

Doctoral students' experiences leading to completion or attrition: a matter of sense, progress and distress

Christelle Devos¹ · Gentiane Boudrenghien¹ ·
Nicolas Van der Linden² · Assaad Azzi² ·
Mariane Frenay¹ · Benoit Galand¹ · Olivier Klein²

Received: 26 May 2015 / Revised: 15 January 2016 / Accepted: 28 January 2016 /

Published online: 17 February 2016

© Instituto Superior de Psicologia Aplicada, Lisboa, Portugal and Springer Science+Business Media Dordrecht 2016

Abstract A central trend in qualitative studies investigating doctoral students' dropout is to stress the importance of students' integration and socialisation in their working environment. Yet, few of these studies actually compared the experiences of doctoral students who completed or quit their PhD. In order to overcome this limitation and identify the factors that differentiate these two groups, the present study interviewed 21 former doctoral students: 8 completers and 13 non-completers. The results show that what best differentiates these two groups of participants is the extent to which they feel that they are moving forward, without experiencing too much distress, on a research project that makes sense to them. We assume that this set of factors is central in the dropout process. Support from doctoral peers was found to play a positive role overall but did not contribute to differentiating the two groups, presumably because peers have a limited impact on dissertation progress. Supervisors' support was central to the participants' stories; it is thus assumed to play a role in the process, but this role is complex and needs further investigation. These results call for a stronger consideration of the doctoral task itself when investigating the process of persistence and attrition and for a more integrated framework that considers jointly both task- and environment-related aspects.

Keywords PhD · Doctoral · Attrition · Dropout · Motivation · Emotions · Supervisor · Peers

Doctoral attrition has recently received a lot of attention, and a growing number of researchers have sought to understand the reasons leading doctoral students to leave the program before obtaining their degree (for a review, see Bair and Haworth 2004). In the existing literature,

✉ Christelle Devos
christelle.devos@uclouvain.be

¹ Université catholique de Louvain, 10 place Cardinal Mercier, B-1348 Louvain-la-Neuve, Belgium

² Université Libre de Bruxelles, 50 avenue F. D. Roosevelt, B-1050 Bruxelles, Belgium

doctoral students' experience is often depicted in relation to their working environment. According to Cantwell et al. (2015), "there has been a considerable amount of research attention given to the influence of social, cultural and institutional factors in explaining a number of aspects of the doctoral experience and the likelihood of these experiences yielding a timely and successful doctoral outcome" (p. 1).

Within this social working environment, the doctoral student supervisor has received the most attention. The doctoral supervisor is considered to be "one of the most important persons—if not the single most critical person—with whom doctoral students will develop a relationship during their doctoral degree program (Baird)" (Barnes and Austin 2009, p. 297). According to the literature review of Jones (2013), 15 % of the research in doctoral studies focuses on the student-supervisor relationship. Overall, these studies show a significant, although complex, influence of the supervising style on PhD students' outcomes (Bair and Haworth 2004; Bell-Ellison and Dedrick 2008; Jairam and Kahl 2012; Ives and Rowley 2005; Litalien 2014; McAlpine and McKinnon 2013; Paglis et al. 2006).

Beyond their supervisor, doctoral students interact daily with their fellow doctoral students (Jairam and Kahl 2012). According to Tinto (1993), social integration, that is, "the process of making friends and becoming part of the departmental, and for some, university-wide, community" (Golde 2000, p. 201), plays an important role in degree completion, complementing the role played by academic integration. In their literature review, Bair and Haworth (2004) state that "in the quantitative studies reviewed, degree completers were more likely to be involved with their academic peers than non-persisters" (p. 500). Yet, on the basis of her interviews, Golde (2000) suggested that although "the absence of social integration can have a negative effect on the quality of the students' experience, such absence is not a precipitator of attrition" (p. 222).

More broadly, PhD students are not part of only one but of numerous communities. Vekkaila et al. (2012) define the scholarly community as "a complex, nested entity that includes several distinct, complementary and partially overlapping communities, groups or teams of doctoral students, advanced researchers as well as other academics" (p. 155). White and Nonnamaker (2008) identify five such embedded communities that are influential in doctoral students' experience: discipline, institution, department, lab and the student-advisor relationship. PhD students take part in activities in these communities and are invited to socialise, that is, to adopt the values, skills, attitudes, norms and knowledge needed for membership of these communities (Weidman and Stein 2003). According to Gardner (2010), this socialisation process is generally considered to be the main determinant of doctoral dropout in recent research, "with researchers attributing poor or inappropriate socialisation to a student's decision to depart the graduate program" (p. 61).

However, beyond doctoral students' social working environment, existing research also stresses other dimensions likely to influence doctoral students' dropout, for example, socio-demographic and employment characteristics (e.g. gender, field of study, institutions, type of funding) (Visser et al. 2007; Wright and Cochrane 2000), doctoral program characteristics and personal and psychological variables. According to Bair and Haworth (2004), psychological variables represent a relatively new and promising direction in the study of doctoral students' attrition and persistence. Since their literature review, several studies have underlined the role of these influences. Castro et al. (2011) analysed women's doctoral success in the light of resilience and emotional intelligence. In a mixed-method research study, Ivankova and Stick (2007) stressed the importance of doctoral students' "self-motivation" beyond social and program-related factors. Spaulding and Rockinson-Szapkiw (2012) examined the factors associated with doctoral persistence and stressed, among other factors, the importance of

personal factors (e.g. motivation for pursuing the degree, reasons for persisting, strategies for dissertation completion) and experience (e.g. personal sacrifice, delayed expectations, dissertation challenges). Martinsuo and Turkulainen (2011) showed in a quantitative study the role of students' goals, time and plan commitment in their progress in the doctoral program. Finally, Cantwell et al. (2015) stressed the importance of considering the doctoral student as a "learner", who needs to manage the intellectual, affective and contingency challenges and demands that are inherent to the doctoral work. When cluster analyses are conducted on the factors underlying these challenges, three clusters of students emerge: constructively engaged, struggling to engage and disengaged. Candidates from the three clusters differ in their ability to acknowledge the uncertainty and complexity of doctoral studies, to be confident in their capacity to deal with it, to take ownership of the task and to regulate their learning activity, cope with difficulties and avoid procrastination.

In sum, in the existing literature on doctoral attrition, doctoral students are often considered in relation to their social working environment. This literature stresses the role of the scholarly communities (supervisor, peers, department, etc.) and the importance for the students of socialising, that is, of becoming a member of these communities. Besides, other studies stress the role of other aspects of the doctoral experience, such as personal and motivational dimensions. These studies focussing on internal factors tend to consider doctoral students in relation to the tasks they engaged in, for example, their doctoral dissertation. These studies are still sparse but likely to represent a new and complementary direction for future research.

