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Review article

Academic career development: A review and research agenda☆

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ABSTRACT

Academic career development refers to the process by which employers as well as scholars working in research, teaching, and/or administrative roles in academic and higher education contexts manage various tasks, behaviors, and experiences within and across jobs and organizations over time, with implications for scholars' work-related identity. In this review article, we address the question: to what extent has conceptual and empirical research on academic career development captured central constructs and processes outlined by two important and comprehensive career development theories? Using social cognitive career theory and life-span, life-space theory as guiding frameworks, we categorized relevant articles published in academic journals into five thematic clusters: (a) individual characteristics, (b) contextual factors, (c) active regulation of behavior, (d) career stages, and (e) work and nonwork roles. Within these thematic clusters, major topics in the existing literature on academic career development include gender differences and women's experiences, mentoring and other career development interventions, and career development in the field of medicine. In contrast, social and cognitive processes, action regulation, later career stages, and the work-nonwork interface have been neglected in the literature on academic career development. We conclude by outlining an agenda for future research, including theoretical and methodological considerations.

1. Introduction

A *career* is defined as the sequence and combinations of work-related roles people occupy across their lifespan (Arthur, Hall, & Lawrence, 1989; Super, 1980). *Career development* is a distinct concept that refers to the process by which both individuals and their employers manage various tasks, behaviors, and experiences within and across jobs and organizations over time, with implications for employees' work-related identity (Brown, 2002; Greenhaus, Callanan, & Godschalk, 2000). Thus, the concepts of career and career development are related yet emphasize different aspects. In particular, compared to research on careers in general, career development research focuses on how individual and contextual factors influence changes in people's careers over time. Several literature reviews have focused on the topics of career development as well as subjective and objective career success (i.e., the attainment of personal goals or tangible rewards such as promotions, respectively) across various occupational fields (e.g., Ng, Eby, Sorensen, & Feldman, 2005; Sullivan & Baruch, 2009; Vinkenburg & Weber, 2012; Wang & Wanberg, 2017). So far, however, no comprehensive review of the literature on academic career development exists, thus preventing theoretical, empirical, and practical progress in this

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area. We review the literature on academic career development rather than academic careers more generally (see Baruch & Hall, 2004), because we are particularly interested in individual and contextual factors that may contribute to changes in people's careers.

Academic career development entails the career development process of scholars working in research, teaching, and/or administrative roles within academic and higher education (i.e., post-secondary or third level education) contexts, such as colleges, universities, academies, conservatories, as well as research institutes and centers (including both "research intensive" and "teaching-focused" organizations; Baldwin & Blackburn, 1981). Thus, the focus of academic career development research and practice is on scholarly-trained individuals (i.e., academics), such as doctoral students, postdoctoral researchers, lecturers, and professors at various ranks and employment arrangements (e.g., sessional, untenured, tenured academics; part- and full-time academics). In contrast, the notion of academic career development does not apply to other employees working in academic and higher education contexts, such as administrative assistants or technicians. Importantly, many if not all academics engage in research, teaching, and administrative roles throughout or in particular phases of their careers. For instance, a professor may conduct research, teach students, and hold administrative roles, such as committee chair, throughout his or her career. In contrast, other scholars might engage in only one or two of these roles over certain time periods or even most of their careers. For instance, a professor who is dean of the faculty may have reduced expectations to conduct research and/or teach courses.

A review on academic career development is timely and important for at least three reasons. First, working in academia is a unique career path for individuals across different fields of study. The individual abilities and motivations, working conditions, organizational interventions, policy approaches, and thus, career development practices in academic contexts differ substantially from those in other contexts (e.g., industrial organizations, public service, or the military, see Baruch, 2013; Huisman, de Weert, & Bartelse, 2002; Roach & Sauermann, 2010). For instance, academics are generally highly educated and specialized in their fields of research and/or teaching (Roach & Sauermann, 2010). Moreover, Roach and Sauermann (2010) observed that, compared to other occupations, academics typically have high intrinsic work motivation and a "taste for science" (p. 422), are more willing to accept a relatively lower salary, and more strongly value working conditions that provide independence and flexibility. Thus, it is important to conduct a literature review on career development in this particular context to gain a better understanding of how it may differ from career development in other contexts.

