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Exploring the relationship between doctoral students' experiences and research community positioning

Anna Sala-Bubaré and Montserrat Castelló

Facultat de Psicologia, Ciències de l'Educació i de l'Esport Blanquerna, Universitat Ramon Llull, Barcelona, Spain

ABSTRACT
Despite the growing number of studies exploring PhD students' experiences and their social relationships with other researchers, there is a lack of research on the interaction between the type of experiences and the social agents involved, especially in relation to not only problems and challenges, but also to positive emotions and experiences. In this study, we addressed this gap exploring the relationship between four ecology doctoral students' most significant experiences and their perceived position in the research community. Additionally, we aimed at exploring the utility of a methodological device with two instruments, *Journey Plot* and *Community Plot*. Results showed, in one hand, that both positive and negative experiences were significant in students' trajectories, but the proportion varied greatly across participants. Supervisors were related to negative experiences, whereas the broader community was mostly source of positive experiences. Research writing and communication experiences were significant in relation to all the social agents, while other contents of experience were restricted to the smallest social layers (e.g. research motives were confined to the individual layer, and research organization to the individual and supervisor layers). Relationships between the type of experiences and participants' position in the community were found and implications for doctoral education discussed.

Introduction

Research on doctoral education has increased exponentially in the last decade (Boud and Lee 2009; Gardner 2010; Lovitts 2005; Neumann and Rodwell 2009), due to the need to appropriately respond to students' diverse backgrounds and to reduce the high drop-out rates among doctoral students (Martinsuo and Turkulainen 2011). As these studies have emphasized, a PhD is essentially a process of training to become an autonomous researcher in a disciplinary research community (Lovitts 2005).

Traditionally, socialization into the community has been considered as a route by which a newcomer is made a part of a community; in the case of doctoral students, the community of researchers in a particular discipline (Golde 1998), that is, the process of

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assimilation of its rules, culture and procedures. Nevertheless, more recent studies adopt different perspectives that stress newcomers' active role in the socialization process, and their efforts to move from periphery to more central positions by engaging in an increasing number of prototypical activities and relationships (Lave and Wegner 1991; McAlpine et al. 2012; Pyhältö and Keskinen 2012; Weidman, Twale, and Stein 2001). From these perspectives, being a researcher involves agentive participation in many of the prototypical activities that define a particular community of practice, and establishing relationships with other members. Thus, they refer to socialization as a two-way process (McDaniels 2010), in which individuals intentionally and constantly negotiate their position in the community and, at the same time, contribute to the evolution of its practices (Castelló and Iñesta 2012; Prior 1995, 2001). Ultimately, this implies individuals should become and act as *active relational agents* (Pyhältö and Keskinen 2012).

Conceived this way, socialization has largely proved to be a complex and difficult process (Castelló, Iñesta, and Corcelles 2013; Gardner 2009; Lovitts 2005). Therefore, research in this field has focused on understanding problems and emotional challenges doctoral students face when dealing with it. Some large-scale studies in different disciplines found problems related to domain-specific expertise, self-regulation and motivation to be the most typical ones (Pyhältö, Toom, et al. 2012). Other small-scale studies reported problems associated to specific areas of PhD students' experience. These areas refer to challenges students face when dealing with academic writing (Caffarella and Barnett 2000; Castelló, Iñesta, and Corcelles 2013) and in the relationship with supervisors and other members of research institutions (Johansson et al. 2014). The need to have a clear representation of the meaning and usefulness of research (McAlpine and Amundsen 2015) and finding support and companionship (Janta, Lugosi, and Brown 2014) have also been stressed as central for students' development. Finally, other studies have repeatedly shown students' difficulties in the construction of a researcher identity and the management of negative emotions related to the aforementioned challenges (Aitchison et al. 2012).

Guidance and support from supervisors are critical to overcome the challenges involved in the process of becoming a researcher (Austin 2002; Hasrati 2005; Johansson et al. 2014), and to help students develop a role as *active relational agents* in the disciplinary community (Pyhältö and Keskinen 2012) in order for them to acquire increasing levels of independence. Cultures and practices promoted in broader contexts, such as university departments and institutions and, especially, students' agency in their relation with these contexts are also fundamental in the socialization process (Gardner 2008, 2010; McAlpine et al. 2012). Overall, these studies point out the need to move beyond the supervisory relationship to also take into account those experiences linked to smaller (individual experiences) and broader social contexts in order to fully understand students' socialization processes and trajectories (Martinsuo and Turkulainen 2011; McAlpine 2013).

Despite the growing number of studies exploring PhD students' problems and challenges as well as their social relationships with other researchers, to our knowledge there is a lack of research on the interaction between the type of experiences and the social agents involved, especially in relation to positive emotions and experiences. This area remains largely unexplored, with only some exceptions in the study of undergraduates' experiences (Beard, Humberstone, and Clayton 2014; Shaw et al. 2008). Exploring this interaction is of high interest since each type of experience may involve different

agents and impact differently PhD students' development as researchers, thus explaining variations in their socialization process.

Consequently, we assume that there might be a complex interplay in the relationship between the type and amount of experiences and students' positioning in the community at the end of their studies. Not only the content of experiences, but also the affective value students attribute to these experiences as well as the social agents involved in each of them, may influence students' position in the community; at the same time, their position at the end of the studies may influence the retrospective interpretation of their journey.

Based on these assumptions, we developed a mixed-method multiple case study (Hall and Ryan 2011; Stake 2013) aimed at extensively describing the most significant experiences of four ecology doctoral students during the PhD journey, and exploring the relationship between these experiences and participants' perceived position in the research community.

