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FOCUSING THE LENS TO SHARE THE STORY: USING PHOTOGRAPHS AND INTERVIEWS TO EXPLORE DOCTORAL STUDENTS' SENSE OF WELL-BEING

Stefanie Benjamin *	University of Tennessee, Knoxville, TN, USA	sbenjam1@utk.edu
James Williams	University of Tennessee, Knoxville, TN, USA	jwill316@utk.edu
Michelle A Maher	University of Missouri – Kansas City, Kansas City, MO, USA	mahermi@umkc.edu

* Corresponding author

ABSTRACT

Aim/Purpose	This study explores PhD students' transition into graduate school, which can be a challenging experience for many.
Background	Using photographs and in-depth interviews, this study provides nuanced insight into influences on first-year PhD students' lived experiences, with a specific focus on these students' perceptions of doctoral student well-being.
Methodology	Twenty-nine first-year biomedical science PhD students from 15 research institutions were asked to take photographs (Participant Produced Images) to illuminate significant influences on their research skill acquisition. The participant-produced photographs were discussed within in-depth phone interviews allowing for a deeper understanding of their lived experiences.
Contribution	While students were asked to identify factors influencing their research skill acquisition, unexpectedly, what emerged from these data was students' clear focus on their concern for their physical and mental well-being. The researchers posit that students' ability to create a "work-life balance" is the foundation of doctoral student success, especially in the early years of doctoral training.
Findings	Findings suggest that it is essential to create a PhD culture in which students feel valued, supported, and nourished, both physically and mentally, for them to develop into successful researchers, teachers, and mentors.
Recommendations for Practitioners	Findings suggest that doctoral programs must support a more collaborative work environment for students and help novice students create a work life balance, perhaps by encouraging them to pursue stimulating or fun activities out-

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	side their school environment. It is imperative for doctoral students to be confident during their doctoral studies, as a lack of confidence tends to breathe life into poor work habits that stymie well-being and happiness.
Recommendation for Researchers	If doctoral programs support a culture that facilitates student well-being, those programs will likely produce happier researchers and teachers who see scholarship and learning as fun. This positive mindset is likely to cascade down within their learning environments and foster positive and productive scholarship and instruction. This mindset and paradigm shift will set a significant precedence for future doctoral learners.
Impact on Society	This study encourages and advances timely and "actionable" dialogue around how to better support doctoral students' sense of well-being, especially in science disciplines.
Future Research	Given study results, exploring mental health and well-being issues with faculty can help elevate mental health awareness in academia.
Keywords	PhD students, well-being, volunteer employed photography

INTRODUCTION

Within the scholarship of doctoral education, an emergent literature base is beginning to identify the critical importance of doctoral student well-being (Hunter & Devine, 2016; Hyun, Quinn, Madon, & Lustig, 2006; Pyhältö, Toom, Stubb, & Lonka, 2012). The concept of 'well-being', defined as "… contentment, satisfaction, or happiness derived from optimal functioning" (McDowell, 2010, p.70), has been linked to doctoral student persistence (Hunter & Devine, 2016; Jairam & Kahl, 2012), academic knowledge and skill development (Pyhältö et al., 2012), and doctoral degree attainment (Ali & Kohun, 2006; Ali & Kohun, 2007; Bair & Haworth, 2005). It is thought to result from support from administrative, social, and financial sources, more democratic supervisory structure, mentorship, and utilization of counseling services (Benton, 2003; Goldberg, 1998; Johnson & Huwe, 2002).

Doctoral student well-being has garnered increased attention as the occurrence of mental health issues among doctoral students is recognized. Mounting dialogue around these issues, which include anxiety, alcohol/drug abuse, depression, and suicide (Eisenberg, Gollust, Golberstein, & Hefner, 2007; Nogueira-Martins, Fagnani Neto, Macedo, Cítero, & Mari, 2004; Waitzkin, Yager, Parker, & Duran, 2006) has heightened awareness of the psychological concerns that often accompanying pursuing a doctorate degree. In a recent large-scale study, doctoral students (n = 3695) were found to be at a much higher risk of developing a psychiatric disorder, such as depression, than were comparison samples of highly educated individuals in the general population (n = 769), highly educated employees (n = 592), and higher education students (n = 333) (Levecque, Anseel, De Beuckelaer, Van der Heyden, & Gisle, 2017). These findings correspond to those presented by Hyun and colleagues (2006), who found that almost half of the graduate students they surveyed reported a stress-related problem that significantly affected their emotional well-being and/or academic performance within the previous year. A myriad of findings from other studies (e.g., Hopwood, Alexander, Harris-Huemmert, McAlpine, & Wagstaff, 2011; Oswalt & Riddock, 2007) underscore the extent to which graduate students are coping with mental health issues.

We too argue that doctoral student well-being is a critically important topic to consider in helping graduate students cope more effectively with their transition to graduate school, succeed as academics, and meaningfully contribute to research and teaching. We posit that normalizing discussions of mental health and well-being amongst graduate students – and those responsible for their scholarly development – can help alleviate stress and isolation that may result in psychological disturbances, doctoral attrition, and even suicide (Ali & Kohun, 2006; Eisenberg et al., 2007).

In this study, we identify and explore factors doctoral students report as substantially affecting their well-being. Our study is situated within the first year of doctoral training in biomedical science programs geographically located throughout the United States. As a contextual backdrop, we first describe doctoral student experiences within scientific doctoral training environments. In the second section, we describe socialization, which we use as theoretical framing for this study. In our third section, we present the study research methods. We use photographs (participant-produced images, also called volunteer employed photography) and interviews to capture students' intimate understandings of how factors affecting well-being emerge and operate, and at times, dominate, within the critical first year of doctoral training. In our fourth section, we present the results of our analysis of doctoral students' photographs and descriptions of developing and maintaining well-being in highly competitive and academically demanding environments. We conclude with recommendations and implications for key stakeholders in the doctoral training environment, including doctoral students, their faculty and institutions, and society as a whole.

Doctoral Student Experiences within the Scientific Doctoral Training Environment

To provide a contextual background for interpretation of first-year biomedical science students' photographs and interviews, we briefly explore the programmatic activities common within these students' first year. The first year of doctoral training is a time of transition, in which doctoral students integrate into departmental, institutional, and disciplinary contexts. As Golde (1998) notes, the four general first-year doctoral tasks are to gain intellectual competence through coursework and, for students in the sciences, within laboratory contexts, integrate oneself into the department, learn about the profession for which one is preparing, and learn about the realities of life as a graduate student.

These four first-year doctoral tasks are typically accomplished through participation in coursework, teaching and research. Most doctoral programs in the sciences require students to complete the bulk of their core coursework within the first two years. Continued enrollment in the program is usually contingent upon successful completion of preliminary and/or comprehensive examinations scheduled during or near the end of the first two years. Thus, within their first year of doctoral training, these students are well aware of upcoming examinations that assess their acquisition of core disciplinary knowledge, and the need to be well prepared for these exams. Some biomedical science programs require first-year doctoral students to assist in course delivery to help finance these students' doctoral training. Luft, Kurdziel, Roehrig, Turner and Wertsch (2004) observe that first-year doctoral students, who have usually just recently earned their own undergraduate degree, are expected to be both disciplinary experts and knowledgeable of appropriate undergraduate pedagogical strategies. Doctoral students sometimes struggle to balance their simultaneous roles of student and teacher (Cho, Kim, Svinicki, & Decker, 2011) and, as Austin (2002) has noted, can receive mixed messages about the value of teaching from their faculty advisors and peers.