Limitations of previous work and purposes of the present study

Existing studies on PhD students' attrition display some limitations, which call for further investigations. First, very few studies explicitly compared completers and non-completers on dimensions other than socio-demographic characteristics. A couple of quantitative studies do so (e.g. Lovitts 2001) but they are very rare, and we could find no qualitative studies carrying out this comparison. Most qualitative studies addressing doctoral attrition conducted interviews either with students who are currently involved in a PhD (e.g. Cotterall 2013; Martinsuo and Turkulainen 2011; Gardner 2010; Mazzola et al. 2011; Pyhältö and Keskinen 2012; Stubb et al. 2012) or with students who dropped out their PhD (e.g. Bayley et al. 2012; Golde 1998, 2000, 2005; Willis and Carmichael 2011). Although interviewing only current or PhD students who dropped out supplies information on several relevant factors and processes, it also presents several limitations. On one hand, interviewing only current PhD students does not make it possible to distinguish common doctoral challenges (i.e. normal difficulties related to the doctoral work) from challenges effectively leading to dropout (i.e. difficulties that, when encountered, lead to dropout). On the other hand, interviewing only students who dropped out precludes investigation of whether or not successful PhD students also faced the challenges and difficulties that led non-completers to quit (and, if it is the case, how they dealt with them in order to finish their PhD). In sum, there is a need to work at identifying the aspects of doctoral experience that allow us to differentiate between PhD students who successfully finished their PhD from those who quit. Identifying those perceptions that differentiate the two groups is likely to shed a new light on the processes leading to doctoral completion or dropout and to raise new issues of interest.

Second, qualitative studies on PhD students' dropout often present a range of challenges, difficulties and obstacles faced by PhD students (e.g. Bayley et al. 2012; Ferrer de Valero 2001; Wao and Onwuegbuzie 2011). Yet, little is known of their interrelations. That is, are

these aspects independent of one another or are they interrelated and, if so, how? There is a need to analyse these factors jointly in a coherent picture in order to understand how they may lead to doctoral dropout.

In order to overcome these limitations and therefore provide a contribution to the understanding of these processes, the aims of the present study are to explore doctoral students' perceptions in order to (1) compare the experiences of PhD students having successfully completed their doctoral studies (completers) versus those who have dropped out (non-completers) in order to identify the dimensions and processes that do and do not allow differentiation between these two groups and (2) analyse these dimensions together in order to consider them in a global picture. In other words, our research questions are as follows: Which aspects of the doctoral students' experience best differentiate completers from non-completers and how are these aspects related to one another?

Method

In order to address our research questions, a qualitative research design was used. This approach was chosen because it allows in-depth examination of the complexity of a phenomenon, exploring how the participants make sense of their experiences, discovering how the different dimensions are related to one another and considering a phenomenon as an amalgam which is more than the sum of its parts (Griffin 2004; Willig 2001). Furthermore, it contributes to the extensive line of research addressing doctoral dropout from a qualitative perspective.

Data collection

Semi-structured interviews were conducted with 21 former PhD students from two Belgian universities: 8 completers and 13 non-completers. We sampled participants so that they reflect both common profiles of PhD students and the diversity of experiences and contexts PhD students are likely to work in. Diversity and balance were sought for the discipline of their PhD (8 from Science and Technology, 7 from Social Sciences, 6 from Health Sciences), the type of funding they received (7 on research grants, 13 in research assistant positions, 1 without funding), the university they were working in and their gender (12 women, 9 men). A summary of the participants' characteristics is presented in Table 1.

The interviews were conducted by the first three authors of the present article. They took place in the researchers' office or in the participants' office or house. An interview protocol was designed following the guidelines provided by Blanchet and Gotman (2010). First, the interviewer provided the participants with a short introduction to the study and with its ethical considerations (e.g. freedom to withdraw at any time). Second, they were presented with figures likely to represent developments in time (e.g. arrows pointing up or down, straight or with ups and downs and dotted lines) and invited to draw the figure of their own doctoral journey. This method was inspired by Vekkila et al. (2013) and Meijer et al. (2011), and the figures were taken from Leclerc-Olive (1997). The drawing produced by each student was then used to support the subsequent discussions and sharing of experiences.

Third, we started by asking the participants to explain their drawing, and three other broad open-ended questions were formulated (e.g. "What was a good/bad day for you during your PhD?"). Between the broad open-ended questions, the discussion developed freely between the informant and the interviewer, punctuated by follow-up questions from the interviewer.

Table 1 Summary of the participants' characteristics

Name	Gender	Discipline	Funding	Age	Duration	Ending
Amanda	F	Agronomy	Grant	23	4	C
Amy	F	Mobility management	Research assistant		1	N-C
Angie	F	Cardiology	Research assistant	24	3	N-C
Anna	F	Germanic languages	Grant	26	3	C
Carol	F	Psychology	Research assistant			N-C
Carrie	F	Medical sciences	Grant	28	2	N-C
Cathy	F	Arts	Research assistant	26	2	N-C
Faith	F	Public health	Research assistant	31	6	C
Francis	M	Informatics	Research assistant	23	2	N-C
Frankie	F	Psychology	Part-time research assistant	34	12	C
Gerald	M	Engineering	Grant	23	4	C
Irvin	M	Medicine	Self-funded	40	18	C
John	M	Pharmacology	Research assistant	28	3	N-C
Justin	M	Informatics	Grant	23	2	N-C
Loren	M	Medicine	Research assistant	29	5	N-C
Luke	M	Geotechnics	Research assistant	24	1	N-C
Marc	M	Informatics	Research assistant	25	2	N-C
Melody	F	Germanic languages	Grant	24	3	C
Nicholas	M	Mathematics	Research assistant	28	7	C
Olivia	F	Agronomy	Grant	23	1	N-C
Valerie	F	Psychology	Research assistant	23	3	N-C

Age age when starting the PhD, *Duration* duration of the PhD before completion or departure (years), *Funding* type of funding, *Grant* 4 years and full-time research, *Research assistant* 6 years, part-time research and part-time teaching

The purpose was to address “what” and “how” questions and to understand the participants' experience from their point of view. We also had a thematic guide with a list of themes that had to be addressed in the interview (e.g. relations with supervisors, teaching assignments). These themes were addressed at the end of the interview if they had not been mentioned before (Hsieh and Shannon 2005). The interviews lasted about 1 h and were recorded. They were transcribed according to the guidelines given by McLellan et al. (2003) and Oliver et al. (2005). The interviewers took notes before (to increase our awareness of our possible biases) and after the interview (to write down our spontaneous impressions).