Specific objectives were:

(1) To identify and analyse the most significant experiences in relation to:
   (a) Content of experiences.
   (b) Social agents involved.
   (c) Affective value of experiences.
(2) To describe students' perceived position in the community at the end of their studies.
(3) To explore the relationship between participants' most significant experiences and their position in the community.

To these objectives, we added another one with a methodological focus; we aimed at exploring the utility of specific instruments designed to elicit participants' memories and discourse about their most significant experiences along the journey, both positive and negative, and their current position in the community. When using retrospective accounts, such as interviews, problems in recalling past experiences are frequent due to memory changes or defects, especially when responders have an emotional attachment to these memories (Golden 1992). In this study, we designed and conducted a mixed-method interview aimed at minimizing these limitations by adding visual representations as complementary means of reflecting and talking about past experiences. We expected that this tools might serve as a guide and, at the same time, provide a structure for the experience narrative, thus helping students visualize their journey and be more precise and focused in their recall.

Methods

Context

The study was set in a three-month online academic writing workshop (January–April 2014) conducted by the authors. Its aim was to help PhD students improve their scientific texts and see them as artefacts-in-activity (Castelló and Iñesta 2012; Prior 2006) and tools to think and develop their knowledge.

Two months after the end of the workshop, individual semi-structured interviews were conducted to capture students' most significant experiences faced during their studies, and

their current perceived position in the community, when they were about to finish their doctoral studies. This study is based on data collected through these interviews (further description is provided in the procedure section).

Participants

The on-line workshop was offered as an elective module to all the doctoral students in the ecology department of a research-intensive university in Barcelona. Eight students enrolled the workshop, and four were included in the present study. They were selected on the basis of the following criteria:

(1) They had to be full-time students, since we assume they have access to a wider range of activities, resources and professional relationships than part-time students (Deem and Brehony 2000; Neumann and Rodwell 2009).
(2) At the time of the interview, they had to be near to completion, thus allowing us to explore their experiences along the whole doctoral journey.

They were all Catalan and had been studying in the same faculty at least one year before to starting the doctorate; therefore, differences related to their knowledge about the institutional and national culture were not expected. Lucia and Nuria[1] were in the fifth year of doctorate; Lucia defended her dissertation in June 2014 (right after the end of the workshop), and Nuria did it four months after. Andreas was in his fourth year, and expected to complete the doctorate in the following year (early 2015), and Alex was finishing the eighth year and defended his dissertation one month after the interview. Although working in the same department, none of them shared research group nor supervisor(s).

Instruments

A methodological device was specifically designed to delve into participants' doctoral experiences and perceived positioning in the community. Two instruments were developed and used in in-depth interviews:

(1) *Journey Plot.* This is an instrument created to retrospectively capture information about participants' positive and negative experiences over time (Shaw et al. 2008; Turner 2015). Participants were given a graphic with two axes, time and emotional intensity of the experience, and were asked to: 'draw a line for the evolution of your doctoral experience, representing the high and low moments, from the beginning until now, and label the experiences represented in the graphic'. Simultaneously, we requested them to describe and explain their graphics, which allowed us to collect problems, difficulties, challenges and also positive experiences, as well as information about the transitions (steep lines and plateaus) between them. *Journey Plot* also worked as a prompt to talk about other experiences that were not labelled in the graphic.
(2) *Communities Plot.* This instrument was designed to explore how students concurrently interpret their research network and position in it. It is a visual representation of the relationships between the interviewee and the most significant groups and

individuals in his/her doctoral experience. We gave participants 10 circles of different sizes and asked them to: 'represent your position in the community, the groups and individuals that are or have been important in your doctoral experience, and the connection among them and with you'. They could use as many circles as needed and were asked to name each circle, explain the composition and whether they were satisfied with their position in the network.

Procedure

During the interview, each participant completed one *Journey Plot* and one *Communities Plot*. Interviews lasted between 40 and 75 minutes and were audio recorded and transcribed. All interviews were gathered according to the research ethics clearance procedures[2] and students voluntarily agreed to participate. Both graphic representations were collected and then digitalized for further analysis. Analysis was conducted in three phases, each related to different objectives of the study.

In the first phase, we analysed participants' discourse to identify the experiences they faced during their doctorate (objective 1). First, after reading the interviews several times to obtain a general picture of the data, we segmented participants' discourse into quotations that referred to a specific experience, which constituted the basic unit of analysis. In this study, a *significant experience* is defined as any event or situation referred by the interviewees as having a significant impact in their doctoral journey. Journey Plot graphics were used as a complement to discourse analysis to help characterize and classify the experiences mentioned by participants in the interview. It is important to note that we took into account all the experiences participants described as having an impact on their journey, not only those directly linked to 'research'. Therefore, we also included 'personal life' experiences whenever they were mentioned by students. As research has demonstrated, individuals' personal relationships and lives greatly influence their academic careers (Johansson et al. 2014; McAlpine and Amundsen 2015; McAlpine, Amundsen, and Turner 2014).

We established three dimensions of analysis: *content*, *social agents* and *affective value* of the experience. *Content* of the experience referred to areas of participants' experience, such as research planning, data collection or attending conferences; whereas *social agents* referred to individuals, groups and communities directly involved in the experience and *affective value* alluded to the emotional tone of experiences. Following the principles of Grounded Theory (Glaser and Strauss 1967), we coded every quotation according to the three dimensions using Atlas.ti qualitative software. For the *content* dimension, we grouped codes in thematic categories to reduce the complexity of the analysis. Regarding the *affective value* of the experience, codes were assigned based on participants' description of feelings and thoughts associated to each experience and on the Journey Plot graphic. Finally, we used Atlas.ti code co-occurrence table to analyse the incidence of each type of experience and the interaction of the dimensions in each case.

