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EXAMINING THE BASIC PSYCHOLOGICAL NEEDS OF LIBRARY AND INFORMATION SCIENCE DOCTORAL STUDENTS

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ABSTRACT

Aim/Purpose: The purpose of this study was to examine how the basic psychological needs of self-determination theory are reflected in doctoral students' motivation to earn the PhD.

Background: As isolating as the doctoral experience seems, it is one that occurs in a social-cultural environment that can either support or hinder the student. This research highlights the motivational influences of library and information science doctoral students regarding experiences of autonomy, competence, and relatedness.

Methodology: Qualitative data were collected from seven (7) enrolled doctoral students at library and information science programs in the United States and Canada. Transcripts from semi-structured interviews and students' personal admission statements were subjected to deductive content analysis for emphasis on three basic psychological needs: autonomy, competence, and relatedness.

Contribution: Findings illustrate the role faculty play in student motivation and satisfaction with the doctoral experience. There are implications for faculty, mentors, and advisors working with current and former graduate students who may be considering a PhD. The findings have implications for doctoral recruitment, advising, and student services of interest to faculty and administrators across disciplines. It also shows the applicability of self-determination theory in the examination of the doctoral student experience and overall motivation.

Findings: Deductive analysis based on self-determination theory (SDT) demonstrates factors related to self-determination theory's basic psychological needs – autonomy, competence, and relatedness – as relevant to participants' motivation to pursue a doctoral degree and to the examination of doctoral student initial motivation. Doctoral students are motivated by multiple factors including their interactions with and encouragement received from current and former faculty. Students report experiences related to autonomy, competence, and relatedness that energized

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	them to pursue a doctoral degree and that have positively influenced their doctoral experience thus far.
Recommendations for Practitioners	Faculty and program administrators may use this data to inform their understanding of the expectations of today's doctoral students and motivational drivers of prospective students and to tailor support services accordingly.
Recommendations for Researchers	This is a preliminary investigation of doctoral student motivation in relation to the basic psychological needs. More research is needed on a larger sample of students to more fully understand the influence of autonomy, competence, and relatedness on doctoral student initial and ongoing motivation.
Impact on Society	This research is an important step in bridging faculty and student perceptions of what is important to their initial and ongoing enrollment in a doctoral program. By improving students' experiences of autonomy, competence, and relatedness, it may be possible to improve the overall doctoral experience leading to completion of the PhD.
Future Research	Future research will expand to include doctoral students farther along in their doctoral programs, the administration of the Basic Psychological Needs Scale, and may examine faculty perceptions of the three basic psychological needs.
Keywords	basic psychological needs theory, doctoral student motivation, library and information science, self-determination theory

INTRODUCTION

Within the field of library and information science (LIS), research on doctoral education has not focused so much on attrition as it has on research output post-PhD and the direction of the discipline, among other topics. Early research on LIS doctoral education has highlighted program characteristics and time-to-completion. More recent literature has investigated disciplinary trends through the examination of dissertation topics, research interdisciplinarity, mentoring, and collaborations at the doctoral level. Throughout the years, questions have arisen about the future of graduate-level LIS education and professional outcomes because doctoral degree recipients have opted out of faculty positions (Futas & Zipkowitz, 1991; Reeling, 1992; Seavey, 2005; Sugimoto, Russell, & Grant, 2009; White & Momenee, 1978). When doctoral degree recipients opt-out of the academy, administrators rightly grow concerned about faculty supply and who will teach the next generation of undergraduate and graduate students.

The faculty shortage issue has been addressed in other disciplines through mentoring programs (Smith & Zsohar, 2007), the creation of new academic programs (Ganley & Sheets, 2009), and faculty preparation programs (Gerolamo, Overcash, McGovern, Roemer & Bakewell-Sachs, 2014). Before LIS administrators adopt any of these strategies, it makes sense to better understand the issue from multiple vantage points. For instance, to gain insight on the faculty shortage issue in special education, Pion, Smith, and Tyler (2003) investigated factors that lead a doctoral student to choose an academic career. The top influential factor was having the initial goal of pursuing a faculty position at the beginning of one's doctoral study. The researcher believes learning students' initial motivation for earning the degree will offer insight into possible career outcomes, including desire to join the faculty ranks, which may speak to faculty shortage concerns.

To gain a better understanding of how doctoral education has been studied through the years, Jones (2013) conducted a thematic analysis of 995 papers published in 45 journals between 1971 and 2012. Six themes emerged including doctoral program design, the student-supervisor relationship, and writing and research. Motivation or reasons for initiating doctoral study did not emerge as a major or an

abandoned theme, indicating a gap in the literature; motivation did appear as part of an overarching theme on the doctoral student experience.

Many factors have been shown to motivate individuals to earn a doctoral degree, such as to become more knowledgeable of one's chosen field, to enter an academic career, for personal fulfillment, because of encouragement from others, and to pursue an interest in research (Anderson & Swazey, 1998; Barnett, Cropley, Hanton, & Fleming, 2013; Brailsford, 2010). Research also has shown that motivation can positively or negatively impact students' perception of their doctoral experience and their decision to continue with the degree (Mason, 2012). Given the seeming importance of motivation to doctoral student success and the overall experience, it is expected that more research would be conducted on the topic, particularly considering ongoing concerns about attrition and completion rates among doctoral students.

The LIS literature has called for more research on the doctorate (Sugimoto, Li, Russell, Finlay, & Ding, 2011). Studies have examined LIS doctoral education using primary sources such as dissertations and surveys completed by program deans and directors; yet, few studies present the students' perspective to gain insight on the doctoral experience. Lawley (1999) studied factors influencing doctoral student attrition identifying several key factors contributing to one's decision to withdraw including lack of perceived career usefulness, poor advisor-student relationships, and frustration with policies and procedures. Citing concerns about the future of LIS education and recruitment as brought forth by Seavey (2005) and during meetings at conferences of the Association for Library and Information Science Education (ALISE), Brown-Syed, Baker, and Wicks (2008) examined admission criteria, retention efforts, and graduation requirements of LIS doctoral programs. From their online survey completed by 17 program administrators, Brown-Syed et al. (2008) concluded that more research is needed on doctoral students' perceptions of their academic programs to inform recruitment efforts and to learn what will "entice them into academia" (p. 114). Another approach might be to query practitioners or master's students on their interest in pursuing a doctoral degree.

This study sought to address concerns in the literature about faculty shortage and the call for more research on LIS doctoral students by examining students' motivation through the lens of self-determination theory (SDT). Existing literature demonstrates concern for the future of LIS graduate education and questions the motive for pursuing doctoral study, yet no research has explicitly examined motivational influences of this discipline or for this population. Specifically, this research focused on the three basic psychological needs that may be supported or thwarted based on one's social-cultural environment, and thus influence subsequent activities.