Data analysis

The data were analysed using a thematic analysis approach (Boyatzis 1998; Braun and Clarke 2006; Fereday and Muir-Cochrane 2006; Vaismoradi et al. 2013). Thematic analysis is “a method for identifying, analysing and reporting patterns (themes) within data” (Braun and Clarke 2006, p. 79). This method is used to organise and describe the data in rich detail and to interpret various aspects of the research topic (Boyatzis 1998; Braun and Clarke 2006).

First, data were read and listened to several times, and initial ideas for the coding and analysis were written down. Second, codes and larger themes were identified. Several authors highlight that codes and themes can be identified either in an inductive or deductive way (Braun and Clarke 2006; Hsieh and Shannon 2005; Gilgun 2005). Following authors such as

Fereday et al. (2006) and Zhou (2014), we used a combination of those two approaches in order to emphasise the dynamic dialogue between theory and data (Zhou 2014). The development of the coding procedure followed an iterative process (Urdu et al. 2007). First, the first three authors of the paper analysed the first transcript in order to identify emerging codes from the material. On this basis, as well as on the existing research on doctoral persistence, an initial set of codes was created in NVivo software (Richards 1999). A second transcript was coded into this set of categories by the first two authors of the paper. They compared their coding and discussed the extracts that had been coded differently in order to improve their mutual understanding of the codes and to specify their definitions. After a set of new transcripts was coded, the content of each category was double-checked and the two researchers discussed their disagreements and misunderstandings about this content. This allowed them to change the coding of the given extract, to modify the definition of the code, to combine two codes or to break them down into separate codes. In doing so, the initial set of codes was therefore progressively amplified and amended as more and more transcripts were analysed. Finally, we checked that the data within the themes cohered meaningfully and that there were clear and identifiable distinctions between the themes (Braun and Clarke 2006). A codebook with all the categories/sub-categories and their definitions was constituted.

Finally, in order to answer to the research questions of the present study, we compared completers and non-completers on key categories. More precisely, we identified the most central categories in the doctoral students' experience, on the basis of the existing literature and the participants' interviews (e.g. initial motivations for starting the PhD, supervisor support, peer support, organisational culture of the scholarly communities, socialisation, perceived interest, utility and appropriation of the research project, progress in their work, etc.), and we compared the completers and the non-completers on these dimensions, searching for patterns of influence that characterised each group and distinguished it from the other group. We generated "theories" characterising the difference between the two groups on the first transcripts, tested them against new transcripts, refined our theories and repeated this process until "all data have been examined and all theories tested against all data" (Kamtsios and Karagiannopoulou 2013, p.811).

Results

We start by addressing doctoral students' perceptions of peer support and supervisor support because they are central dimensions in the existing literature. Second, we develop the aspects of their experience that allowed us to best differentiate completers from non-completers. Third, we develop an overarching aspect in our participants' experience: the importance of "moving forward". In the discussion, we relate these findings to the existing literature and suggest directions for future research.

Peer and supervisor support

Doctoral peer support

We first compared the participants on doctoral peer support, that is, the quality of the relationships that they share with the other doctoral students and the emotional or instrumental help they receive from them. Overall, we observe that there is little difference between the completers and the non-completers on this aspect of their experience.

Three types of interactions between the PhD students and their doctoral peers were identified among the whole sample of participants. First, most of the participants report sharing good relationships with their PhD colleagues. According to those participants, there is a good atmosphere in their team, they have fun together, they share daily discussions, they offer emotional or instrumental help when they need it and some of them become close friends. Second, only a few of them have little or no contact with other PhD students, typically if there are few or no other PhD students in their team, if the work involves spending long hours in the field or in libraries or if their PhD is self-funded. Third, few of them experience a bad atmosphere, tensions, competition, individualism or sabotage from their close colleagues or in the larger team.

However, these three types of situations occur at similar frequencies across the two groups of participants and do not allow differentiation of them. We could therefore suggest that peer support has little impact on PhD students' final persistence versus dropout. We could formulate the hypothesis that peers may brighten or darken PhD students' days, help them to cope in case of difficulties (through emotional support or instrumental help), but, in the end, they do not make a difference to students' decisions to persist in or to quit the PhD.

Supervisor support

Throughout the interviews, the participants talk extensively about their supervisor. The supervisor is their reference person; they expect support from him/her to help them progress in their work, and he/she is likely to play a central role in their experience. For example, when asked what advice he would give to a new doctoral student, Gerald told us that *"The supervisor is very important. It is really...when someone has a good supervisor, who is there to help, who offers good advice, good research orientations, who is able to boost motivation when we are experiencing doubts...all of that I think that... if someone has a good supervisor, it is possible for him/her to do a dissertation that is motivating and that leads to something"*.

Three types of supervisors' (un)supporting styles and behaviours, the absence of such behaviours and the occurrence of blocking behaviours. In the first case, the supervisor offers behaviours which are considered to be positive, constructive and supportive. In the second case, the supervisors offer very little or no help because, for example, they have very little time to offer the students or little knowledge of their work. In the third situation, the participants perceive their supervisors as obstacles, blocking the progress of their dissertation. This was the case, for example, in the situations where the supervisor requires them to work in a direction or in a way that they find irrelevant (and/or prevents them going in a direction that they consider promising). More details on supervisors' attitudes and practices that are valued or regretted by doctoral students can be found in Devos et al. (2015).

However, when comparing completers and non-completers, we observe that the quantity and quality of support offered by the supervisor and the quality of the relationship do not offer a clear distinction between the two groups. It cannot be said that the completers were offered more positive support, received more help with their work (e.g. more frequent meetings) or shared a better human relationship with their supervisor. Furthermore, some non-completers received positive support and shared a very good relationship with their supervisor (e.g. Marc, Justin), whereas some completers experienced very low levels of support and had a difficult relationship with their supervisor (e.g. Amanda, Frankie).

In sum, while a supporting supervisory style may increase doctoral students' chances to stay on track and complete their PhD and negative supervision may lead to discouragement and dropout, this is not always the case. The relationship between these two factors is more

complex. What seems more important is how doctoral students are going to deal with this aspect of their experience, in relation to other factors, in order to progress and complete their PhD. A determining process could therefore be the extent to which the participants managed to progress with their work *thanks to or despite* their supervisors' behaviour. We formulate the hypothesis that this idea of advancing with one's doctoral work is the most crucial element in PhD students' experience and the aspect that is, in the end, likely to have the stronger impact on students' completion or dropout. This is developed in the next section.

