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DOCTORAL CANDIDATES' RESEARCH WRITING PERCEPTIONS: A CROSS-NATIONAL STUDY

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ABSTRACT

Aim/Purpose	This study aimed to explore individual variation in doctoral candidates' perceptions about research writing and themselves as writers (<i>research writing perceptions</i>) across three countries (Spain, Finland, and the UK) and the relationship with doctoral candidates' research conditions and social support.
Background	The present study employed a person-centered approach to identify profiles among doctoral candidates' in relation to their research writing perceptions and the association between these profiles and research conditions and experiences (e.g., thesis format, thesis language, enrollment modality, phase of the doctorate, number of publications, and drop-out intentions) and perceived social support from supervisors and research community.
Methodology	1,463 doctoral candidates responded to the Doctoral Experience survey. EFA and CFA were used to corroborate the factor structure of the research writing scale. Research writing profiles were identified by employing cluster analysis and compared regarding research conditions and experience and both types of social support.

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Contribution	This study contributes to the literature on doctoral development by providing evidence on the social nature of doctoral candidates' writing development. It is argued that doctoral candidates' perceptions of writing are related to transversal factors, such as doctoral candidates' researcher identity and genre knowledge. It also shows that most candidates still lack opportunities to write and learn to write with and from other researchers.
Findings	Three writing profiles were identified: Productive, Reduced productivity, and Struggler profiles. Participants in the Productive profile experienced more researcher community and supervisory support and had more publications, Struggler writers reported drop-out intentions more often than participants in the other profiles, and Reduced productivity writers were more likely to not know the format of the thesis. The three profiles presented similar distribution in relation to participants' country, the language in which they were writing their dissertation, and whether they were participating in a research team.
Recommendations for Practitioners	Supervisors and doctoral schools need to be aware of difficulties involved in writing at the PhD level for all doctoral candidates, not only for those writing in a second language, and support them in developing transformative research writing perceptions and establishing collaboration with other researchers. Research teams need to reflect on the writing support and opportunities they offer to doctoral candidates in promoting their writing development.
Recommendations for Researchers	Further studies should take into account that the development of research writing perceptions is a complex process that might be affected by many and diverse factors and vary along the doctoral trajectory].
Future Research	Future research could explore the influence of factors such as engagement or research interest on doctoral candidates' research writing perceptions. The field could also benefit from longitudinal studies exploring changes in doctoral candidates' research writing perceptions.
Keywords	doctoral candidates; doctoral writing; writing perceptions; social support; research writing; cross-national study

INTRODUCTION

Research writing is a key factor for successful doctoral degree completion. Not only are the most important outputs (e.g., dissertations, research papers, conference abstracts) written products, but writing is also an essential tool for PhD candidates to develop their thinking, their knowledge, and their identity as researchers (Paré 2017; Starke-Meyerring 2011). Ultimately, research writing allows doctoral candidates to participate in their research community (Flowerdew, 2000; Ivanic, 2004; Li, 2006)¹.

However, research writing is a challenging activity because it involves complex cognitive and social processes of knowledge construction (Bereiter & Scardamalia, 1987), identity development (Kamler & Thomson, 2006; Maher, et al., 2008), and interaction with and participation in the research community (Hyland, 2002; Russell, 1997). In order for doctoral candidates to be successful research writers, they need to learn the social practices of their specific research community (Bazerman, 2009) and to develop effective writing strategies that allow them to overcome the challenges and contradictions

¹ In this paper, we use the terms communities and research communities to refer to all the disciplinary research, academic and professional communities with whom doctoral candidates interact and participate, directly or indirectly, during their doctoral trajectory.

that emerge when writing research texts (Castelló, Iñesta, & Corcelles, 2013; Cotterall, 2011). In this regard, research shows that the strategies doctoral candidates and other writers develop are highly mediated by the perceptions they hold about writing and themselves as writers (Castelló, Iñesta, & Monereo, 2009; Lavelle & Bushrow, 2007; Negretti, 2012; Yore, Hand, & Florence, 2004). Moreover, these perceptions also are related to the amount and quality of texts writers compose (Lavelle & Bushrow, 2007; Prat-Sala & Redford, 2010; Torrance, Thomas, & Robinson, 1992).

Therefore, it is important to investigate what writing perceptions doctoral candidates have and the role they play in their development. Previous studies conducted in this topic, such as Cerrato-Lara, Castelló, García-Velázquez, & Lonka (2017) and Lonka et al. (2014), have explored the relationships among doctoral candidates' writing perceptions, and between writing perceptions and candidates' well-being and sociodemographic characteristics. However, they did not look at the individual variation in relation to doctoral candidates' writing perceptions. Moreover, these studies did not explore the relationships between doctoral candidates' writing perceptions and social support and experience nor did they contrast the findings with their actual productivity. Research in other contexts has found great variations among writers in relation to their perceptions about writing (Ivanič & Camps, 2001; Lavelle & Bushrow, 2007; Negretti, 2012). This diversity is likely to appear also among doctoral candidates, as their research contexts may be different and promote or hinder the development of their writing expertise in many diverse ways. The present study is different from previous studies (Cerrato-Lara et al., 2017; Lonka et al., 2014) in that it takes a person-center approach to explore doctoral candidates' writing perceptions in different contexts and it expands the variables and factors to be explored in relation to them.

