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Motivation for PhD studies: Scale development and validation☆

David Litalien [a,*], Frédéric Guay [b], Alexandre J.S. Morin [a]

[a] Australian Catholic University, Australia
[b] Université Laval, Canada

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ABSTRACT

In Canada and the United States, doctoral attrition rates are estimated to vary from 40% to 60%. Motivation has been proposed as a determinant of doctoral degree completion. The purpose of this study was to develop and validate a scale based on self-determination theory, to assess five types of regulation (intrinsic, integrated, identified, introjected, and external) toward PhD studies. Based on two samples (N = 244, N = 1060), this study involved five steps: (1) item development, (2) factor validation, (3) reliability assessment, (4) convergent and discriminant validity assessment, and (5) measurement invariance testing. Findings from both samples were similar, supporting a five-factor first-order structure and a two-factor higher-order structure, scale reliability, and convergent and discriminant validity as shown by correlations among motivation subscales and correlations between each subscale and various outcomes. Additionally, complete measurement invariance was supported across gender, citizenship status, program type, age, and program progression.

1. Introduction

In OECD (Organization for Economic Cooperation and Development) countries, the number of doctoral degrees awarded grew by 40% in only eight years (from 140,000 in 1998 to 200,000 in 2006; Auriol, 2010). Even in Canada and the United States, where a lower increase had been expected, enrollment in doctoral programs rose by 57% and 64%, respectively, between 1998 and 2010 (OECD, 2013). This growing interest in doctoral studies is partly explained by perceived individual benefits, such as higher income, wider employment opportunities, better working conditions, and increased professional and personal mobility (Auriol, 2010; HRSDC, 2006, Statistics Canada and HRSDC, 2009). Moreover, through their research, they produce and disseminate knowledge, develop innovations, and facilitate social and economic development (AUCC, 2009; Bloom, Hartley, & Rosovsky, 2006; Wendler et al., 2012). However, despite the intensified enrollment and associated benefits, doctoral attrition rates, which fluctuate widely across programs, remain high in North America, estimated at 40% to 50% (MERS, 2013; Nettles & Millett, 2006). Even among rigorously selected students receiving prestigious fellowships, dropout rates can be as high as 25% (Wendler et al., 2010).

Although some students may quit school for practical reasons (e.g., attractive job opportunities, family issues), the consequences for others, as well as universities and society, are unfortunate. Students who dropout find fewer employment opportunities, and their self-esteem can be negatively affected (Lovitts, 2001; Statistics Canada and HRSDC, 2003). Moreover, the substantial time and energy they invested in their studies could have been directed to other areas of their personal and professional lives. For universities, doctoral attrition reduces resources while incurring costs for faculty members having invested considerable time in research projects that will remain incomplete. For society, non-completion of doctoral studies results in lower productivity and competitiveness compared to other countries (Wendler et al., 2010, 2012).

Regardless of the education level, motivation has become a central concept in the understanding of academic persistence and achievement (Pintrich, 2003) and could be particularly important in helping PhD students achieve their goals. Compared to other education levels, doctoral studies are conducted in less structured environments, demand greater independence, involve heavier workloads (e.g., conducting research, publishing results), and encompass more complex tasks. Furthermore, PhD students must invest a considerable amount of time in their studies.

In previous studies, motivation has been proposed as a key construct to explain why some students successfully complete their PhD studies while others do not (see Bair & Haworth, 2005 and Reamer, 1990, for a review; Ivankova & Stick, 2007; Lovitts, 2001). Both in surveys and interviews, students commonly report motivation (or lack thereof) as a reason for leaving or persisting in their program. Most studies

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* Corresponding author at: 25A Barker Road, Locked Bag 2002, Strathfield, NSW 2135, Australia.
E-mail address: David.Litalien@acu.edu.au (D. Litalien).

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interested in doctoral students' motivation are qualitative (e.g., Austin, 2002; Cardona, 2013; Jablonski, 2001; Kärner, Kukemelk, & Herdlein, 2005; O'Meara, Knudsen, & Jones, 2013; see also Bair & Haworth, 2005; Reamer, 1990, for a review) and underscore the relevance of this construct to persistence and success. Diverse motives have emerged from these studies (e.g., intrinsic versus extrinsic reasons, Cardona, 2013; Ivankova & Stick, 2007; personal and professional reasons, Hoskins & Goldberg, 2005; unwillingness to experience failure, Clewell, 1987; commitment, O'Meara et al., 2013), suggesting that motivation to pursue PhD studies is multifaceted. Although insightful, qualitative studies are based on small samples and on a specific discipline or population (e.g., African–American; King & Chepyator-Thomson, 1996), thereby limiting the generalizability of the findings.

Some quantitative studies have also looked at doctoral students' motivation. Unfortunately, most of these studies have neglected to consider the multidimensionality of this construct. It has thus been conceptualized as a single dimension, assessed with a self-report scale (e.g., self-motivation, Ivankova & Stick, 2007), a single item embedded in a list of potential reasons for noncompleters' departures (Lovitts, 2001), or a single item asking students to evaluate their level of motivation compared to their peers (Pauley, Cunningham, & Toth, 1999). As an exception, Anderson and Swazey (1998) asked 2,000 students to assess the importance of various reasons for undertaking doctoral studies. Several reasons were endorsed, such as the desire to gain knowledge in a specific field, conduct research, teach in higher education, and get a well-paying job.