LITERATURE REVIEW

DOCTORAL STUDENT MOTIVATION

As demonstrated by Jones (2013), most extant literature has not been centered on doctoral student motivation. Still, there is a growing body of literature examining doctoral students' initial motivation in academic disciplines such as engineering (Baytiyeh & Naja, 2011; Guerin & Ranasinghe, 2010; London, Cox, Ahn, Branch, & Zephirin, 2014; Mokhtar, 2012; Peters & Daly, 2013), education (Jablonski, 2001; Leonard, Becker, & Coate, 2005; Stehlik, 2011; Wellington & Sikes, 2006), and business (Stiber, 2000). Some studies were conducted using online surveys with motivational factors selected a priori by the researcher based on existing literature (Anderson & Swazey, 1998; Stehlik, 2011; Stiber, 2000). Others analyzed data inductively from responses gathered in semi-structured interviews.

Similar emerging themes run through the studies, though researchers apply different labels to the motivational factors identified. For example, career aspirations, development of knowledge about the field, and a desire to create or invent were common motivations reported by engineering students (Baytiyeh & Naja, 2011; Guerin & Ranasinghe, 2010; Mokhtar, 2012; Peters & Daly, 2013). Peters and Daly (2012), through interviews with a small sample, identified three main reasons for practicing

American engineers to return to school for doctoral study, all of which fell under the umbrella of "career". Students entered doctoral programs to facilitate the transition from industry to academia to teach or conduct research, to change specialty within an industrial career, or to advance in their current career path. For one student, possessing a doctoral degree meant more control over research activities (i.e., being able to obtain funding and act as the principal investigator).

While the desire to learn more about one's chosen field and various career-related motivations were commonly reported across multiple disciplines, the desire to create or invent new products was unique to engineering students (Baytiyeh & Naja, 2011; Guerin & Ranasinghe, 2010). In Baytiyeh and Naja's study of practicing engineers (those with at least 5 years of experience) and master's-level students in Lebanon, both populations expressed interest in pursuing a doctoral degree to invent new products, 52% and 55% respectively. One might assume that practicing engineers are already employed in workplace settings that allow for product development, but this apparently is not the case for some. The two populations also were similar in their desire to pursue a Ph.D. to learn more about the field (60% of students and 57% of engineers) and to help others learn (54% of students and 51% of engineers), though it is unclear in what context these students want to help others learn (e.g., industry, academia, or the non-profit sector). Both populations of students could be considered early career, which may explain similarities in motivational factors; professionals entering doctoral study in mid-to-late career are thought to do so for reasons of transition, professional development, and self-fulfillment (Gill & Hoppe, 2009).

Starting a doctoral program is a deeply personal decision. Students are motivated by factors falling along the intrinsic-extrinsic continuum that do not always align with the outcomes presented in doctoral program recruitment materials. Though existing literature shows that individuals initiate doctoral study as preparation for academic careers (Anderson & Swazey, 1998; Gill & Hoppe, 2009; Moreno & Kollanus, 2013) or because of an aim to conduct research (Guerin, Jayatilaka, & Ranasinghe, 2015; Kemp, Molloy, Pajic, & Chapman, 2014; Leonard et al., 2005), another common thread running through much of the research is the motivation to pursue a doctoral degree to satisfy a personal goal.

As the highest degree one can attain, it is understandable that earning a doctorate is a personal dream for many. Ninety percent of American clinical psychology students reported a personal desire to obtain a Ph.D. as the main factor for study (Zimak, Edwards, Johnson, & Suhr, 2011), and many students in an American professional doctoral program in instructional leadership cited a desire to realize a goal or dream as motivation for doctoral study (Jablonski, 2001). The notion of doctoral study as personal fulfillment is not exclusive to the social sciences and education. Individuals in science, technology, engineering, and mathematics (STEM) fields and business also cite personal fulfillment as motivational factors for pursuing doctoral study (Kemp et al., 2014; Mohktar, 2012; Stiber, 2000).

Though there is overlap in motivational factors among academic disciplines, as Golde and Dore (2001) stress, "the nature of doctoral education differs among disciplines", thus discipline-specific research is important "in all matters related to doctoral education …" (p. 41). Discipline-specific research is warranted given the significant differences in individual doctoral programs, academic departments, and career outcomes – differences which may influence motivation (Jablonski, 2001; Moreno & Kollanus, 2013). For instance, as mentioned previously, engineering students were motivated by a desire to invent, which is a rather discipline-specific task. Likewise, a student's motivation may differ based on the doctoral program's structure. Categorizing strength of motivation as strong, moderate, or weak, Moreno and Kollanus (2013) in their study of computer science students in Finland and Austria found that students in structured programs (characterized by formal and competitive admissions processes, structured curriculum, and limited time for completion) exhibited a strong motivation to apply to doctoral study as demonstrated by the students actively researching doctoral programs at multiple universities. By contrast, students in traditional programs (characterized as having a rolling application process, flexible curriculum, and flexible time-to-completion requirements) were more evenly spread among the three strength levels. Additionally, students in structured programs were more extrinsically motivated, seeking the degree for career needs; whereas students in

traditional programs expressed intrinsic motivations for initiating doctoral study. Location and type of program were among the motivational factors given by students in Jablonski's (2001) research. Students were particularly motivated by the cohort-based, no-residency doctoral program designed especially for working professionals.

Even with the variance in factors, what is apparent is the benefit of possessing some type of motivation as an energizing force to progress to completion. Library and information science faculty mentors were interviewed about their relationship with LIS assistant professor faculty members (who had recently experienced the doctoral process), which mirrored that of the faculty member-doctoral student relationship (Sugimoto, 2012). Faculty mentors pointed to motivation as significant to success as well as some level of initiative-taking on the part of the advisee: "a Ph.D. program is a self-selection process…if they aren't motivated enough to make it happen, then maybe that's part of the natural selection process" (Sugimoto, 2012, p. 107). Likewise, they also thought motivation important for future success in academia. Specific motivational factors are not identified; however, staying motivated during doctoral study was the student's responsibility.

Thinking of doctoral student motivation – and by extension overall satisfaction with the doctoral experience – as primarily the responsibility of the student ignores the social and cultural environment in which doctoral study occurs and runs counter to the literature. Individuals enter doctoral study energized by a range of motivating factors – some internal to the student such as for personal achievement, others based on more external factors including encouragement received from influential others. Internal and external factors continue to impact students' motivation throughout the doctoral experience. External factors have been shown to affect students' persistence, motivation, and intent to continue or leave doctoral programs. Volkert, Candela, and Bernacki's (2018) research on nursing doctoral student motivation and stressors identified program and support issues as predictive of students' intention to leave. Increased program issues, especially those related to the student-advisor relationship, increased student stress and intention to leave illustrating the influence of external factors on motivation. For older doctoral students, recognition and value of industry skills and experience was shown to impact self-efficacy and desire to continue studies indicating that motivation and satisfaction are not outside faculty advisors' realm of concern (Robertson, 2017).

Doctoral Education in Library and Information Science

At a meeting of the Board of Education for Librarianship in 1925, Sisler and Coulter championed the need for "more advanced study than that offered in a two-year graduate school" (as cited in Abrera, 1987, p. 39). Sisler and Coulter remarked, "The profession needs instructors to staff the university schools of librarianship, it needs librarians who are scholars to assume the directorship of university libraries, and it needs specialists who can speak with authority in a limited field of knowledge" (p. 39). After this address would follow a 30-year period (1926-1958) of published literature wherein library school administrators debated how to select students competent enough to undertake doctoral research; the need for subject specialization (rather than a Ph.D. in library science) as preparation for work in academic libraries; and the need for a doctoral level of study to give the librarian "not only a scholarly command of his field, but a knowledge of the functional organization and administration of the materials and personnel under his control" (p. 41).