The aim of this study is, therefore, to explore individual doctoral candidates' research writing perceptions across three countries (Spain, Finland, and the UK) and the relationship with doctoral candidates' research conditions and social support. Looking at individual differences among doctoral candidates' writing perceptions could help us better understand the development of writing perceptions and their role in the doctoral journey. Ultimately, results should guide the design of effective and individualized writing support and resources.

DOCTORAL CANDIDATES' PERCEPTIONS ABOUT RESEARCH WRITING

Writing perceptions have been defined as the mental representations, practices, and habits individuals hold about research writing and themselves as writers (Castelló, McAlpine, & Pyhältö 2017; Lonka et al., 2014). Previous research has shown that doctoral candidates' maladaptive perceptions (e.g., blocks, procrastination, perfectionism, and seeing writing as an innate ability) hinder their writing and research process, while others are beneficial for their progress (adaptive perceptions), especially those related to seeing writing as knowledge transforming tool and productivity. Regarding maladaptive perceptions, blocks are the inability to produce text (Rose, 1980), while procrastination is the action of delaying or postponing important tasks (Onwuegbuzie, 2000). Research has shown that both types of perceptions are related to lower productivity, but also to reduced well-being and drop-out intentions (Castelló et al., 2017; Lonka et al., 2014).

Perfectionism has been defined as the constant search of a perfect product and the establishment of unrealistic standards, and thus the endless revision and inability to finish texts (Boice, 1993; Kearns, Forbes, Gardiner, & Marshall, 2008). This type of perception has been traditionally conceived as a maladaptive perception because it can hinder or completely paralyze the writing process when reaching very high levels. Nevertheless, it could be argued that average levels of perfectionism are desirable when writing highly complex, specific, and demanding texts such as research articles and doctoral thesis. Previous studies have shown that perfectionism is related to seeing writing as a knowledge-transforming tool but, at the same time, to lower productivity and reduced well-being (Cerrato-Lara et al., 2017; Castelló et al., 2017; Lonka et al., 2014). Other maladaptive perceptions are those related to seeing writing as an innate ability, that is, as an ability that cannot be learnt but a skill or gift that individuals have or do not have (Sawyer, 2009). These beliefs are particularly incapacitating for candi-

dates who perceive themselves as poor writers or experience frequent blocks and procrastination and have been related to doctoral candidates' lack of interest (Lonka et al., 2014).

In turn, adaptive perceptions of writing involve seeing writing as a knowledge-transforming tool and seeing oneself as a productive writer. Knowledge-transforming perceptions entail perceiving writing as a way to create new knowledge, rather than as a means to reproduce what is already known (Bereiter & Scardamalia, 1987) and using writing and texts as tools to learn about oneself as a writer, about the research topic, and about the text at hand (Castelló et al., 2013; Prior, 2006). On the other hand, productivity perceptions involve seeing oneself as being a productive, effective, and active writer. Both types of adaptive perceptions promote engagement, research productivity, and well-being and are negatively related to blocks and procrastination (Cerrato-Lara et al., 2017; Castelló et al., 2017; Lonka et al., 2014).

RESEARCH WRITING AS A SOCIO-CULTURALLY EMBEDDED ACTIVITY

Socialization into the research community is a key objective of doctoral education (Lovitts, 2005). Doctoral candidates are expected to learn and internalize the research culture, activities, and rules to participate effectively in the community (Gardner, 2008; Paré, 2017) but, at the same time, they act as active agents in negotiating and transforming the rules and culture of the communities (Prior, 1995; Sala-Bubaré & Castelló, 2017). Research writing and learning how to write are important parts of the socialization of doctoral candidates, as research writing is a socially situated activity that is embedded in the research community (Castelló et al., 2013; Li, 2006; Starke-Meyerring, 2011). Along their trajectory, doctoral candidates learn and develop their research writing competence and knowledge through the interaction with other researchers, authors, writers and texts (Cotterall, 2011; Lee & Kamler, 2008; Prior, 2006). Consequently, their perceptions about research writing are also transformed as they enter and interact with the communities (Bazerman, 2013; Caffarella & Barnett, 2000; Castelló et al., 2013; Starke-Meyerring, 2011).

Doctoral candidates can participate in different layers of their communities, from the close relationships PhD candidates establish with, for instance, peers and supervisors, to their participation in the broader community, as well as the discipline and the broader cultural and national contexts (Sala-Bubaré & Castelló, 2017). Previous research highlights the crucial role supervisors have in supporting and promoting candidates' learning and research development (Hasrati, 2005; Kamler & Thomson, 2006; Martinsuo & Turkulainen, 2011; Pyhältö, Vekkaila, & Keskinen, 2015). Yet, interactions with other individuals and groups, such as research team and peers, can also contribute significantly to PhD candidates' socialization and development as researchers (McAlpine, Paulson, Gonsalves, & Jazvac-Martek, 2012; Sala-Bubaré & Castelló, 2017). Their relationships with and participation in the research institutions, and arguably in broader social and cultural contexts, are other important factors in understanding doctoral candidates' progress and socialization (Gardner, 2008, 2010).