Perhaps more than any other activity, research dominates the schedules of first-year doctoral students in the sciences. These students are immersed in research upon entry into their doctoral program. In the biomedical sciences, many programs require students to rotate through research laboratories in their first year. Rotations allow students to conduct small projects as they become familiar with the science produced in that laboratory (Golde, 1998). Rotations also allow students to become familiar with the teammates and the faculty advisor(s) with whom they would closely work with if they were to permanently join a laboratory (Hall, 2006). Selecting a laboratory within which their personality and emerging scientific interests are aligned is a crucial task. These students will typically spend long hours in the laboratory (~45 hours per week, on average (Ferreira, 2003)) and their eventual dissertation work will usually be an extension of the line of scientific inquiry for which the laboratory is known (Parry, 2007).

Within biomedical sciences doctoral training, the context within which the current study is situated, student attrition rates are estimated to be between 25% - 40% (Council of Graduate Schools, 2008;

Nettles & Millett, 2006). The highest attrition rates fall within the first few years (Council of Graduate Schools, 2008; Lott, Gardner, & Powers, 2009). Cassuto (2013) suggests those who leave can be divided into two groups: those who leave because they are "not up to the demands of the [doctoral training] tasks" and "those who have the ability to finish but chose not to" (p. A27). Cassuto adds that most who leave fall into the second group, a statement that has been well supported in doctoral education literature (e.g., Golde, 2005; Lovitts, 2001).

Higher education is facing a major problem, a doctoral attrition rate of near or at 50 percent (Cassuto, 2013; Kong et al., 2013); and some reports suggest that some doctoral learners cannot handle the mental aspect of doctoral programs (Pyhältö et al., 2012).

THEORETICAL FRAMING

SOCIALIZATION INTO A WORLD OF HIGH ANXIETY

PhD students dwell in a world of high anxiety (Ali & Kohun, 2006; Levecque et al., 2017) and their anxiety often stems from self-imposed mental struggles and issues produced during their PhD experiences (Schillebeeckx, Maricque, & Lewis, 2013). First-year PhD students in particular are susceptible to anxiety for several reasons. First, they are subjected to "intense and influential" socialization processes upon entry to graduate school (Lovitts, 2001, p. 41). These socialization processes are designed to transform a disciplinary outsider into a disciplinary insider, and include learning not simply new disciplinary knowledge, but also new norms, values, and expectations held by the academic community they have joined (Austin & McDaniels, 2006). Those who do not internalize and successfully act upon these norms, values, and expectations are at high risk for attrition within their first year (Golde, 1998).

Second, and relatedly, first-year PhD students are in the process of becoming experts in their chosen discipline, but they have far to go. As Kuwahara (2008) notes, these students are at the bottom of the academic hierarchy, lacking the knowledge and skills of their professors and more advanced peers. Kuwahara suggests this status and comparatively weaker knowledge and skill may fuel feelings of anxiety. Finally, earlier we noted that many first-year biomedical science students are required to rotate through laboratories. This means that for most or perhaps all of their first year, these students are without a permanent faculty advisor. As the doctoral faculty advising relationship is widely perceived as contributing to broad positive student outcomes such as sense of belonging (Weidman, Twale, & Stein, 2001) and retention (Lovitts, 2001), being without a permanent faculty advisor almost certainly contributes to feelings of anxiety.

With the above contextual and theoretical framing in mind, the broad question this study explores is: What factors do biomedical science doctoral students report as significantly affecting them, either positively or negatively, as they transition into a research-intensive doctoral program?

RESEARCH METHODS

Qualitative research and visual methodologies connect to broader societal issues, ideologies, and ways of understanding human nature (Benjamin, 2015). In general, scholars find qualitative research methods especially useful in discovering the meaning that people give to events they experience (Bogdan & Biklen, 2003; Denzin & Lincoln, 2000). This study uses two qualitative methods, photo-elicitation and in-depth interviews, to gather student perceptual data to grasp, with rich in-depth data, PhD students' lived experiences.

Participant-produced images, also known as volunteer employed photography (VEP), are widely used as a means of understanding how people view their environment, their sense of place, and what is important to them (Benjamin, 2015). This data collection technique asks participants to take a number of photographs of a particular subject or theme, using their smart phones or any device that can capture images, that can later be analyzed using a variety of quantitative and qualitative methods

(Garrod, 2007). Under the VEP approach, the visual data collected by participants enables their viewpoints, biases and experiences to be taken into account in the research (Loeffler, 2004). More importantly, using VEP equalizes the researcher and participants' role in the study, empowering the participants to gather, generate, and analyze data (Harper, 2002).

For the researcher to truly comprehend the photographs taken by the participant, an in-depth interview providing a stimulus for conversation about the photographs and space for reflection is needed (Benjamin, 2015). Harper (2002) asserts that participants may have a different response to an image rather than to a text, as, "the parts of the brain that process visual information are evolutionarily older than the parts that process verbal information" (p. 13). Thus, the VEP interview allows for participants to elucidate their photograph, visually seeing each photograph that they take while explaining the meaning behind each image. Moreover, the information gained from VEP interviews elicits more of a reflective conversation from participants rather than traditional, verbal-only interviews (Reese, 2013).

Participants

The current study is part of a larger project undertaken in 2014 to follow a national United States (U.S.) cohort of over 300 PhD students in the biological sciences (i.e., micro-, cellular, molecular, and developmental biology) through the first four years of doctoral training. Of the over 300 students participating in the larger study, 130 participated in an in-depth interview during their first year of doctoral training. Of these, 50 were invited to participate in this photo-elicitation study. Invitations were issued based on a desire to secure a sample representing geographically dispersed research institutions and diverse student demographics. Invitations were issued during the summer between students' first and second year of doctoral training.

Of the 50 students invited to participate, 29(58%) did so. Of those who declined, the most common reason given was lack of time in an overfull schedule. Each of the 29 participants received a $20.00 Amazon gift card for compensation Participants represented 15 research institutions geographically dispersed throughout the U.S. Eighteen (62%) were female. Participants self-reported the following ethnicities: 15(52%) White, 2(1%) Asian, 2(1%) Black, 2(%) Latino/a, and 8(28%) two or more ethnicities.

Data Generation

Volunteer Employed Photography (VEP)

Using their cell phone or another mobile device, participants were asked to take at least six digital photos and email them to either the first or third author. Photography prompts and guidance included: (1) send us at least three photos of positive influences on your research skill development over the past year (photos can be of people, places, items, activities, etc.); (2) send us at least three photos of negative influences on your research skill development over the past year (photos can be of people, places, items, activities, etc.); (3) send us a photo that represents you as a researcher, one photo that represents you as a PhD student, and one photo that represents you as an individual; (4) no nudity or vulgar photographs should be taken; (5) if faces of individuals are shown in the photograph, the individual photographed must sign a written consent form provided by the researchers; if no consent is given, the individual's face will be blurred to protect his or her privacy; and (6) at no time should you put yourselves in danger in taking the photographs. Once digital photos were received, they were stored on a secure server and a phone interview was scheduled with the participant.