In the second phase, in order to describe students' perceived position in the community (objective 2), we focused on participants' *Communities Plot* graphic and discourse. We read and summarized participants' explanation in light of the final composition to describe their perceived position in the research community. Ethnographic interpretation

of discourse was conducted, based on meanings expressed by participants. In both phases, authors discussed codes, categories and interpretation of compositions iteratively until consensus was reached.

The third phase consisted of analysing each participant's data looking for relationships between the three dimensions of experiences and with his/her position in the community (objective 3). In phases 1 and 2 each individual constituted a separate case in order to fully understand the complexity of their journey, whereas in phase 3 we also conducted cross-case comparisons to identify shared and specific relationships based in our theoretical assumptions.

Results

According to our two first objectives, we start by describing and presenting results of the *content*, *social agents* and *affective value* of participants' experiences and the communities they mentioned. This will be done by means of (a) presenting the categories emerged, and (b) describing each participant's experiences and perceived position in the community. We provide the Journey Plot and Communities Plot graphics of each participant to illustrate the results. Finally, regarding our third objective, we present the relationships between participants' most significant experiences and their position in the community through within- and cross-case analysis.

Categories regarding participants' experiences

Regarding *content*, diversity of participants' experiences was grouped into six categories: *motives* to engage in research, issues regarding *organization of research* and *research procedures*, *writing and communication*, *roles and responsibilities*, and all those aspects linked to *personal life* students mentioned as influencing their doctoral trajectory. Definitions and examples are displayed in Table 1.

Regarding the *social agents* dimension, the analysis revealed that students' experiences were better described in relation to different *types* of social contexts, in terms of their proximity-distance from the students, rather than in relation to specific individuals. Thus, the emerging codes referred to five social layers, ranging from smaller (individual) to broader social contexts (disciplinary community): individual, supervisory relationship, research group, (inter)national researchers and broader community (see Table 2).

Finally, the dimension *affective value* of the experience included both *positive* ('I think that everything was very good at the beginning […] I was motivated to do the thesis'; Nuria) and *negative* experiences ('I had already written the first paper, and here, well, my supervisor took four months or so to read it […] I want to quit science forever!'; Andreas).

Describing each participant experiences and perceived position in the community

For each participant, we first explain experiences based on students' discourse around the *Journey Plot*, and second the positioning into the community based on the *Communities Plot* created in each case.

**Table 1.** Categories, definitions and examples of dimension *content of the experience*.

Categories	Definition	Example
Research motives	Meaning of research, participants' motivations to do research and study a PhD, and expectations about the future.	'I liked going to New Zealand, it was scientific motivation because it was truly applied science (…) "maybe another type of science exists, out of university", motivation!' (Andreas)
Research organization	Issues of planning (such as defining thesis objectives or designing experiments), distribution or lack of time and also physical, human or economic resources (getting funding for a project and obtaining a PhD scholarship).	'I was stressed, I think, because I had many things, monthly samplings and I was still doing the masters and we also went two weeks to Alicante, one week to Valencia' (Lucia)
Research procedures	Experiences related to specific data collection and analysis procedures (mostly field sampling and lab work and analysis).	'I finished defining the data I would have because I took all the pictures' (Alex)
Research writing and communication	Experiences related to any phase of the writing process and any type of text, as well as those related to communication of research, mostly conferences and congresses.	'[…] I also wrote an article at that time, it was rejected' (Nuria)
Roles and responsibilities	Experiences related to differentiation of tasks and roles in the relationship with others, including guidance and help (or lack of) from members of their communities and mismatches and disagreements in perceptions and expectations of their position and roles.	'[My supervisor] always works alone, it works for him (…) but when you work with other people, you need to discuss a plan, a way to address a topic' (Nuria)
Personal life	Experiences that were not related to their research and academic tasks, but reported as important in their doctoral journey, such as starting or ending a relationship or moving to a new apartment.	'My girlfriend dumped me, she dumped me (…) It was important' (Alex)

Lucia

Experiences. Lucia is the only participant that described more positive than negative experiences. Most of her most significant experiences involved only the *individual layer*, both in a *positive* and *negative* sense, followed by those related to the *broader community* and the *research group*, which were mostly positive (see Figure 1).

Table 2. Codes, definitions and examples of the dimension *social agents*.