More specifically, previous studies suggest that the availability and provision of resources to facilitate research progress and an effective and increasing participation in the communities are crucial for early career researchers' development (Gardner, 2007; Pyhältö, McAlpine, Peltonen, & Castelló, 2017). Social support is defined here as the resources in the social environment that doctoral candidates both perceive to be available and use for their research work (Vekkaila, Virtanen, Taina, & Pyhältö, 2016). The resources can come from different formal and informal relationships within and outside the research communities and work environment. Previous research has shown that social support, both from the supervisor and the research community, promotes early career researchers' well-being, research productivity, positive and engaging experiences, and overall satisfaction with the PhD (Gardner, 2010; Jairam & Kahl, 2012; Pyhältö et al., 2017; Pyhältö, Vekkaila, & Keskinen, 2015; Sala-Bubaré & Castelló, 2017). Yet, the role of different sources of social support on doctoral candidates' writing perceptions has remained largely unexplored (Aitchison, Catterall, Ross, & Burgin, 2012).

In this study, we aimed at analyzing individual variation in doctoral candidates' research writing perceptions across three countries (Spain, Finland, and the UK) and how these perceptions relate to individuals' research conditions and social support to gain a complete understanding of the role of writing perceptions in the PhD candidates' experience.

The specific objectives were:

1. Identify different research writing perceptions profiles among doctoral candidates.
2. Analyze the association between profiles and variables related to research conditions and experience (thesis format, thesis language, enrollment modality, phase of the doctorate, research productivity, and study abandonment intentions).
3. Analyze the association between profiles and perceived social support from supervisors and research community, participation in a research team and country.

METHODS

This study is part of a larger mixed-method cross-national research project on early career researchers identity development (FINS-RIDSS Researcher Identity Development; for a greater detail on the aims and design of the project see Castelló, Pyhältö, & McAlpine, 2018). The present study takes a quantitative approach to analyze doctoral candidates' research writing perceptions using a cross-national survey – the *Doctoral Experience* survey – which was developed in the first phase of this project.

PARTICIPANTS

Table 1. Sociodemographic characteristics of the participants of the study

	n	%
Gender		
Women	880	64
Men	495	36
Country		
Spain	1129	77.2
Finland	236	16.1
United Kingdom	98	6.7
Age		
Less than 30 years old	342	25
30 to 39 years old	571	41.8
40 to 49 years old	287	21
More than 49 years old	167	12.2

Altogether, 1463 social sciences doctoral candidates participated in the study. Table 1 shows the characteristics of the doctoral candidates in our sample. Most participants were women, most of them were from research-intensive universities in Spain and were between 30 and 39 years old. A greater balanced was observed regarding the enrollment modality, with slightly higher numbers for part-time candidates (see Table 2). Moreover, more than half of the participants were doing their thesis as a

monograph, and most of them were either working outside the university or hold a personal grant. Finally, a majority of candidates reported working primarily alone in their theses.

Table 2. Research conditions of the participants of the study

	n	%
Enrollment modality		
Full-time	624	46.6
Part-time	715	53.4
Format of the thesis		
Monograph	800	58.4
Compilation of articles	363	26.4
Don't know yet	208	15.2
Funding		
Personal grant	512	37.5
Job at university	195	14.3
Job outside university	469	34.4
No funding	189	13.8
Phase of the doctorate		
First phase	391	29.3
Second phase	522	39.1
Third phase	423	31.7
Research group status		
Working mainly individually	1117	78.1
Working both individually and in a research group	234	16.4
Working mainly in a research group	80	5.6

INSTRUMENT: THE DOCTORAL EXPERIENCE SURVEY

As mentioned above, the instrument used in this study was the *Doctoral Experience* survey. In its full version (available for free download at the project's website www.researcher-identity.com), the survey explores different areas of early career researchers' experiences, such as engagement, work-life balance, and research conceptions, through a combination of open-ended and multiple-choice questions. It was developed simultaneously in four languages (Catalan, Spanish, Finnish, and English) and in two versions (for doctoral candidates and post-doc researchers) by three cross-cultural teams, and it was later translated into Swedish, Danish, and French. This survey has already been analyzed and used in previous studies to explore post-docs' writing perceptions and social support, among other factors (Castelló et al., 2018; McAlpine, Pyhältö, & Castelló, 2018; Pyhältö et al., 2017).

This study is based on doctoral candidates' data from the research writing scale, including six factors (22 items): blocks (six items), procrastination (four items), knowledge creation (three items), productivity (four items), perfectionism (three items), and innate ability (two items) (adapted from 'The

Writing Process Questionnaire' developed and validated by Cerrato-Lara et al., 2017; Lonka et al., 2014). The social support scale (Pyhältö et al., 2015, 2017; Vekkaila et al., 2016) was also used, which includes two factors: researcher community (6 items) and supervisory support (5 items). All the items were measured using a 7-point scale (1 = strongly disagree, 7 = fully agree) (see Table 3).

Table 3. Scales and questions from the Doctoral Experience survey used in the study.