Progressing serenely in a project that makes sense

A central finding in our material is that the participants are above all concerned about progressing with their thesis and about the factors that will help or impede their progress with their doctoral work (e.g. supervisor support). What differentiates completers from non-completers is therefore the extent to which they are moving forward (without experiencing too much distress) on a research project that makes sense to them.

This hints at several aspects of students' experience that may possibly be ingredients in successful candidature:

- (a) Being able to work on a project that makes sense to them (versus having no research project or being forced to work in a direction that does not make sense to them).
- (b) Experiencing a feeling of progress in the development of the material that will constitute the thesis (e.g. getting significant results, solving a mathematical problem, making a programme work versus stagnating, going in circles, being stuck or blocked in this progression)
- (c) Experiencing no or limited feelings of emotional distress (versus suffering from experiencing the thesis work as a burden)

These are the key ingredients that allowed us to differentiate the completers compared to the non-completers. While all the dropout participants faced difficulties and obstacles that prevented them from attaining at least one of the success ingredients, all the completers managed, in the end, to advance on a research project that made sense to them and to do so with no, or with a reasonable amount of, emotional distress. This was not necessarily the case from the beginning. The journey was not straightforward for all of them. Some of them started on a project that did not make sense to them and managed to change it; others experienced long periods of stagnation with no significant results, with episodes of high emotional distress, etc. Yet, they managed to overcome these pitfalls and ended on the right path. These patterns of individual trajectories are investigated in another article. In the present article, we take a transversal approach and focus on the situation the participants end up in and on aspects of their experience that are related to completion or dropout in the PhD. These possible "ingredients for success" are detailed below.

Being able to work on a project that makes sense to them

"Knowing where they are going"

A first possible ingredient for success (and a risk factor for those who do not have this ingredient) is to have an idea—at least a vague one—of "where they are going" with their doctoral research. It appeared to be important for the students to have a research project, a

subject to work on, an objective and/or a plan, whether these directions came from themselves or were suggested or imposed by their supervisor. In other words, in order to succeed, PhD students need to have an idea of the aims of their research project, the directions that their work is going to take and/or what the final product will consist in. It does not matter whether these ideas are very clear or specific at the beginning, since for most candidates, they are going to change over time. What appeared to be important is to have a general idea of where they are heading. This idea of “knowing where they are going ” echoes some studies on the doctoral experience, which observed—more global—feelings of uncertainty (Gardner et al. 2012), “feeling lost” or “having a plan” (Gardner 2010).

In our sample, all the participants who completed their PhD reported having this clear direction in mind, whether from the beginning or later, whether this clarity emerged progressively or appeared suddenly. In contrast, three of the non-completers (Frederic, Carol and Luke) never managed to get a research project. They had not received a research project from their supervisor and did not manage to find by themselves a research subject that they considered to be interesting and/or relevant enough for a PhD. For example, Luke recalls that *“I gradually realised that it was not enough, things were not falling into place and despite the little elements that were emerging, I still could not see the bigger picture which would have constituted a longer term research project”*.

Having a project that makes sense

Having a research project is therefore necessary but not sufficient for success. A second possible ingredient for success is that this research project makes sense for the PhD students, that is, that they consider it as their own, that they experience interest in it and that contributes to “what they think their research should be useful for”.

First, the interviews revealed the importance for the PhD students of experiencing a sense of *ownership* over their project and of considering the project as their own and not, for example, the project of their supervisor. A participant (Amanda) for example told us that *“I really wanted it to work out. I wanted... well, this was my project. It was a bit like my baby”*. This sense of ownership can exist from the beginning (e.g. when the PhD students start the process with a project that they choose and elaborate themselves) or develop later (e.g. when the project progressively becomes more specific or when a project offered by the supervisor is appropriated by the PhD student). This idea of ownership echoes Deci and Ryan’s idea of “internalisation”, which is described as an active process in which individuals attempt to transform external norms and requests into personally endorsed values and objectives (Deci and Ryan 2000).

Second, often related—but not always—to this feeling of ownership, the research project needs to inspire *feelings of interest, passion and pleasure*. These dimensions echo existing constructs such as interest in expectancy-value frameworks (Eccles and Wigfield 2002) and in other lines of research (e.g. Hidi et al. 2004), as well as the concept of flow (Csikszentmihalyi 1997).

Third, the research project needs to allow PhD students to *contribute to what they think their research should be useful for* (e.g. to make the science progress, to develop knowledge useful for the field, to obtain a stable professional position). Note that the instrumentality we have uncovered is broad and not limited to the self, although it depends somewhat on their personal and professional goals and aspirations. For example, Gerald remembers how everything changed for him when his committee identified a direction that really made sense to him: *“What really motivated me was not only to work in this direction but that we decided to write a programme nearly from zero, and to develop something that could directly be used by*

industrial workers (...) From that day on, my motivation has been multiplied by ten". This echoes the findings of Golde (2005), which stressed that a common concern among dropped out PhD students was the "narrowness of professional expertise" and the "difficulty to communicate findings in a usable way" (p. 682).

In our sample, all the completers reported having a project that, overall, made sense to them. However, not all three components need to be present for completion. For example, one of the completers (Melody) reported a limited interest and instrumentality of the research project. Yet, because she had a strong ownership over this project (and was progressing at a satisfying speed), she managed to reach the end. The key element is therefore to have an overall feeling that the project makes sense to them with regard to at least one of these three aspects.

On the other hand, the interviews led us to think that their research project did not make sense for 8 out of our 13 non-completer participants (Valerie, Angie, Marc, Cathy, John, Justin, Carrie and Olivia). They struggled to find a general meaning (Angie), an intellectual interest (Marc, Justin) or a perception of instrumentality (Cathy) for their project, or they were forced to work on a research project that did not make sense to them (Valerie, John, Carrie and Olivia). These last participants had in mind a direction that they wished to follow but were prevented from doing so by their supervisor. The PhD students in this type of situations therefore did not understand this requirement, felt like they were facing a wall when they ineffectively tried to explain their point of view and/or suggest alternative directions of work and consequently felt powerless.

Progressing in the development of the material that will constitute the PhD thesis

Besides being able to state that "I know where I am going and this direction makes sense to me", a third ingredient for completion is the extent to which the PhD students were progressing in developing the material that would constitute their thesis.

