



Does It Feel the Same? Danish and Finnish Social Science and Humanities Doctoral Students' Academic Emotions

Henrika Anttila^{1*}, Jenni Sullanmaa² and Kirsi Pyhältö^{1,3,4}

¹Faculty of Educational Sciences, University of Helsinki, Helsinki, Finland, ²Faculty of Education and Culture, University of Tampere, Tampere, Finland, ³Faculty of Educational Sciences, University of Oulu, Oulu, Finland, ⁴Centre for Higher and Adult Education, Faculty of Education, Stellenbosch University, Stellenbosch, South Africa

Even if pursuing a doctorate is both emotionally challenging and rewarding, empirical research focusing on doctoral students' academic emotions is limited. Therefore, in this study we have contributed to bridging the gap in the research on the doctoral experience by mapping the emotional landscape of doctoral experience. In addition, we have shed light on potential invariants and socio-cultural characteristics of the emotional landscape by doing a cross-country comparison between Danish and Finnish doctoral students. A total of 272 doctoral students (Danish: 145, Finnish: 127) from the field of humanities and social sciences responded to the Cross-cultural Doctoral Experience Survey. The data were both qualitatively and quantitatively analyzed, using a mixed methods approach. The results showed that the doctoral students experienced a wide range of both positive and negative emotions embedded in various activities of the doctoral experience, including supervision, scholarly community, doctoral research, development as a scholar and structures and resources. The results revealed some associations between the emotions that were experienced as well as differences between the countries.

Keywords: doctoral students, academic emotions, cross-country comparison, Finnish doctoral students, Danish doctoral students, mixed methods

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*Correspondence:

Henrika Anttila
henrika.anttila@helsinki.fi

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INTRODUCTION

Pursuing a doctorate is both intellectually and emotionally challenging. It involves facing failures and stumbling across frustrating experiences. The doctoral journey also encompasses experiences of inspiration and enthusiasm, joy of discovery, and pride over defeating seemingly overwhelming obstacles. As a result, doctoral experiences have been often referred to as an emotional rollercoaster (Morrison-Saunders et al., 2010). Regardless, emotions in doctoral education is an under-explored field of research, particularly studies focusing explicitly on analyzing the doctoral candidates emotions are lacking. Few prior studies on the topic have explored primarily negative emotional states such as exhaustion and anxiety (e.g., Hyun et al., 2006; Kernan et al., 2011; Levecque et al., 2017; Virtanen et al., 2017; Pappa et al., 2020). Accordingly, the narrative of emotional experiences of doctoral studies is mainly negatively loaded and dominated by pain (Clarence, 2021; McAlpine and Amundsen 2009; Mewburn 2011). At the same time, studies on the positive attributes and doctoral students' positive emotions are missing (e.g., Clarence, 2021), resulting in limited understanding on characteristics of emotionally optimal doctoral experience. In general, research on doctoral student's

academic emotions is limited both in terms of its focus and the scope (Aitchison et al., 2012; Gearity and Mertz 2012; Cotterall 2013) resulting in fragmented understanding on the emotional landscape of the doctoral experience. Yet, building emotionally optimal learning environment for doctoral students that enables not only to cope with challenges faced but also flourish in their studies, provides gaining better understanding on emotional characteristics of such experience. Such environments are like to further contribute on doctoral students well-being and degree completion. To our knowledge there have been no prior cross-cultural studies on doctoral students' emotions, shedding light on potential invariants and socio-cultural characteristics of the emotional landscape of the doctoral experience across the countries. We take up the challenge by 1) exploring both positive and negative emotions embedded in doctoral experience, and 2) by mapping the emotional landscape of doctoral experience among Danish and Finnish social sciences and humanities doctoral students to detect invariants and socio-cultural characteristics of such experience.

Academic Emotions in Doctoral Education

Academic emotions are intense and short-lived active states (e.g., Ekman 1992; Pekrun et al., 2002) aroused by studying for a doctorate. While empirical proof on doctoral students' academic emotions is still limited, it has been suggested that emotions play a key role in toning the doctoral experience (Morrison-Saunders et al., 2010; Cotterall 2013). Few prior, typically small-scale, qualitative key studies on doctoral students' emotional landscape (e.g., Baptista 2014; Cotterall 2013; Herman 2010; Morrison-Saunders et al., 2010) shedding light on the range on emotions in experienced during the doctoral studies suggest that emotions impact the whole doctoral journey. Herman (2010) for instance implied emotions being part wide variety of activities of conducting a doctoral degree such as collecting and analysing data, publication, writing the thesis, social interactions and wrapping up the degree, while Cotterall (2011) emphasized especially writing and supervision related experiences. Morrison-Saunders et al. (2010) investigated emotions in different phases of doctoral journey. Their results showed variety of different emotional experiences such as anxiety, fear, excitement, loneliness, frustration, and elation and furthermore implied that negative emotions were most commonly experienced in the middle part of the doctoral research, typically related to data collection.

