Exploring the spatiotemporal scales of doctoral paths: lower and higher-scale actions of doctoral studies and how they are interrelated (0341)

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Introduction

Carrying out doctoral studies is not an isolated process. It involves a multitude of different actors, actions, settings, roles, and relationships (see e.g. Lee & Boud 2009; Cumming 2010). This paper explores the lower and higher-scale (Blommaert 2007) actions that doctoral students carry out during their studies and how these actions are connected with each other. By using the theoretical concept of *scales* (Blommaert 2007; Blommaert et al. 2014) and a theoretical-methodological framework of *nexus analysis* (e.g. Scollon & Scollon 2004; 2007), this study explores the complex relationships and linkages between the different dimensions of doctoral studies, focusing on both temporal and spatial dimensions. The aim of the paper is to help in building a more holistic model of doctoral studies and the process of doing a doctorate.

Towards a more holistic picture of doctoral education

The multifaceted nature of doctoral studies has led to numerous studies discussing the doctoral process from different viewpoints (see e.g. El-Ghoroury et al. 2012; Ferguson 2009; Green 2005; Levecque et al. 2017; Maher et al. 2008; Parker-Jenkins 2018; Poole 2015; Trafford & Leshem 2009; Wellington 2013; Zhao et al. 2007). However, as Cumming (2010) argues, to meet the demands of the changing doctoral education, a more holistic conception of it is required. Some attempts towards a wider model have been presented (e.g. Scott et al. 2004) but the model of 'doctoral enterprise' by Cumming (2010), depicted in Figure 1, is the most extensive one so far:

Figure 1. Integrative model of doctoral enterprise. (Cumming 2010: 31)
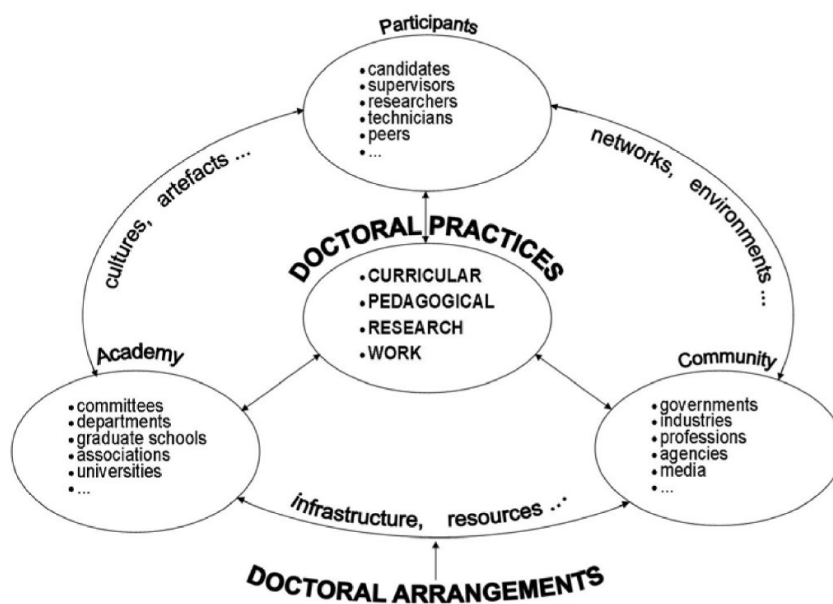
This model presents doctoral education as an *ecosystem* of interrelated components, rather than a system consisting of inputs and outputs. Cumming argues that boundaries between different areas and disciplines in doctoral training should be faded in order to boost creativity and innovation – according to the growing demands of knowledge societies. Secondly, Cumming urges us to see doctoral education as a responsibility that is shared, which is why doctoral practices have to be improved continuously. Third, the traditional approaches towards doctoral education, which involve on campus attendance for example, are not enough anymore. Finally, there seems to be an increasing emphasis that is set on doctoral students' academic and research skills, as well as their employability skills, for instance. (Cumming 2010).

Theoretical-methodological framework: *Scales* and *nexus analysis*

Although based on studies conducted in the Australian context, Cumming's (2010) model provides an excellent starting point for re-envisioning doctoral training also in Europe. To expand Cumming's (2010) existing work, I use the concept of 'scales' (Blommaert 2007; Blommaert et al. 2014) to connect the different levels of doctoral interface. As a metaphor, 'scales' refers to those complex distinctions we make within context. Furthermore, it can be used to illustrate that social events and processes move and develop on a continuum of scales which are layered (Blommaert 2007; Blommaert et al. 2014; Geertz 2004). However, 'scale' is not only a spatial metaphor. In addition, every social event also simultaneously develops in time. As the phenomena that develop both in time and space are social, the TimeSpace in which these phenomena develop are an "objective" context made social: people make physical space and time into controlled, regimented objects and instruments through semiotic practices, meaning that semiotised TimeSpace is social, cultural, political, and ideological. Moving from one scale-level to another indexes images of society through semiotised metaphors and images of time and space. In social interaction, this kind of 'scale jumping' (Uitermark 2002: 750) is transformed into interactional patterns, which index norms, and expectations. (Blommaert 2007).