The aim of the PhD is to develop a research question and to answer it while adding something new to the existing literature. The task is one of problem-finding versus problem-solving, which calls for post-formal thinking and strongly differs from what students have faced previously (Cantwell et al. 2015). Furthermore, in the actual process of research, it is difficult to publish or defend a thesis that does not show any significant results or advance. PhD students therefore need to gather material that will enable them to defend a thesis (e.g. by getting a coherent set of experiments displaying significant results, solving a mathematic equation that demonstrates some relevant properties, having one or more articles accepted or published, etc.).

In our sample, all the completers told us that they managed in the end to find a relevant research question and to develop the material that allowed them to defend their thesis. On the contrary, six (Loren, Angie, Marc, John, Justin and Olivia) of the non-completers encountered serious difficulties in developing the material that would constitute their PhD. This was due to various reasons, some being internal to the individual (e.g. perceived intellectual abilities, competences, effort, etc.) and others external (e.g. being lucky with the experiment's results, difficulties in finding a sample of participants). For example, Marc reported this experience of lack of progress: *"There were still no results. It went on and on, we were searching for things, but found nothing very relevant. We got nothing out of it. We were at a standstill. There was a start and then it stalled all the way, despite all the efforts that we were making to make it work"*. This feeling of "being stuck", reinforced by the negative comparison between what had been done and what was still to be done, led them to experience high levels of distress and discouragement.

Reasonable levels of distress

Finally, besides having a project that made sense, and perceiving progress in gathering the thesis material, the extent to which the PhD students expressed a positive emotional experience with their PhD appeared to matter as well. Most of the completers report having experienced ups and downs, calm and stressful episodes, joy and doubts. Yet, despite having experienced difficult times, the negative emotions expressed by completers did not take the upper hand and did not become too hard to deal with. On the other hand, even though the thesis is progressing, it may happen that reaching such high levels of emotional distress may prevent the PhD student from continuing. This was the case for one of our participants (Cathy). Although she was progressing in a project that she considered her own, the emotional distress associated with this work was too heavy and led her to quit the PhD. Furthermore, most of the participants who experienced other difficulties ended up experiencing high levels of distress (John, Olivia and Ann).

The key role of emotional well-being and distress echoes broad lines of research that emphasise the importance of these aspects in predicting behavioural outcomes (e.g. persistence versus dropout), both in the doctoral field (Cotterall 2013; Mazola et al. 2011; Nutov and Hazzan 2011; Vekkaila et al. 2013) and in other educational contexts (e.g. Schutz and Zembylas 2009).

To summarise, we found that all the completers managed, in the end, to feel that they had made progress on a research project that made sense to them and did so with no or with a reasonable amount of emotional distress. Conversely, all the non-completers faced difficulties and obstacles that prevented them from attaining at least one of the completion ingredients. They either (1) could not work on a research project that they considered to be their own because (a) they had no research project or (b) they were forced to work in a direction that did not make sense to them), (2) they were stuck and not able to progress in developing the material needed to complete their thesis or (3) they were progressing but doing so was such a source of emotional distress that they could not cope any more. The general idea of moving forward with one's work was therefore found to be central in the doctoral students' experience.

The overall importance of moving forward

These results lead us to a key transversal dimension in doctoral students' experience: the need to be moving forward.

On one hand, the impossibility of moving forward underpins three of the four experiences associated with dropping out depicted above: going round in circles when unsuccessfully trying to find a research project, being blocked by their supervisor who prevents them from working in a direction that would make more sense to them and/or stagnating when trying to develop the material that might constitute the thesis.

On the other hand, the need to move forward is central in both completers' and non-completers' daily experience. In total, 135 extracts (i.e. 2.26 % of the interviews) and 18 of the 21 participants refer to this idea. Overall, moving forward triggers positive feelings among participants. Francis for example recalls that *"I was happy when I found articles or ideas that could possibly lead me to something, even wrong directions, but something...To have done something that was possibly going to lead me to... I don't know to what but...make me move forward"*. In addition, this feeling is related to the feeling of "having done something" by the end of the day. When they were asked "what was a good/bad day" for them during their PhD, 12 of the 21 participants spontaneously reported that a bad day ended with the feeling they had "done nothing". For example, Luke recalls that *"[a bad day] was a day that I spent reading*

articles, articles and articles, without figuring out where it was taking me, and realising that the more articles I was reading, the more there was still to read, and that it was not going to change anything to the way I was working or identifying objectives for my research. I would say that those moments really were the worst moments". Finally, episodes of particular importance for them were the specific moments, events and actions leading to insights that unblocked a situation in which they felt stuck (e.g. solving a long-lasting problem, finding a good idea, finding an interesting article). These specific moments in which they felt that they were breaking the deadlock and able to move forward again were experienced as real moments of grace. Three of the participants mention such episodes, for example: *"A good day, a wonderful day was when something that had been bugging me for months suddenly worked out. There have been two or three such moments during my PhD. Something has blocked me during a very long time, I suddenly find what it was, and the results directly appeared because there was only that little thing to unblock"* (Gerald). On the basis of these results, we suggest that this feeling of moving forward is one of the key processes in doctoral students' experience.

Discussion

In the current literature on doctoral students' attrition, major lines of research stress the importance of the social working environment (i.e. supervisor, peers, department and other scholarly communities) while studies seldom address the role of intra-individual (e.g. emotional, motivational and metacognitive) dimensions (Cantwell et al. 2015). Hence, the present study, which compared the perceptions of doctoral completers and non-completers, sheds light on new aspects of their experience that are likely to play a role in the outcome of their doctoral journey. Our interviews underlined the importance for the PhD students of feeling that they were making progress, on a research project that made sense to them, without experiencing too much distress. These aspects of their experience were central in their discourses and were the only coherent pattern of elements that allowed us to differentiate completers from non-completers.

These results, suggesting that doctoral students should understand the demands of the doctoral task and the need to self-regulate their learning, are in line with (a) the results obtained in a number of studies conducted in the doctoral context and (b), more broadly, with Carver and Scheier's self-regulation model (Carver 2004; Carver and Scheier 1998).