VEP interviews

Upon photo receipt, a short (15-20 minute) phone interview was conducted during which the student participant described photos in detail. Interviews, a "construction site of knowledge" (Weiss, 1994, p. 29), allowed us to elicit participants' interpretations of their lived experiences (Merriam, 2009) during

their first year of doctoral training. Description prompts included: (1) describe this photo and what it represents to you; and (2) how has it influenced your research skill development this past academic year? When necessary, the interviewer probed for additional relevant information to clarify varying interpretations of the photo. This level of detail was necessary as photo meanings were often symbolic, and without the student's interpretation would have been misinterpreted. With participant permission, interviews were recorded and transcribed verbatim as the first step of data analysis (Abramson, 1992).

Data Analysis

Photos and interview transcripts were uploaded into a shared document with the qualitative software NVivo to provide a seamless record for each participant. For the first cycle of coding methods, each author individually analyzed and coded the transcripts from each participant (Saldana, 2016) using in vivo and value codes. These codes were used as a method of understanding the participants' perspectives and actions. In total, 87 codes were established by the three authors. As a research team, we relied on intensive group discussion, "dialogical intersubjecitivy," coder adjudication, and group consensuses as an agreement goal (Brinkmann & Kvale, 2015; Harry, Sturges, & Klingner, 2015; Saldana, 2016; Sandelowski & Barroso, 2007) via emails and telephone conversations that helped to resolve any discrepancy with our coding. Next, we grouped together any codes that we felt were coded similarly in order to illuminate any redundancy. After this step, we finalized the codes and identified themes establishing thematic parameters and frequency within analytic memos (Miles, Huberman, & Saldana, 2014). To recap, this process of inductive thematic analysis involved coding the data and then grouping the codes into distinct themes represented in the results section (Strauss & Corbin, 1998).

Results

Our study analyses were guided by the broad question: What factors do biomedical science doctoral students report as significantly affecting them, either positively or negatively, as they transition into a research-intensive doctoral program? Using inductive thematic analysis, three interconnected themes emerged: Managing Relationships, Maintaining Health, and Finding Purpose and Place.

Managing Relationships

Of the 29 participants, 28 (97%) identified "managing relationships" as significantly affecting – either positively or negatively – their sense of well-being. We grouped the identified relationships into five categories: Faculty advisors/PIs, advanced peers/lab managers/postdocs, lab mates/graduate students, family members, and pets.

Faculty advisors/PIs

Most students in our sample had spent much of their first year rotating through laboratories. By the time we interviewed them in the summer after their first academic year, almost all had committed to a single laboratory. This suggests that most had at that point developed at least a working relationship with the person who would be their faculty advisor and mentor throughout the remainder of their doctoral studies. Even at this relatively early stage in their doctoral tenure, a fair number of participants identified this relationship as a factor substantially affecting their well-being.

Of the 29 participants, 11 (38%) identified their relationship with their faculty advisor, also called, in the biological sciences, a Primary Investigator or 'PI', as either positively or negatively affecting their sense of well-being. Four reported positive relationships with their PIs; descriptions included:

> That [photo of an office door] is actually my PI's office. It can be an intimidating place, but it can also be a very challenging and intellectually stimulating place. Every time that we have a meeting, there is no such thing as a short conversation with my PI, or an easy one, for that

matter. So, the door to his office is a little bit intimidating to go in there, but it is also a very challenging and intellectually stimulating place, and it is where a lot of really good conversations happen, and it feels like you are really pushing your limits every time you are in there having conversations with him. (Participant 24, American Indian/White female)

I had my first committee meeting and it actually went pretty well, and then that day it stormed, and I was sitting in the parking lot and I looked up, and there was this rainbow. And I thought, 'Wow, I feel really lucky, I don't know why, but it is a good sign.' I'm really lucky because I have a PI that really believes in me and I get enough individual attention that I think a lot of graduate students don't get, so I think I am really lucky, and that is what that picture is about (Participant 117, Asian/Latina female, describing a photo of a rainbow) as shown in Figure 1.

Figure 1. Participant 117 photo of a Rainbow

Two participants described somewhat or outright negative relationships with their PI. In one case, a student (Participant 18, White female) stated, "At the moment, I am a little intimidated by my supervisor [PI], and I think what I need to work on is approaching her and being more open with her about how I feel about the project."

PIs have an opportunity to guide first-year PhD students by easing them into their doctoral studies and encouraging them or serving as continual support throughout their educational process. However, nonexistent or diminished PI support can adversely affect doctoral students' learning process. When PIs fail to establish a welcoming, supportive environment, doctoral students often view the educational environment as adversarial and intimidating. Many failed to seek out assistance from their PIs due to inherent fear, and fear has shown to stymie doctoral students' educational growth (Pyhältö et al., 2012).

Some students noted a feeling of admiration and joy when they mentioned supportive PIs, and this form of happiness has been chronicled to augment the well-being of doctoral students. One student documented an emotion of luck when conversing about her reassuring PI, but effective leaders recognize this action as inspiring followers to perform at an extremely high-level (Sisson & Adam, 2013).

Advanced peers, lab managers, and postdocs

In the sciences, laboratory-based research teams can include the PI, postdoctoral fellows, lab managers, advanced doctoral students, and novice doctoral students (Parry, 2007; Stephan, 2012). This arrangement allows novice doctoral students to be mentored by multiple advanced people, especially in their first few semesters. We found ample evidence that these 'multiple mentors' had substantial impacts on students' well-being, both for better and for worse. We also noted that almost all evidence came from female participants. Representative statements included:

> One of the [two] women [in this photo] is me, and one is my mentor, a postdoc … She has been really patient; she has shown me how to do everything … She is just one of the best influences I have had since I joined this lab, which is what has helped me to overcome all of the difficulties (depression, being unfamiliar with microbiology, the frustration of science in general). She is the one who pushes me to be better and she educates me in this. (Participant 173, Latina female)

> [**Interviewer: I see a photo of cardboard boxes]** Those aren't cardboard boxes - that is a castle! Can't you see the castle!? (laughs) It has the arms symbol over it. While I was away on vacation it was my birthday, and when I came back the next week they [lab mates] had built this castle for me for a birthday present.. **[Interviewer: Are you close to your lab mates?]** Yes. They are two third-year graduate students and a post doc. I'm starting to enter into their friendship circle, but they have been together for two to three years already (Participant 104, White female)

> [The meaning behind this photo of a "flammable" sign is that] the person who is training me, the lab manager, can be a really good source of knowledge … but there are certainly days where she just gets in these moods where mentoring is not her top priority, and so there are certainly times when it is clear that she is resenting when I have to interact so much with her. (Participant 24, American Indian/White female)

Laboratory teams that include advanced peers, lab managers and postdocs become students' building blocks of knowledge. Advanced team members scaffold students' learning, inspiring them to ask questions and to engage in scientific inquiry, even when experimental failure is a likely outcome among novice doctoral researchers (Delamont & Atkinson,2001). However, advanced peers can also represent a source of tension and difficulty, especially for researchers who are near the bottom of the academic hierarchy (Kuwahara, 2008), and are beholden to others for assistance.