Scales and questions	Number of items	Measure and values
Research writing scale	22	Likert scale (1-7)
Social support scale	11	Likert scale (1-7)
Drop-out intentions	1	Yes/no
Research group status	1	Alone/in a group/both
Thesis format	1	Monograph/compilation of articles/ don't know yet
Thesis language	1	English/Others)
Research productivity	2	Numeric value

In addition, drop-out intentions (one item: yes/no), research groups status (alone/in a group/both), thesis format (monograph/compilation of articles/don't know yet), thesis language and research productivity in terms of number of publications in peer-reviewed journals (a) as first author and (b) as a co-author/not first author were also explored. The question about the language of the thesis was different in each country and participants could select among all the official languages in their country, in addition to English as an international language, and 'others'. The diversity of responses was later recoded into English as L1, English as an International Language and other L1 languages (including Spanish, Finnish, Catalan, Swedish, among others).

DATA COLLECTION

Data collection took place during the first half of 2015. A group of researchers in each country contacted the doctoral schools of several universities in Spain ($n = 75$), Finland ($n = 2$), and the UK ($n = 2$). Doctoral school administrators and coordinators of doctoral programs were requested to send out an e-mail to all the doctoral students in their programs inviting them to respond to the *Doctoral Experience* survey. It took 15 to 20 minutes to complete the survey. All the participants received written information about the project and gave their consent to participate according to the research ethics clearance procedures in the respective jurisdictions.

DATA ANALYSIS

We performed a series of Exploratory (EFA) and Confirmatory Factor Analyses (CFA) to determine the factor structure of the writing scale items. At first, EFAs were carried out with Maximum Likelihood extraction and both orthogonal and oblique rotations. The decision about the number of factors to retain was based on both the eigenvalues of the factors and the theoretical salience of the rotated factors. The five-factor solution suggested by the results of EFAs was further confirmed with CFAs conducted using IBM SPSS Amos Version 22. Both maximum likelihood and asymptotically distribution free estimation methods were used. Fit indexes used were Comparative Fit Index (CFI), Goodness of Fit Index (GFI) (good fit considered with values over .95, and acceptable over .90), and Root Mean Square Error of Approximation (RMSEA) values under .05 are good, between .05 and .08 are acceptable and over .10 indicate questionable fit (Byrne, 2010; Kline, 2005; Steiger, 2007).

K-means cluster analysis was used to identify research writing profiles among the doctoral candidates. Cluster solutions with two, three, and four clusters were tested. The three-cluster solution was the most theoretically sound and provided the most homogeneous and distinctive profiles. Differences among the three profiles were explored. Kruskal-Wallis and ANOVA tests were conducted to explore associations between profiles and perceived supervisory and community support. Mann Whitney U and Bonferroni's post hoc tests were performed to explore differences among profiles. The association between profiles and the other variables, namely, age, gender, phase of the doctorate, thesis format, researcher group status, abandonment intentions, and first-author and not first-author publications, was assessed by means of Chi-square tests and adjusted residuals. To reduce the heterogeneity among the participants in relation to their publication experience, the variable was recoded and publication experience of four or more articles was grouped into the same category. We used three articles as a threshold since in Finland, the UK and Spain a minimum of three publications is needed for an article compilation thesis and, therefore, having four or more publications can be considered as high productivity among the doctoral candidates.

RESULTS

Table 4 shows that doctoral candidates in our study held high levels of knowledge transforming perceptions and medium levels of perfectionism. They scored medium-low in productivity, as well as in blocks and procrastination, and they did not see writing as an innate ability. Regarding social support, the perceived support from supervisors was slightly higher ($M = 5.40, SD = 1.51$) than perceived community support ($M = 5.02; SD = 1.32$). 31% of the participants had considered dropping out of their PhD studies.

Table 4. Means and standard deviation of the scales of writing perceptions

Writing factors	Mean	Std. Deviation
Blocks & Procrastination	3.53	1.19
Perfectionism	4.11	1.39
Innate Ability	2.06	1.25
Knowledge transforming	6.03	0.89
Productivity	3.78	1.27

As for publication experience, most of the sample had no publications, especially as co-author (66.7%) (see Table 5). Experience as co-authors was lower than as first authors in regard to all the levels, except for the highest, four articles or more.

Table 5. Publication experience as first author and co-authors of the participants

Num of publications	As first authors	As co-authors
No publications	780 (55.8%)	932 (66.7%)
1 article	241 (17.3%)	160 (11.5%)
2 articles	164 (11.7%)	110 (7.9%)
3 articles	87 (6.2%)	59 (4.2%)

WRITING SCALE STRUCTURE AND WRITING PROFILES AMONG DOCTORAL CANDIDATES

Table 6. Factors and items of the writing scale resulting from the exploratory factor analysis

Academic writing factors	Items
Blocks & procrastination (alpha = .827)	I start writing only if it is absolutely necessary.
	I find it easier to express myself in other ways than writing.
	I hate writing.
	My previous writing experiences are mostly negative.
	I often postpone writing tasks until the last moment.
	Without deadlines, I would not produce anything.
	I sometimes get completely stuck if I have to produce texts.
	I find it difficult to start writing.
Perfectionism (alpha = .627)	I find it difficult to write, because I am too critical.
	I find it difficult to hand over my texts because they never seem complete.
	I could revise my texts endlessly.
Innate ability (alpha = .770)	The skill of writing is something we are born with; it is not possible for all of us to learn it.
	Writing is a skill which cannot be taught.
Knowledge transforming (alpha = .658)	Writing is a creative activity.
	Writing often means new creating new ideas and ways of expressing oneself.
	Writing develops thinking.
Productivity (alpha = .771)	I write regularly regardless of the mood I am in.
	I produce a large number of finished texts.
	I am a regular and productive writer.
	I write whenever I have the chance.