First, the idea of progress versus "stuckness" has been addressed a number of times in doctoral research. Girves and Wemmerus (1988) investigated how individual and environment-related variables predicted progress toward a doctoral degree. More significantly, Kiley (2009) suggests that when encountering threshold concepts in their doctoral journey, PhD students may at first experience a feeling of stuckness. According to the author, "for many doctoral students, there is at least a stage during candidature when they could be described as being 'stuck' as they encounter a particular threshold concept which challenges them. The experience of being 'stuck' can manifest as depression, a sense of hopelessness, 'going round in circles' and so on. (...) Being stuck in ways that can be counter-productive and perhaps even destructive to self-confidence and self-esteem can have serious consequences for learners, for example losing the will to remain with the programme and the ability to complete in a timely fashion" (p. 293 and 295). Furthermore, beyond encountering a threshold concept, this feeling of lack of progression or stuckness may be due to doctoral students' difficulty in managing uncertainty. According to Cantwell et al. (2015), "at the core of successful candidature is an epistemic base where uncertainty and complexity are both acknowledge and

accepted" (p. 16). Low tolerance of academic uncertainty and complexity combined with flawed understanding of the epistemology of doctoral study are likely to result in a detrimental feeling of stagnation and stuckness. These considerations therefore call for research investigating the aspects of doctoral work that may be related to this feeling of stuckness.

Second, the idea of moving forward toward a goal relates to the feedback loop model of self-regulation of Carver and Scheier (1998). This model suggests that people's actions follow three processes: goal setting (i.e. establishing specific reference points or desired end states), goal operating (i.e. taking actions directed toward goal achievement and monitoring goal state or rate of progress) and goal monitoring (i.e. considering potential constraints and available resources for obtaining success) (Brunette et al. 2013). People are therefore progressively able to adjust their behaviour in order to reduce the discrepancy between their current and desired end state. This framework is therefore relevant to our results, which stress the importance of progress toward the goal of completing a meaningful doctoral project, that is, progressively reducing the discrepancy between current and desired end states. Furthermore, beyond this action loop that assesses the magnitude of the discrepancy, the authors suggest that a "meta-loop" assesses the rate of discrepancy reduction. This assessment triggers positive affects when the current rate of change meets or exceeds one's desired rate of change and negative affects when it falls below one's desired rate of change. This assumption offers a relevant perspective for understanding why being stuck was such a deep source of distress for the PhD students in our sample.

The centrality of this idea of making progress with one's doctoral work may explain why we found no difference between completers and non-completers in their relationship with their doctoral peers. Peers are likely to brighten the students' days, to make them feel good at work, to listen to them when they are facing difficulties, to help them when they are encountering specific problems, etc. Yet, peers have little control over the students' dissertation content. They usually have a limited impact on the students' progress with their work and may therefore have a limited impact on the final outcome of the PhD.

These results also support the assertion of Tinto (1993) that academic integration is more important than social integration. Accordingly, Golde (2000) found that the doctoral students who dropped out she interviewed "described the student community positively, although it did not play an appreciable role in attrition" (p. 221). She states that "the absence of social integration can have a negative effect on the quality of the students' experience, but it is not a precipitator of attrition" (p. 222). The specific role of doctoral peers therefore needs to be further clarified in future studies.

In contrast, the advisor is able to have more impact on students' progress with their doctoral work as his/her role consists in supervising students' work. Our interviews support the literature showing that the supervisor plays a central role in doctoral students' experience. This is in line with the findings of Golde (2000) as the author states that "pivotal in each story was the importance of a supportive advising relationship in helping students making progress toward their degree. Conversely, a problematic advising relationship was implicated in the attrition decision" (p. 219).

However, our results do not support Golde's conclusion in that they suggest that a supportive supervision does not necessarily lead to completion and, inversely, that a lack of supervision or a difficult relationship with the supervisor does not always lead to dropping out. It would therefore be interesting to explore in more detail the link between supervisor's attitudes and students' outcomes (Lavigne et al. 2007) and, conversely, how progression may be related to seeking help from the supervisor (Grunschel et al. 2013). On the basis of our results, we could formulate the hypothesis that the role of the supervisor consists in

ensuring that doctoral students progress in a research project that makes sense to them without experiencing too much distress, that is, to offer autonomy to the students who are experiencing those ingredients and to offer help and structure to the students who struggle with those aspects of their experience. This antecedent role of the supervisor's support on motivational and emotional dimensions and, in turn, on doctoral persistence and dropout could be tested in a large-scale quantitative study.

In addition, future qualitative studies are needed to explore complex and intertwined processes occurring between doctoral students and their supervisors, for example, whether supervisors consider students as learners, how supervision is perceived and interpreted by students, the degree of fit between supervisory behaviour and students' expectation and needs (Pyhältö et al. 2012) and the extent to which supervisor and student will be able to regulate their relationship in order to offer each other what they both need (de Ridder and de Wit 2006; Zimmerman 1990).

In sum, the contribution of the present study is to shed light on overlooked and potentially important factors of doctoral students' experiences leading to completion or dropout and to consider how these factors may be interrelated in a coherent whole. The results can be represented in a picture where doctoral students are moving forward on a path toward, on the horizon, a research project that makes sense to them and where the supervisor is ensuring that they are progressing and offering help if it is not the case. The contribution of the present study, conducted on a small number of interviews in a particular context, is therefore to suggest new potentially interesting directions that need to be replicated and deepened in future studies.

A limitation of the present study is that "the stories from the participants are specific to the contexts, interpretations and perspectives of these particular participants" (Gopaul 2014, p. 9). As such, "the narratives reflect perceptions of reality rather than objective reality and do not necessarily encompass the experience of other doctoral students in similar or different" contexts (p. 9). Also, this study focused exclusively on reported recalls of doctoral students, so perspectives of institutional leaders, faculty members or administrative personnel were not included. In addition, the participants in our study were asked to tell their story retrospectively, which may have led them to reinterpret the events differently in order to construct a self-protective global meaning for their experience. Finally, inter-rater reliability indices and triangulation of the information collected with other sources would have helped strengthen the findings.

Future studies are therefore needed in order to (1) explore the role of progressing toward a meaningful doctoral project in other contexts (e.g. other countries) with longitudinal qualitative designs (e.g. multiple interviews at different points during the PhD) and multiple sources of information (Gardner 2009); (2) test the relationships that we found and hypothesised in large-scale quantitative designs in order to analyse more precisely the weight of each dimension in the attrition decision, their interrelations and the causality directions and (3) consider how to articulate the present findings—stressing the role of the PhD students' progress toward a meaningful goal—and the existing research on the doctoral journey—highlighting the importance of socialising into scholarly communities.