Lab mates/graduate student peers

Many students seemed to contribute their sense of well-being to positive relationships they had developed with their lab mates and other graduate student peers, usually those with whom they entered the program. These students became allies with whom to discuss issues and challenges. Representative statements included:

> That [photo] is of my PI and lab mates. The photo was taken after lab … they are all so supportive. The first semester it was rough, [but] my lab was awesome and very supportive, giving me advice. If I had any questions they helped me out a lot. [**Interviewer: Why was it a rough semester?]** I moved to a new state [and] getting used to the area. There was a lot to do, get my project going, write a grant. It was nice to have my cohort because we got along really well. (Participant 72, Black/American Indian/White male)

> This [photo of me with friends] is a representative picture of a group of friends I have here that I made after coming to grad school. It is a group of people to go to have fun and have an intellectual and stimulating conversation. In terms of research, we talk about questions and progress. We can bounce ideas off of each other [and] talk about problems in my field and problems and concerns and sharing in my thesis lab. I was able to use them as a sanity check when I was bouncing around different labs. They helped me to figure out the things I want [such as] whether mentors would be good or not … (Participant 236, American Indian/White male)

However, not all lab mate or peer relationships were positive. Two students reported lab mate relationships that weighed heavily on their mind:

It [photo] is actually my lab mate's desk. He is not a pleasure to work with, by any means. This past spring semester, he has really been a negative presence in the lab; he really does bring other people

down. He has a really bad problem with trying to take dominance over others, and he doesn't do that with me, because I just don't tolerate stuff like that. I am very – you know, I don't have time for that crap. But, in any case, he is really a negative presence for everyone else and for me. (Participant 165, American Indian/Asian/Native Hawaiian male)

This [photo – as shown in Figure 2] is a picture of me swimming with sharks. I feel I'm in a precarious position in my PhD career right now due to interpersonal drama with other members of my lab and I'm not sure if or how it's going to be resolved (Participant 291, White female).

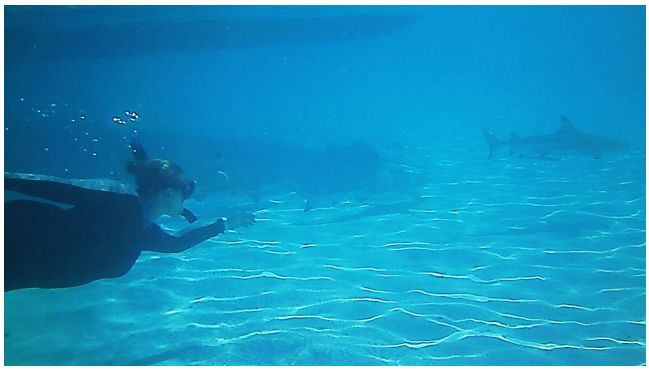

Figure 2. Participant 291 Swimming with Sharks

Lab mates and peers served as a catalyst for fun and supported each other during tough periods. These relationships sparked internal happiness, happiness has been noted as a key to overcoming difficult mental and physical obstacles (Golde, 2005). Students generated unique ideas from interactions with lab mates and peers, so these relationships served as an important role in their learning process. However, negative lab mates and peers impeded students' educational experiences. Motivation dwindled or dissipated from negative lab experiences, dissolving students' happiness and well-being.

Family/significant partners

Almost all (27, 93%) participants identified family and significant partners as an important support system throughout their first year in their doctoral program. The positive influence helped them maintain a healthy mental status to work through various struggles within their daily lives:

> That is my fiancé. He has been super supportive of me continuing my education … [he] helps me manage stress (Participant 13, Latina/White female)
>
> That [photo] is my best friend; she has always been my biggest supporter. We literally went to every school together except graduate school. We went to kindergarten through college. She is one of the biggest parts of my life. **[Interviewer: Where is she located?]** She is located back home, but she is engaged to my younger brother. (Participant 64, Black male)
>
> Me and my girlfriend are eating gelato [in this photo]. This is the representative picture for our relationship. She is someone who keeps me grounded, she is someone I can vent to and share my successes and failures with. I can always go to her for a good time and distress. She is also in a graduate program so we can share our frustrations about things together. She is someone I can be myself with and not being concerned with formalities or expectations. (Participant 236, American Indian/White male)
>
> This [photo - as shown in Figure 3] showing 'I heart you'] was taken by my wife for me when she was doing some painting. Marriage has been the most amazing blessing I could have moving into adulthood. I'm not sure I could be capable of going through this stage of life with as much grace as I have without my beautiful wife. (Participant 213, White male)

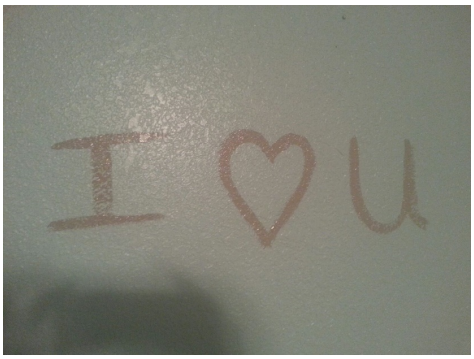

Figure 3. Participant 213 "I Love You" photo

With the assistance and support of loved ones, the PhD students interviewed were able to manage their stress and maintain a positive attitude. Although some of their family members did not live close, students still felt like they were able to communicate thanks to technological advances. PhD students used social media, such as Facebook, to overcome stressful times during their doctoral experiences. Supportive families encouraged students to embrace the tough times, and many students felt it was their obligation to stay in the fray, due to support from their family and significant others. These people assisted students to maintain a sense of well-being, serving as a refuge to students' daunting PhD pursuit.

Pets

The last identified relationship was with pets. Studies have concluded that pet ownership helps reduce stress (e.g., Barker, Knisely, McCain, Schubert, & Pandurangi, 2010). Several students agreed that having pets, whether personally owned or not, contributed to their well-being:

> Cats, they keep me calm and sane … and it is just nice to have an animal who always loves you even when your life is crazy and stressed and you have eight things to do, so it's really nice. They are my babies (Participant 60, White female, describing a photo of cats).

> This [photo of Gus, my dog – as shown in Figure 4] is really about life outside of the lab. I think a lot of us graduate students really forget about that but something that I think is very important for me is being able to not live in the lab. [**So, do you see a lot of other people who do that?**] Yeah, there are definitely some people who kind of throw everything else to the wind for a month at a time because they are working on something important and then they end up really burning out, and I have already seen some of that. (Participant 69, White male)

Figure 4. Participant 69's dog, Gus

Pets provided love and support to students, without charging them for their time and without excessive communication. An axiom in many cultures is that a dog is a human's best friend. Students' statements suggested that pets were very therapeutic to their mental balance, providing a sense of calm as students completed readings. Pets made students feel special and important, at times when they might have felt insignificant and unappreciated. Further, pets gave students someone to come home to, and forced them to venture outside of the laboratory and embrace nature and obligations beyond their PhD program.

Maintaining Physical and mental health

Recognition of the need to manage one's physical and mental health to successfully meet the challenges of doctoral training was a major theme throughout students' transcripts. As one (112, Latino male) reflected, "A lot of PhD students forget to take care of themselves; I see it a lot. Science is important, but your body is more important." Eighteen participants provided photos and descriptions identifying this recognition.

Activities served as an emotional and mental release for many doctoral learners, using informal and formal activities, such as fitness classes, dance, and television as their forms of catharsis. Countless studies (e.g., Biddle & Mutrie, 2007; Lubans, Plotnikoff, & Lubans, 2012; Rodríguez, Látková, & Sun, 2008) have shown the immediate and long-term benefits of physical fitness and outdoor activities on the well-being of individuals. Several students described participating in activities to maintain their physical health. Activities included biking, playing team sports, running marathons, hiking/camping, playing Frisbee, yoga, and gardening.