Second, in the context of an intensifying "war for talent" in academia (van den Brink, Fruytier, & Thunnissen, 2013), changes in higher education frameworks (e.g., more temporary contracts; Schmidt & Langberg, 2007), and an aging academic workforce (Stroebe, 2010), the topic of academic career development has received increased attention from both researchers and practitioners in recent years. Due to relatively high levels of uncertainty and competition associated with the pursuit of academic careers, many academic institutions around the globe now take a strategic approach to personnel and career development. Thus, the need for a thorough synthesis and critical discussion of the literature on academic career development is also justified by the growing importance that researchers and practitioners attribute to the topic.

Finally, conceptual and empirical articles on academic career development are currently scattered across different scientific disciplines (e.g., medicine, education, vocational behavior) and academic journals, without conceptual integration. This lack of integration prevents a systematic understanding of the topic, and hinders further theoretical development, rigorous empirical studies, and clear recommendations for practical applications. We believe that not only researchers who study career development, but also individual academics, academic and higher education institutions, and policy makers can benefit from an integrative literature review.

The overarching goal of this article, therefore, is to review and critically discuss conceptual and empirical (i.e., quantitative and qualitative) research on academic career development published over the past several decades. We argue that it is imperative that a literature review on this topic is based on well-established and comprehensive theories from the field of career development. Thus, we use social cognitive career theory (Lent & Brown, 1996; Lent, Brown, & Hackett, 1994) and life-span, life-space theory (Super, 1980; Super, Savickas, & Super, 1996) as guiding frameworks for our review. We chose these two complementary "grand theories," because they are widely used to study career development and because they comprehensively capture both content and process aspects of career development (Brown & Lent, 2016; Lent & Brown, 2013). We address the following research question in this review:

> *Research Question:* To what extent has conceptual and empirical research on academic career development captured central constructs and processes outlined by social cognitive career theory and life-span, life-space theory?

To answer this research question, we categorize relevant journal articles using five theoretically derived thematic clusters: (a) individual characteristics and personal resources, (b) contextual factors, (c) active regulation of behavior, (d) career stages, and (e) work and nonwork roles.

Overall, our review contributes to the career literature in two important ways. First, based on two well-established career development theories, we summarize and critically discuss which topics research on academic career development has investigated and which topics have been neglected and require further attention. Thus, our review integrates this burgeoning literature and identifies conceptual and methodological implications for future research. Second, we contribute to theory evaluation and development in the field of career development by discussing how findings from the literature on academic career development may advance research on social cognitive career theory and life-span, life-space theory. Specifically, topics that have been emphasized in the literature on academic career development may be used to extend these theoretical frameworks or to better understand their applicability to different career contexts. Again, we emphasize that our focus is on reviewing the research literature on academic career development and not the literature on academic careers in general. Thus, our conclusions apply to the process by which individuals and their employers manage careers over time, while we do not derive implications for the broader topic of academic careers. The use of social cognitive career theory and life-span, life-space theory as two prominent theoretical frameworks that aim to explain people's career

development is consistent with our focus in this review.

2. Theoretical background

We base our review on two well-established and comprehensive "grand theories" that are often used to guide empirical research in the career development literature (Baruch & Bozionelos, 2011; Brown & Lent, 2016; Lent & Brown, 2013): social cognitive career theory and life-span, life-space theory. Importantly, while we conducted a theory-based literature review, we did not limit our literature search to only those articles that have used these theories. Rather, we conducted a broad literature search to obtain research on academic career development, and then mapped such research back onto the general tenets of these two theories.

