (Clara, doctoral student)

This quote exemplifies the conflicting signals that the doctoral students perceive in the research manager's way of assessing the department's work. On the one hand, Gunnar's requirement for ongoing publishing is a source of annoyance and is regarded as excessive unpedagogical behavior, because it singles out and exposes the less productive doctoral students. On the other hand, this behavior also stimulates the doctoral students' desire to remain goal-oriented and hard-working, because they genuinely share the endeavor to publish and seek high-quality research. Thus 'the list' can be regarded as a reminder of the doctoral students' *raison d'être* and in this way 'the list' and Gunnar's clear prioritization of it sets the tone of the microclimate.

## 5. Discussion

The case study set out to provide a theoretically based definition of *microclimate* and apply this concept to a case study of the microclimate in an ecological niche of doctoral education. Below we will first discuss the strengths and limitations of the concept and then reflect on the results in a broader discussion about doctoral education.

The concept of microclimate presented in this article provides an understanding of the emotional and nonarticulated

functioning of a research department's microclimate, and how this shared emotionality affects the interactions of the employees even though they are not explicitly aware of it. Furthermore, in our conceptualization of the term 'microclimate,' we suggest sociological concepts such as *feel for the game* and *illusio* as suitable analytical tools for investigating microclimates in the ecological niche of doctoral education. These concepts draw attention to less explicit and less measurable features of doctoral education, namely the social construction of research groups' microclimate in terms of a shared emotionality that emerges in the group members' desire to play the game, their style of conduct (for instance in supervision), and their dynamic and emotional exchange of values and preferences. When we apply the concept of microclimate in research on doctoral education, the concept helps counteract an individualistic view on doctoral education as a matter of completion rates caused by autonomous individuals producing a thesis (Kyvik & Olsen, 2013). Instead, the sociological concept of microclimate emphasizes that the functioning of social groups, e.g. research groups, is fundamentally dialogical and that learning within these groups is socially constructed and dependent on how the participants (both the 'educator' and 'learner') relate emotionally. In this way the suggested concept of microclimate is in line with the concept of emotionality suggested by Green and Bowden (2012) in their description of completion contexts in doctoral supervision: 'Emotionality represents the feelings that affect the relationship between the PhD candidate and the supervisory team in terms of their various ways of seeing the joint enterprise' (p. 75).

The limitation of our concept is that it has not yet been empirically tested in other contexts, and therefore we cannot conclude that the concept holds in contexts other than 'Spark.' Therefore, we invite colleagues and educational researchers to challenge the concept and apply it in various contexts in order to ground the notion of microclimate in doctoral education.

### 5.1 How does the microclimate support doctoral students?

Our study emphasizes that learning to conduct a research project and become a (successful) researcher requires absorption in the microclimate of real and successful research environments. The results of our study showed that the microclimate of such a department can actually be described and that it influences the doctoral students' development. Walsh (2010) found that doctoral students in groups with an inclusive microclimate reported fewer problems. Our study confirms the importance of doctoral students feeling included, primarily because the including microclimate seems to stimulate the doctoral students' feeling of belonging to a community of successful researchers. Louis and colleagues (2007) found that students' trajectories benefit from being in a successful context that exhibits an open climate and high levels of productivity and expertise. Our study confirms the importance of doctoral students feeling openness and inclusiveness from other employees, feeling that their presence and ideas are appreciated by other employees, and feeling inspired, paced and motivated by the high levels of productivity and expertise in the department. Accordingly, the microclimate at 'Spark' included a shared emotionality in line with the theoretical concept of microclimate and the three premises about emotionality outlined in subsection 2.1 in this article. Firstly, emotions are context-dependent behavior, for instance when the behaviors of the research manager and the supervisors were interpreted as a fine-tuned balance of seriousness and humor that was characteristic of the overall shared emotionality of the department. Secondly, emotions arise between interactors, for instance when a doctoral student felt the desire to do research as a kind of infection of the whole department ('you become "infected" by the desire to do research') – a desire that was carried over to the doctoral students through subconscious exchanges between interactors in the department. Finally, emotions tie groups together, for instance when doctoral students described a sense of mutual appreciation, because they felt that their ideas and suggestions were heard by the others in the department.

The above-mentioned emotions seem to be important for the doctoral students' socialization into a researcher career because the emotions most likely motivate and affect the students' behaviors and actions (Crossley, 2001). In a study on optimal motivation for talent development, Rea (2000) suggested a prototypical model for the development of talent among students that balances serious-minded and fun-minded motivational processes. This balance creates a zone of optimal motivation – a so-called 'flow zone' – between the emotional extremes of anxiety and boredom. It is achieved by giving students very high levels of exciting challenges and the necessary room for relaxing mastery of these challenges. According to Rea, the flow zone produces an ideal pathway for optimal development. Our study confirms the significance of such balanced learning situations in a talent development environment such as a research department. Rea developed his model on Csikszentmihalyi's definition of flow (Csikszentmihalyi, Rathunde, & Whalen, 1993). Flow is proposed as a form of optimal achievement motivation that is reached when one finds oneself in the equilibrium of feeling challenged and feeling capable of coping with these challenges. The state of flow enables students to concentrate all their resources and efforts on carrying out a task at hand. Consequently, the students' learning opportunities are optimized. Our study confirms that the doctoral students' experiences of daily

work in general have much in common with what is described as flow, because the microclimate supports the creation of flow zones around the students. However, our study indicates that we have to broaden Rea's unit of analysis. Rea (2000) and Csikszentmihalyi et al. (1993) were primarily concerned with the relationship between the educator and the learner, and the learner's egocentric experience of flow, whereas our approach encompasses the ecological niches around the students in order to understand how these flow zones come about. Therefore we suggest that successful ecological niches, and not only individual experiences, can be characterized as flow zones, i.e. 'rooms' or human-made niches for optimal development. In order to expand the notion of flow zones as human-made niches for optimal development, we will turn to concepts from Bourdieu's sociology (Bourdieu, 1990; 1998) to discuss how the microclimate supports the flourishing of flow zones at 'Spark.'

