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Gaining insight into doctoral persistence: Development and validation of Doctorate-related Need Support and Need Satisfaction short scales



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ABSTRACT

Based on self-determination theory, a few studies have identified competence satisfaction as a major determinant of doctoral persistence. However, these studies did not use scales validated in the domain of doctoral studies, and failed to include all dimensions of the target constructs of need support and need satisfaction, or used a composite score of need support. To address these limitations, we conducted two studies (total $N = 1458$) aimed at developing and validating short, self-report scales of Doctorate-related Need Support and Need Satisfaction (D-N2S). The scales exhibited satisfactory psychometric properties of reliability as well as construct, criterion-related, known-groups, predictive, and face kinds of validity. All but one dimension (i.e., relatedness satisfaction) was positively related to doctoral persistence intentions and all but two dimensions (i.e., autonomy support and relatedness satisfaction) were negatively related to actual dropout. As expected, doctoral students in social sciences and humanities reported higher levels of autonomy support and autonomy satisfaction but lower levels of relatedness satisfaction than doctoral students in sciences and technology or health sciences. Representing another important contribution of our research, results further suggest that dimensions of need support (or satisfaction) should not be combined into a general measure of support (or satisfaction).

1. Introduction

In recent years there has been a dramatic expansion in the enrolment of doctoral students. However, approximately 50% of these students fail to complete their doctorate (Golde, 2000). In order to understand the causes of this high attrition rate, research on doctoral persistence has mainly focused on three sets of factors: Characteristics of doctoral students, characteristics of supervisors or features of doctoral programs, and features of the supervisory process (for a review, see Bair & Haworth, 2004). The general conclusion is that the phenomenon is complex and "there is no one reason why doctoral students leave" (Gardner, 2010, p. 62). However, a robust finding is the association between doctorate completion and both the quantity and quality of contact between the student and her or his supervisor(s) (Bair & Haworth, 2004).

1.1. Features of the supervisory process

Dealing with a high level of requirements, many doctoral students doubt their abilities and consider quitting when they believe they lack the necessary skills to succeed as researchers (Golde, 2000). They thus

expect to receive constructive feedback from their supervisor(s) and progress more when it is given (Ives & Rowley, 2005). Doctoral students are, in particular, required to build independent thinking while simultaneously managing long-term deadlines (Lovitts, 2005). Hence, striking a balance between guidance and autonomy is a key element of successful supervision (Overall, Dean, & Peterson, 2011). Doctoral studies also involve the integration of students in a lab and/or program, and scientific community (Gardner, 2010). In this regard, evidence suggests that doctoral students are more likely to persist if they develop a meaningful and collegial relationship with their supervisor(s), faculty or other doctoral students, and engage in social and scientific activities related to their doctoral programs (Tinto, 1975).

However insightful, the literature on doctoral persistence has been criticized because it lacks a comprehensive theory, thereby preventing the coherent accumulation of knowledge (Bair & Haworth, 2004). A promising framework to conceptualize and investigate the relationships between supervisors' support and doctoral students' self-perceptions, on the one hand, and doctorate completion, on the other hand, is self-determination theory (SDT; Deci & Ryan, 1985, 2000), and its offshoot, basic needs theory (BNT; Ryan & Deci, 2002).

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1.2. Self-determination theory

A macro-theory of human motivation, SDT sets out with the fundamental assumption that individuals are active organisms with inherent tendencies toward self-actualization (Deci & Ryan, 1985, 2000). However, to account for the frequently observed cases of apathy or alienation, these inherent tendencies are regarded as potentialities requiring specific conditions to become reality. Specifically, the fulfillment of individuals' potential involves the satisfaction of three basic psychological needs: competence, autonomy, and relatedness. These are considered to be essential for the initiation and orientation of human activity. The need for competence refers to individuals' feelings of efficiency and mastery. The need for autonomy refers to individuals' feelings of volition and free will. The need for relatedness refers to individuals' feelings of connection and closeness with others (see also Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010).

According to SDT, need satisfaction - i.e., the perception that one is acting with a sense of autonomy, competence, and relatedness - motivates individuals to engage in an activity. Specifically, individuals are expected to be intrinsically motivated (i.e., doing something because it is inherently interesting or enjoyable), when they: a) can freely choose to pursue an activity (autonomy), b) master the activity (competence), and c) feel connected and supported by people who are important to them (relatedness). Furthermore, they are expected to be more engaged in an activity when intrinsically motivated (for a review, see Deci, Vallerand, Pelletier, & Ryan, 1991).