We chose to focus our theory-based review on social cognitive career theory and life-span, life-space theory, and not other theories, for three reasons. First, unlike other important and general frameworks (e.g., person-environment fit theory), these theories were specifically developed for research on career development (Brown & Lent, 2016), and are thus more relevant to the present review. Second, both theories capture content (i.e., psychological and contextual factors) and process aspects of career development, and thus provide a coherent yet parsimonious theoretical background upon which to base our review (Lent & Brown, 2013). Finally, both theories have received broad empirical support (Brown & Lent, 2016; Lent & Brown, 2013). In contrast, empirical research on other theories (e.g., career construction theory; Savickas, 2005) has primarily focused on specific constructs derived from such theories (e.g., career adaptability), which limits their applicability to a broad literature review. In the following, we outline key propositions of social cognitive career theory and life-span, life-space theory and derive five thematic clusters that we subsequently use to structure our literature review.

2.1. Social cognitive career theory

Social cognitive career theory focuses on the development of career interests, making career choices, and individual and contextual influences on career behavior (Lent et al., 1994; Lent & Brown, 1996). The theory emphasizes individual agency, that is, people's ability and motivation to influence their environment and their own career development. Social cognitive career theory draws on Bandura's (1986) social cognitive theory and the triadic-reciprocal model, which propose bidirectional influences between individual characteristics (e.g., abilities and beliefs), contextual characteristics (e.g., social support), and overt behaviors. As noted by Lent, Brown, and Hackett (2002), social cognitive career theory "attempts to trace some of the complex connections between persons and their career-related contexts, between cognitive and interpersonal factors, and between self-directed and externally imposed influences on career behavior" (p. 256). More specifically, the theory explains how person inputs (e.g., gender, predispositions) and contextual factors (e.g., mentoring) impact work and career performance via a cognitive-behavioral process. The latter includes learning experiences, self-efficacy, outcome expectations, interests, and goals. Consistent with social cognitive career theory, we categorize research on academic career development into three thematic clusters: (1) individual characteristics and personal resources as "person inputs" of academic career development, (2) contextual influences on academic career development, and (3) active regulation of behavior in the context of academic career development. The difference between the first and third themes is that the former includes rather stable factors, whereas the latter focuses on more dynamic factors.

2.1.1. Individual characteristics and personal resources

Social cognitive career theory suggests that individual difference characteristics can impact people's career development via learning processes and the psychological regulation of behavior (Lent et al., 2002). Based on this assumption, we reviewed the literature to identify individual characteristics and personal resources that may influence academic career development. Such characteristics and resources may include demographic characteristics (e.g., age, gender), personality traits (e.g., conscientiousness), as well as relatively stable abilities, beliefs, attitudes, and motivation.

2.1.2. Contextual influences

Social cognitive career theory also proposes that individuals steer their career development within the context of environmental opportunities and constraints (Lent et al., 2002). Consistently, we reviewed the literature for theory and empirical evidence on contextual factors that impact academic career development. Such contextual factors may include more proximal factors, such as working conditions, social support and networks, career development programs and specific interventions, as well as more distal factors, such as specific academic disciplines, professional societies, and societal and cultural contexts.

2.1.3. Active regulation of behavior

Finally, the prediction of active career behaviors (e.g., making career choices, investing effort to achieve career goals) is a central component of social cognitive career theory (Lent et al., 2002). Thus, we reviewed the literature for studies that investigated specific actions related to academic career development, such as goal setting, long-term planning, use of specific strategies, and feedback seeking (Zacher & Frese, 2018).

2.2. Life-span, life-space theory

To guide our theory-based review, we further use life-span, life-space theory (Super, 1980; Super et al., 1996) to identify additional important topics in the study of academic career development. Like social cognitive career theory, life-span, life-space theory

also considers individual and contextual characteristics, but its primary focus is on different life and career stages, as well as the work and nonwork roles that people occupy across their lifespan. Specifically, five developmental stages (with approximate age ranges) are described by this theory: growth (birth to 14 years), exploration (15–24 years), establishment (25–44 years), maintenance (45–65 years), and decline (65 years and older). Importantly, Super et al. (1996) noted that these age ranges represent historical norms that may change and that, in times of more dynamic careers, people may go through these stages several times, independent of their age. The work and nonwork roles outlined by life-span, life-space theory include child, student, leisurite, citizen, worker, spouse, homemaker, parent, and pensioner (Super, 1980). Thus, the theory adopts a developmental and role-based perspective (Super, 1984) that complements social cognitive career theory in important ways (see Lent & Brown, 2013, for an integration of the two theories). Based on life-span, life-space theory, we include two additional thematic clusters to structure our literature review: (1) academic career development in and across different career stages, and (2) academic career development related to different work and nonwork roles.