With regard to the last point, we suggest that these perspectives and findings are complementary rather than contradictory. We suggest that our results call for considering together (a) the tasks on which the PhD students are working and the goals they are pursuing, (b) the processes that occur during their doctoral journey (e.g. socialisation, changes in their identity) and (c) the persons and groups the PhD students are interacting with and who contribute to their progress with their work and their socialisation (e.g. the supervisor, peers, lab, department, discipline community). We suggest that these levels of experience are interrelated and influence each other. For example, PhD students who are working on a research project that

makes sense for them will be happy to discuss it with other researchers, which will lead them to socialise with the community's norms and values. In turn, this increased socialisation will motivate them and give them ideas on how to continue their progress on their own doctoral work. In turn, progressing with their work will lead them to publish articles, which will lead them to be asked to review other researchers' papers, which will increase their socialisation, develop their skills and, in turn, their progress with their own research.

In sum, the results of the present study and these considerations call for a greater integration between the different theoretical perspectives used to address doctoral attrition and for the development of an integrated framework that considers all these levels of analysis together in order to better understand these social and motivational processes.

Compliance with ethical standard

Funding This study was funded by the Fonds de la Recherche Scientifique (F.R.S.—FNRS) (grant number F.R.F.C. 2.4609.12)

References

- Bair, C. R., & Haworth, J. G. (2004). Doctoral student attrition and persistence: a meta-synthesis of research. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 19, pp. 481–534). The Netherlands: Kluwer Academic Publishers.
- Baird, L. L. (1995). Helping graduate students: A graduate adviser's view. In A. S. Pruitt-Logan & P. D. Isaac (Eds.), *Student services for the changing graduate student population*. New Directions for Student Services, 72 (pp. 25–32). San Francisco, CA: Jossey-Bass.
- Barnes, B. J., & Austin, A. E. (2009). The role of doctoral advisors: a look at advising from the advisor's perspective. *Innovative Higher Education*, 33, 297–315.
- Bayley, J. G., Ellis, J. B., Abreu-Ellis, C., & O'Reilly, E. K. (2012). Rocky road or clear sailing? Recent graduates' recollections and reflections of the doctoral journey. *Brock Education*, 21(2), 88–102.
- Bell-Ellison, B. A., & Dedrick, R. F. (2008). What do doctoral students value in their ideal mentor? *Research in Higher Education*, 49(6), 555–567.
- Blanchet, A., & Gotman, A. (2010). *L'entretien - L'enquête et ses méthodes* (2ème ed.). Paris: Armand Colin.
- Boyatzis, R. E. (1998). *Transforming qualitative information: thematic analysis and code development*. Thousand Oaks: Sage Publications.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mind-sets matter: a meta-analytic review of implicit theories and self-regulation. *Psychology Bulletin*, 139(3), 655–701.
- Cantwell, R., Bourke, S., Scevak, J., Holbrook, A., & Budd, J. (2015). Doctoral candidates as learners: a study of individual differences in responses to learning and its management. In *Studies in Higher Education* (pp. 1–18).
- Carver, C. S. (2004). Self-regulation of action and affect. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of Self-regulation. Research, Theory, and Applications* (pp. 13–39). New York: Guilford.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.
- Castro, V., Garcia, E. E., Cavazos, J., & Castro, A. Y. (2011). The road to doctoral success and beyond. *The International Journal of Doctoral Studies*, 6, 51–77.
- Cotterall, S. (2013). More than just a brain: emotions and the doctoral experience. *Higher Education Research & Development*, 32(2), 174–187.
- Csikszentmihalyi, M. (1997). *Finding flow: the psychology of engagement with everyday life*. New York: Basic Books.
- De Ridder, D. T. D., & De Wit, J. B. F. (2006). Self-regulation in health behaviour: concepts, theories, and central issues. In D. T. D. De Ridder & J. B. F. De Wit (Eds.), *Self-regulation in health behaviour* (pp. 1–23). Chichester, England: John Wiley & Sons.
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: human needs and the self-determination of behaviour. *Psychological Inquiry*, 11(4), 227–268.

- Devos, C., Van der Linden, N., Boudrenghien, G., Azzi, A., Frenay, M., Galand, B., & Klein, O. (2015). Doctoral supervision in the light of the three types of support promoted in self-determination theory. *International Journal of Doctoral Studies*, 10, 438–464.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53, 109–132.
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1), 80–92.
- Ferrer de Valero, Y. (2001). Departmental factors affecting time-to-degree and completion rates of doctoral students at one land-grant research institution. *The Journal of Higher Education*, 72(3), 341–367.
- Gardner, S. K. (2009). Student and faculty attributions of attrition in high and low-completing U.S. doctoral programs. *Higher Education*, 58, 97–112.
- Gardner, S. K. (2010). Contrasting the socialization experiences of doctoral students in high- and low-completing departments: a qualitative analysis of disciplinary contexts at one institution. *The Journal of Higher Education*, 81(1), 61–81.
- Gardner, S. K., Jansujwicz, J., Hutchins, K., Cline, B., & Levesque, V. (2012). Interdisciplinary doctoral student socialization. *International Journal of Doctoral Studies*, 7, 377–394.
- Gilgun, J. F. (2005). Qualitative research and family psychology. *Journal of Family Psychology*, 19(1), 40–50.
- Girves, J. E., & Wemmerus, V. (1988). Developing models of graduate student degree progress. *Journal of Higher Education*, 59, 163–189.
- Golde, C. M. (1998). Beginning graduate school: explaining first-year doctoral attrition. *New Directions for Higher Education*, 101, 55–64.
- Golde, C. M. (2000). Should I stay or should I go? Student descriptions of the doctoral attrition process. *The Review of Higher Education*, 23(2), 199–227.
- Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: lessons from four departments. *The Journal of Higher Education*, 76(6), 669–700.
- Gopaul, B. (2014). *Inequality and doctoral education: exploring the “rules” of doctoral study through Bourdieu’s notion of field*. *Higher Education* (pp. 1–16).
- Griffin, C. (2004). The advantages and limitation of qualitative research in psychology and education. *Scientific Annals of the Psychological Society of Northern Greece*, 2, 3–15.
- Grunschel, C., Patrzek, J., & Fries, S. (2013). Exploring reasons and consequences of academic procrastination: an interview study. *European Journal of Psychology of Education*, 28(3), 841–861.
- Hidi, S., Renninger, K. A., & Krapp, A. (2004). Interest, a motivational variable that combines affective and cognitive functioning. In D. Y. Dai & R. J. Sternberg (Eds.), *Motivation, emotion, and cognition: integrative perspectives on intellectual functioning and development* (pp. 89–115). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288.
- Ivankova, N., & Stick, S. (2007). Students’ persistence in a distributed doctoral program in educational leadership in higher education: a mixed methods study. *Research in Higher Education*, 48(1), 93–135.
- Ives, G., & Rowley, G. (2005). Supervisor selection or allocation and continuity of supervision: Ph.D. students’ progress and outcomes. *Studies in Higher Education*, 30(5), 535–555.
- Jairam, D., & Kahl, D. H., Jr. (2012). Navigating the doctoral experience: the role of social support in successful degree completion. *International Journal of Doctoral Studies*, 7, 311–329.
- Jones, M. (2013). Issues in doctoral studies—forty years of journal discussion: where have we been and where are we going? *International Journal of Doctoral Studies*, 8, 83–104.
- Kamtsios, S., & Karagiannopoulou, E. (2013). Conceptualizing students’ academic hardiness dimensions: a qualitative study. *European Journal of Psychology of Education*, 28, 807–823.
- Kiley, M. (2009). Identifying threshold concepts and proposing strategies to support doctoral candidates. *Innovations in Education and Teaching International*, 46(3), 293–304.
- Lavigne, G., Vallerand, R., & Miquelon, P. (2007). A motivational model of persistence in science education: a self-determination theory approach. *European Journal of Psychology of Education*, 22(3), 351–369.
- Leclerc-Olive, M. (1997). Le dire de l’évènement (biographique). [Telling (biographical) events]. In *Villeneuve d’Ascq: Presses Universitaires du Septentrion*.
- Litalien, D. (2014). *Persévérance aux études de doctorat (Ph.D.): modèle prédictif des intentions d’N-C [Persisting in the PhD: A model predicting intention to quit] (Doctoral dissertation)*. Université Laval, Québec, Canada. Retrieved March 25, 2015 from <http://www.theses.ulaval.ca/2014/30573/30573.pdf>
- Lovitts, B. E. (2001). *Leaving the ivory tower: the causes and consequences of departure from doctoral study*. New York: Rowman & Littlefield.