The EFAs performed with the Writing scale variables suggested that five factors (Blocks & procrastination, Perfectionism, Innate ability, Knowledge transforming, and Productivity), explaining 44.04% of the variance, should be retained (see Table 6). Blocks and Procrastination were two different factors in the original scale, but the results of the EFA suggested one common factor should be retained. Although they can be conceptualized as two different perceptions, blocks and procrastination can be two sides of one common problem, in that procrastination behaviors might be a form of early blocks or ways for writers to avoid struggles. Moreover, two items (“I only write when the situation is peaceful enough” and “Writing is difficult because the ideas seem stupid”), initially included in the Blocks and Perfectionism factors, were excluded from the analysis based on their eigenvalues. They also presented some theoretical problems: the need for a peaceful atmosphere could be related to issues other than blocks, for instance, perhaps doctoral candidates are often forced to work in

noisy and crowded places and therefore feel they need a peaceful situation to write. Moreover, saying one's own ideas seem stupid was initially in the perfectionism factor, but it could also be interpreted as an expression of writers' self-efficacy and self-esteem, which is not an aspect included in the survey. Previous studies have also found these two items to behave differently than expected (Cerrato-Lara et al., 2017). The remaining factors (Perfectionism, Innate ability, Knowledge transforming, and Productivity) had the same structure as in the original Doctoral Experience survey (Castelló et al., 2018; Pyhältö et al., 2017).

This result was further supported by the results of the testing of a 5-factor Confirmatory Factor Analysis model (CFI = .916, GFI = .936, RMSEA = .061). Figure 1 shows the factorial model of the writing scale resulted from the CFA. Following CFA, we calculated the means of each subscale to be used as composite variables in K-means cluster analysis.

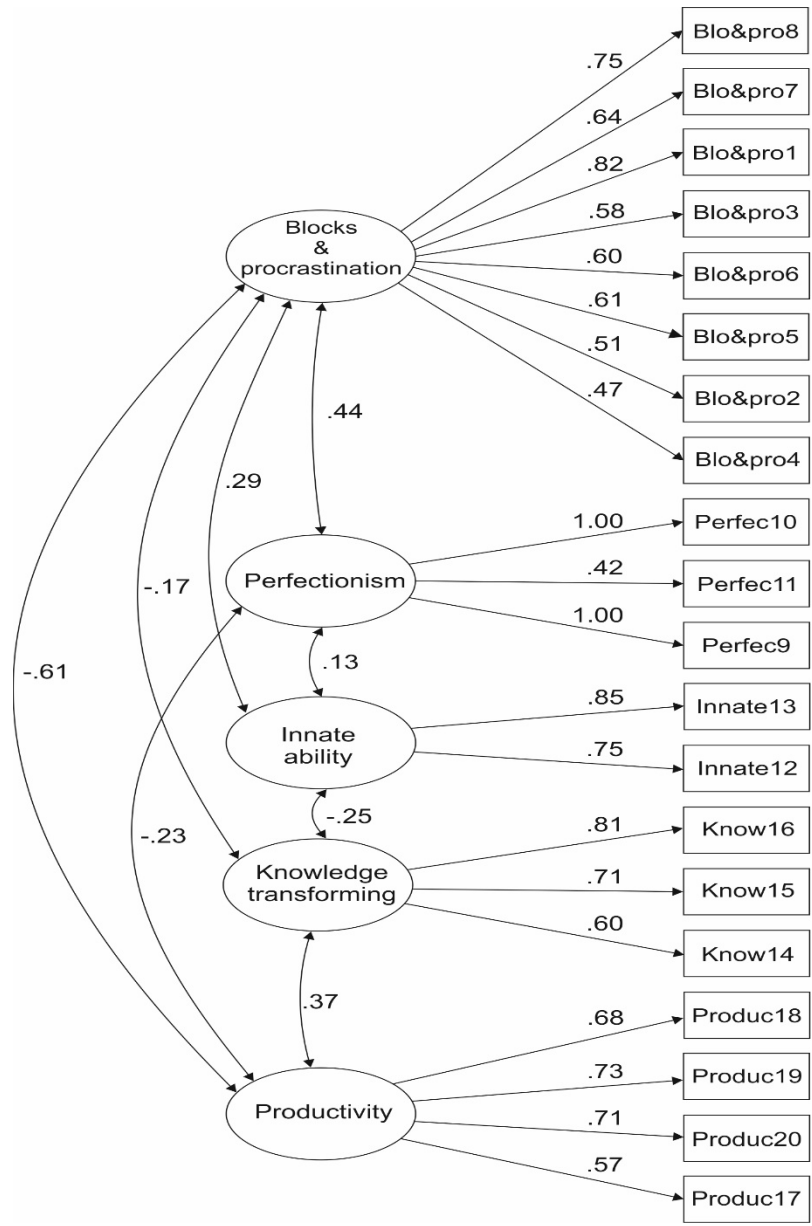


Figure 1. Five-factor model of the writing scale.