In addition to the few studies focusing on directly on doctoral students' emotions (e.g., Baptista 2014; Cotterall 2013; Morrison-Saunders et al., 2010) there are studies where the focus of the investigation is not particularly on academic emotions, but they are raised as a complementary or anecdotal observation along with reporting the main findings. Furthermore, these studies have focused on a specific single activity context such as research writing (Caffarella and Barnett 2000; Aitchison et al., 2012), supervisory relationship (e.g., Janta et al., 2014) and research community experiences (Stubb et al., 2011; Emmioğlu et al., 2017). For example, prior studies have shown that writing provokes both positive (such as joy and pleasure) and negative (such as exhaustion, lack of interest and anxiety) emotions among

doctoral students (Aitchison et al., 2012; Gearity and Mertz 2012; Cotterall 2013). Yet, the negative emotions tend to dominate the research writing experience and are shown to be associated with writing-related problems such as procrastination and writing block (Aitchison et al., 2012; Gearity and Mertz 2012; Cotterall 2013). On the contrast, engaging in collaborative writing has been shown to induce positive emotions (Ferguson 2009). In addition to research writing, there is evidence, that supervision and scholarly community may be highly important in terms of doctoral students positive and negative emotional experiences (Emmioğlu et al., 2017; Stubb et al., 2011; Janta et al., 2014; Lin 2012). For example, the good fit between supervisor and supervisee induces positive emotions among the students, while a mismatch will provide a source of negative emotions (Gearity and Mertz 2012; Cotterall 2013; McAlpine and McKinnon 2013). Furthermore, supervisory support and frequent supervisory meetings are associated with doctoral students' satisfaction, while friction in supervisory relationship and supervisory abandonment are associated with experiences of loneliness (Janta et al., 2014; Mantai and Dowling 2015). Doctoral students have also frequently reported to experience their scholarly community as intellectually and socially isolating rather than as a source of empowerment (Golde 2005; Stubb et al., 2011; Janta et al., 2014). There is also tentative evidence that doctoral students tend to conceal the emotions they have experienced (Manathunga 2005; Herman 2010), perhaps because there has not been space for expressing emotions in research in general (Bondi 2005) or that it would turn in to a discussion about a student's mental health, questioning their ability to carry out doctoral research (Beard et al., 2007).

Research on doctoral students' wellbeing further shows that the students suffering from negative emotional states such as cynicism and exhaustion is high, increasing their risk of dropping out, developing depression and burnout (Stubb et al., 2011; Anttila et al., 2015; Swords and Ellis 2017; Corner et al., 2019; Pappa et al., 2020). It has been proposed that female doctoral students experience more of negative emotional states such as stress, exhaustion and isolation, as well inadequacy than male doctoral students (Brown and Watson, 2010; McAlpine et al., 2020). In turn, there is also some evidence that positive emotions such as pride, enthusiasm and interest are associated with more timely doctoral completion, increased research productivity, and a reduced risk of attrition (Ali et al., 2007; Lambie et al., 2014; Sakurai et al., 2014; Castello et al., 2016). This indicates that positive activating academic emotions (such as enjoyment, pride, interest and hopefulness) potentially provide an important and underutilized resource (e.g., Pekrun et al., 2002; Hidi and Renninger 2006; Ruthig et al., 2007; Trigwell et al., 2012; Mega et al., 2014), for promoting doctoral students' academic performance, intrinsic motivation, self-efficacy and researcher development. In turn, negative emotions (such as frustration, anxiety, disappointment, loneliness and exhaustion) may decrease doctoral students' motivation, direct attention away from their doctoral research, and reduce academic performance (Blair 2002; Pekrun et al., 2002; Lewis et al., 2011). In particular, negative deactivating emotions (such as exhaustion, loneliness and disappointment) can be detrimental

for doctoral student development, whereas the role of negative activating emotions (such as anxiety and frustration) is more equivocal and can even benefit the progress if they promote long term goals (Tamir 2009). Overall, as the basic function of emotions is to serve the fight or flight function that helps individuals to preserve their survival and wellbeing (Frenzel and Stephens, 2013) we presume that academic emotions have profound impact on doctoral experience and degree completion. Moreover, in order to enhance the positive experiences, we need to identify such emotions and furthermore pinpoint the scholarly activities that evoke them. Our study contributes to the body of literature, by focusing explicitly on the emotional landscape of doctoral education, including both positive and negative academic emotions. It also sheds light on potential invariants and socio-cultural characteristics of doctoral students' academic emotions.