In 1959, Danton published a seminal work that contributed a history of early doctoral programs through an examination of seven areas: 1) dissertations produced by subject and institution, 2) program objectives, 3) major fields of librarianship studied, 4) obstacles faced by institutions in meeting objectives, 5) attrition and time-to-completion, 6) positions currently held by doctoral recipients, and 7) contributions of doctoral studies to the profession. He showed that doctoral programs aimed to impart research and subject mastery experienced high attrition rates likely due to lack of funding and fellowships, students completed programs in approximately six years, and graduates went on to academic careers. Post-Danton studies surveyed doctoral programs and their outcomes.

Marco's (1967) survey of doctoral program deans and directors found few similarities in the programs' admission criteria, curriculum, and graduation requirements. Further, doctoral graduates were found to be employed in two main areas: academic library administration and teaching in library schools, with women more concentrated in teaching positions. Carpenter and Carpenter (1970) studied similar variables to describe socioeconomic characteristics of doctoral students who were found to be mostly middle-aged males from middle class families employed in administrative positions. The Carpenters concluded that there were not enough doctorates for the need, recommending earlier recruitment of candidates and increased funding for students. A similar supply-demand concern was raised by White and Momenee (1978) but in relation to graduate-level faculty.

White and Momenee (1978) called into question one's commitment to a research doctoral degree when, in their research, it became clear that graduates (almost 25%) had little to no interest in conducting research: "one wonders for what reason these individuals sought a research terminal degree" (p. 212). The purpose of a doctoral degree remained an area of concern years later when Futas and Zipkowitz (1991) declared library educators an endangered species. An aging workforce of already second-career professionals, non-competitive salaries for beginning faculty, and an inability to attract replacement candidates rightfully ignited a cause of concern because "if there are not enough library educators in the next decade, there will not be enough librarians in the decade after" (p. 149). Reeling's (1992) examination of LIS doctoral students over a 20-year period (from 1970-1990) found a significant drop in doctoral recipients choosing to teach. Several reasons were identified including low starting salaries, problems with the tenure process, and lack of teaching opportunities during the PhD program. Over a decade later, library educators were still in endangered species status according to Seavey (2005) who surveyed students in an American LIS doctoral program to understand their future plans – only half of students surveyed indicated interest in LIS education.

Sugimoto, Russell, and Grant's (2009) research did not aim to address Seavey's concern, but their review of the LIS doctoral education landscape from 1930-2007 did support his uneasiness about the future of the discipline. Their research revealed that 78% of doctoral graduates were not in faculty positions. Sugimoto et al. (2009) also found a decreasing trend in the percentage of faculty with LIS doctoral degrees. Taken together, this data led Sugimoto et al. (2009) to conclude there is a need for further investigation regarding doctoral student motivation. Was their motivation for pursuing doctoral study something other than preparation for a tenure-track career? A better approach might be to query practitioners or master's students on their interest and motivation in pursuing a doctoral degree.

Few LIS studies have presented the students' perspective to gain insight on the doctoral experience, and little attention has been paid to motivation as it relates to doctoral education. Decades ago, motivation for choice of dissertation topic, along with various other aspects of the doctoral experience, was included on a questionnaire completed by LIS doctoral graduates (Slavens, 1979). Since then motivation has received a cursory mention. For instance, in a study on mentorship faculty spoke of motivation as important to doctoral student success (Sugimoto, 2012). They also presented doctoral student motivation as the sole responsibility of the student with responses such as: "people have to be organized and self-motivated enough to make it through" (p. 107) and "If a student can't figure out [how to succeed] for themselves, isn't motivated enough to figure it out themselves … they're just going to sink" (p. 108). This contradicts student reports of motivational and success factors in the doctoral experience (Mason, 2102). Considering the dearth of information on LIS doctoral student motivation and the disconnect between faculty and student perceptions of contributors to motivation and success, further examination is warranted.

THEORETICAL FRAMEWORK

Self-determination theory (SDT) is a contemporary motivation theory that surmises that "all individuals have natural, innate, and constructive tendencies to develop an ever more elaborated and unified sense of self" (Deci & Ryan, 2002, p. 5). This theory was formulated during a time when motivation

theories were based on experiments with non-human subjects and focused on deficits, for example Hull's drive theory, which suggested that behavior was driven by the need to satisfy physiological needs (e.g., hunger, thirst, sex, and avoidance of pain) (Graham & Weiner, 1996). Broader motivation theories were proposed to account for a wider range of choice-based behaviors, independent of conflict or reinforcement, for which the energy to act was intrinsic to the individual. SDT is also a theory of human development assuming that humans have a propensity to thrive and act in ways that facilitate well-being and expand one's competencies and capacities. These actions may come about through intrinsic or extrinsic means. Behaviors that are intrinsic are inherently interesting wherein the incentive is the "spontaneous feelings of effectance and enjoyment that accompany the behaviors" (Ryan & Deci, 2017, p. 14). Extrinsic behaviors are attributed to a separable outcome such as approval by one's peer or a promotion. Self-determination theory takes a dialectical view that regulation or behavior is impacted by one's social-cultural environment, which can either nurture or impede one's innate growth potential and personal development (Deci & Ryan, 2002). In SDT, humans are viewed as growth-oriented foremost, and malleable such that one's behavior regulation "can be reliably instigated through exposure to different social environments" (Ryan & Deci, 2017, p. 15).

As a meta-theory, SDT is comprised of six mini-theories related to intrinsic and extrinsic motivation, goal contents, and relationship motivation. Relevant to this research is basic psychological needs theory, which posits that individuals possess a basic need for competence (feeling effective), relatedness (feeling connected to others, caring for and being cared for by others, and having a sense of belongingness with individuals and community), and autonomy (acting from interest and being the perceived source of one's own actions) (Deci & Ryan, 2002). Rather than focus on survival through the satisfaction of physiological needs like early motivation theories, SDT focuses on three needs that, working in tandem with one's social-cultural environment and experiences, impact an organism's ability to thrive and achieve well-being. Some tenets of basic psychological needs theory are:

- needs vary from person to person and are universal across cultures and developmental stages;
- all three needs are positively facilitated by autonomy support; and,
- the effects of the need being supported or thwarted are experienced regardless of individuals' value of the need (Ryan & Deci, 2017).

In SDT, autonomy is based on Heider's (1958) and de Charms's (1968) theory of perceived locus of causality and relates to the need to control one's experiences and actions. To be autonomous, one's actions must be self-selected and in alignment with one's interests and values. An individual's perceived support or control of actions impacts one's intrinsic motivation and well-being. In an educational setting, an example of autonomy may be giving students a selection of electives from which to choose to meet degree requirements or doctoral students choosing their dissertation topic rather than following in an advisor's footsteps or research agenda.