First of all, we suggest that the microclimate of 'Spark' fleshes out and gives the students a distinct sense of how the department operates. By acclimatizing to the microclimate the doctoral students learn to be sensitive to how the game of the department must be played and felt. An example is the way the research manager displays 'the list' and thereby instigates either a sense of failure or success in the students and lets them feel the consequences of being able (or not) to play the publication 'game.' Another example is the episode where the research manager exemplifies (and thereby authorizes) riotousness and humor as a significant style of conduct in the department's daily life. Newly arrived research students will, therefore, unavoidably feel the seriousness and humor that are attributed to research activities when they interact with the other employees. In this microclimate the *feel for the game* (Bourdieu, 1990; Crossley, 2005) is disclosed to the students, because the employees generally do not hide the way they feel about work and wear the preferences, aversions, and motivational drives that characterize the department<sup>2</sup> on their sleeves; in other words, the students are repeatedly exposed to the expression of what it feels like to be (and become) a researcher at 'Spark.'

Moreover, the study shows that students are encouraged – or 'brainwashed' (Barbara, doctoral student) – to appreciate and adopt the desire, i.e. *illusio* (Bourdieu, 1998; Crossley 2001; 2005), to play the game that characterizes the experienced employees' activities in 'Spark.' This seems to happen because the students' efforts to engage in the 'game' matter to the department. The students experience this from being appreciated and paced. These 'encouragements' seem to include the students in the 'game' and promote their sense of belonging, which furthermore strengthens their desire to participate in the 'game' and play the role of a researcher at 'Spark.' From a developmental perspective, we suggest that this microclimate supports the making of a flow zone, in which the students can concentrate their resources on and absorb themselves in their research activities and learn to play their role in the 'game' to the benefit of their own development, their supervisors' CV, and the department's reputation. This cohesive microclimate contrasts with more isolated microclimates (Walsh, 2007), which make students fearful of expressing what comes to one's mind, anxious of being left on their own, neither recognized nor valued, or frustrated by meeting a laissez-faire supervisory style (Gatfield, 2005). Emotions like this can get in the way of full absorption in one's research activities, and therefore inhibit the doctoral student's learning opportunities, because the student feels that he/she is being cut off, which will urge the student to reflect on his/her social dysfunctionality (Leder, 1990, p. 99). Moreover, this could make students question the value of fully participating in the activities of the department and cause 'disillusionment' (Crossley, 2005, p. 157). The above suggests that enacting optimal achievement motivation in doctoral education and the creation of flow zones in a research department is not an individualistic endeavor – it arises from socially constructed and coherent microclimates.

Clearly, further research on doctoral education microclimates is needed to determine optimal ways in which research managers, supervisors, doctoral students, and other employees may create, co-create, and recreate the microclimates they inhabit. Qualitative inquiries, such as the case study presented in this article, may enhance our knowledge about the micro-sociological workings of specific microclimates and inspire other people (including researchers) to reflect on their own microclimates. However, more studies are needed in order to explore doctoral education microclimates at various levels (individual, group/team, organization, and country/society) and to specify whether variables and processes such as emotions are level-specific, emergent, or cross-level in nature. Additionally, future research should also include quantitative investigations focusing on comparable and measurable variables with a view to identifying context-specific and/or subject-specific differences and similarities in the thoughts, feelings, and behaviors of various organizational members.

## 6. Conclusion

Our study shows that a research environment's microclimate in the form of a shared emotionality is to be regarded as a pervasive and significant feature in the daily activities of doctoral students and employees in general. Participation in the microclimate enables all employees at 'Spark' to carry out their jobs efficiently and – what is the most

important focal point of this paper – it facilitates the education of the new researchers and thus contributes to the productivity of the department. We conclude that the key features in the microclimate of ‘Spark’ are mutual appreciation, balancing seriousness and humor, desire, and ambition. These key features constitute the shared emotionality that sets the scene for the microclimate and creates and supports a successful doctoral education, because this particular microclimate: 1) fleshes out the professional attitude that is necessary for becoming a successful researcher in the department; 2) shapes and adapts the students’ desires to grasp and identify with the department’s activities and practices; and 3) provides the students with access to flow zones that drive their education.

The results may suggest practical implications for fostering and cultivating successful ecological niches in medical education at doctoral level. First, research leaders and supervisors should be aware that they act not only as academic masters but also as creators and maintainers of a particular microclimate that directly and openly affects the doctoral students’ approach to their work. Consequently, research leaders and supervisors should seek knowledge about practical ways of managing their roles as creators and maintainers of a microclimate. Second, a successful research environment is constructed by active engagement in the emotionality of the environment. Ecological niches such as ‘Spark’ and all other doctoral education environments are socially constructed niches – they are not just ‘there.’ They are human-made niches with a human-made shared emotionality. Consequently, doctoral students should learn how to influence, create, and maintain a successful microclimate in the ecological niches they inhabit in order to contribute to a productive and motivating research environment.

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## Notes

Note 1. Bourdieu used the metaphor of 'games' in an attempt to clarify the nature of the social fields, that is, the various subworlds into which society can be differentiated. Like games, social fields are structured by a range of conventions and goals, which ultimately have no rational foundations, and therefore depend on the participants' deep affective investment in them (Crossley, 2005, p. 157).

Note 2. In the same way, the microclimate most likely has an excluding effect, i.e. the microclimate is immediately explicit about the demands and expectations to its members, and in this way it makes it possible for early self-selection among newcomers.