Doctoral Education in Denmark and Finland

In Finland, a master's degree is required to apply to undertake doctoral education. The applicant provides a research plan that is assessed by the research board of the doctoral school. Thus, acceptance is not guaranteed. Funding is not automatically provided, but can be applied for from projects, foundations or universities' doctoral student posts, for instance. The doctoral dissertation can be written either as a monograph or as an article-based doctoral thesis, including three or four published peer-reviewed articles and a summary. In the social sciences and humanities, monographs have been the traditional form, but the number of article-based dissertations is increasing (Niemi et al., 2011; Valo 2013). Doctoral studies are expected to be completed in four years, but often they take longer. In the fields of humanities and social sciences, the studies have typically taken longer than in other fields (Academy of Finland 2003). When completed, a doctoral dissertation is evaluated by two external examiners, usually professors from other national or international universities. After the pre-examination, the manuscript is approved by the faculty for a public oral defence, and an academic opponent is nominated. After successful completion of the public defence, the faculty grants the doctoral degree. Although development of more structured studies has occurred, doctoral programmes are highly research-intensive: only minimal course work is included, and doctoral research is started from the very beginning (Niemi et al., 2011).

In Denmark there are two ways of conducting a doctoral degree. The first one is a 4 + 4 model that entails completing both the master's degree and a four-year doctoral degree. The more common route for applicants is the 5 + 3 model, in which they have already completed their master's degree and apply for the three-year doctoral degree. In this model, the status of the doctoral student is more of a staff member than of a student. The applications are assessed by the graduate school. In Denmark, the dissertation can also be submitted either in the form of a monograph or as an article-based dissertation consisting of four articles that are published or accepted for publication and a summary (Jensen 2007). The doctoral programmes are commonly fully funded by the universities,

through national research grants or combined with co-funding by private companies or university colleges. In the industrial doctoral degree, the student is employed by a company, which receives government support for the student (Jensen 2007). Danish doctoral students are also often required to attend another research environment, for instance by participating in a research exchange abroad.

The choice to collect data from Finland and Denmark, were both practical, and deliberate. Prior research on doctoral experience have focused heavily Anglophone contexts (Frick and Mouton, 2021) and other socio-cultural contexts have been studied to the lesser extent. Resulting gap in the literature on doctoral experience in this regard. Finland and Denmark have both adopted Nordic social welfare model emphasizing for example ambition to maintain full employment, high degree of equality, a high level of taxes and public spending on welfare (Greve, 2007) The countries share many similarities that make the comparison both meaningful and possible. The doctoral education in both countries is based on common socio-cultural features such as a tradition of public education that includes the doctoral education and thus there are also no tuition fees in Finland and Denmark (Andres et al., 2015). Also, the research culture and quality of doctoral research is similar as they produce similar numbers of doctoral graduates annually, have weighted citation impacts above world average and similar publication productivity (NordForsk 2011; Danish Ministry of Higher Education and Science 2017). Finland and Denmark are also both committed to the Bologna process (European Commission/EACEA/Eurydice, 2018; Andres et al., 2015; Gudmunsson, 2008). The national contexts also differ from each other to some extent to make comparison interesting; there are different paths to studying for a doctoral degree, different ways of funding and different requirements for students' international mobility (Andres et al., 2015). These similarities and differences make the comparison justified and provide more insights on the social-cultural and invariant aspects of academic emotions in doctoral education. In addition, we were able to access to collect data from both contexts.

Aim of the Study

The aim of this study is to gain a better understanding of the emotional landscape of doctoral experience by exploring Danish and Finnish social science and humanities doctoral students' academic emotions in the negative and the positive key experiences of their doctoral journey. Also, activities in which the emotions arose were identified to gain a better understanding of the landscape. In addition, gendered differences in the emotions experienced, association between the academic emotions, and attrition intentions and various study attributes [thesis format, research group status, enrolment (full-time/part-time)] were explored.

Accordingly, the following research questions were addressed:

- 1) What positive and negative academic emotions do doctoral students describe as part of their key experiences in doctoral education?

TABLE 1 | Participants' research group status, enrolment, drop-out intentions, form of dissertation and time to candidacy.

	Denmark (n = 145)	%	Finland (n = 127)	%	All (n = 272) n/%
	N		N		
Research group status					
Mainly on my own	116	80%	109	85.8%	225/82.7%
Mainly or partly in a research team	26	17.9%	18	14.2%	44/16.2%
Enrolment					
Fulltime	122	84.1%	64	50.4%	186/68.3%
Part-time	22	15.2%	60	42.7%	82/30.2%
Drop-out intentions					
Yes	36	24.8%	36	28.3%	72/26.5%
No	106	73.1%	89	70.1%	195/71.7%
Form of dissertation					
Monograph	64	44.1%	56	44.1%	120/44.1%
Summary of articles	67	46.2%	66	52%	133/49%
I don't know	9	6.2%	3	2.4%	12/4.4%
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M/SD</i>
Time to candidacy	3.7	1.1	6.3	3.5	4.9/2.8

- 2) Are gender, thesis format, research group status, enrolment (full-time/part-time) or drop-out intentions related to the academic emotions experienced by students?
- 3) Are there differences between Finnish and Danish doctoral students' academic emotions?
- 4) In what doctoral education activities are the emotions embedded in?