Competence refers to one's "need to feel able to operate effectively within [one's] important life contexts" (Ryan & Deci, 2017, p. 11). Deci and Ryan (2002) based their conceptualization of competence on the work of White (1959), who posited there is an innate need to experience feelings of effectance on the environment, and it is effectance motivation that energizes an individual to act (Deci & Ryan, 2002; Ryan & Deci, 2017). Additionally, SDT theorists stress the importance of feeling competence toward activity that is self-governed or autonomous rather than those with outside control; thus, autonomy and competence work together to support intrinsic motivation. Lastly, included in the need for competence is the need to engage in activities that are sufficiently challenging and provide opportunities for growth, such as in a doctoral program.

Relatedness is experienced when one feels socially connected to or cared for by others and feels one is making a significant contribution among others (Ryan & Deci, 2017). Additionally, it is the "basic need to feel responded to, respected, and important to others" (Ryan & Deci, 2017, pg. 96). As with competence, the experience of relatedness must be genuine not superficial, not behaving in a manner

just to feel connected or integrated, which undermines well-being and motivation. Relatedness can be experienced in several ways during one's doctoral experience including when there is a fit between advisor and student or student and department or academic discipline, when faculty take interest students' work even when it differs from one's own, or when there has been positive socialization among students and students are well-integrated into the program.

Self-determination theory has been applied to studies involving health and exercise likely because of its focus on well-being and thriving as related to human development. It also has been applied to research on human resources, the workplace, and even virtual environments. SDT was selected as the theoretical lens for studying doctoral student motivation for several reasons. First, with its focus on realizing one's human capacities and talents, SDT was considered well-suited because human capacity is sometimes realized through educational attainment, and a degree at the doctoral level represents the pinnacle of educational attainment and demonstration of one's capacity for learning. Second, the theory offers a more holistic explication of motivation through its extension of the concept of extrinsic motivation and its consideration of the social-cultural experiences that may impact one's decision to act. Third, Ryan and Deci (2017) stress the universality of SDT and the three basic psychological needs in analyzing behavior.

Further, research on the doctoral student experience, especially that on doctoral student socialization, peer relationships, and attrition and persistence, supported the use of SDT as a theoretical framework for investigating doctoral student motivation. Though the latter stages of doctoral study are admittedly solitary, there exists a social-cultural aspect to doctoral study – in both the decision to pursue the degree and the early years of study – that is illuminated through an examination using self-determination theory. For example, research on peer relationships and mentoring within doctoral programs confirm the importance of paying attention to the social-cultural aspects of the doctoral experience. Peer mentor relationships serve as academic and emotional support for students while also supporting students' socialization and exchange of information and ideas as demonstrated in a study on LIS doctoral students (Lee, Anderson, & Burnett, 2017). For these reasons, self-determination theory was deemed an appropriate and fruitful theoretical framework through which to examine doctoral student motivation.

Application of Self-Determination Theory in Doctoral Education

This study adds to this emerging body of literature on SDT and doctoral education. An early study using self-determination with a population beyond undergraduates was Hegarty (2010) who used SDT and the Academic Motivation Scale (Vallerand et al., 1992) – based on SDT – to examine motivation types of graduate education and business students similar in age to doctoral students. Since then, the theory has been used to examine doctoral student attrition and completion rates and entering student motivation (Beck, 2016; Cardona, 2013; Kemp et al., 2014; McCarthy 2016; Rockinson-Szapkiw, Spaulding, Swezey, & Wicks, 2014). Using elements of self-determination theory (cognitive evaluation theory and organismic integration theory), Kemp et al. (2014) investigated the motivational orientation of doctoral students in the biomedical sciences. Analyzing interview transcripts within the SDT framework led to the identification of three motivational orientations present in the biomedical students – instrumental, benevolent interest, and innate interest – corresponding to categories on the intrinsic-extrinsic continuum of self-determination theory: introjected regulation, integrated and identified regulation, and intrinsic regulation, respectively.

Applying different elements of SDT, Mason (2012) investigated students' motivation to continue doctoral studies. Rather than study motivation from an intrinsic versus extrinsic perspective, Mason – using a sample of 125 students enrolled in information technology, arts and science, business, education, botany, religion, and organizational and behavioral science programs – focused on the three basic psychological needs such as in the present study. Results supported Mason's hypothesis that autonomy, competence, and relatedness are positively related to students' motivation to continue with

their education. Though Mason's study focused on students' motivation to continue, the basic psychological needs could also influence a student's decision-making progress. For example, a student's perception of a doctoral program as autonomy-supporting and one that fosters relatedness may influence the decision to apply to one program over another. More recently, self-determination theory was the theoretical framework applied to a study of doctoral students' motivation for selecting a research topic (Mosyjowski, Daly, & Peters, 2017), and Lynch, Salikhova, and Salikhova (2018) examined internal motivation for scholarly activities and academic coursework relative to satisfaction of the basic psychological needs in the university environment.

METHOD AND DATA ANALYSIS

CONTEXT

This study was guided by the research question:

> *In what way is basic psychological needs theory of self-determination theory reflected in LIS doctoral student initial motivation?*

This research received ethics approval by the Queensland University of Technology Human Ethics Committee as part of the researcher's doctoral dissertation. Other ethical practices included using participant numbers instead of names to protect the anonymity of participants when sharing findings and removing potentially identifying information from transcripts and any published reports of the study.

Miles and Huberman (1994) stressed the importance of bounding samples to set parameters on whom to include in a study and under what conditions given the means and time constraints of the study. This study was bounded in its selection of first-year LIS doctoral students in the United States and Canada. North American LIS doctoral programs are similar in degree requirements and milestones, i.e., coursework, comprehensive or qualifying examination, dissertation proposal and writing, and dissertation defense. Another bounding feature in this study was the use of ALISE data. ALISE – the Association for Library and Information Science Education – is a well-regarded professional association for the study and advancement of LIS education. ALISE regularly publishes a statistical report detailing the status of library and information science education including data on admissions, enrollment, and faculty makeup, among other data points. Doctoral programs included in the study were selected based on their inclusion in the 2015 ALISE Statistical Report (Albertson, Spetka, & Snow, 2015).

PARTICIPANTS

The research reported here is the qualitative phase of a sequential mixed methods study wherein participants first completed a quantitative survey – the Academic Motivation Scale – before moving to the second qualitative phase described here. Initial recruitment for the overall study occurred via emails sent to LIS program directors and other administrators with knowledge of and access to first-year doctoral students. Eligible participants from the earlier quantitative phase were emailed a request to participate in the qualitative phase; these students had indicated on the survey a willingness to participate in the interviews.

Seven doctoral students participated in semi-structured interviews. Six doctoral programs in the U.S. and Canada were represented in the sample; two participants were enrolled at the same institution. Participants represented a range of research interests including the information needs of emerging youth, social media and identity, and alternative methods of record-keeping. Most participants had earned graduate degrees in library and information science in addition to humanities and art history. The time between entrance to a doctoral program and completion of the most recent degree was 1 to 18 years, with most students entering the PhD program immediately following completion of a master's degree. Participant demographics are represented in Table 1.