Three distinctive research writing profiles were detected (see Figure 2). The first cluster culled from our analysis was Struggler profile. This was the most common profile (37.6%) ($n = 547$) among the doctoral candidates. Doctoral candidates employing the Struggler profile showed high levels of perfectionism, suffered from blocks and procrastination, but at the same time reported average levels of productivity. They were also most likely to perceive writing as innate ability compared to other profiles.

The second profile was Reduced productivity representing 34.8% ($n = 506$) of the doctoral candidates in the sample. The Reduced productivity holders showed average levels of blocks, procrastination and perfectionism and combined with slightly reduced levels of productivity. Compared to other profiles Reduced productivity holders least often perceived writing as an innate ability.

The third cluster culled from our analysis was the Productive profile. It was the least common profile among the doctoral candidates, representing 27.5% ($n = 400$) of our sample. The doctoral candidates displaying this profile reported high levels of productivity, perceived writing as knowledge transformation, reported the lowest levels of perfectionism, and did not suffer from blocks and procrastination.

Differences between the writing profiles entertained by women and men were detected. Women were more likely to employ struggler profile (68.8%), while men were more likely to belong in the productive profile (41.7%) ($\chi^2(2) = 8.926, p < .05$). Productive writers were also more likely to be older (28.1% of them were between 40 and 49 years old, and 59.5% were younger than 40), whereas Reduced productivity profile holders were more likely to be younger than 40 (72.3%) ($\chi^2(6) = 22.084, p = .001$).

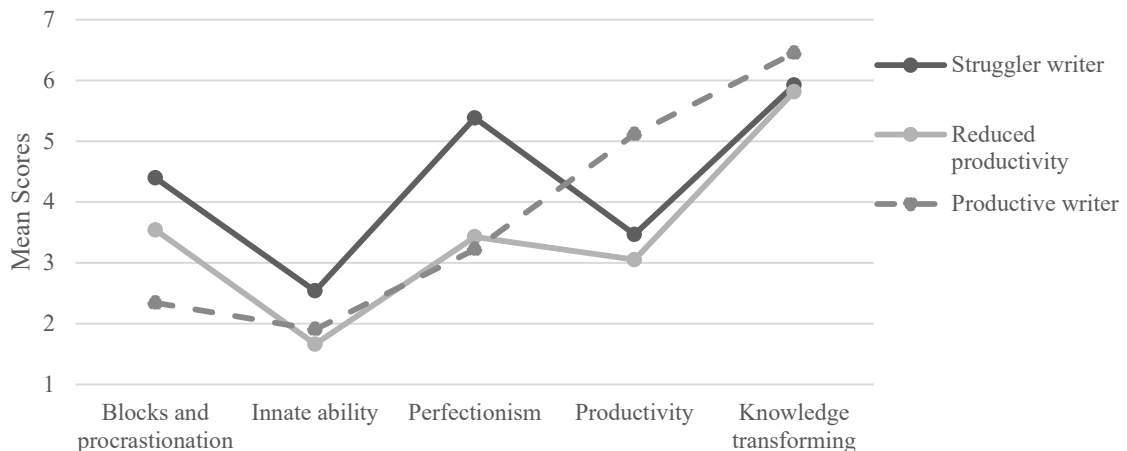


Figure 2. Doctoral candidates' research writing profiles

VARIATION AMONG PROFILES IN RELATION TO RESEARCH CONDITIONS AND EXPERIENCE

The productive profile holders were more likely to conduct a monograph (62.8%) dissertation whereas those doctoral candidates employing a Reduced productivity profile were more likely to not yet know the format of their thesis (18.8%) than struggler (13.3%) and productive profile holders (13.4%) ($\chi^2(4) = 10.256, p < .05$). Although not significant ($p = .067$), doctoral candidates in the Reduced productivity profile were slightly more likely to be part-time candidates (57.6%) than Pro-

ductive (51.5%) and Struggler profiles (50.6%). There were no differences among profiles regarding the phase of the doctorate ($p = .694$).

Further investigation showed that Reduced productivity profile holders reported the lowest number of publications as first authors: 60.4% of these doctoral candidates had no publications yet, and only 22.5% had more than one paper as first authors (see Table 7) ($\chi^2(8) = 26.996, p < .001$). On the contrary, Productive writers had the highest number of papers published as first authors: only 50.9% of them had not yet published as first authors, and 13.7% had four or more papers published. Productive writers also had more experience as co-authors than the other profile holders did ($\chi^2(8) = 15.546, p < .05$).

Regarding the language of the thesis, we did not find significant differences among the profiles based on whether they wrote their thesis in English as an L1, in English as an L2, or in a different L1 (mostly Spanish and Finnish) ($p = 0.91$).

Finally, doctoral candidates in the Struggler profile were most likely to have considered dropping out of their studies (38.9%) than Reduced productivity (30.9%), and Productive profile (20.5%) ($\chi^2(2) = 33.939, p < .001$).