2.2.1. Career stages

Consistent with the developmental perspective of life-span, life-space theory, we review the literature on academic career development to identify studies that focus on distinct career stages, including early, middle, and late career (Slocum & Cron, 1985), as well as career stages involving growth, exploration, establishment, maintenance, and decline. Moreover, we aim to identify studies that adopt a lifespan developmental approach to academic career development (Fasbender & Deller, 2017; Ng & Feldman, 2012).

2.2.2. Work and nonwork roles

A central tenet of life-span, life-space theory is that individuals occupy multiple work and nonwork roles at a single point in time and across their careers and lives (Super, 1980). Thus, we aim to identify research that investigates academic career development of people in different life roles (e.g., professor and parent), and in several specific roles within the work context (e.g., professors hold teaching and leadership roles).

3. Method

Between February 2017 and February 2018, we conducted several comprehensive literature searches of the electronic search engines Web of Science and Google Scholar, using the search terms “academic,” “career,” and “development.” We used all three of these search terms simultaneously (instead of only “academic” and “career”) because, as noted in the Introduction, we are particularly interested in the academic career development process in this review. Compared to the broader notion of academic careers, academic career development emphasizes the role of individual (e.g., employee characteristics and actions) and contextual (e.g., employer support and development opportunities provided) factors that may impact on changes in scholars' careers and their work-related identity (Brown, 2002; Greenhaus et al., 2000). This decision implies that, consistent with our goal for this review, we will only derive conclusions regarding the literature on academic career *development* (based on our use of these three search terms), and not regarding the literature on academic careers more generally.

With regard to inclusion and exclusion criteria, we did not set a starting date for our searches, and we included all English-language conceptual and empirical (i.e., quantitative or qualitative) articles on academic career development that have been published in peer-reviewed academic journals. Our initial searches yielded a total of 2551 entries. We refined our initial sample of articles by scanning titles, abstracts, and keywords, and by excluding those studies that were not relevant to our review or that were not accessible through the databases of different university libraries. To further narrow this sample, we also excluded book chapters and conference abstracts. Further reasons for exclusion were that studies focused on the academic development of children, high school students, or undergraduate students.

Our final sample included 151 journal articles on academic career development published between 1981 and February 2018. Table 1 provides a list of journals that published two or more articles on academic career development in this time period. Due to restrictions on manuscript length, it is not feasible to cite and summarize each of the articles we identified though our literature searches. Instead, we summarize a large, but selected sample of these articles that best map onto the five aforementioned career development themes. A list of all references is available under the following link: https://osf.io/q5eb2/?view_only=addd17f162204c4581ffca3b78702fd3. The first and third authors categorized all relevant articles using the five themes (any disagreements were resolved through discussion). Subsequently, if possible, these authors further categorized studies into additional subcategories of each broader theme (e.g., gender as part of individual characteristics).

4. Results

In the following, we summarize and integrate findings of those articles identified via our literature searches that best exemplify each of the five thematic clusters that structure our review. Where applicable, we also note how such studies fit within subcategories of these clusters.

4.1. Individual characteristics and personal resources

According to social cognitive career theory, various person inputs can influence individuals' career development, including demographics, personality, and relatively stable abilities, attitudes, and beliefs (Lent et al., 1994). We noted that a large number of

Table 1
Journals that published two or more articles on academic career development between 1981 and February 2018 (Ordered by Number of Articles Published; Journals that Published the Same Number of Articles are in Alphabetical Order).