Codes	Definition	Example
Individual	Experiences involving only the student.	'I started writing the first chapter (by myself)' (Andreas)
Student–supervisor relationship	Experiences involving the student and his/her supervisor.	'I thought: fantastic because this will be the occasion to really talk about what we will do, right? And I got quite disappointed because I saw that he (supervisor) didn't plan anything for me' (Nuria)
Research group	Experiences involving other colleagues in their department or research group.	'My scholarship was linked to a project with a different main researcher, so we often consult him and after the research stay we went to talk to him and he said "no, no, not this"' (Alex)
(Inter)national researchers	Experiences involving groups and other agents that had a direct relationship with the participants in a national or international context, such as people or groups of their research stays.	'In the research stay there were very positive things, very positive, that I saw in my thesis comparing to theirs' (Andreas)
Broader community	Experiences related to or directed towards poorly defined or large audience(s) and communities, or even the whole disciplinary area.	'In February my paper got accepted' (Lucia)
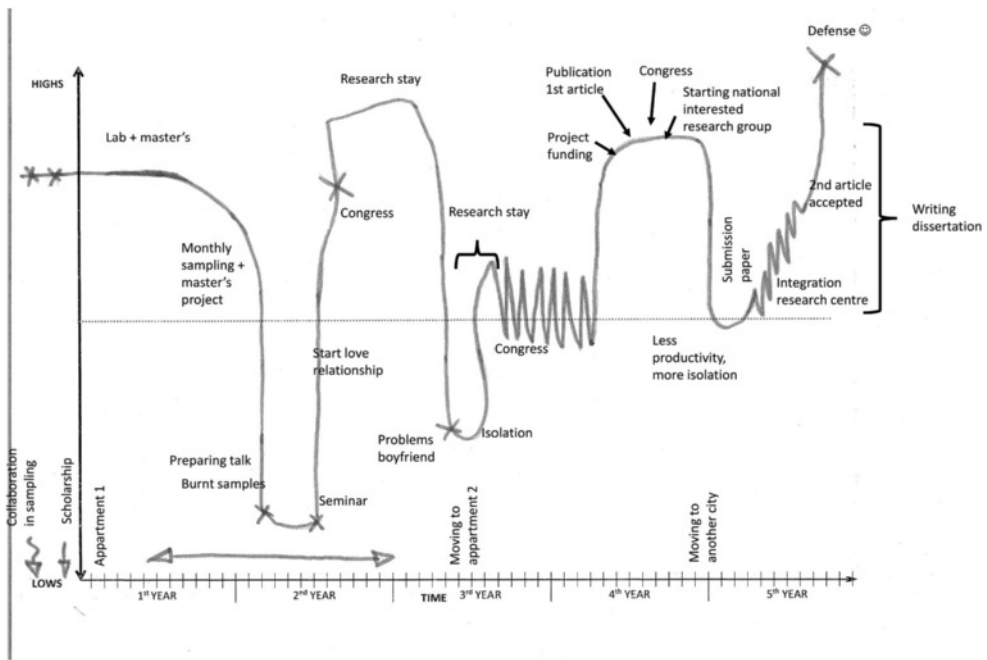
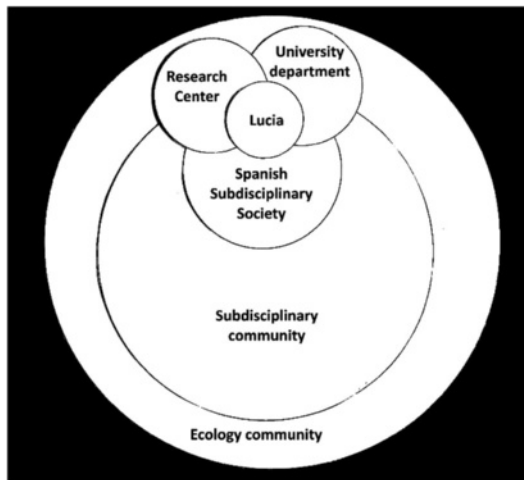**Figure 1.** Lucia's representation of her journey.

Scientific writing and communication experiences, especially when the *broader community* was involved, were also an important source of *positive* experiences as this excerpt illustrates: '[Congress A] was very cool, so I came back very motivated […] and I also met people I would work with in the United States'. She also reported *positive* experiences related to *roles*, mainly involving the *research group* and the *broader community*; and to *organization of research*, which were concentrated on the *individual level*. *Personal life* had a great impact in her journey too, with both positive and negative experiences. Instead, *research procedures* were not source of significant experiences for her, and she did not mention any experience, *positive* or *negative*, related to *research motives*. She was very engaged on her research all along the journey, despite the highs and lows of the experience. Finally, she mentioned very few experiences with her *supervisor*, and most of them were related to *scientific communication*.

Position in the community. As displayed in Figure 2, she positioned herself as being part of the broader community as well as of the *University Department*, *Another Research Centre* and the *Sub-discipline National Association* because she had responsibilities in each of them. At the beginning of the workshop she said her position was 'limited' but after completing the PhD she admitted not feeling that way anymore, although she did not have any contract linking her to the university department.

Andreas

Experiences. Andreas mentioned more *negative* than *positive* experiences, especially related to *roles* and *writing and communication* (see Figure 3). This last category, along with issues of *research motives*, was also an important source of *positive* experiences for
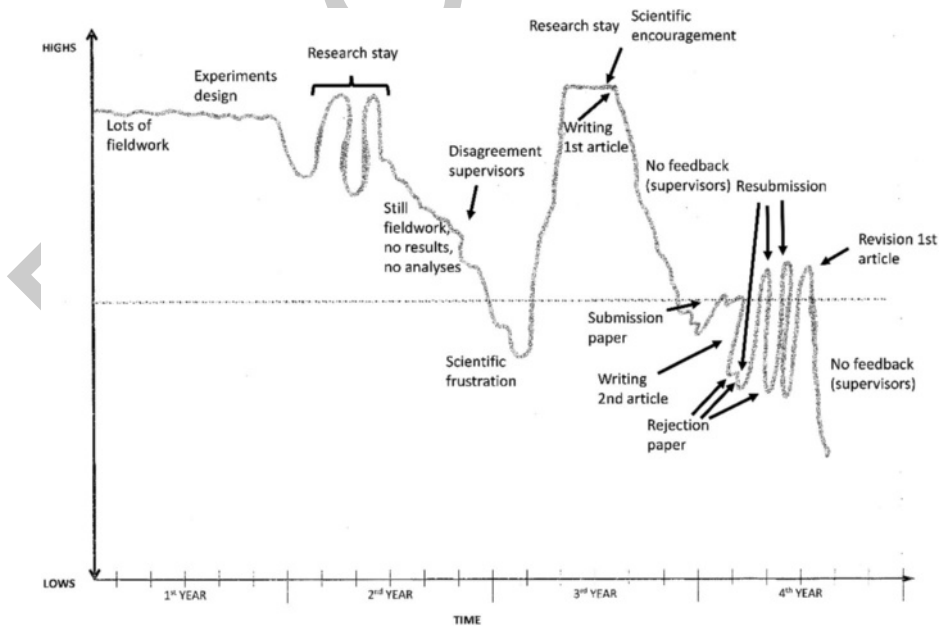
Figure 2. Lucia's representation of her position in the research community.

him: 'two days ago I corrected it, I read it again and […] now I think no, now I am going to send it and it will be much better, I am proud, I would publish it'. He did not mention any personal experience that influenced his doctoral work throughout the journey.