Representative comment included:

> I am actually a part of the dance company, a ballet company on campus, and … I am in the picture. I think it is important to take time away from science and not forget your hobbies and the things that you like, so part of me is being a dancer, and so I might be a scientist, but I'm also a dancer, and I need to have time to be able to do that – as shown in Figure 5 (Participant 117, Asian/Latina female, describing a photo of dancers' legs).

Figure 5. Participant 117 photo of Dancers' Legs

Many described participating in various activities to maintain their physical and mental health and reduce stress triggered by their doctoral student responsibilities and PI or lab mate personalities. The widespread recognition among students of their need to manage both body and mind was most likely due to the emotional highs and lows associated with doctoral training (Aitchison, Catterall, Ross, & Burgin, 2012; Hunter & Devine, 2016). As one student stated:

> This photo [of a cell phone showing predicted weather for the next five days] has to do with the weather, and as you can see from the photo, you can see that the weather is really different every single day. One day it is summer, one day it is thunder storming, one day it is slightly cloudy. That kind of shows my emotions as a PhD student … I am on a very day-by-day basis right now. (Participant 23, Latina/White female)

Students also described relaxing by watching movies/television or playing games, either by themselves or with their family and friends:

> I'm not a huge gamer; it [playing video games] followed me from high school. It is a great way for me to unwind. I am introverted so I need to re-charge. It can be a mindless thing so it is a great way to take a break from thinking critically. It is a great way to un-clog for a bit. It isn't a distraction that can be found in the lab or campus; only something I can do when I'm at home. (Participant 109, Black/White female; describing a photo of video gaming equipment)

Perusing television channels and engaging in television shows served as a therapeutic activity for some students, it gave them a reprieve from the grueling tasks involved with completing their PhD. The doctoral process is an all-encompassing endeavor that requires immense focus and commitment, so it is imperative to release one's self from this intense pressure from time-to-time. Video games, television, and other escapist activities can play a significant role in detaching students from that heightened reality of intense topics or obstacles faced within their doctoral program.

However, in some instances, participating in activities to relieve stress cause additional issues:

> The environment here is work hard play hard. Someone is always hosting a party or going out. If someone isn't careful you can get too involved in that environment. There is more partying here in graduate school than when I was an undergrad … I had to cut back because I was getting physically tired. For example, a couple of weeks ago there was a happy hour with my cohort, then after that was a free beer, then after that someone's birthday party ... so too many events. Once in a while it is nice but too much is not good. To stay healthy, I don't want to drink that much. I know people who drink a lot and that is scary, and I don't want to fall into that – as shown in Figure 6 (Participant 109, Black/White female, describing a photo of a refrigerator stocked with beer).

Figure 6. Participant 109 photo of a Beer-Stocked Refrigerator

Finally, given the mounting evidence that many doctoral students suffer from psychological ailments (Levecque et al., 2017; Tsai & Muindi, 2016), we were not surprised to find at least one student in our sample who was candid about this challenge:

> This is [a photo of] a supplement to help with depression. I suffer from depression and it is a hard thing to overcome … it is a negative influence on my research and as an individual

> because you need to fight with something constantly to feel better. It is something you have to overcome constantly. It is an ongoing battle that is never going to end; it is like a constant obstacle in your career and in your personal life. (Participant 173, Latina female)

Maintaining physical and mental health requires engaging in activities outside of one's doctoral program. Doctoral learners noted how mindfulness, meditative exercises, and physical activities helped with their anxiety and reduced stress levels through activities like yoga, walking/jogging, biking, and swimming. Ultimately, these activities provided them with balance, and doctoral learners are much more likely to find purpose when they are mentally and physically stable (Haynes, Bulosan, Citty, Grant-Harris, Hudson, & Koro-Ljungberg, 2012).

Finding Purpose and Place

Within our data, we found extensive evidence of students' attempts to grapple with their transition into their doctoral programs by striving to create their own purpose and place within their new worlds. Many students offered glimpses into these attempts and their accompanying emotional states. Here we offer representative examples that showcase the range of experiences and reflections upon finding purpose and place:

> I don't know what I am doing, ever … sort of in the shadows, and that is kind of how I feel like. I feel like I don't know what I am doing, ever. I don't know why I am here. I don't know what is going on most of the time. And so that is how I feel. I feel like I just need to sit back and let everyone else do their thing and then I will just kind of hide in the background, hopefully going unnoticed and then eventually just graduate – as shown in Figure 7 (Participant 151, White female).

Figure 7. Participant 151 Hiding in the Shadow

> [In this photo of my arms with pin pricks], I am in the middle of taking an allergy test. This is where they poke you with samples of different plants and animals. Over the last year as a person being poked and tested - seeing my reactions to these new experiences, I felt the same way being a PhD student. Some things I was assaulted or poked with went well, no reaction. Other things were challenging and produced negative reaction. (Participant 236, Asian/White male)

> This [photo – as shown in Figure 8] was taken in a car, and I'm on a long road, and I am just in the beginning of the road, and that is what describes me as a PhD student. I am barely beginning my career, and it is a long journey with probably a lot of obstacles to overcome, but I am very hopeful that I get to the end of it. (Participant 173, Latina female)

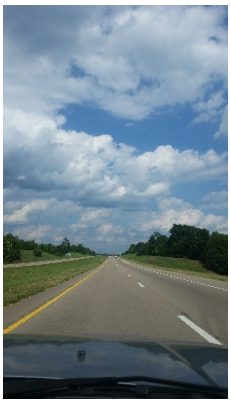

Figure 8. Participant 173 of The Long Road

I am not sure if it comes out in the picture [photo of a hallway] very well, but where I am standing is actually quite dark. And down farther, down the hallway, is actually quite bright. And it is kind of like, 'Ok, I'm in my first year going into my second year, and it is all pretty hazy about what I really need to be doing. But there is a light at the end of the tunnel, even though it is far away.' So, I guess right now, I have an idea of what I am doing, it takes a little bit longer than what I would like to, but at the same time, I recognize that there is an end in sight, it is just a lot further way right now than what it will be in a few years. (Participant 165, American Indian/Asian/Native Hawaiian male)

The IPhone [in the photo] is not really significant, it is what is on the phone [that is significant]. The background is chaotic, right? Chaotic, a lot of motion, and then in the foreground is a caravan moving through the desert and everything seems serene and ordered, and you see the stars and so much beauty. And I think this is how I would describe myself, that I am on a pilgrimage, like the caravan in the desert, and I strive to be at peace and have a sense of order in the midst of a world that is very chaotic and seems to be moving around seemingly without purpose. And I think I strive to be an example of the fact that we do have a sense of purpose and we are moving toward it very slowly but with purposefully and with great peace and serenity. (Participant 190, Asian male)

[Interviewer: And then the last photo is of a lion, and it is titled, 'My mood right now.'] Yes, I feel like I have stood tall in the end, because especially last semester, well last semester was of course a transition, but this semester it was like everything else was thrown at me, and I feel like I have stood tall, and nothing at this point can really deter me from my goal of getting my PhD (Participant 64, Black male)

This [photo- as shown in Figure 9] is a sunset over the mountains, and I love it, I am very much a nature person, and I have two dogs and I go out that way a few times a week just to go hiking with them, and, so, when I go out and I see that sunset behind the mountains, I feel very at peace, so I feel at peace with myself and those around me and I feel like I am in the right place, doing the right thing, and I am with the right people, and it feels really good, and it has taken a lot to get here, so yeah, that is definitely seen as a symbol of that, I guess. (Participant 24, American Indian/White, female)