Journal	Number of articles published on academic career development
Academic Medicine	21
Academic Psychiatry	7
Journal of Women's Health	5
Academic Emergency Medicine	4
Family Medicine	3
Higher Education	3
Higher Education Research & Development	3
International Journal for Academic Development	3
Journal of Dental Education	3
The American Journal of Surgery	3
Archives of Internal Medicine	2
Career Development International	2
Journal of Geography in Higher Education	2
Journal of Higher Education Policy and Management	2
Journal of Professional Nursing	2
Journal of the American Geriatrics Society	2
Journal of Vocational Behavior	2
Mentoring & Tutoring: Partnership in Learning	2
Policy Futures in Education	2
Research Evaluation	2
Studies in Higher Education	2

Note. For a list of all references of articles included in this review, see: https://osf.io/q5eb2/?view_only=addd17f162204c4581ffca3b78702fd3

articles that focused on individual characteristics and personal resources examined the role of gender for academic career development, particularly women's experiences. In contrast, other individual characteristics (e.g., abilities, ethnic and national background) and personal resources (e.g., self-esteem, resilience) were investigated by a much smaller number of studies. We therefore further categorized this literature into articles that focused on gender and women's experiences as well as articles that focused on other individual characteristics and personal resources.

4.1.1. Gender differences and women's experiences

Studies in this category mainly focus on female academics' career paths and experiences, as well as the role of gender for career development programs and career success. Regarding career paths and experiences, Fritsch (2016) identified three distinct patterns of career development for female academics. These included an individualistic, output-driven pattern, a political-sustainable pattern, and an adaptive-flexible pattern. Bryson (2004) demonstrated that women in academia, as compared to men, are less likely to gain or perceive employment benefits due to fixed-term contracts. A study conducted in eight academic medical centers found that women perceived or anticipated more active discrimination than men (Cochran et al., 2013). In addition, one third of women believed that gender stereotypes were a barrier to their career aspirations.

In another study, female professors at a medical school described gender-based discrimination (e.g., being ignored) as a significant challenge to their career development (Pingleton, Jones, Rosolowski, & Zimmerman, 2016). They reported coping with discrimination using techniques such as downplaying, keeping a distance, and using humor. A study by Terosky, O'Meara, and Campbell (2014) examined the role of women's sense of agency in their advancement from associate to full professor. Agency was constrained by several factors, including workload, interactions with colleagues, fit between personal values, and institutional promotion criteria. In contrast, perceived abilities, self-selected professional networks, and institutional support promoted a sense of agency in career advancement. We identified only one study on the role of gender for academic career development in a non-Western context (Alwazzan & Rees, 2016), a qualitative study with female medical educators in Saudi Arabia. Themes uncovered by this study included gender inequalities (e.g., women being overlooked for leadership positions), gender stereotypes (e.g., women being viewed as more likely to take part in shared leadership), and gendered specialties (e.g., surgery being dominated by men).

A number of studies focused on the role of gender for career development programs and interventions. For instance, Fried et al. (1996) investigated the outcomes of interventions to address gender-based career obstacles and improve faculty development at a medical school. They found that due to such interventions, the proportion of women retained and promoted increased significantly, and that more than half of the women and some men reported improvements in timeliness of promotions, reduced manifestations of gender bias, access to information needed for faculty development, and salary equity. Similarly, Helitzer et al. (2014) surveyed participants of three career development programs for female faculty in academic medicine. The study showed that leadership, negotiation, networking, and interpersonal skills improved through these programs. Chang et al. (2016) examined the effect of a career development program on retention, finding that female participants were significantly less likely to leave academic medicine and less likely to switch institutions after 10 years.

Finally, a number of studies focus on gender differences in objective indicators of academic career success (e.g., salary, promotions). For instance, Kim (2011) found no evidence of less favorable outcomes for women in terms of salaries, career development,

and workload at a public academic institution. Another study concluded that women and men in Sweden have the same probability of obtaining a postdoctoral fellowship and becoming professors (Danell & Hjerm, 2013). However, women who were not postdoctoral fellows had a smaller chance of becoming professors in comparison to men, possibly due to women's disadvantages with regard to informal networking. In a department of medicine, Kalyani et al. (2015) found no gender differences in the attainment of independent funding by male or female career development awardees. However, a more recent study by Blumenthal et al. (2017) showed that, after accounting for several factors that influence academic rank, women are less likely to be full professors in cardiology faculty at medical schools in the United States. Finally, based on a series of semi-structured interviews with new academics and senior academic mentors in education faculties, Angervall, Beach, and Gustafsson (2015) argued that women's academic labor is often exploited to enhance the careers of their male colleagues and supervisors.