A mini-theory, namely BNT, was later developed to account for the role played by the social context in the satisfaction of the three basic needs (Ryan & Deci, 2002). A central tenet of BNT is that the availability of involvement, autonomy support, and structure within the social context contributes to the satisfaction of the three basic needs. The extent to which these processes occur is known as 'need support'. Need support can be operationalized either in terms of individuals' perceptions, or in terms of concrete behaviors. Prior research has distinguished several behaviors or components within each dimension of need support (for a review, see Stroet, Opdenakker, & Minnaert, 2013). Involvement, which is associated with the need for relatedness, includes showing affection, expressing attunement, dedicating resources (e.g., time), and being dependable. Autonomy support, which is associated with the need for autonomy, includes providing choice as opposed to attempting to control the student's work, appreciating the student's point of view, and promoting curiosity-based explorations. Structure, which is associated with the need for competence, includes presenting clear instructions, offering guidance, communicating positive expectations, and providing constructive feedback (see also Hospel & Galand, 2016).

According to BNT, the three dimensions of support are essential triggers of (intrinsic) motivation, engagement in an activity, and eventually persistence. As such, people will tend to persist in an activity and stay in contexts that support their need satisfaction. These predictions have been substantiated in different domains, including health, psychotherapy or education (for reviews, see Deci & Ryan, 2008; Stroet et al., 2013). In sum, SDT adopts a dialectical approach whereby differences in motivation, achievement, and well-being are considered to be the product of the interaction between individuals' inherent tendencies and patterns of social relationships that support or frustrate these tendencies.

1.3. The present research

SDT may be a useful framework for gaining insight into doctoral persistence and to investigate the motivational potential of supervisory processes. Indeed, the three dimensions of need support and the three dimensions of need satisfaction postulated by the theory correspond fairly well to the challenges mentioned earlier in relation to the experiences of doctoral students. SDT thus allows the integration of these

previous findings in a single, coherent framework in a domain where empirical investigations have been mostly atheoretical. Moreover, contrary to SDT, the few theoretical frameworks (e.g., the interactionist model of student attrition; Tinto, 1993) that have been applied to doctoral studies do not give motivation a central role despite the fact that motivation has been proposed as a key explanatory variable in studies on doctoral persistence (e.g., Litalien & Guay, 2015).

Finally, although still few in number, studies on Doctorate-related Need Support and Need Satisfaction have yielded encouraging results. Losier (1994) presented longitudinal data consistent with the view that the provision of autonomy support and involvement predict future persistence intentions through the satisfaction of SDT's three basic needs. Litalien and Guay (2015) showed that doctoral students who perceived their social context to be more supportive of their needs expressed lower levels of dropout intentions: such a context strengthened their intrinsic motivation toward doctoral studies, which in turn satisfied their need for competence.

However, this body of research is limited in several respects. First, some dimensions of need support or need satisfaction have been omitted. Losier (1994) did not include structure and his measure of involvement referred to sources of support other than the supervisor. Litalien and Guay (2015) included neither autonomy satisfaction, nor relatedness satisfaction, and they used a composite score of need support. While identifying competence satisfaction as a major determinant of doctoral persistence, previous research may have overlooked the (relative) importance of other dimensions of need support or need satisfaction.

Second, the scales used included items that do not seem to measure the intended construct. For instance, to measure autonomy support, Losier (1994) used items like 'My supervisor is concerned about me' (our translation) which seems to tap more into involvement. In a similar vein, the same items were sometimes used to measure different dimensions. For instance, the item 'My supervisor gave me the tools to develop my skills' (our translation) was used to measure autonomy support in Losier (1994), whereas it was used to measure structure in Litalien and Guay (2015).

Although not explicitly guided by SDT, the study by Overall et al. (2011) ought to be mentioned. These scholars used an extended list of items to measure the degree to which doctoral students felt their supervisor(s) provided them with academic, autonomy, and personal support. These dimensions match fairly well with the dimensions of SDT. Overall and her colleagues adapted items from the Learning Climate Questionnaire (Williams & Deci, 1996), which is grounded in SDT, to measure autonomy support and elaborated other items to measure academic and personal support in the domain of doctoral studies. The items were factor analyzed and factor loadings were all > 0.70 (N. Overall, personal communication, October 7, 2013), but factor analyses were carried out for each dimension separately. It is thus impossible to exclude the possibility that some items tap into more than one dimension of supervisor support. This problem is amplified by the fact that inter-correlations between dimensions were large, ranging from 0.63 to 0.87. In Litalien and Guay (2015), inter-correlations between dimensions of support were similarly large, ranging between 0.75 and 0.90. Thus, a third limitation is that the scales used to measure need support or need satisfaction have not been formally validated in the domain of doctoral studies.

Because of the large size of inter-correlations between the different dimensions of need support observed in their studies, Litalien and Guay (2015) decided to compute a general need support score. Thus, they could not assess the extent to which the indirect effects of need support on doctoral persistence through need satisfaction were dimension-specific. This brings us to a fourth and last limitation: To our knowledge, no research has examined the relationships between need support and need satisfaction in a single measurement model.

In order to address the above limitations, we constructed short, self-report scales of Doctorate-related Need Support and Need Satisfaction

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