Table 1. Participant demographics

Participant	Gender	Age	Ethnicity	Country of Study
P1	F	25-34	Asian	U.S.
P2	F	25-34	Caucasian	U.S.
P3	F	35-44	Caucasian	U.S.
P4	F	45-54	African-American	U.S.
P5	F	25-34	Asian	Canada
P6	M	25-34	Caucasian	Canada
P7	GQ*	25-34	Caucasian	Canada

*One student identified as genderqueer and has been referred to using singular "they" in this article.

Canadian participants were enrolled in two different programs in southern Ontario universities ranked in the top 10 for universities offering medical or doctoral degrees according to Maclean's (2016), a Canadian newsmagazine known for ranking universities. Additionally, the universities were among the U15 Group of Canadian Research Universities, a collective of research-intensive universities (U15.ca/about-us, n.d., para 1). American participants were enrolled in Research 1 universities in the Mid-Atlantic, South Atlantic, and East North Central regions of the United States (Carnegie Classification of Institutions in Higher Education, 2017).

Data Collection

Those who responded affirmatively to the interview request were sent an interview consent form and a request to submit a copy of the personal admission statement they submitted during the admissions application process. A requirement of many doctoral programs is for applicants to submit a personal admission statement in addition to test scores, transcripts, and letters of reference as part of the admission package. In the personal admission statement applicants are called upon to discuss their career goals, research interests, educational and work background in relation to the chosen research area, and reason for applying to the doctoral program. The personal admission statements were collected from participants with the expectation they would provide additional insight into participants' motivational influences for enrolling in a doctoral program. Of course, the usefulness of the personal admission statement to inform the research questions depended on the writing prompts posed on the admissions application, which vary from institution to institution. Details contained in the statements were expected to enrich or corroborate data obtained in interviews, and the researcher acknowledges that data from the statements might have diverged from interview data. Personal admission statements have not been used as a source for information regarding doctoral student motivation, thus making a methodological contribution to existing literature.

Upon receipt of the consent form and personal admission statement, interviews were scheduled at a mutually agreeable time and format – either via phone or Skype. Semi-structured interviews were conducted with the convenience sample of 7 participants. The interviews explored reasons for earning the doctoral degree with questions such as, "Why do you want to earn a doctoral degree?" and "Tell me about your decision to earn a degree in library and information science." Participants also

responded to a question about their current doctoral experience, "How would you describe your doctoral experience been thus far?", which elicited responses highlighting aspects of the doctoral experience important to students' satisfaction with their program.

Data Analysis

All participants consented to being audio-recorded. The longest interview lasted 74 minutes; the shortest was 29 minutes. The interviews were recorded using a digital voice recorder; the voice memo feature of a smartphone was used as a secondary recording method. The researcher transcribed the interview files manually verbatim, which allowed me to become familiar with the data and begin the data analysis process (Brinkmann & Kvale, 2015). Microsoft Media Player and Microsoft Word were used during the transcription process.

Following transcription, transcripts were cleaned, which included correcting grammar and spelling, numbering the lines of the transcript, and applying a header with page number and attribute codes. Attribute codes represented descriptive participant information and served to jog my memory of the participant; attribute codes also aided in categorizing participants (Saldaña, 2016). Disfluent speech (e.g., pauses, partial words, and restarts) of myself and participants were not corrected to maintain the authenticity of the transcription (Rosenfelder, Fruehwald, Evanini, & Jiahong, 2011). Cleaning the transcripts also involved anonymization of sensitive information, such as name of the institution, to conceal the identity of respondents. Interview transcripts were then manually coded for data analysis.

Deductive content analysis, based on the basic psychological needs theory (BPNT) of self-determination theory, was conducted to identify ways in which theory applied to the motivation of LIS doctoral students. No standardized procedure exists for conducting a qualitative content analysis. This research utilized a combination of content analysis and coding techniques based on analytic approaches put forth by Elo and Kyngäs (2007), Zhang and Wildemuth (2009), Hsieh and Shannon (2005), Merriam and Tisdell (2015), and Saldaña (2016). The data analysis processes presented by these authors encouraged systematic inductive and/or deductive analysis, which suited the aims of this study.

Coding began inductively with printed copies of the transcript and personal admission statements and a composition book wherein the researcher recorded the assigned code, the location in the text represented by the code, and a memo and/or reflection about the textual data. First cycle coding was conducted in an open coding manner most often associated with grounded theory (Corbin & Strauss, 2015). Four types of coding methods were used in the first cycle of open coding selected from 33 coding techniques described by Saldaña (2016). Specifically, holistic, process, in vivo, and descriptive coding were used. These generic methods were recommended for first cycle coding when it is known that more refined and deliberate decisions would be made in subsequent coding cycles. Holistic coding paired well with the overall lumper coding process employed. Holistic coding also supported my intent of using the first cycle to get grounded in the data. Process coding uses gerunds to capture action described in the textual data, appropriate here as the act of deciding to earn a doctoral degree may have involved actions such as talking with advisors or visiting institutions that then motivated an individual to pursue the degree. In vivo coding uses the participants' own words as the code. A key purpose of the current study was to add to the literature through the student perspective, thus the importance of using in vivo codes to document the participant's viewpoint.

With these four coding methods in mind, coding proceeded in a lumper coding fashion, an efficient coding method that looks at data in chunks rather than line by line or sentence by sentence as with splitter coding (Saldaña, 2016). Coding began inductively seeking to address the study's ultimate research question: "What factors motivate individuals to earn a doctoral degree?" The researcher aimed to select codes that were salient and essence-capturing of segments of data that were relevant and responsive to the research questions. Simultaneously, the researcher coded deductively based on self-

determination theory asking the question of each code, "What basic need is expressed here?", a question that helped me review the data and codes deductively based on the three basic psychological needs of SDT (i.e., competence, autonomy, and relatedness) to address the research question presented here.

An intermediate cycle of coding and analysis occurred during the transfer of data from the manually-created codebook to a word-processed document. During this transfer, codes were reexamined, revised, and sometimes combined to create an overarching code. For example, as coding progressed from transcript to transcript, the initial code "Why PhD" became an overarching code with sub-codes or second-level codes specifying the various reasons participants gave for earning a doctoral degree. In this manner, the written codes were not merely transcribed from the codebook to the computer; rather the codes were reviewed for their applicability to the representative chunk of data and revised as necessary. The process of constant comparison continued through the codebook of written codes asking of the data, "Does this code adequately label the text?" and "Does this text convey the basic psychological need?" Throughout the coding process, the researcher engaged in reflective memo-writing, which, like constant comparison, is characteristic of grounded theory research. The final task of data analysis was to aggregate codes based on patterns, similar content, and the basic psychological needs of self-determination theory.