MATERIALS AND METHODS

Participants

Altogether 272 doctoral students (65.8% women; 32.7% men) from research-intensive universities in Denmark ($N = 145$), and Finland ($N = 127$) participated in the study. Participants ranged in age from under 25 to over 50 years (mode 25–29 years). The participants included doctoral students in various phases of their studies, with 43% of participants studying for the first or second year. Most of the doctoral students (68.3%) studied full-time. A majority reported working mainly on their own (82.7%) as opposed to working in a research team, and 49% were undertaking an article-based dissertation (see **Table 1**). The purpose of the study was explained to all participants. It was emphasized that participation was voluntary. The study was initiated and carried out in close co-operation with the administration of the graduate schools of the universities in question. Among other things, this co-operation included several reviews of the research protocol by the university administration. In both countries, the participants gave their consent to participate according to the research ethics clearance procedures in the respective jurisdictions.

Data Collection and the Cross-Country Doctoral Experience Survey

The data were collected by email through an online survey in 2015 from Danish and Finnish doctoral students. The survey was

sent to all registered doctoral students in social sciences and humanities at the two case universities. The instrument used in this study was the *Cross-Country Doctoral Experience* survey (prior versions Pyhältö et al., 2009; Pyhältö et al., 2012; Pyhältö et al., 2015; Pyhältö et al., 2016). The survey has been validated in several contexts both nationally and internationally (e.g., Pyhältö et al., 2016; Pyhältö et al., 2017). In Finland, doctoral students who did not have Finnish as their native language received the questionnaire in English or in Swedish. In Denmark, the survey was available in English. The survey consisted of both Likert scale statements and open-ended questions. In this study, information regarding the emotional experiences during doctoral studies was collected through the following four open ended statements.

- 1) The most positive experience from the beginning of my doctoral journey until now was when . . .
- 2) At that time I felt . . .
- 3) The most negative experience from the beginning of my doctoral journey until now was when . . .
- 4) At that time I felt . . .

Doctoral students had the opportunity to describe these statements in their own words and without word limits. In addition, *the drop-out intentions* (yes/no), *research groups status* (alone/in a group/both), *time-to candidacy* (starting year versus estimated graduation), *gender* (female/male), *dissertation format* (monograph/article-based dissertation), *enrolment* (full-time/part-time), and *country* (DEN/FI) were explored. It took 15–20 min to complete the survey.

Analysis

To achieve an optimal understanding of doctoral students' emotional experiences, a mixed methods approach was used in this study (e.g., Johnson et al., 2007; Creswell and Plano Clark 2018) by combining both qualitative and quantitative methods in the data collection and analysis. Mixed methods research involves

TABLE 2 | Frequencies of positive and negative emotions in doctoral experiences.

	Positive emotions (<i>f</i>)	Negative emotions (<i>f</i>)
Activating	Self-efficacy (85) Enthusiasm (79) Gratitude (7)	Frustration (53) Anxiety (4) Insecurity (33) Shame (1)
Neutral	Satisfaction (55) Belonging (25)	Sadness (23)
Deactivating	Relief (21)	Disappointment (35) Inefficacy (36) Exhaustion (28) Lack of interest (9) Loneliness (29)

f = frequency.

integrating ideas from both qualitative and quantitative approaches (Johnson et al., 2007). In this mixed methods study the research design was qualitatively driven, but in the data analysis, the results of the qualitative content analysis utilised quantification of the qualitatively constructed categories (Krippendorff 1980), representing the idea of conversion mixed methods design (Onwuegbuzie and Johnson 2006). The quantification was carried through by calculating the frequency that the category appeared in the data and then by using quantitative analysis methods.

Qualitative Analysis

First, the answers to the survey's open-ended questions were qualitatively content analyzed (e.g., Drisko and Maschi 2015) using an abductive strategy (e.g., Chamberlain 2006). The qualitative analysis process included three complementary phases. In the first phase, every emotion of the positive and negative key experience was given a code (e.g., satisfaction, anger etc.). Each key experience could include several emotions and a maximum of three positive and four negative emotions were identified within the same experience. After this, similar emotions were grouped together resulting in six positive emotions: i.e. self-efficacy, enthusiasm, gratitude, satisfaction, belonging and relief, and 10 negative emotions: i.e. frustration, anxiety, insecurity, shame, sadness, disappointment, inefficacy, exhaustion, lack of interest and loneliness. Finally, to identify the activities in which the emotions were embedded, the key positive and negative experiences were categorized according to the activity to which the emotions were related: *supervision, scholarly community, doctoral research, development as a scholar, and structures and resources*. The coding was done by the first author independently, but 20% of the data was subjected to an independent parallel analysis. The second author analyzed the data by using the predetermined criteria described above. The inter-rater agreement was 94%.