Regarding the *social dimension*, Andreas mentioned fewer experiences with *(inter) national researchers* and the *broader community*. It seems that for him much of the experience developed in an *individual* layer, and to a lesser extent, in the *research group* and in the *relationship with his supervisors*. Interestingly, while Andreas' *individual experiences*

Figure 3. Andreas' representation of his journey.

were both *positive* and *negative*, the other two social layers were always associated to *negative* experiences, especially in relation to the *negotiation of roles*.

Position in the community. Although he had a good insight on the broader communities in his field, Andreas defined himself as an outsider: 'I'm not here, in the centre, I'm in one side […] I'm like an independent entity'. As Figure 4 shows, he placed his position in the periphery of his group because he did not share most of the group's connections with other research groups and communities. He also felt part of groups with whom he had done his research stays (relationships that he did not share with his group either). His position and relationships with the community were quite independent of his group, and he was not satisfied with it.
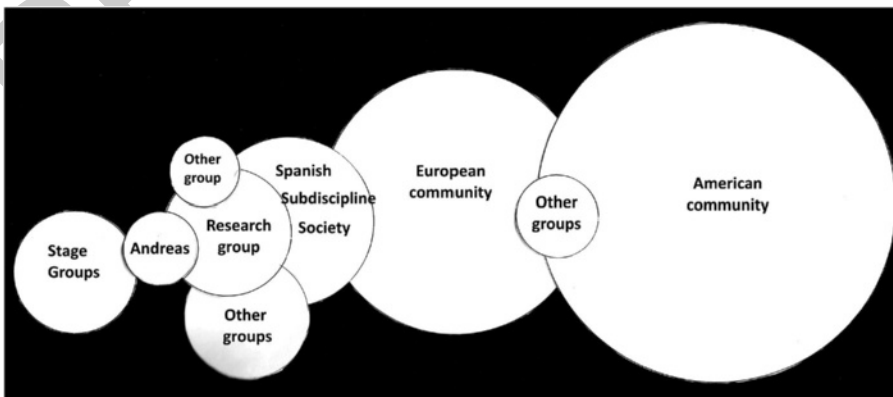
Alex

Experiences. Alex was the only participant that mentioned all types of experiences (see Figure 5). They were mostly centred in the *individual* layer, being *negative* more prevalent than *positive* experiences. Although fewer experiences involved the *broader community*, they had a positive effect in the perception of *research motives*: 'it was a chance to know [American authors] and they also had another way to look at things … for me it was a discovery to see that interesting things could be done'. Also important both in a *positive* and *negative* sense were relationships with the *(inter)national researchers* and his *supervisor*, the latter especially in relation to research planning.

Indeed, *research organization* problems were the most frequent in Alex's case ('my father asked me "what hypothesis do you have?" and I said "I don't know, I don't know if we have any"'), followed by *personal* experiences and issues related to *data collection*.

On the contrary, *positive* experiences were more distributed, being *scientific writing and communication* the most prevalent ('we just published it, in 2014 […] I'm very happy'), followed by issues regarding *motives*, *roles* and *organization of research*.

Position in the community. As a result of this diversity of experiences, he represented his position in the community as an outsider (see Figure 6). He knew it, he talked about it but he looked at it from the outside. His participation was limited and mainly aimed at contradicting the major trend in the *European community*, his

Figure 4. Andreas' representation of his position in the research community.
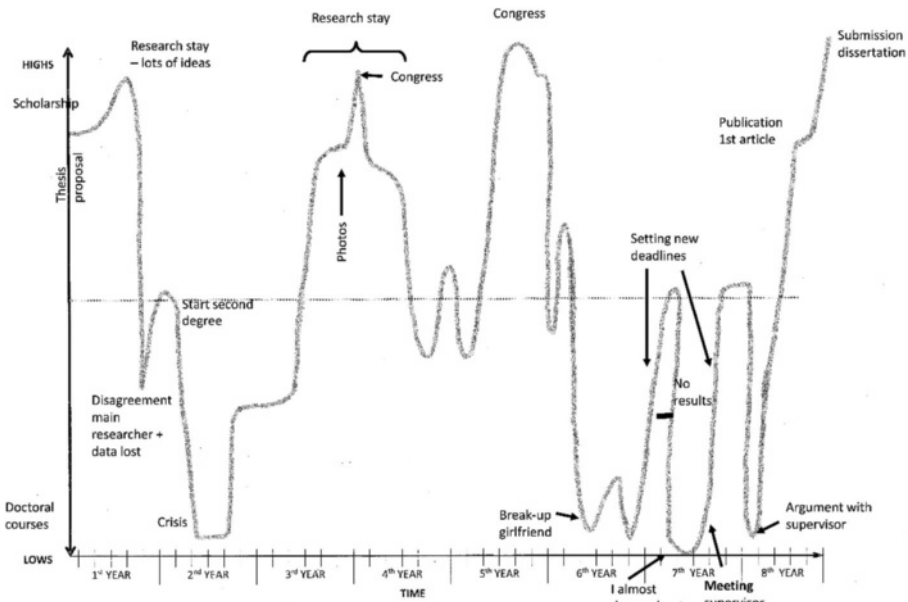
Figure 5. Alex's representation of his journey.