LIMITATIONS

The objective of this research was to examine LIS doctoral student motivation through the lens of self-determination theory. The aim of inquiry was not to generalize to wider populations or to present a definitive reality but rather to present initial, exploratory insights as a point of reference for further research, and to start a dialogue regarding a little studied phenomenon in the LIS discipline. This research is limited in its generalizability due to the small convenience sample size (n=7). First-year doctoral students face many challenges – acclimation to the doctoral experience and culture, navigating relationships with cohort members and faculty, and juggling school, family and possibly work obligations; it was understandable that students did not choose to participate due to time constraints. Recruitment was further impacted by the lack of current student information available on doctoral program websites. Information, specifically contact information for students, was inconsistent from program to program making it especially challenging to recruit students directly; thus, a reliance on program administrators to forward recruitment information to applicable students.

Steps were taken to identify and recruit participants beyond the initial recruitment announcement to program administrators. The researcher used the Wayback Machine, a digital archive of the internet that captures pictures of web pages and makes the images available online, to compare the current student directory with that of the previous year to ascertain students' year in the doctoral program. Upon determining that a student was likely a first-year doctoral student, contact was made directly via email (if an email address was available) with a request to participate. This approach was somewhat fruitful; however, this approach also resulted in contacting students who were beyond their first year of study.

Qualitative studies have been criticized for their subjective nature. Critics point to bias on the part of the researcher, which may influence interpretation of results and overall methodological choices. However, even quantitative studies have an element of bias as they may be based on the researcher's own curiosity or interest that led to the phenomenon under study. The researcher endeavored to reduce bias by writing self-reflective notes on personal assumptions that may have shaped the direction and interpretation of this research.

RESULTS

Self-determination theory focuses on a core set of needs believed to be optimal for all human functioning across stages of development. These needs – for autonomy, competence, and relatedness –

are "essential for growth, integrity, and well-being" and "must be satisfied for psychological interest, development, and wellness to be sustained" (Ryan & Deci, 2017, p. 10). SDT further surmises that whether an individual finds value in the need, its satisfaction or thwarting has an impact on one's functioning. The following sections discuss findings from the interviews and personal admission statements in relation to the three basic psychological needs.

Autonomy

Perceived autonomy support has been positively associated with graduate student satisfaction and motivation. In the present study, fulfillment of the need for autonomy was experienced among the participants through the encouragement they received from others concerning their decision to earn a doctoral degree and their choice of research topic. For instance, P1 when discussing her research interest was referred to scholars studying the same topic with whom she might work and institutions that might be a good fit for her area of interest. She encountered autonomy-supportive feedback such as, "I don't know how you're going to do it, but I find that fascinating also" (P1, personal communication, December 8, 2016). Another participant recounted receiving support for his research topic: "One of the professors, actually, when I told them this idea, they were particularly interested in working on it with me" (P6, personal communication, December 21, 2016). Such feedback from scholars in the discipline seemed to weigh positively on participants' decision to earn a PhD and affirmed their choice of research topic.

Continued autonomy-supportive experiences after starting the doctoral program may have impacted participants' satisfaction with their programs thus far, a finding documented in the literature. Doctoral students in various disciplines including business, education, and botany, felt more motivated to continue their studies when they felt freedom to pursue their research interest (Mason, 2012). Conversely, lack of support particularly for one's choice of research topic coupled with lack of choice of faculty advisor can make for a less satisfying doctoral experience (Golde, 2000). Like 65% of students in Golde and Dore's study (2001), P2 initially selected an advisor based on a match of intellectual interests. Unfortunately, P2 experienced a last-minute change in faculty advisor from one who was the main appeal for selecting the institution to another faculty member less interested in her research topic, leaving her to feel like "nobody here is particularly interested in what I want to do" (P2, personal communication, December 12, 2016). She remains at the institution despite feeling unsupported in her dissertation topic.

All participants in the current study entered doctoral study with a fairly defined research agenda based on previous academic and research experience, identification of gaps in the literature, or personal interest. One participant reported that her initial research topic was reshaped after conversations with faculty advisors. P3's initial interest was in a sensitive topic from the young adult perspective, but the decision was made to focus on the same population from a less controversial lens:

> The more I spoke with professors about studying that, particularly young adults, it can be kind of a testy subject. And there was a fear that I might not be able to do the research that I need to do. So, I've actually shifted my focus. (P3, personal communication, December 13, 2016)

A concession, yes, but still within the participant's general area of interest in young and/or emerging adults allowing her to still feel a degree of autonomy as surmised from her hopeful tone during the interview:

> So, yeah, it's a big jump … the emerging adult is going to be an easier group to study … because you don't need to get parental consent anymore, um, and I can really ask them the types of things that I want to ask them without the fear of offending anyone or you know, talking about any subject that's touchy. (P3, personal communication, December 13, 2016)

Experiencing autonomy of research topic selection may vary by academic discipline; students in the sciences are known for working in their faculty advisor's lab and taking on a related research project or a project attached to a funding source (Mosyjowski et al., 2017). Had P3 not been afforded some degree of autonomy, she may have been less interested in continuing with the doctoral program. This was the case in Devos et al.'s (2016) research for a doctoral student who increasingly lost motivation because he was not interested in the research topic suggested by his advisor. Further, had P3's primary motivation been based on research-related factors, this change in research topic may have thwarted her intrinsic motivation for the degree altogether.

Competence

The need for competence is satisfied, in part, by positive feedback. Task-oriented feedback occurs without an external source of feedback, that is, the feedback is built into the task, such as completing a crossword puzzle. After acceptance and matriculation, progressing through the program and meeting milestones such as qualifying exams and IRB approval likely serve as positive task-oriented feedback of one's competence toward doctoral work. Other-mediated feedback is commonly experienced in education settings when one receives feedback from professors (Ryan & Deci, 2017). In both forms, positive feedback enhances intrinsic motivation.

Participants experienced positive, other-mediated feedback prior to applying to doctoral programs during discussions with former faculty and academic advisors who encouraged them to apply for the PhD. P4 reflected on the significance of being remembered by former professors when seeking letters of recommendation, which she regarded as speaking favorably to her intellectual ability: "They remembered who I was. And, it was mainly of course, through my academic work in their class. … That point is important because it just shows that academically I could do the work" (P4, personal communication, December 16, 2016). P4's need for competence was also experienced through task-oriented feedback as experienced by her progressive attainment of higher education. She became more confident of her academic abilities as she moved from bachelor's to master's, thus supporting her motivation to continue to a doctoral degree. Even with experiences that positively supported her need for competence and receiving affirming task- and other-mediated feedback, P4 admitted having feelings of imposter syndrome when comparing herself to classmates. Were these common imposter feelings coupled with negative experiences related to her competence, her intrinsic motivation for earning the doctoral degree may have been thwarted.

Another participant recalled the positive feedback they received during their master's program, which supported the need for competence when considering doctoral study: "She had written some very supportive comments about—…she felt I was a strong writer, she felt I could easily carry out research" (P7, personal communication, December 21, 2016). For some participants, other-mediated feedback came in the form of a simple comment like, "Oh, you'll be teaching this class someday" (P3, personal communication, December 13, 2016). Successfully completing a master's degree and receiving support from faculty served as positive feedback of participants' competence motivating them to apply to doctoral programs.