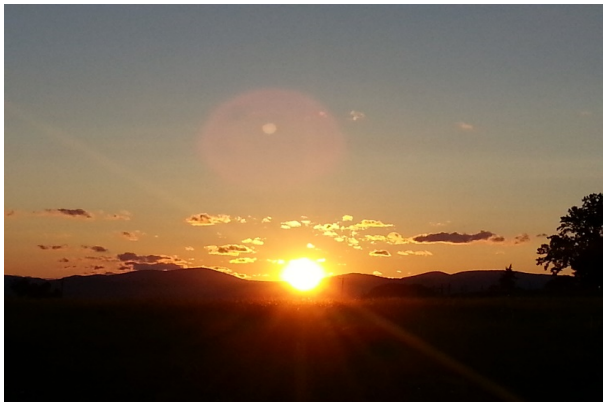

Figure 9. Participant 24 photo of Sunset over the Mountains

The first year of doctoral training involves almost unending transitions (Gardner & Barnes, 2009Weidman et al., 2001)). Not only have most students relocated to a new geographic location, they have upended their professional and interpersonal networks, meeting and interacting with new people both on and beyond campus who will profoundly influence their doctoral experience. They are grappling with new disciplinary skills and knowledge in efforts to transform themselves from disciplinary outsiders to insiders (Austin & McDaniels, 2006). This sense of transition was very evident in students' photos and descriptions.

DISCUSSION

This study explored the factors doctoral students reported as significantly affecting them, either positively or negatively, as they transitioned into research-intensive doctoral programs. Using photographs and interviews, we were able to step into students' worlds and see their unfolding doctoral experiences through their eyes to identify salient factors affecting their lives. These factors included a robust relationship network spread across campus and beyond, and careful attention to maintaining a work-life balance grounded upon physical and mental health activities. Based on our findings, we posit that maintaining a work-life balance mitigates the emotional hurdles that are naturally a part of the doctoral journey (Satchwell et al., 2015). Specifically, we argue that when students recognize the importance of maintaining a work-life balance, they tend to be more hopeful of their future as burgeoning professionals in their chosen field. They are also more likely to be retained in their doctoral programs through degree completion (Golde, 2005; Hunter & Devine, 2016).

Based on the above findings, we highlight study implications that significantly contribute to and advance current dialogue about the importance of doctoral student well-being. To begin, we note that our original intention in conducting this study was to identify factors that students reported as affecting their research skill development. We were surprised, then, when well-being emerged as the clear focus of students' responses. To us, this suggests that research skill development, which we had conceptualized as existing purely in a cognitive domain, is to some (potentially large) extent dependent on a student's physical, mental, and emotional health, in short, it is dependent up their well-being. With this in mind, we offer three implementations of our findings.

First, the current generation of doctoral students is different from their predecessors in that they mirror society's growing recognition of the importance of the critical need to balance physical, mental, and emotional health (Academics Anonymous, 2014; Taylor, Kiley, & Humphrey, 2017). Unlike doctoral students who have come before, these students appear reluctant to make the classroom and laboratory the focal points of their life during the length of their doctoral tenure, which in 2015 in the life sciences, spanned about seven years (National Science Foundation, 2017). While they appear more than willing to put forth the cognitive effort and work the long hours required to earn their discipline's highest degree, they are highly cognizant of an internal need to balance doctoral program

obligations with other life obligations. If this need is unmet, potentially negative implications arise in terms of students being retained to doctoral degree retainment.

Second, universities fit the profile of 'greedy institutions' (Sullivan, 2014; Wright et al., 2004). Coser (1974) coined the term 'greedy institutions' to denote institutions that place very high demands on employees. Greedy institutions "seek exclusive and undivided loyalty, and they attempt to reduce the claims of competing roles and status positions on those they wish to encompass within their boundaries" (Coser, 1974, p. 4). We argue that doctoral programs in the sciences housed within universities are 'greedy' in their own right, as they place very high demands on students in the sciences, especially those in their first year of doctoral training. As early is 1986, Sauer noted the "exacting structure imposed on students by the laboratory sciences…" (p. 3). Students must quickly learn to negotiate long hours in laboratory rotations with extensive coursework, which often leaves little, if any time for life beyond the campus. However, doctoral students' emerging and intense focus on balance and well-being suggests implications for doctoral programs. Specifically, to attract a diverse student population of the best and brightest, these programs may need to reconsider the extent of their 'greediness.' This may be a particularly salient issue in science, technology, engineering, and mathematics fields (STEM), in which women, students of color, and U.S. citizens are underrepresented among doctoral degree recipients (Lott et al., 2009; National Science Foundation, 2013).

Finally, institutions themselves must find ways to more nimbly respond to doctoral students' need for work-life balance and find ways to support students holistically, not just academically. More universities are seeing the need for counseling services due to the increase in the number of diverse students with complicated needs (Simon, 2017; Williams, 2017). However, research indicates that nationwide, universities lack student affairs and counseling resources to address a significant proportion of students' needs on college campuses, either at the undergraduate or graduate level (Galligher, 2012; Givens & Tjia, 2002; Hyun et al., 2006; MIT, 2001). Therefore, it appears critical for graduate programs to begin to address the shortage of mental health resources available to students, and to facilitate conversations normalizing mental health and well-being within the graduate student and faculty populations.

CONTRIBUTION

Doctoral training can be a difficult undertaking, and it is imperative to focus the lens on ways to facilitate doctoral student success. We argue that it is essential to create a PhD culture in which students feel valued, supported, and nourished, both physically and mentally, for them to be successful mentors, researchers, and teachers. Doctoral programs tend to produce stressful working environments and situations, which impact doctoral learners in a negative fashion (Bair & Haworth, 2005). Our findings suggest that doctoral programs would benefit from creating a more collaborative work environment for doctoral students while supporting students' work life balance and acknowledging students' need to engage in stimulating or relaxing activities outside of their school environment. While the life of a PhD student researcher will likely remain challenging, Juniper, Walsh, Richardson, and Morley (2012) encourage researchers to have more open discussions of the challenges these students face. We hope our findings will add to this discussion to promote the importance of well-being and encourage practical efforts to address mental health problems among doctoral students. In doing so, we posit that retention of doctoral students could be improved.

Doctoral programs provide learners with environments that instruct them on how to comport themselves as academics and researchers (Calonge, Chui, Thadani, Mark, & Pun, 2011). Academia needs scholars who enjoy researching and teaching to create and to sustain strong future academic environments. If doctoral programs can normalize and prioritize physical and mental well-being for their doctoral learners, then those programs will likely produce happier researchers and teachers who see scholarship and learning as enjoyable. This positive mindset should cascade down within their learning environments and transmute to productive scholarship and instruction. This mindset and paradigm shift will, hopefully, set a significant precedence for future doctoral learners.

REFERENCES

Abramson, P. R. (1992). *A case for case studies*. Thousand Oaks, CA: Sage.

Academics Anonymous. (March 4, 2014). *There is a culture of acceptance around mental health issues in academia.* Retrieved from https://www.theguardian.com/higher-education-network/blog/2014/mar/01/mental-health-issue-phd-research-university

Aitchison, C., Catterall, J., Ross, P., & Burgin, S. (2012). Tough love and tears': Learning doctoral writing in the sciences. *Higher Education Research & Development, 31,* 435–447.