community of reference. Although he enjoyed research, he did not agree with the community's values (research pace and driving motivations) and thus felt proud about being out of the community: 'When a new [technique] is released, it makes a very high impact publication, even if it isn't relevant for ecology. They want to follow the trend, and I don't like it. […] we go too fast, no! Slow down, people!' Although much of his journey happened in the individual sphere, he represented his position together with his *supervisor*.
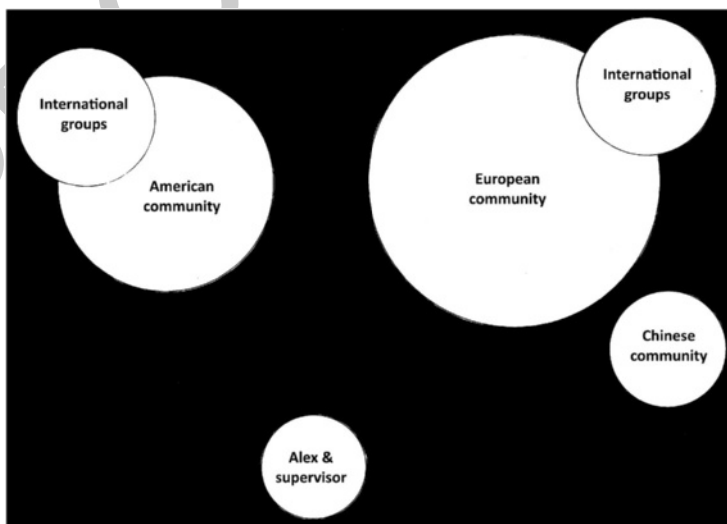

Figure 6. Alex's representation of his position in the research community.
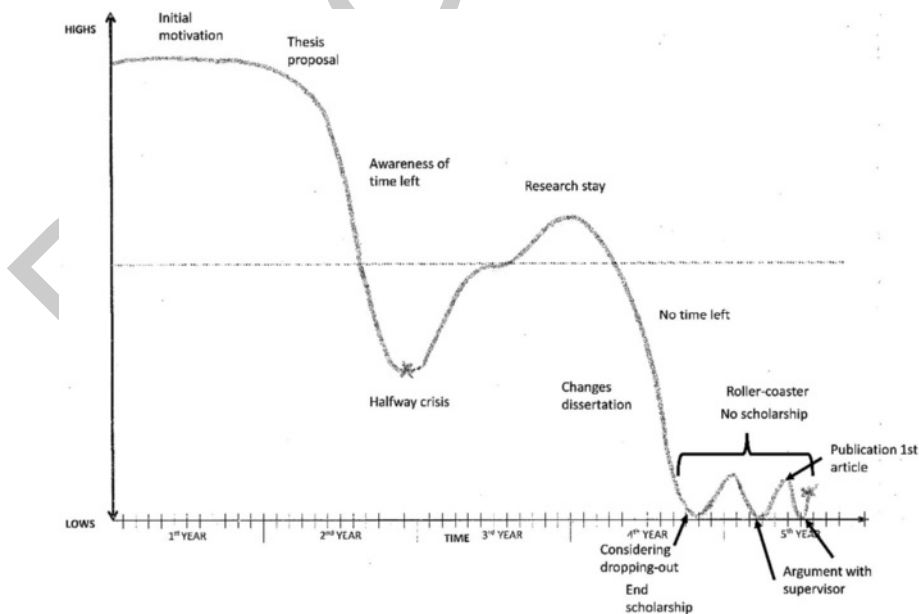
Nuria

Experiences. Nuria described over five times more *negative* than *positive* experiences (see Figure 7). The very few *positive* experiences she explained were mostly *individual* experiences related to *scientific writing and communication*, such as 'publishing an article […] the only work that has resulted in a paper'. Nevertheless, this area was mainly a source of *negative* experiences, along with *roles*, *motives* and *organization of research*. In her case, *personal life* and *research procedures* issues did not appear when explaining her journey.

As for the *social* dimension, the *individual layer* had a high significance but, in Nuria's experience, issues related to her *supervisor* were equally important and were a source of only *negative* experiences. She mentioned many problems, especially related to *roles and responsibilities* concerning the lack of guidance and mismatches in expectations: 'He tells me things he wants me to change, but he never tells me why nor how this helps me to achieve the objectives'. Instead, experiences related to *motives to do research* and *scientific communication* happened mostly in the *individual* layer.

Finally, the *broader social* layer was not relevant to understand her doctoral journey, although she had participated in conferences and had done a research stay ('Here I went on a research stay. It went well but it was not useful for my thesis').

Position in the community. Nuria did not work in a team, she felt she was 'doing a very isolated thing' and even her *supervisor* was far from her in the network (see Figure 8). She felt part of the *university department* and the *PhD students group*, but she saw them more as 'social clubs' than professional communities.

Accordingly, she felt completely out of the community and she thought that the few interactions she had with the *broader community* had not had any impact and she did not value them at all: 'Every once in a while we go to a congress but it's a thing that …

Figure 7. Nuria's representation of her journey.
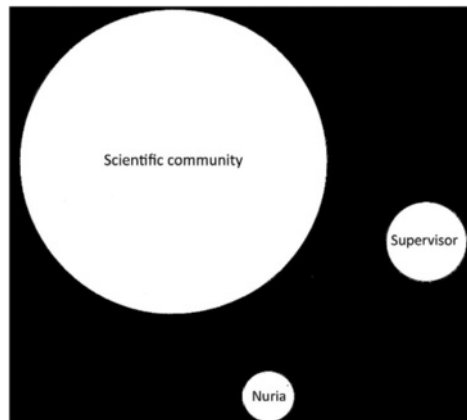
Figure 8. Nuria's representation of her position in the research community.

you go there, you have fifteen minutes to talk, you talk and leave […] you don't feel like you have any impact'. She was very unhappy with her position.