Relatedness

Relatedness was the most prominent of all basic psychological needs reflected by participants. Though little has been written from the perspective of basic psychological needs theory, much has been said about the student-advisor relationship and doctoral student socialization and their impact on student satisfaction, persistence, motivation, and time-to-completion that points to the importance of relatedness in the doctoral experience (Devos et al., 2016; Golde, 2000; Pyhältö, Vekkaila, & Keskinen, 2012). For instance, doctoral students in a variety of disciplines who experienced relatedness with their advisors felt more motivated to continue their studies and were more satisfied with their programs (Mason, 2012). Additionally, the cohort model has been shown to positively influence persistence and increase relatedness among students and faculty (Beachboard, Beachboard,

Li, & Adkison, 2011; Lake, Koper, Balayan, & Lynch, 2018). This was confirmed by P7 who went from a large master's program to a doctoral program where there were four other students in P7's cohort: "I get to know them really well; the professors know us well. … It's a really cool experience to be able to, like, get involved and, like, be that knowledgeable about the rest of my cohort in a different way" (Personal communication, December 21, 2016).

Participants in this study had experienced at least one semester of doctoral study, thus the acclimation and socialization to doctoral education was underway, and they were starting to have experiences that supported or hindered relatedness. Relatedness was evident in one participant's personal admission statement when it came to selecting a doctoral program. P3 wrote, "[Institution] has accepted me with open arms. … I cannot think of another institution where I have felt more at ease and no student or faculty population that I could hope to influence and be influenced by" (Personal admission statement, n.d.). This student's previous experience with the department left her with a feeling of relatedness that influenced her decision to continue studies in the doctoral program. P1 also was enrolled at an institution she previously had attended and had experienced relatedness; however, this was not addressed in her personal admission statement.

Relatedness manifested in participants as being cared for both prior to entering the doctoral program, which seemed to positively impact the motivation to enroll, and during doctoral study, which has played a role in reported satisfaction thus far with their doctoral experience. Prior to applying to doctoral programs, P1 experienced being cared for when after expressing interest in research and doctoral studies a mentor referred her the information sciences discipline and others suggested possible doctoral programs. Along the way she encountered people who took interest in her research and the contribution she was making to the discipline. Receiving feedback from "accomplished academics who said, 'Wow, this is fascinating research'" bolstered her motivation for earning the degree. She further felt welcomed by scholars and doctoral students at conferences when during conversations she encountered others assuming she was a PhD student based on her work – also fulfilling the need for competence.

Similarly, prior to applying, P4 experienced feeling cared for when others shared their experiences of making it through doctoral studies. She received advice on sticking to her research agenda, selecting faculty for the dissertation committee, and navigating doctoral studies as a woman of color. Experiences of relatedness have continued for P4 in her doctoral program through her interactions with faculty, whom she described as wanting students to succeed (e.g., suggesting resources and research methods), but not pushing them through the program. She stated, "They're always available for you. It's not an atmosphere where, um, you're on your own type of thing." Additionally, she actively sought relatedness by surrounding herself with "very supportive people".

It was a feeling of relatedness that motivated P5 to apply to the information studies program at her institution. She experienced a lack of community in her former discipline due in part to environmental factors, namely the layout of the department. In the information studies department she found an environment that fostered experiences of relatedness, which seemed to have positively impacted her overall doctoral student experience: "It's just the way it's built. The faculty of information has its own building. So, the entire structure is just people studying in information so already that is—creates a sense of community" (P5, personal communication, December 19, 2016). The structure further facilitated relatedness among the students as she went on to say:

> We have shared office spaces … we see each other quite frequently. … I can go to any of them with questions … each of them are all at different stages of their PhD, of course. So, if I have a question about, um, qualifying exams I can just go to that third-year student, you know, and they'll be happy to answer my questions. … I didn't get the sense that that existed in my [other] department.

According to the Ryan and Deci (2017), the basic psychological needs are universal irrespective of gender, socioeconomic status, culture, and beliefs. Further, the value one places on the basic psycho-

logical need does not preclude the individual experiencing satisfaction or frustration of the need. Unlike other participants who appeared to value being cared for by and connected to others, these types of interactions did not seem to appeal to P6 who described himself as "not good with social situations". It is possible that the type of interactions associated with relatedness did not appeal to him regardless of the value he placed on the basic psychological need.

The doctoral experience, for some, is one of isolation such that lack of relatedness hinders progress to completion. Like autonomy, the absence of relatedness negatively impacts the doctoral experience. Lack of interaction with advisors had a demotivating effect for Chinese international students according to Zhou (2014). As mentioned earlier, P2 experienced a lack of autonomy in her selection of a dissertation topic due to a change in faculty advisor. This change also led her to feel the effects of an absence of relatedness as suggested by her comment: "It has been challenging not having really any common ground with anybody here" (Personal communication, December 12, 2016), demonstrating the interrelatedness of the three basic psychological needs are interrelated as depicted in Figure 1.

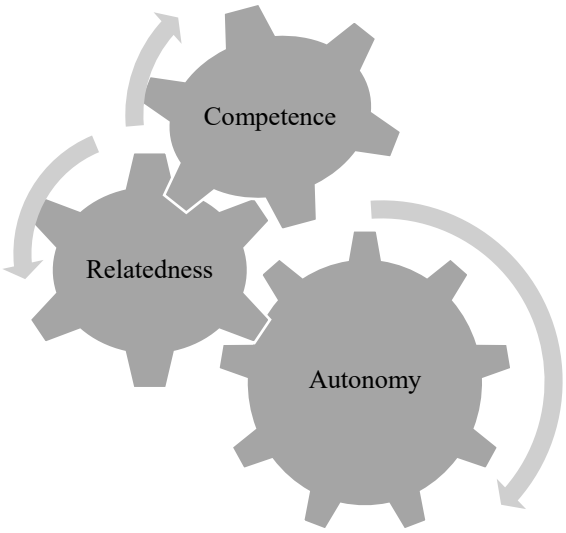

Figure 1. Interrelatedness of the three basic psychological needs

The three basic psychological needs positively influence each other and work together as depicted by the gears image here. Autonomy figures prominently in self-determination theory; thus, its larger appearance. Lack of autonomy influences relatedness in that students who feel less autonomous in turn feel less connected to their faculty advisor and less cared for by the program as experienced by P2.

DISCUSSION

In this article, the researcher has used qualitative data sets of 7 library and information science doctoral students to examine their initial motivations for doctoral study. Specifically, my goal has been to describe how self-determination theory's three basic psychological needs (autonomy, competence, and relatedness) were reflected in their initial motivations for earning a PhD to highlight how autonomy, competence, and relatedness can be used to frame discussions on doctoral studies. While the researcher does not make claims to the generalizability of the findings, this research presents new insights on the doctoral student perspective of value to LIS academic deans, faculty, prospective students, and professional associations, and the wider doctoral education community. The basic psychological needs have previously been used to examine doctoral students' motivation to continue with PhD studies.

For participants in this study, competence-, autonomy-, or relatedness-affirming interactions as a prospective doctoral student positively motivated them to follow through with their interest in earning a PhD. Even little encouraging words along an individual's educational path seemed to support their basic psychological needs and energize them to pursue the degree. For this reason, it may be inferred that autonomy-, competence-, and relatedness-supportive experiences should be incorporated into interactions with graduate students, even when it is unclear that a student is interested in doctoral study. Interactions between prospective student and current doctoral student were as motivating as those between prospective student and faculty, helping prospective students see themselves as part of the academic community.