Quantitative Analysis

Frequencies were calculated for each emotion reported in the positive and negative key experiences, and for each doctoral

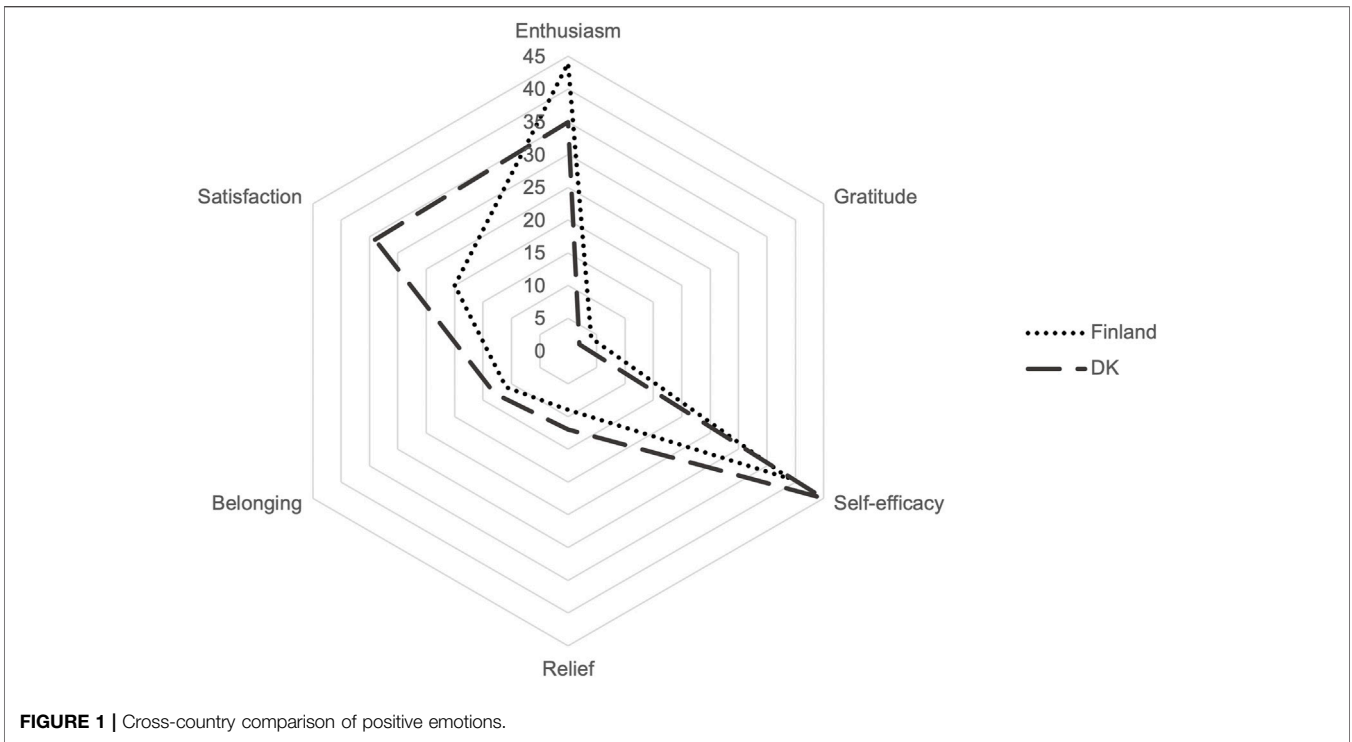
activity that the experiences were embedded in. Cross-tabulations and Chi-square tests were used to explore the associations between the emotions and their contexts as well as with the background variables. In cases in which more than 20% of the cells had an expected frequency lower than five, Fisher's exact test was used.

RESULTS

Emotions in Key Experiences of Doctoral Studies

The results showed that the doctoral students described a wide variety of positive and negative emotions embedded in key experiences of doctoral education. They reported 523 emotional experiences, involving six distinct positive and ten negative emotions (see Table 2.). The academic emotions reported ranged from self-efficacy and interest all the way to exhaustion and loneliness, showing a wide spectrum of emotional experiences during doctoral studies. In total, the doctoral students reported slightly more positive emotions ($f = 272$) than negative ones ($f = 251$). The most often reported positive emotions were self-efficacy ($f = 85$), enthusiasm ($f = 79$) and satisfaction ($f = 54$). As for negative emotions, frustration was most described ($f = 50$), but also disappointment ($f = 35$), inefficacy ($f = 34$), insecurity ($f = 33$), loneliness ($f = 29$) and exhaustion ($f = 28$) were frequently reported. Although the spectrum of the emotions was quite extensive, some of the emotions, such as gratitude, anxiety, shame, and lack of interest were described rarely and thus were not at the core of doctoral students' emotional experiences. In terms of the arousal level of the emotions, most of the positive emotions were activating ($f = 171$), whereas most of the negative emotions were deactivating ($f = 137$).