In summary, research on gender differences and women's experiences related to academic career development reflects a key proposition of social cognitive career theory: person inputs, such as gender, are likely to interact with contextual influences in predicting career behavior and success (Lent et al., 1994). Consistent with this proposition, the studies reviewed here suggest that contextual factors such as job and employment characteristics, gender-based discrimination, and purposeful career development interventions can play an important role for female academics' career development. Moreover, other person inputs such as coping behaviors can potentially mitigate negative influences on female academics' career development. Despite these observations, it is also clear that the findings on gender differences in objective career success are mixed, suggesting a need for further research – particularly research that aligns findings of no gender differences with the existence of the gender pay gap and the (relatively) low proportion of women full professors in some disciplines (e.g., Nelson & Rogers, 2003).

4.1.2. Other individual characteristics and personal resources

Although studies of individual characteristics predominantly focus on female academics' career paths and experiences, there were several notable examples of other individual characteristics as well as personal resources in this literature. For example, an article by Flores et al. (2016) describes an initiative that was established to address the lack of diversity in the pediatric and biomedical research workforce. The initiative supports grant applicants who are members of underrepresented minority groups, disabled, or from socially, economically, or educationally disadvantaged backgrounds. Other articles describe similar programs aimed at increasing the number of individuals from underrepresented minority groups who pursue academic careers in dentistry (Sinkford, Valachovic, Weaver, & West, 2010) and medicine (Daley et al., 2011).

With regard to personal resources, Lieff (2009) offers a conceptual framework on faculty members' search for meaning and professional fulfillment at work, as well as their ability to reflect on these issues and to achieve a better fit with their work context. Another conceptual article by Machado-Taylor, Soares, Ferreira, and Gouveia (2011) discusses various individual, job-related, and organizational factors affecting job satisfaction and motivation of academics. Based explicitly on social cognitive career theory, an empirical study by Ismail, Ali, and Arokiasamy (2012) showed that personality traits (e.g., conscientiousness, extraversion) positively predicted self-rated career advancement in both public and private universities in Malaysia, above and beyond the effects of organizational and family support. Finally, Anderson et al. (2016) also used social cognitive career theory to develop new self-report measures of self-efficacy in scientific communication, career outcome expectations, and scientific interests.

Considering the theme of individual characteristics and personal resources, research on the role of individual characteristics other than gender and personal resources for academic career development is still relatively rare. This is an unfortunate observation, particularly because social cognitive career theory offers that a number of substantively important individual characteristics and personal resources (e.g., internal cognitive and affective states) operate reciprocally with behaviors, situated within context. Arguably, this narrow focus on demographic features presents an incomplete picture of academic career development, as viewed through the lens of social cognitive career theory. What is also clear is that such research has been conducted to address issues of social importance (e.g., noted gender gaps in academic careers, broadly defined). However, this by itself cannot account for the lack of research focusing on other characteristics and resources that are potentially important for academic career development.

4.2. Contextual influences

In addition to person inputs, social cognitive career theory suggests that various background and more proximal contextual influences impact career behaviors and outcomes (Lent et al., 1994). We categorized articles that focus on contextual influences on academic career development into those that focus on mentoring, additional career development programs and interventions, academic disciplines, working conditions and resources, and national culture.

4.2.1. Mentoring

The topic of mentoring (i.e., personal and career guidance provided by an experienced person in the work context; Kram, 1985) has received a great deal of attention in the literature on academic career development. Mentoring is often examined in combination with the topics of gender (e.g., Schmidt & Faber, 2016) or age/career stage (e.g., Foran-Tuller et al., 2012). We identified two recent articles that adopted theoretical approaches to understand the role of mentoring for academic career development. First, Sood, Tigges, and Helitzer (2016) offered a two-pronged framework, which includes individual mentoring competencies as well as the institutional climate for mentoring. The researchers suggest that activities aimed at improving the institutional climate should complement training activities for individual mentors. Second, Manson (2016) argued that institutions are as important to the advancement of the research careers of early-stage investigators as is the investigators' sense of agency.