Relationships between participants' most significant experiences and their position in the community

As seen, students' journey and perceived position in the community greatly varied from one another. For the cross-case comparison, we looked at those emergent trends that account for particular relationships between the experiences and network of each individual.

Lucia was the only participant that perceived herself as a member of the research community and other smaller communities, maybe due to the fact that she was the only one that reported having more *positive* experiences along the journey, especially in relation to the *community layer*. Lucia's interaction with broader communities involved the communication of her research (e.g. publishing or presenting a paper). Interestingly, her perception of her position changed during the last months of the doctorate and this change might have also promoted a reinterpretation of the journey, especially in relation to negative experiences.

On the other hand, Alex perceived himself as an outsider. But, surprisingly, he was happy with it. His position was far from all the communities he included in the graphic due to disagreements with their values and the pace of research, too fast for him. Accordingly, most of his journey happened in the *individual* and *supervisory* relationship layers. He mentioned many positive experiences, although negative ones were more frequent in his narrative, especially in relation to the organization of research, explaining why it took him eight years to finish the thesis.

Despite the significant differences between these two participants, both are characterized by a feeling of satisfaction with their position in the community (however different these positions are). In this sense, what they both have in common is not the amount of interactions with the *broader community* (Lucia reported many more experiences in congresses and publications) but the *positive* affective value of these interactions, which boosted their motivation to do research.

Andreas' and Nuria's stories are different. Their journey is characterized by a higher proportion of *negative* experiences, especially in their relationship with supervisors regarding the negotiation of *roles and responsibilities,* and in the *communication of research.* Relationships with the broader community were scarce and mostly negative. These problems probably led to a high dissatisfaction with their position in the community at the end of their studies. In their networks, we can observe a perceived lack of support from their supervisors and research groups: Nuria represented her *supervisor* and herself far from the community and from each other, and Andreas perceived himself in the periphery of his research group because he felt he did not receive any help to establish and maintain professional relationships and he did not participate in his group's relationships with other researchers.

Discussion and conclusions

The objective of this study was to identify and describe the most significant experiences that doctoral students have during the PhD journey and to relate them to their perceived position in the research community. Additionally, we aimed at exploring the utility of two specific instruments designed to elicit participants' memories and discourse through graphic representation. We expected to find complex interactions between types of experiences and social agents, as well as differences in their importance across the four participants; differences that should help us explain variations in their perceived position in the research community.

As seen, our participants mentioned having many different significant experiences during their journeys. In contrast to previous studies' findings (Pyhältö, Toom, et al. 2012), they mentioned fewer problems regarding disciplinary expertise, such as research procedures. Instead, they expressed facing more problems and challenges in relation to research communication (e.g. writing papers, presenting their research in a conference) and the differentiation and fulfilment of roles and responsibilities (e.g. lack of help or guidance, disagreements in expectations of duties). A possible explanation for these differences could be that, while previous studies explored the most *typical* challenges of doctoral students at different stages, we analysed the most *significant* experiences of advanced students. Domain-specific problems may be frequent but also more easily solved by asking for specific support or help, while problems related to research writing and communication and role negotiation tend to be more ill-defined and, most importantly, sometimes related to participants' identity and position in the community (Aitchison et al. 2012; Caffarella and Barnett 2000; Castelló, Iñesta, and Corcelles 2013). Their solution is more complex and they are more likely to have a greater impact on the experience. In line of previous research (Johansson et al. 2014; McAlpine, Amundsen, and Turner 2014), personal life was also important for some of our participants, who experienced significant downs in their perception of the doctoral journey as a result of personal problems that, from their own perspective, had an impact in their emerging researcher identities.

Regarding the affective value of the experience, it is important to note that even the journey of the apparently most successful student (Lucia) was not unproblematic, as evidenced by the large number of problems she reported. This fact, together with the other

participants' struggles with their socialization into the community, support the claims of the complexity of this process, specially when considered as a two-way process (McDaniels 2010), in which individual act as active relational agents and intentionally negotiate their position with the community (Castelló, Iñesta, and Corcelles 2013; Gardner 2009; Lovitts 2005; Pyhältö and Keskinen 2012). However, positive experiences were also important and quite frequent in the doctoral journey and thus worth analysing in order to fully understand participants' experience, as Beard, Humberstone, and Clayton (2014) also proposed.

In relation to the *social dimension*, participants' experiences were characterized in gradually increasing layers that had a differential impact on students' journey. For our participants, individual experiences (i.e. experiences that did not directly involve any other person but the student), both negative and positive, were the most frequent in the doctoral journey, probably due to students' attempts to increase their levels of autonomy (Gardner 2008; McAlpine et al. 2012). Although rarer, the amount and, more importantly, the affective value of experiences involving broader social layers appeared to be crucial to promote their socialization and position in the community (Martinsuo and Turkulainen 2011; McAlpine 2013). Positive experiences, especially when they involved other social agents, appeared to be related to participants' feeling of belonging in the research community.

In our study, only one participant, Lucia, was able to become agentive enough to overcome the challenges and move to less peripheral positions, thus becoming a *legitimate participant* (Lave and Wegner 1991). It seems that students' satisfaction with their position in the community is not related to having less negative experiences, but to the success in overcoming and solving the problems.