A single gendered difference in reported emotions was identified: male students reported satisfaction more often than female students did ($\chi^2[1] = 5.22, p < 0.05$). Some associations between the emotions reported in the key experiences and study related attributes were also detected. Doctoral students studying part-time reported more frustration ($\chi^2[1] = 4.17, p < 0.05$), whereas students studying full-time experienced more loneliness ($\chi^2[1] = 6.28, p < 0.05$) and insecurity ($\chi^2[1] = 6.05, p < 0.05$). Students who had considered dropping out reported more relief ($\chi^2[1] = 7.48, p < 0.01$), and on the other hand sadness ($\chi^2[1] = 5.56, p < 0.05$). Students working mainly or partly in a research group were slightly more likely to report loneliness compared to students working mainly on their own (Fisher's exact test, $p < 0.05$). Moreover, students writing an article-based dissertation were more likely to report relief than students writing a monograph or not knowing the form of their dissertation ($\chi^2[1] = 6.43, p < 0.05$). Students who did not know the form of their dissertation, in turn, were more likely to report loneliness ($\chi^2[1] = 13.10, p < 0.01$) compared to students writing a monograph or an article-based dissertation. However, the group that did not know the form of their dissertation was small ($n = 12$), most of these students being in the early phase of their studies.



Cross-Country Comparison of Academic Emotions in Key Experiences of Doctoral Studies

Based on the comparison between Finnish and Danish doctoral students, in general the most often reported emotions in the

positive and the negative key experiences of doctoral studies showed similar patterns, but there were also some differences. Finnish students reported a higher number of positive emotions ($f = 129$) and negative emotions ($f = 108$) while positive ($f = 143$) and negative ($f = 143$) emotions were more evenly reported by the Danish doctoral students.

TABLE 3 | Comparison between Denmark and Finland of the frequencies of positive and negative emotions in different aspects of doctoral experience.

	All				Finland				Denmark			
	Positive		Negative		Positive		Negative		Positive		Negative	
	<i>f</i>	%	<i>f</i>	%	<i>F</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Supervision	26	9.6	44	17.5	20	15.5	15	13.9	6	4.2	29	20.3
Scholarly community	99	36.4	34	13.5	40	31.0	15	13.9	59	41.3	19	13.3
Doctoral research	74	27.2	47	18.7	33	25.6	16	14.8	41	28.7	31	21.7
Development as a scholar	15	5.5	38	15.1	5	3.9	14	13.0	10	7.0	24	16.8
Structures and resources	58	21.3	88	35.1	31	24.0	48	44.4	27	18.9	40	28.0
Total	272		251		129		108		143		143	

In terms of the positive emotions (**Figure 1**), it seemed that the Danish students more often reported satisfaction, while enthusiasm was emphasized by the Finnish students. In terms of negative emotions (**Figure 2**), insecurity, exhaustion, loneliness, lack of interest and sadness were more frequently reported by the Danish doctoral students. In turn, disappointment was emphasized more in the reported emotions by the Finnish doctoral students. Moreover, Danish doctoral students were more likely to report insecurity than Finnish students, and this association was statistically significant ($\chi^2[1] = 5.69, p < 0.05$).

Academic Emotions in Different Aspects of Doctoral Experience

The results further showed that doctoral students' academic emotions were embedded in a wide variety of activities provided by doctoral education including supervision, practices of scholarly community, conducting doctoral research, development as a scholar and structures and resources. **Table 3** shows that positive emotions were most related to experiences with the scholarly community (36.4%) entailing interaction with fellow doctoral students, working as part of a research group, networking with other researchers, participating in international conferences and being able to complete a research exchange abroad. For example, doctoral students reported belonging when receiving social support and feedback from their peers and other researchers, self-efficacy when being acknowledged by the research community, and enthusiasm while networking with other researchers. Also, experiences relating to conducting *doctoral research* were a common source of positive emotions (27.2%), typically consisting of reaching significant milestones such as getting their work published and making discoveries in the doctoral research process, which were sources of inspiration and self-efficacy. Doctoral students reported relief at overcoming problems related to their doctoral research, and enthusiasm from learning new skills relating to their work. Positive emotions were also frequently related to experiences regarding *structures and resources* (21.3%) including relief and enthusiasm of having funding and enjoying the balance between research and other academic duties such as teaching. Also, satisfaction caused by having adequate research facilities such as an office space and sufficient tools to do research was included in this category.

Positive emotions embedded in *supervision* and *development as a scholar* were seldom reported. Positive emotions related to the *supervision* (9.6%) such as enthusiasm and satisfaction typically resulted from receiving support and constructive feedback from the supervisor(s), having a good supervisory relationship and experience of the supervisor's expertise and commitment to the doctoral students' process. Positive emotions relating to *development as a scholar* (5.5%) such as self-efficacy, arise from experiences of becoming more skillful researchers.