Ali, A., & Kohun, F. (2006). Dealing with isolation feelings in IS doctoral programs. *International Journal of Doctoral Studies, 1*, 21–33. Retrieved from https://www.informingscience.org/Publications/58

Ali, A., & Kohun, F. (2007). Dealing with social isolation to minimize doctoral attrition - A four stage framework. *International Journal of Doctoral Studies, 2*, 33–49. Retrieved from https://www.informingscience.org/Publications/56

Austin, A. E. (2002). Preparing the next generation of faculty. *The Journal of Higher Education, 73*(1), 94–122.

Austin, A. E., & McDaniels, M. (2006). Preparing the professoriate of the future: Graduate student socialization for faculty roles. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 21, pp. 397–456). Netherlands: Springer.

Bair, C. R., & Haworth, J. G. (2005). Doctoral student attrition and persistence: A meta-synthesis of research. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 481–534). The Netherlands: Springer.

Barker, S. B., Knisely, J. S., McCain, N. L., Schubert, C. M., & Pandurangi, A. K. (2010). Exploratory study of stress-buffering response patterns from interaction with a therapy dog. *Anthrozoös*, *23*(1), 79–91.

Benjamin, S. (2015). Is this how you pictured it? In S. P. Hanna, A. E., Potter, E. A. Modlin, P. Carter, & D. L. Butler (Eds.), *Social memory and heritage tourism methodologies*, (pp.92-108) .New York, NY: Routledge.

Benton, T. (2003). The 5 virtues of successful graduate students. *The Chronicle of Higher Education, 50*(2), C3.

Biddle, S. J., & Mutrie, N. (2007). *Psychology of physical activity: Determinants, well-being and interventions*. Routledge.

Bogdan, R., & Biklen, S. (2003). Data analysis and interpretation. In R. Bogdan & S. Bilken, *Qualitative research for education: An introduction to theory and methods* (4th ed.). Boston, New York, San Francisco: A & B.

Brinkmann, S., & Kvale, S. (2015). *Interviews: Learning the craft of qualitative research interviewing* (93rd ed.). Thousand Oaks, CA: Sage.

Calonge, D. S., Chui, P., Thadani, D. R., Mark, K. P., & Pun, C. F. K. (2011). In-service development for graduate teaching assistants: A blended-learning and formative approach. *Journal of University Teaching and Learning Practice, 8*(3). Available at: http://ro.uow.edu.au/jutlp/vol8/iss3/3

Cassuto, L. (2013). PhD attrition: How much is too much? *The Chronicle of Higher Education*. Available at: http://www.chronicle.com/article/PhD-Attrition-How-Much-Is/140045

Cho, Y. J., Kim, M., Svinicki, M. D., & Decker, M. L. (2011). Exploring teaching concerns and characteristics of graduate teaching assistants. *Teaching in Higher Education, 16,* 267 – 279.

Coser, L. (1974). *Greedy institutions: Patterns of undivided commitment*. Free Press. New York.

Council of Graduate Schools. (2008). *PhD completion and attrition: Analysis of baseline demographic data from the PhD Completion Project*. Retrieved from http://www.phdcompletion.org/information/publications.asp

Delamont, S., & Atkinson, P. (2001). Doctoring uncertainty: Mastering craft knowledge. *Social Studies of Science, 31*, 87–107.

Denzin, N. K., & Lincoln, Y. (2000). *Qualitative research* (pp. 413-427). Thousand Oaks, CA.

Eisenberg, D., Gollust, S., Golberstein, E., & Hefner, J. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry, 77,* 534–542.

Ferreira, M. (2003). Gender issues related to graduate student attrition in two science departments. *International Journal of Science Education, 25*, 969–989.

Galligher, R. (2012). *National survey of counseling center directors*. Pittsburgh, PA: University of Pittsburgh Counseling Center.

Gardner, S. K., & Barnes, B. J. (2009). Graduate student involvement: Socialization for the professional role. *Journal of College Student Development*, *48*(4), 369–387.

Garrod, B. (2007). A snapshot into the past: The utility of volunteer-employed photography techniques in planning and managing heritage tourism. *Journal of Heritage Tourism, 2*(1), 14–35.

Givens, J., & Tjia, J. (2002). Depressed medical students' use of mental health services and barriers to use. *Academic Medicine*, *77*(9), 918–921.

Goldberg, C. (1998, October 21). After suicide, Harvard alters policies on graduate students. *The New York Times,* p. A20.

Golde, C. M. (1998). Beginning graduate school: Explaining first-year doctoral attrition. *New Directions for Higher Education, 101,* 55–64.

Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: Lessons from four departments. *The Journal of Higher Education, 76,* 669–700.

Hall, Z. W. (2006). Maintaining vitality through change: Graduate education in neuroscience. In C. Golde & G. Walker (Eds.), *Envisioning the future of doctoral education: Preparing stewards of the discipline* (pp. 207–225). San Francisco, CA: Jossey-Bass.

Harper, D. (2002). Talking about pictures: A case for photo elicitation. *Visual Studies*, *17*(1), 13–26.

Harry, B., Sturges, K., & Klingner, J. (2005). Mapping the process: An exemplar of process and challenge in grounded theory analysis. *Educational Researcher, 34*(2), 3–13.

Haynes, C., Bulosan, M., Citty, J., Grant-Harris, M., Hudson, J., & Koro-Ljungberg, M. (2012). My world is not my doctoral program… or is it?: Female students' perceptions of well-being. *International Journal of Doctoral Studies*, 7, 1-17. Retrieved from https://www.informingscience.org/Publications/1555

Hopwood, N., Alexander, P., Harris-Huemmert, S., McAlpine, L., & Wagstaff, S. (2011). The hidden realities of life as a doctoral student. In V. Kumar & A. Lee (Eds.), *Doctoral education in international context: Connecting local, regional and global perspectives* (pp. 212–231). Serdang, Selangor, Malaysia: University Putra Malaysia Press.

Hunter, K. H., & Devine, K. (2016). Doctoral students' emotional exhaustion and intentions to leave academia. *International Journal of Doctoral Studies, 11,* 35–61. Retrieved from https://www.informingscience.org/Publications/3396

Hyun, J., Quinn, B., Madon,T., & Lustig, S. (2006). Graduate student mental health: Needs assessment and utilization of counseling services. *Journal of College Student Development, 47,* 247–266.

Jairam, D., & Kahal, D. (2012). Navigating the doctoral experience: The role of social support in successful degree completion. *International Journal of Doctoral Studies, 7*, 311-328. Retrieved from https://www.informingscience.org/Publications/1700

Johnson, W. B., & Huwe, J. M. (2002). Toward a typology of mentorship dysfunction in graduate school. *Psychotherapy: Theory, Research, Practice, Training, 39*(1), 44–55.

Juniper, B., Walsh, E., Richardson, A., & Morley, B. (2012). A new approach to evaluating the well-being of PhD research students. *Assessment & Evaluation in Higher Education, 37*(5), 563–576.

Kong, X, Chakraverty, D., Jeffe, D. B., Andriole, D. A., Wathington, H. D., & Tai, R. H. (2013). How do interaction experiences influence doctoral students' academic pursuits in biomedical research? *HHS Author Manuscripts, 33*(3-4), 76–84. doi: 10.1177/0270467613516754

Kuwahara, N. (2008). It's not in the orientation manual. In C. P. Casanave & X. Li (Eds.), *Learning the literacy practices of graduate school* (pp. 186–200). Ann Arbor, MI: University of Michigan Press.