Despite these efforts, the assessment of motivation for PhD studies has rarely been based on a valid theoretical framework. According to Cardona (2013), the development of appropriate conceptual frameworks for understanding motivation at this academic level has been hindered by the complexity of this multifaceted construct and the assumption that students' experiences at this level are specific to their academic discipline. We believe that, in order to gain deeper insight into students' reasons for pursuing a doctoral degree, further research needs to adopt a multidimensional perspective based on a well-established theoretical framework.

One motivation theory that has demonstrated its value and validity in the context of education is self-determination theory (SDT; Ryan & Deci, 2009). A key proposition of SDT is that more internalized regulations (i.e., the person fully endorses the behavior) produce more positive outcomes than less internalized forms of regulations (i.e., the behavior is performed due to internal pressures or external reasons). This perspective has been well supported in primary, secondary and college students (see Guay, Ratelle, & Chanal, 2008), and appears to be well-suited for understanding motivation and persistence in doctoral students as well. Although the distinction between more or less internalized types of regulation has rarely been applied to graduate students, previous studies have found interesting results (see Ahmed & Bruinsma, 2006; Losier, 1994), to which we devote more attention below. However, these studies also included weaknesses. The goal of this study was therefore to develop and validate an SDT-based scale to assess motivation for PhD studies, called the Motivation for PhD Studies scale (MPhD).

1.1. Self-determination theory

SDT proposes that various types of motivation regulate human behavior (Deci & Ryan, 1985, 2012). Intrinsic regulation refers to performing an activity for its own sake, for interest and enjoyment. In contrast, extrinsic motivation refers to engaging in an activity as a means to an end that is separate from the activity itself (Deci & Ryan, 2012). To better account for the motivational process, Deci and Ryan (1985, 2012) suggested that extrinsic motivation consists of four types of regulation that reflect various levels of self-determination. From low to high self-determination, these are external regulation, introjected regulation, identified regulation, and integrated regulation (Deci & Ryan, 1985, 2012). External regulation occurs when an individual adopts a behavior to obtain a reward or to avoid punishment. Introjected regulation occurs when the individual is driven by internal pressure either to pursue self-aggrandizement and contingent self-worth or to avoid guilt and shame. When behaviors are more internalized, accepted and valued, as in identified regulation, individuals consider their behaviors to be important in themselves. Integrated regulation is the most autonomous form of regulation, occurring when behaviors are congruent with the personal goals, values and needs that constitute the self. Whereas identified and integrated regulations underlie a greater sense of autonomy, they remain extrinsic, as the desired outcome remains separable from the activity itself.

According to SDT, these five types of regulation can be situated along an autonomy continuum encompassing, in order, intrinsic, integrated, identified, introjected and external forms of regulation, where intrinsic regulation is the most autonomous type of motivation and external regulation, the least autonomous (Deci & Ryan, 1985, 2012). Because these regulations are aligned on a continuum, they are expected to show a simplex correlation pattern, with stronger positive correlations between adjacent forms of regulation than among more distal forms. For example, intrinsic and integrated regulations should be positively correlated, whereas intrinsic regulation should be more weakly (and potentially negatively) correlated with external regulation.

In line with this continuum, SDT distinguishes two broader categories of motivation: autonomous (including intrinsic, integrated and identified regulations) and controlled (including external and introjected regulations). Autonomous motivation appears to be associated with positive outcomes, such as intention to persist (Black & Deci, 2000; Vallerand, Fortier, & Guay, 1997), performance in course-related activities (Boiché, Sarrazin, Grouzet, Pelletier, & Chanal, 2008), and subjective well-being (Litalien, Lüdtke, Parker, & Trautwein, 2013), whereas controlled motivation appears to be associated with negative outcomes, such as rote learning (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004), anxiety (Ryan & Connell, 1989) and lower positive affect (Gillet, Lafrenière, Vallerand, Huart, & Fouquereau, 2014).

1.2. Assessing motivation for PhD studies from an SDT perspective

In the past 30 years, various scales have been developed to assess the different types of regulation proposed by SDT across a wide variety of contexts (e.g., sports, education, and work; Deci & Ryan, 2000). However, few SDT-based studies have assessed motivation in doctoral students. To our knowledge, only Ahmed and Bruinsma (2006) and Losier (1994) have investigated motivation in doctoral and master's students from the SDT perspective. However, they used a slightly adapted version of the Academic Motivation Scale (AMS; Vallerand, Blais, Brière, & Pelletier, 1989; Vallerand et al., 1992), which was developed mainly for high school and college students. Only minor changes were made to the wording (e.g., "high school" was replaced by "graduate studies"), and no questions were added to address students' doctoral dissertations, research skills development, or advisors, all of which are considered key components of doctoral programs. Moreover, these modified versions were never empirically validated. Changes made to the AMS and other instruments to measure doctoral motivation could result in limited explanatory or predictive value, because the items may have little relevance to doctoral studies and could lead to ambiguity about what is being measured (e.g., highly different interpretations of items).

Furthermore, the AMS was originally designed for younger students, and does not include items to assess integrated regulation, which occurs in a more advanced stage of psychological development when the person's identity has been formed (Ratelle, Guay, Vallerand, Larose, & Senécal, 2007). This type of regulation could be particularly relevant for graduate students, who usually have to juggle a number of roles (e.g., worker, spouse, and parent) that might interfere with their studies. Students who fully integrate their behaviors might be more likely