Moreover, only those who successfully negotiated their role and responsibilities in the relationship with their supervisors and research group were satisfied with their participation and experiences involving the broader disciplinary community. For the other two participants, experiences involving supervisors were very frequent but mostly negative. In those cases, students had problems experiencing a sense of belonging with the immediate research context and thus they may have seen relationships with other more distant researchers and communities as challenging rather than stimulating. In turn, their supervisors often failed in helping them become *active relational agents* (Pyhältö and Keskinen 2012). The scarcity of relationships with national and international researchers and groups may also be related to the challenges of becoming active relational agents and, ultimately, to students' feelings of isolation from the disciplinary community.

In this regard, Alex's situation was unexpected due to the apparent contradiction between his feelings and position, which can be described as *happy outsider*. His process was also problematic but, in this case, not due to the perceived lack of support and agreement with his supervisor, like in Andreas' and Nuria's case. Instead, he showed resistance to certain rules and ways of doing of the research community (Prior 1995), and tried to transform some practices from his outsider positon. He chose to play an active role, not only in assimilating certain procedures, but also, and more interestingly, in not accommodating to some rules of the community. He strategically chose when and where to interact with it, and that may explain why he had fewer but positive experiences related to the broader community. It could be argued that taking this active role was related to the satisfaction with his position. Moreover, Alex case shows that there might not be one single successful socialization process and outcome, but many and less conventional paths.

On the other hand, while most of the contents of experience were restricted to the smallest social layers (e.g. research motives were confined to the individual layer, and research organization to the individual and supervisor layers), research writing and communication experiences were distributed among all the social layers. Research on academic writing has stressed its dual nature, as being both an individual cognitive process and a social activity of a highly situated nature (Castelló, Iñesta, and Corcelles 2013; Prior 2006). Moreover, the fact that our participants described a similar number of positive and negative experiences of these type emphasizes the importance and the affective intensity involved in writing and communication for an unknown audience.

Regarding our methodological objective, the instruments designed were useful to elicit discourse about experiences and communities. *Journey Plot* helped us to retrospectively capture the most significant experiences in the doctoral studies of our participants, place them in time and get a sense of their trajectory. In turn, the *Communities Plot* instrument promoted students' reflection and detailed description of their scientific network and their relationships with the different significant agents. Moreover, they are valuable tools for raising students' awareness about their PhD experience, and for overcoming some interviews limitations (Golden 1992) by facilitating the recall of past experiences and the assessment of their intensity.

We are aware that our study also has some limitations. First, we do not claim our findings to be representative of all the doctoral students due to the small sample size of our study and to the many characteristics shared by the participants regarding their research conditions (e.g. same affiliation, same type of enrolment, same discipline). Differences are likely to appear in other groups of students, as well as in other disciplines and contexts different than the one presented here. Moreover, the relationships found should also be explored and expanded in larger samples in order to contrast present findings.

Second, we did not collect longitudinal data of the evolution of the experience and the position in the community, which would have helped to understand how students' perceptions change. However, this is a first attempt to explore relationships between significant experiences and position in the community, by means of two non-traditional instruments. These instruments showed a promising potential for the characterization of the complex process of becoming a researcher, and could also be used to examine other topics and fields. Future research might use them to explore students' stories about the evolution of their experiences and deepen in the relationship between these experiences and students' position in the community.

This study has implications for doctoral education. Since problems and challenges are frequent even for the most successful students, it seems necessary to develop institutional resources to promote students' awareness and learning about how to be agentive in anticipating and overcoming the difficulties. Although this can be accomplished by several means, we consider that sharing some common experiences and their affective value with peers and reflecting on how these experiences are related with students' position in the researcher community might be quite effective, especially if reflection is supported by visual and interactive tools similar to the two instruments used in this study. Moreover, explicit negotiation of the terms, roles and responsibilities, not only with the supervisor but also with other significant agents, may help prevent and solve some of the identified challenges of the doctoral work.

On the other hand, as our results suggest, creating and expanding a research network is critical for students' engagement in the doctorate and, more importantly, for their future careers in academia. Students might benefit from actively seeking to improve their position and expand their network by establishing relationships with other researchers in their field and strategically selecting when, where and how to participate in the community, for example by participating in conferences, associations and research projects. In doing this, they may also increase their knowledge about the practices of the disciplinary community, and thus will be more prepared and well positioned to transform it.

In turn, it is suggested that institutions, supervisors and research groups provide students with resources and opportunities to develop as active agents in the community, both in preparing publications and communications and in establishing and maintaining relationships with other national and international researchers in their field of study. They could also support the communication of results not only by assessing the number of outcomes, but also by offering spaces and resources to discuss early findings and drafts, and courses aimed at helping students improve their communicative and writing competence.

Overall, results stress the need to avoid the *culture of institutional neglect* (McAlpine et al. 2012) by promoting students' agency in solving challenges and networking, and by raising awareness of the role that social layers and experiences can have in future career directions and opportunities.

We hope the conceptual and methodological issues raised in this study contribute to better understanding complex interactions between experiences and socialization in order to benefit harmonic doctoral students' development.

Notes

1. All participants are referred to by pseudonyms.
2. Study design, procedure and tools were approved by the ethics committee of the Faculty of Psychology, Education, Sciences and Sport Blanquerna on 19th May 2014 registration number 241012/DP.

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Notes on contributors

Anna Sala-Bubaré, PhD student at Ramon Llull University funded by the Training Program of University Teachers of the Spanish Ministry of Education, Culture and Sport (FPU2013/06957). Her research focuses on the writing and identity development processes of doctoral students.

Montserrat Castelló, full professor of psychology, and director of the Psychology, Learning and Development Research Institute at Ramon Llull University. Her research lines focus on the teaching

and learning of epistemic writing, the regulation processes in academic writing and research, and identity development of teachers and researchers.

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