Experience of autonomy-support also occurs in the recruitment and application process when a prospective student learns whether what they want to study will be supported at their target institution. During initial conversations with doctoral programs, prospective students learn if there is flexibility – if they have a choice in their research topic or if they must work on a faculty member's project. Participants in the present study described more autonomy than expected; their desired topic of study was outlined in the personal admission statements, and during the interviews they had kept to their initial topic thus far.

Further, as demonstrated by this study's participants, the experiences encountered in one's environment as a doctoral student impact overall satisfaction throughout their doctoral program. Participants who reported positive experiences with their program thus far attributed their satisfaction to collaborative cohort experiences and faculty who expressed care for their academic progress and understanding of the coursework. Recognition and affirmation of academic abilities positively influence students' self-efficacy and belief in their academic fit particularly for first-year doctoral students (Rogers-Shaw & Carr-Chellman, 2018). Likewise, a participant in the present study expressed less satisfaction with her program because her advisor did not fully understand or accept her proposed research topic, which led to the student to feel less related to her advisor. An example of the connection between experiencing support of basic needs and satisfaction with the doctoral experience was seen in Zhou's (2014) research on persistence motivation in Chinese international students. Though students shared research interests with their faculty advisor, meeting some of the need for relatedness, students still expressed dissatisfaction with their overall experience due to the limited support and feedback from advisors – autonomy-supportive behaviors – which left them feeling less productive. Thus, faculty satisfaction of psychological needs is just as important to students farther along in their doctoral work when there is an expectation for more one-on-one collaboration with faculty. Within-university support of competence, autonomy, and relatedness was similarly found to bolster doctoral students' internal motivation toward scholarly activities (Lynch et al., 2018). Unfortunately, faculty and administrators may see this as a time for students to demonstrate competence as an independent researcher, requiring less guidance and interaction. Autonomy-supportive instructors are responsive, flexible, and encouraging of students' intrinsic motivation (Deci & Ryan, 2002) throughout students' academic career.

Faculty are recommended to offer substantive, regular feedback on students' work beyond the grade, support development of new skills, provide choices for how students can demonstrate competence, and balance affirmation with critique. These behaviors support students' feeling of competence. Faculty and advisors would do well to offer positive feedback regarding students' competence and their choice of research areas, even for those who have not expressed interest in doctoral work because, as shown in the present study, some participants were uninformed about doctoral education until it was mentioned by faculty. Baard (2002) identified ways in which supervisors in an organizational setting could support competence – most of which can be applied to the doctoral education setting. These include training, preparing, and supporting subordinates; agreeing on achievable goals; providing optimal challenges; and allowing feedback to occur regularly. Previous research indicates that similar competence-supportive activities lead to increased satisfaction and persistence among doctoral students (Pyhältö et al., 2012). This was evident in the present study with regard to partici-

pants' previous academic experiences – positive experiences with progressively more challenging academic work – which energized them to pursue the doctorate.

Regarding relatedness, program administrators can use findings from this study in recruitment efforts. Programs should be intentional about the faculty and current students who are selected for recruitment activities, involving women, people of color, persons with disabilities, and others with whom prospective students might experience a connection that may positively impact intrinsic motivation for earning the PhD. Further, programs are encouraged to include in their rubric for matching students with advisors, consideration of the students' basic psychological needs and pair with faculty accordingly. This may involve making matches after one or more semesters and could be undertaken in conjunction with the administration of Basic Psychological Needs Satisfaction Scale (Deci & Ryan, 2000; Gagné, 2003). As Baard (2002) writes, "experiencing mutual reliance and respect is at the heart of the relatedness need. It is about feeling connected, sharing a mutual goal, and being in a relationship for the long haul" (p. 266). Such mutual reliance is possible in a doctoral setting provided faculty and others buy into the importance of relatedness factors and commit to their practice.

Literature shows that faculty place the onus of doctoral student success and motivation squarely on the student (Gardner, 2009; Sugimoto, 2012). It is no secret that some faculty put doctoral students through the paces, making an already challenging experience even more so. However, when examining doctoral student motivation and experiences through the lens of self-determination theory we see that the social and cultural environment – including relationships with cohort members and faculty – supports or hinders motivation and overall satisfaction. The findings of this study contradict faculty statements in the literature that present the doctoral experience as an exercise in natural selection and self-reliance.

This study focused on a small group of doctoral students in library and information science. Future research should investigate a larger sample of LIS students as well as students farther along in their doctoral studies. To facilitate comparison and broader application of the findings, an examination of self-determination theory and doctoral students in other disciplines is needed. Lastly, additional research should examine doctoral students using the Basic Psychological Needs survey to develop a better understanding of just how the presence or absence of these needs impact motivation and doctoral student experience.

CONCLUSION

According to previous studies (Gardner, 2009; Sugimoto, 2012), maintenance of motivation throughout doctoral study rests with the student. This study's examination of doctoral student motivation through the lens of self-determination theory, specifically the theory's focus on basic psychological needs, has demonstrated that faculty influence on student motivation is significant. Indeed, the social-cultural environment has been shown to be a key factor in students' initial motivation for doctoral study as well as their initial satisfaction with their program. The study's findings run counter to faculty estimations of their impact on the doctoral education experience. For this study's first-year library and information science doctoral students, the basic psychological need for autonomy, competence, and relatedness were satisfied through receiving from faculty:

- Encouragement and interest in students' proposed research topic,
- Positive feedback as they progressed from one degree to the next, being remembered fondly by past instructors, and instructors' willingness to provide recommendations for doctoral study, and
- Care as demonstrated by suggesting doctoral programs, sharing advice for surviving the doctoral experience as a person of color, and being available to students to discuss their interests and coursework, respectively.

These experiences, outside the students' purview of responsibility, positively impacted their motivation to earn the PhD and, if continued, have been shown to contribute to their successful comple-

tion years later. It is important for faculty and program administrators to take seriously student reports of experiences within the academic environment that support or thwart motivation and well-being, and to act accordingly. This research highlights autonomy-, competence-, and relatedness-supportive actions that may be undertaken by faculty, doctoral advisors, and administrators to strengthen their constructive and meaningful impact on prospective students' decision to pursue a PhD and the doctoral student experience itself.

Turning to concerns about a faculty shortage due to LIS PhD earners seeking employment outside of academia, the influence of faculty advisors has been documented in the literature and validated in this research. Just as interactions with faculty serve as motivating factors to earn a PhD, experiences during doctoral study may motivate students to pursue careers in academia. Faculty should embrace their role in shaping the future educational and career pursuits of students that may include entering the academy. Likewise, faculty must expand their vision of the role they play in supporting or hindering doctoral student well-being. Responses from doctoral students in the current study highlight experiences both prior to applying to doctoral programs and during doctoral study that challenge existing faculty perceptions of their role. These findings should be of great interest to any program administrator and faculty interested in drawing future academicians to the discipline.

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