Table 7. Publication experience as first-authors and co-authors in peer-reviewed journals of participants in the three writing profiles

Num of publications		Publications as first-authors			Publications as co-authors		
		Struggler	Reduced productivity	Productive	Struggler	Reduced productivity	Productive
No publications	Count	290	290	200	351	329	252
	%	55,3%	60,4%	50,9%	67,0%	68,5%	64,1%
	z		2,5	-2,3			
1 article	Count	93	82	66	60	62	38
	%	17,7%	17,1%	16,8%	11,5%	12,9%	9,7%
	Z						
2 articles	Count	76	41	47	44	37	29
	%	14,5%	8,5%	12,0%	8,4%	7,7%	7,4%
	z	2,5	-2,7				
3 articles	Count	27	34	26	23	18	18
	%	5,2%	7,1%	6,6%	4,4%	3,8%	4,6%
	z						
4+ articles	Count	38	33	54	46	34	56
	%	7,3%	6,9%	13,7%	8,8%	7,1%	14,2%
	z		-2,0	3,9		-2,4	3,6

Note: only significant adjusted standardized residuals are retained ($z < -1.9; z > 1.9$).

VARIATION AMONG PROFILES REGARDING THE SOCIAL AND CONTEXTUAL DIMENSIONS

As displayed in Table 8, doctoral candidates' profiles were also different in regards to the perceived support from the supervisor ($\chi^2(2) = 33.547, p < .001$) and the researcher community ($F(2, 1417) = 10.760, p < .001$). Productive profile reported greater support from the supervisor than doctoral candidates in the Struggler ($U = 81,575.5, p < .001$) and Reduced productivity profile ($U = 82,164.5, p < .001$), while the former profile also reported higher levels of supervisory support than doctoral candidates in the Struggler profile ($U = 122,399, p < .05$). Doctoral candidates with Productive profile also experienced more researcher community than their counter partners with Strugglers and Reduced productivity profiles.

No statistically significant differences were detected in writing profiles held by Spanish, Finnish and the UK doctoral candidates, nor by candidates conducting their dissertations on their own, in the research group or both alone and in the group.

Table 8. Profiles' perceived social support means, standard deviations and post-hoc comparisons

Factors	Struggler	Reduced productivity	Productive	Post-hoc tests
Supervisor support	5,20 (1,56)	5,38 (1,50)	5,72 (1,40)	Prod > Strug** > RedProd*
Community support	4,86 (1,36)	5,00 (1,30)	5,27 (1,28)	Prod > Strug**, RedProd**

* $p < .05$, ** $p < .01$

DISCUSSION

The aim of this study was to explore individual doctoral candidates' research writing perceptions across three countries and how these perceptions relate individuals' research conditions and social support. Our analysis revealed three profiles in relation to participants' writing perceptions slightly different from those of postdoc researchers (Castelló et al., 2017). Although they were quite balanced in number, the most common profile was that of Struggler writers, which might not be surprising since doctoral candidates are novice writers in their research communities and learning about research writing is a long, complex, and challenging process (Aitchison et al, 2012; Kamler & Thomson, 2006). These doctoral candidates held less transformative writing perceptions and experienced more problems when writing than candidates in the other two profiles. Despite these problems, their levels of productivity were medium, which indicates that they managed to overcome their writing problems to a certain extent and survive in a high demanding publishing scenario (Cotterall, 2011; Li, 2006). The second most common profile was Productive writers, similar to that found in previous studies among post-doc researchers (Castelló et al., 2017). These participants held transformative writing perceptions and experienced fewer problems when writing. Moreover, they had more publication experience. Finally, the less common profile was Reduced productivity writers. It was an unexpected profile in that these participants held transformative writing perceptions and experienced fewer problems in writing than Struggler writers. Nevertheless, they were the least productive among the three profiles, both in relation to their perceptions and the reported number of publications. These doctoral candidates were also more likely to not have decided the format of their dissertation. The low productivity of these doctoral candidates, despite their adaptive perceptions, could be due to the fact that they did not have many opportunities, or they did not write often (Lee & Kamler, 2008; Paré, 2017), but instead, they focused on other research-related tasks, such as data collection and analysis. Further studies should be conducted to explore the reasons behind the low productivity of those doctoral candidates who hold adaptive perceptions of research writing.

In general, the results show that participants in the three profiles held relatively high transformative perceptions of writing: innate ability perceptions were below the medium point even for struggler

writers, and the three profiles showed high levels of writing as a knowledge transforming tool, as some previous studies also have shown (Castelló et al., 2017, 2018; Lonka et al., 2014). However, all doctoral candidates in our study also experienced blocks and procrastination to a certain extent. Although differences among the profiles were significant (ranging from low to medium-high levels), these results confirm that even productive and adaptive writers struggle with writing to some extent (Aitchison et al., 2012; Bazerman, 2009; Kamler & Thomson, 2006). In contrast, perfectionism levels showed a different pattern. Perfectionism seemed to be the most salient problem experienced by struggler writers and even productive writers reported medium levels of perfectionism, which suggest that these perceptions might not be as maladaptive as those of blocks and procrastination. While high levels of perfectionism may relate to unreasonable expectations and standards regarding one's own writing (Caffarella & Barnett, 2000; Lonka et al., 2014), medium levels may be desirable to succeed in a highly demanding and competitive context such as the academia (Kearns et al., 2008).