Negative emotions, on the other hand, were strongly emphasized in relation to *structures and resources* (35.1%). This included insecurity regarding financial situations and future employment, frustration towards the high levels of bureaucracy in the university and the short-term doctoral posts or funding, and exhaustion while trying to manage doctoral research while balancing with other academic duties. Negative emotions in other aspects of doctoral experience were rather evenly distributed. Negative emotions regarding experiences related to *doctoral research* (18.7%) included feelings of inefficacy, frustration and exhaustion relating to problems in getting articles published or difficulties in analysis processes, research instruments or research designs. Also, experiences related to *supervision* (17.5%) evoked negative emotions such as insecurity, loneliness and disappointment in situations in which doctoral students experience problems in their supervisory relationship such as lack of supervision, encouragement and support from their supervisors. Experiences related to *development as a scholar* (15.1%) entailed negative emotions, especially inefficacy and exhaustion regarding a lack of ability, skill and knowledge to pursue a doctorate and carry on with the doctoral research. Doctoral students seldom described negative emotions related to the *scholarly community* (13.5%). They were related to experiences of being an outsider in the community and lack of support or feedback from other researchers and peers that resulted in loneliness, sadness and disappointment. Some students also expressed frustration related to situations where the environment was seen to be too competitive or hostile.

Further investigation showed that there were some differences between Finnish and Danish doctoral students' emotions embedded in different activities provided by the doctoral education (**Table 3**). Although both Danish and Finnish doctoral students' negative emotions were most related to structures and resources, Danish doctoral students' negative

emotions were more evenly distributed across the range of activities. In terms of positive emotions, the results showed that Finnish doctoral students' emotions were more often related to supervision compared to the Danish doctoral students. This association was also statistically significant ($\chi^2 [4] = 13.31, p = 0.01$).

DISCUSSION

Methodological and Ethical Reflections

In this study, we used the *Cross-Country Doctoral Experience* survey to investigate Danish and Finnish social science and humanities doctoral students' academic emotions in key experiences of doctoral journey. The survey has been validated in prior studies (Pyhältö et al., 2009; Pyhältö et al., 2015; Pyhältö et al., 2016; Pyhältö et al., 2017). In this study we focused on two key experiences of the journey, positive and negative, and emotions embedded in them. The approach provided knowledge on the academic emotions raised by the most significant experiences. However, a limitation of the approach is that it overlooks less significant emotional experiences during the doctoral studies. Due to the cross-sectional data, and as the respondents were asked about the most important experiences on their doctoral journey thus far, the phase in which they were in their studies at the time of the data collection might have also influenced the choices of the key experiences. A major strength of the study is the cross-country comparison between Finland and Denmark. Data from the two contexts support the validity of the results in terms of what kind of emotions doctoral students experience during the doctoral journey. The participants included doctoral students from one university in each country and were all studying in the social sciences and humanities. Thus, further studies are needed to examine whether the emotions related to the doctoral journey show similar patterns in other disciplines and contexts.

This study followed the principles of research integrity in Finland and Denmark (Finnish Advisory Board on Research Integrity, 2012; Ministry of Higher Education and Science in Denmark, 2014; ALLEA, 2017). As the participation was voluntary, participants were adults, and the study itself did not pose risks or involve intervention in the physical integrity of the participants, we did not require a formal ethics review from neither of the countries (Finnish Advisory Board on Research Integrity, 2009; Ministry of Higher Education and Science in Denmark, 2014).

Theoretical Reflections and Educational Implications

The results of this study showed that the doctoral students experienced a wide range of positive and negative emotions. Yet, some of the emotions, such as gratitude, shame and lack of interest were rarely described and thus, it might imply that the emotional landscape of the doctoral experience is quite specific. Although research has mostly focused on the negative emotions of the doctoral journey (e.g., Hyun et al., 2006; Kernan et al., 2011;

Virtanen et al., 2017), in our study, slightly more positive emotions were reported, such as feelings of self-efficacy, enthusiasm and satisfaction. In turn, frustration was clearly the most often reported negative emotion related to the doctoral journey, with disappointment, inefficacy and insecurity also often described. Hence, the doctoral journey seems to be colored by both highs and lows in doctoral experience. Our findings partly confirm prior studies describing doctoral experience as an emotional rollercoaster, but also partly contradicts the findings that suggest doctoral studies being negatively loaded and dominated by pain (Clarence 2021; McAlpine and Amundsen 2009; Mewburn 2011). Although slightly more positive than negative emotions were reported relating to the key doctoral experience, the variety of the negative emotions was broader and more specific. Negative emotions have been suggested to be easier to distinguish and more easily explicated to others compared to positive emotions (Ekman 1992; Fredrickson 2001). However, it should be noted that negative emotions are part of normal life, doctoral studies included. From this perspective, the key question is not necessarily how to avoid negative emotions, but rather how to manage and channel them to promote the students' long-term goals effectively (Tamir, 2009). Yet, it is important to note that striving to create new knowledge pushes the doctoral students beyond the borders of their proximal zone of development, making them particularly emotionally vulnerable. Accordingly, the emotional tone of the doctoral experience should be monitored to identify if and when extra support is needed to overcome the challenges provided by the doctoral studies.