- Martinsuo, M., & Turkulainen, V. (2011). Personal commitment, support and progress in doctoral studies. *Studies in Higher Education*, 36(1), 103–120.
- Mazzola, J. J., Walker, E. J., Shockley, K. M., & Spector, P. E. (2011). Examining stress in graduate assistants: combining qualitative and quantitative survey methods. *Journal of Mixed Methods Research*, 5(3), 198–211.
- McAlpine, L., & McKinnon, M. (2013). Supervision—the most variable of variables: student perspectives. *Studies in Continuing Education*, 35(3), 265–280.
- McLellan, E., MacQueen, K. M., & Neidig, J. L. (2003). Beyond the qualitative interview: data preparation and transcription. *Field Methods*, 15(1), 63–84.
- Meijer, P. C., De Graaf, B., & Meirink, J. A. (2011). Key experiences in student teachers' development. *Teachers and Teaching: Theory and Practice*, 17, 115–129.
- Nutov, L., & Hazzan, O. (2011). Feeling the doctorate: is a doctoral research that studies the emotional labor of doctoral students possible? *The International Journal of Doctoral Studies*, 6, 019–032.
- Oliver, D., Serovich, J. M., & Mason, T. L. (2005). Constraints and opportunities with interview transcription: towards reflective practice in HIV/AIDS intervention research. *Social Forces*, 84(2), 1273–1289.
- Paglis, L. L., Green, S. G., & Bauer, T. N. (2006). Does adviser mentoring add value? A longitudinal study of mentoring and doctoral student outcomes. *Research in Higher Education*, 47(4), 451–476.
- Pyhälä, K., & Keskinen, J. (2012). Doctoral students' sense of relational agency in their scholarly communities. *International Journal of Higher Education*, 1(2), 136–149.
- Pyhälä, K., Vekkalila, J., & Keskinen, J. (2012). Exploring the fit between doctoral students' and supervisors' perceptions of resources and challenges vis-à-vis the doctoral journey. *International Journal of Doctoral Studies*, 7, 395–414.
- Richards, L. (1999). *Using NVivo in qualitative research*. London: Sage.
- Schutz, P. A., & Zembylas, M. (2009). *Advances in teacher emotion research: the impact on teachers' lives*. New York, NY: Springer Publishing.
- Spaulding, L. S., & Rockinson-Szapkiw, A. J. (2012). Hearing their Voices: factors doctoral candidates attribute to their persistence. *International Journal of Doctoral Studies*, 7, 199–219.
- Stubb, J., Pyhälä, K., & Lonka, K. (2012). The experienced meaning of working with a PhD thesis. *Scandinavian Journal of Educational Research*, 56(4), 439–456.
- Tinto, V. (1993). *Leaving college: rethinking causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.
- Urdan, T., Solek, M., & Schoenfelder, E. (2007). Students' perceptions of family influences on their academic motivation: a qualitative analysis. *European Journal of Psychology of Education*, 22(1), 7–21.
- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: implications for conducting a qualitative descriptive study. *Nursing & Health Sciences*, 15(3), 398–405.
- Vekkalila, J., Pyhälä, K., Hakkarainen, K., Keskinen, J., & Lonka, K. (2012). Doctoral students' key learning experiences in the natural sciences. *International Journal for Researcher Development*, 3(2), 154–183.
- Vekkalila, J., Pyhälä, K., & Lonka, K. (2013). Experiences of disengagement—a study of doctoral students in the behavioural sciences. *International Journal of Doctoral Studies*, 8, 61–81.
- Visser, M. S., Luwel, M., & Moed, H. F. (2007). Attainment of doctoral degrees at Flemish universities: a survival analysis. *Higher Education*, 54, 741–757.
- Wao, H. O., & Onwuegbuzie, A. J. (2011). A mixed research investigation of factors related to time to the doctorate in education. *International Journal of Doctoral Studies*, 6, 115–134.
- Weidman, J. C., & Stein, E. L. (2003). Socialization of doctoral students to academic norms. *Research in Higher Education*, 44(6), 641–656.
- White, J., & Nonnamaker, J. (2008). Belonging and mattering. How science doctoral students experience community. *NASPA Journal*, 45(3), 350–372.
- Willig, C. (2001). *Introducing qualitative research in psychology: adventures in theory and method*. Buckingham, UK: Open University Press.
- Willis, B., & Carmichael, K. D. (2011). The lived experience of late-stage doctoral student attrition in counselor education. *The Qualitative Report*, 16(1), 192–207.
- Wright, T., & Cochrane, R. (2000). Factors influencing successful submission of Ph.D. theses. *Studies in Higher Education*, 25(2), 181–195.
- Zhou, J. (2014). *International students' motivation to pursue and complete a Ph.D. in the U.S. Higher Education* (pp. 1–15).
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: an overview. *Educational Psychology*, 25, 3–17.