Levecque, K., Anseel, F., De Beuckelaer, A.,Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy, 46*, 868–879.

Loeffler, T. A. (2004). A photo elicitation study of the meanings of outdoor adventure experiences. *Journal of Leisure Research, 36*(4), 536.

Lott, J. L., Gardner, S., & Powers, D. A. (2009). Doctoral student attrition in the STEM fields: An exploratory event history analysis. *Journal of College Student Retention: Research, Theory & Practice, 11*, 247–266.

Lovitts, B. (2001). *Leaving the ivory tower: The causes and consequences of departure from doctoral study*. Lanham, MD: Rowman & Littlefield.

Lubans, D. R., Plotnikoff, R. C., & Lubans, N. J. (2012). A systematic review of the impact of physical activity programmes on social and emotional well-being in at-risk youth. *Child and Adolescent Mental Health, 17*(1), 2–13.

Luft, J. A., Kurdziel, J. P., Roehrig, G. H., Turner, J., & Wertsch, J. (2004). Growing a garden without water: Graduate teaching assistants in introductory science laboratories at a doctoral/research university. *Journal of Research in Science Teaching, 41*, 211–233.

McDowell, I. (2010). Measures of self-perceived well-being. *Journal of Psychosomatic Research, 69*, 69–79.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

Miles, B., Huberman, M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks, CA: Sage Publications.

MIT Mental Health Task Force. (2001). *Mental health task force report*. Retrieved from http://web.mit.edu/chancellor/mhtf/

National Science Foundation. (2013). *Women, minorities, and persons with disabilities in science and engineering: 2013*. *Special Report NSF 13–304*. Arlington, VA.

National Science Foundation. (2017). *Doctorate recipients from U.S. universities: 2015*. *Special Report NSF 17-306*. Arlington, VA: National Center for Science and Engineering Statistics. Retrieved from https://www.nsf.gov/statistics/2017/nsf17306/

Nettles, M. T., & Millett, C. M. (2006). *Three magic letters: Getting to PhD*. Baltimore, MD: The Johns Hopkins University Press.

Nogueira-Martins, L., Fagnani Neto, R., Macedo, P.C.M., Cítero, V.A., & Mari, J.J. (2004). The mental health of graduate students at the Federal University of Sao Paulo: A preliminary report. *Brazilian Journal of Medical and Biological Research, 37*(10), 1519-1524.

Oswalt, S., & Riddock, C. (2007). What to do about being overwhelmed: Graduate students, stress and university services. *College Student Affairs Journal, 27*, 24–44.

Parry, S. (2007). *Disciplines and doctorate*. Dordrecht, The Netherlands: Springer.

Pyhältö, K., Toom, A., Stubb, J., & Lonka, K. (2012). Challenges of becoming a scholar: A study of experienced problems and well-being of doctoral students. *ISRN Education, 12, Journal of Documentation, 68*(4), 559–581.

Reese, K. L. (2013). *Exploring doctoral student experiences from the perspectives of mid-career professionals in educational leadership using photo-elicitation* (Doctoral dissertation, Clemson University).

Rodríguez, A., Látková, P., & Sun, Y. Y. (2008). The relationship between leisure and life satisfaction: Application of activity and need theory. *Social Indicators Research*, *86*(1), 163.

Saldana, J. (2016). *The coding manual for qualitative researchers*. Thousand Oaks, CA: Sage Publications

Sandelowski, M., & Barroso, J. (2003). Creating metasummaries of qualitative findings. *Nursing Research 52*(4), 226-233.

Satchwell, C., Partington, H., Barnes, L., Gurjee, R., Ramsdale, S., Dodding, J. D., & Drury, K. (2015). Our breadcrumb trail through the woods: Reflections on the use of a secret Facebook group as a strategy for

surviving and thriving on the doctoral journey. *International Journal of Doctoral Studies, 10,* 465-482. Retrieved from https://www.informingscience.org/Publications/2306

Sauer, J. L., (1986). *Role, responsibility, and success in graduate school* (Doctoral dissertation, University of California, Los Angeles). Dissertation Abstracts International, 47(102A).

Schillebeeckx, M., Maricque, B., Lewis, C., (2013). The missing piece to changing the university. *Nature Biotechnology, 31*, 938–941.

Simon, C. (2017, May 4). *More and more students need mental health services. But colleges struggle to keep up.* Retrieved from http://college.usatoday.com/2017/05/04/more-and-more-students-need-mental-health-services-but-colleges-struggle-to-keep-up/

Sisson, L. G., & Adams, A. R. (2013). Essential hospitality management competencies: The importance of soft skills. *Journal of Hospitality & Tourism Education, 25(3)*, 131-145. doi:10.1080/10963758.2013.826975

Strauss, A., & Corbin, J. (1998) *Basics of qualitative research: Techniques and procedures for developing grounded theory.* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Stephan, P. (2012). *How economics shapes science.* Cambridge, MA: Harvard University Press.

Sullivan, T. A. (2014). Greedy institutions, overwork, and work-life balance. *Sociological Inquiry, 84,* 1–15. doi:10.1111/soin.12029

Taylor, S., Kiley, M., & Humphrey, R. (2017). *A handbook for doctoral supervisors*. Routledge.

Tsai, J. W., & Muindi, F. (2016). Toward sustaining a culture of mental health and wellness for trainee in the biomedical sciences. *Nature Biotechnology, 34*, 353–355.

Waitzkin, H., Yager, J., Parker, T., & Duran, B. (2006). Mentoring partnerships for minority faculty and graduate students in mental health services research. *Academic Psychiatry*, *30*(3), 205–217.

Weidman, J. C., Twale, D. J., & Stein, E. L. (2001). Socialization of graduate and professional students: A perilous passage? *ASHE-ERIC Higher Education Report, 28*(3). San Francisco: Jossey-Bass.

Weiss, R. (1994). *Learning from strangers: The art and method of qualitative interview studies.* New York: The Free Press.

Williams, L. (2017, May/June). *Under pressure: The growing demand for student mental health services.* Retried from: https://www.agb.org/trusteeship/2017/mayjune/under-pressure-the-growing-demand-for-student-mental-health-services

Wright, M. C., Howery, C. B., Assar, N., McKinney, K., Kain, E. L., Glass, B., Kramer, L., & Atkinson, M. (2004). Greedy institutions: The importance of institutional context for teaching in higher education. *Teaching Sociology, 32*(2), 144–159.

BIOGRAPHIES

Stefanie Benjamin is an Assistant Professor in the Retail, Hospitality, and Tourism Management program at the University of Tennessee. Her research interests include cultural and historical landscapes regarding heritage tourism in the U.S. South with special attention devoted to power, politics, and counter narratives. Additionally, she is devoted to sustainable tourism through planning, education, and development; film-induced tourism; slave narrative performances; festivals/events; facilitating improvisational theater games in higher education; and PhD students' well-being and mental health.

Currently, **Dr. James Williams** serves as an assistant professor at the University of Tennessee and is the owner of UNMASKYTP, LLC, training leaders to be happy, to be more productive, and to be more successful in their personal and professional endeavors. He has also published research on emotional intelligence, soft skills, sports, leadership, employee training, mentorship, hospitality pedagogy, human resource management, and personal and professional development.

Michelle A. Maher is Professor and Program Coordinator of the Higher Education Administration program at the University of Missouri-Kansas City. Her current research explores doctoral student research and disciplinary writing skill development and higher education access and equity issues.