Results also showed that productive writers experienced the highest levels of social support, both from the supervisor and the research community. In turn, they also had more publications in collaboration with other researchers. Previous studies found similar results in regard to post-doc researchers (Castelló et al., 2017). These findings point at writing as a social activity, with social support acting as a resource for the development of more transformative and facilitating perceptions of writing. Socialization of doctoral candidates into the written practices and genres of the research community by means of close collaboration with other researchers is thus crucial for their development as researchers (Caffarella and Barnett, 2000; Lee & Kamler, 2008; Paré, 2017; Prior, 2006). Moreover, the nature of the relationship between adaptive research writing perceptions and effective participation could be bidirectional, since adaptive research writing perceptions may act as facilitators of a positive experience and successful interactions in the research community (Castelló et al., 2013; Cotterall, 2011). The greater likelihood of struggler writers of dropping out of the doctorate also seems to suggest a protecting function of transformative research writing perceptions.

Our results also indicated that having a research group had no relationship with doctoral candidates' writing profile, which suggests that research groups may not have been acting as socializing agents and that working in a group does not necessarily mean feeling appreciated and supported by them. Thus, promoting adaptive research writing perceptions is not only a matter of having the opportunity to interact with other researchers but also of the quality of these interactions and explicit and specific writing support (Cotterall, 2011; Kamler & Thomson, 2006; Starke-Meyerring, 2011). Despite its potential facilitator function, doctoral candidates in our study seemed to have few opportunities to publish, especially in collaboration with other researchers: more than half of the overall participants had no experience as first authors in peer-review journals, and two-thirds had no experience as co-authors. This implies that collaboration with other researchers (or participation in projects other than their thesis) is not so frequent (Cotterall, 2011; Sala-Bubaré & Castelló, 2017), at least regarding joint publications. The fact that candidates still perceived medium-high levels of support might indicate low awareness of the potential ways in which this collaboration can be instantiated or a lack of interest in this type of collaboration with the community (Gopaul, 2015).

On the other hand, the language in which they wrote their thesis had no relationship with doctoral candidates' research writing perceptions profiles. Although we acknowledge there are differences in the writing process and challenges among writers of different languages and L1 and L2 writers (Flowerdew, 2000; Ivanič & Camps, 2002), our results suggest, as Hyland (2016) argued, that other factors are responsible for doctoral candidates' perceptions about academic writing and their writing processes, such as the doctoral candidates' identity as researcher and author, awareness and knowledge about the genre and the expected audience (Castelló et al., 2013; Cotterall, 2011; Paré, 2017; Starke-Meyerring, 2011). Moreover, these profiles seemed to be also independent of the national context, since no differences among the three countries were identified. Thus, the profiles identified in this study can be to some extent generalized across those European countries. Further studies should verify the scope and persistence of this generalization.

This study has some limitations. We cannot claim this sample to be representative of all the doctoral candidates in the three countries because participation in the study was voluntary and especially in the case of the UK doctoral candidates since these participants were underrepresented compared to Spanish and Finnish participants. The cross-national comparison was a first attempt to assess differences among doctoral candidates' research writing perceptions in the three countries included in the study. However, further analysis should be conducted in order to explore similarities and differences in the way doctoral candidates approach and perceive research writing in relation to their national context. Moreover, the development of research writing perceptions is a complex process that might be affected by many and diverse factors, some of which might not have been taken into account in this study. Further research could expand the scope to explore the influence of other factors, such as engagement, interest in research and critical incidents. The field could also benefit from longitudinal studies that explore changes in doctoral candidates' research writing perceptions along the doctoral trajectory.

The study has also some implications for doctoral education. Supervisors and doctoral schools need to be aware of difficulties involved in writing at the doctoral level and plan support and assistance for all candidates, not only for those writing in a second language. Resources to support candidates' writing should also challenge and transform their perceptions of research writing in order to promote the development of transformative perceptions that facilitate learning and productivity. Research teams are also suggested to reflect their role on doctoral candidates' development as researchers and research writers and on the writing support and opportunities they offer them. Finally, doctoral candidates need to actively seek collaboration with researchers outside the supervisory relationship. Institutions and supervisors should promote candidates' agency and provide support and structures to facilitate such collaborations.

CONCLUSIONS

This study examined individual variation in doctoral candidates' research writing perceptions across three countries and the relationship between these perceptions and individuals' research conditions and social support. Three distinctive research writing perceptions profiles were identified, namely, Struggler writers, Productive writers, and Reduced productivity writers, in order of prevalence. The profiles were different in terms of experienced social support, number of publications, format of the thesis, and drop-out intentions.

Results point at writing as a social activity that is facilitated by doctoral candidates' relationships with other researchers. Research teams were expected to be among the influencing social factors, but no differences were identified among candidates in this regard, which suggests they are not acting as socialization agents for doctoral candidates, at least in relation to the development of transformative research writing perceptions. Moreover, there were no differences among L1 and L2 writers and among countries in participants' research writing perceptions profiles. These results imply that other transversal factors, such as doctoral candidates' researcher identity and genre knowledge, can better explain the variation in research writing perceptions.

Doctoral candidates would benefit from institutional and supervisor support in developing transformative research writing perceptions and in collaborating with researchers other than the supervisors. The need to rethink and strengthen the role of research teams in doctoral candidates' writing development is also suggested.

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