Further investigation showed that the academic emotions were associated with study and research group status. Part-time doctoral students reported experiencing more frustration, whereas students studying full-time experienced more loneliness and insecurity. This finding is partly in line with prior study suggesting that part time students are more satisfied with their health, living, and life satisfaction (Isohäätä et al., 2017) as insecurity and loneliness are both quite detrimental emotional experiences. On the other hand, frustration, might be induced by challenges to balance between the doctoral studies and full-time work or other responsibilities. On the other hand, having several commitments simultaneously may also protect part-time students from the social isolation or solitariness that has often been reported regarding doctoral studies (Gordon 2003; Golde 2005; Hockey 1991; Nyquist et al., 1999; Pyhältö, Tikkanen, Anttila, submitted), compared to full-time doctoral students, who primarily rely on the researcher community. Part-time students might also be more financially independent and have more secure career prospects (Isohäätä et al., 2017), resulting in a lower sense of insecurity. Surprisingly, doctoral students who worked mainly or partly in a research group reported loneliness more often than students working mainly on their own. This might be due to higher expectations for social support and sense of belonging by students working in a research group compared to those working on their own (Pyhältö et al. submitted). On the other hand, this might imply that the students who have decided to

embark on the doctoral journey on their own have ensured the social networks needed to support them on the journey.

Further investigation showed that academic emotions were embedded in various activities of the doctoral experience, including supervision, scholarly community, doctoral research, development as a scholar, and structures and resources. Positive emotions were most commonly related to the scholarly community and the doctoral research. Hence, the research work itself and the social interactions within the researcher community provided a central source of positive emotions that can further support engagement. The negative emotions, on the other hand, were mostly related to inadequate structures and resources, such as bureaucracy, funding and employment.

The cross-country comparison between Finland and Denmark showed that the emotions experienced mostly followed similar patterns in terms of the most reported emotions, implying that the general emotional landscape was somewhat consistent regardless of the socio-cultural context. However, there were also some differences between the two countries. The Finnish doctoral students reported enthusiasm and disappointment more frequently than their Danish peers, while the Danish students more often reported satisfaction, insecurity, exhaustion, loneliness, lack of interest and sadness than Finnish students did. The comparison further showed that supervision was emphasized as a source of positive emotions particularly by the Finnish doctoral students, providing a potential resource for further cultivating doctoral students' satisfaction with their studying, experience of belonging and study progress (e.g., Janta et al., 2014; Lin 2012; Pyhältö et al., 2015), and buffering of burnout (Corner et al., 2017). At the same time, almost half of the negative emotions reported by the Finnish doctoral students were related to structures and resources, whereas with the Danish doctoral students, the negative emotions were more evenly distributed between the various aspects of the doctoral experience. One reason for this may be that the ways of funding doctoral studies in Finland and in Denmark are different (Andres et al., 2015). In Finland, doctoral students are not automatically funded by universities or foundations, whereas in Denmark, doctoral students are commonly fully funded by the universities, national research grants or combined with co-funding by private companies.

Emotions are often perceived as something “soft” and irrational (Herman 2010). However, our results imply that emotions are a central part of the doctoral experience that at its best provides the driving force for overcoming challenges and

staying resilient when facing obstacles. Emotions also provide markers for the students themselves and their research communities that something is going on that is worthwhile to pay closer attention to. At its worst, extensive and prolonged negative emotional experiences may risk doctoral students' mental health and increase the odds for dropping out. Based on this we have some suggestions for scholarly community and doctoral supervisors. First of all, we need to start acknowledging that doctoral studies is not only about reason, but also emotions do play a pivotal role in it. To harness the power of emotions for the benefit of the researcher development and to promote research we need learn to identify doctoral students' emotions and understand their learning-related functions. Secondly, social support has been shown to be major elicitor of positive emotions (Anttila et al., 2017) implying that investing in providing informal and emotional support for the doctoral students would promote positive doctoral experience. As this study only provided a snapshot a lot of future work in this field is needed in order for us to understand, the impact of the emotions, how to foster emotionally optimal learning environments and support our doctoral students well-being and degree completion.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

As a first author HA had the main role in writing of the manuscript and analyzing the data. JS played a major role in analyzing the results, presenting them appropriately and providing a parallel analysis of the data. KP designed the questionnaire and was responsible in the data collection and write-up of the manuscript.

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