When further theorising the concept of 'scales' Blommaert et al. (2014) concluded that when using several data sets and methods of analysis, it is possible to widen the range of the studied issue. To study a social topic in such a way, nexus analysis (e.g. Scollon & Scollon 2004) provides an excellent mode of inquiry. According to the principles of nexus analysis, when a specific social action happens repeatedly, it can be called a *social practice*. Social actions and practices are both surrounded by 1) **historical bodies** (how a certain role is played by different people), 2) **discourses in place** (all those discourses circulating a material place and in moment and time where certain social action happens), and 3) **interaction order** (all those possible social arrangements that are used to form relationships during social interaction). (Scollon & Scollon 2004). These three elements of social action are all intertwined, as illustrated by Figure 2:

Figure 2. Social action
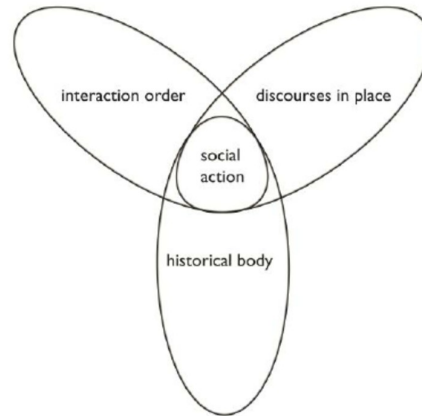
The underlying idea of nexus analysis is similar with the concept of scales: nexus analysis encourages the researcher examine the linkages between smaller (or lower) and larger (or higher) scales, which is why the researcher should not 'get stuck' on single observable moments, events, or participants. (Scollon & Scollon 2004).

Doing insider ethnography at CERN

The data for this study was gathered by doing insider ethnography (see e.g. Alvesson 2003; O'Reilly 2008) at CERN (the European Organization for Nuclear Research) between July 2015 and December 2016. The participants were doctoral students of physics or engineering, who were at different stages of their studies and came from eight different European countries. I began the data collection by conducting a semi-structured interview with each participant. After this, I moved on to mapping the cycles of people, places, and discourses identified in the engaging stage and to look for links and transformations, as well as their inherent timescales (Scollon & Scollon 2004). I observed the participants and talked to them during and outside their working hours, focusing on the topics that had emerged in the interviews. Some new themes emerged as well. All the notes were added to my fieldwork journal. I also recorded two group meetings of one of the participants and took 360 photos in different parts of CERN.

After the fieldwork when all the data was organised, the final research questions were sharpened:

1. Which lower and higher-scale (and in-between) actions do doctoral students perform during their studies?
2. How do the different levels of actions intersect throughout doctoral studies?

Preliminary results

The data analysis is currently ongoing. However, the first round of analysis shows that there are a great deal of lower-scale actions (momentary, local, personal, and subjective) that take place throughout doctoral studies. These are mainly to be seen when observing doctoral students' daily work. However, when the doctoral students talk about their work, higher-scale actions (timeless, translocal, impersonal, and objective) emerge; actions on a university-level

but also on a national level are frequently talked about in relation with one's own study experiences and perceptions of one's future career. When mixed, these are all instances of scale-jumping (Blommaert 2007: 6; Uitermark 2002). The next step is to take a look at the interrelatedness of the actions on different scale-levels and to discuss what these linkages mean for doctoral students, doctoral studies, and society.

Another preliminary result is related to the theoretical-methodological approach of this paper: Although nexus analysis has not been a widely-used approach in higher education studies, its suitability in studying different types of higher education settings is promising. Because of its focus on action, nexus analysis expands the traditional focus on structures, which typically has been the dominant trend when studying higher education (policy) change (Saarinen & Ursin 2012). The second reason why nexus analysis offers a powerful starting point for higher education research is that its ultimate goal is to facilitate *change*. The starting point of doing nexus analysis stems from defining a societal issue or a problem, and the intention to address that problem. For example, not everyone completes the doctoral education they have started and many have to extend the time to finish their studies compared to what they had originally planned (Frischer & Larsson 2000; Green 2005; Kiley & Mullins 2005). With the help of a more holistic picture of doctoral education, this paper hopefully helps in creating stronger tools for the development of doctoral studies in the entire European Higher Education Area.

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