We identified several empirical studies describing evaluations of specific mentoring programs, most of which have been

developed for, or implemented with, academics in medical or health disciplines. For instance, Serwint, Cellini, Spector, and Gusic (2014) reported that a "speed mentoring" event was positively evaluated by both mentors and protégés. In a study with pediatric academic professionals, Fleming et al. (2015) found an increase in the ability to define career goals, as well as career-relevant knowledge, skills, and behaviors following participation in a two-year mentoring program. Similarly, Phitayakorn, Petrusa, and Hodin (2016) found that a one-year mentoring program for junior surgery faculty in cooperation with senior faculty members led to improved career planning and higher involvement of protégés' in professional societies. In contrast, this study did not find effects on productivity and work-life balance. A study by Iversen, Eady, and Wessely (2014) examined factors that influence the success of a mentoring program. Protégés' age (i.e., younger), the frequency and duration of protégé-mentor meetings, as well as the quality of interactions positively affected academic career success reported by protégés. Moreover, the researchers found that 93% of academic mentors involved in the program agreed that being a mentor has been worthwhile. Mentors reported that mentoring had familiarized them with the "bigger picture" in their field and motivated them to think about their own career development. Finally, Ferguson and Wheat (2015) reflected on their experiences with starting a social media discussion group for early career academics. They concluded that online forums such as Twitter can be a source of support and knowledge sharing.

We found several articles that focused on mentoring experiences and outcomes of academics that were not enrolled in a specific program. For example, Kaderli, Muff, Stefenelli, and Businger (2011) surveyed female surgeon academics and found positive relationships between having an informal mentor and various indicators of objective career success, such as number of publications and research awards obtained. Similarly, Holliday, Jagsi, Thomas, Wilson, and Fuller (2014) reported positive associations between mentoring received and various productivity metrics (e.g., number of publications and citations, h-index) in a sample of academic radiation oncologists. Similarly, a mixed-methods study found that mentoring contributed to the professional advancement of academic protégés through opportunities for career and leadership development, learning from a role model, building professional relationships, and increased job satisfaction (Ambler, Harvey, & Cahir, 2016).

Finally, a few studies examined the effects of different mentoring arrangements and practices used in academic settings. For example, Kirchmeyer (2005) investigated effects of different types of mentoring on academic career success. Using a sample of early- and mid-career accounting academics, this study found that the number of internal mentors positively predicted protégés' career rank, whereas external mentors positively influenced the number of publications. Curtin, Malley, and Stewart (2016) surveyed doctoral students on their experiences with different types of mentoring. Results showed that instrumental and psychosocial mentoring positively predicted protégés' self-efficacy and interest in pursuing an academic career.

In summary, studies on the role of mentoring for academic career development demonstrate some connection to social cognitive career theory, which posits an important role of self-efficacy. Consistent with Bandura (1997), social cognitive career theory suggests that self-efficacy is developed and modified via four complimentary mechanisms, which serves as sources of feedback: personal performance accomplishments, vicarious learning, social persuasion, and physiological/affective states. Mentoring serves to engage each of these mechanisms to some extent, providing support for the development of career-related self-efficacy.

4.2.2. Additional career development programs and interventions

In their "guide to academic research career development," Gail Neely, Smith, Graboyes, Paniello, and Paul Gubbels (2016) suggest that prerequisites to a successful academic career include a commitment to time-consuming high-quality research, the ability to learn from and withstand setbacks, acquiring funding sources, as well as guidance and mentoring. However, missing from this list of predictors of academic success are systematic career development programs and interventions organized by academic institutions. In contrast, Stead, Sadosty, and Decker (2005) included training in their "roadmap" to increase academic career success. In this section, we highlight studies that investigated the effectiveness of career development programs and interventions aimed at developing academic careers, in terms of research, teaching, and/or administration.

Rust et al. (2006) presented the results of a faculty development program in a medical school designed to increase the diversity of academics. Participants were trained in teaching, scientific and grant writing, research, and minority career issues, using a one-year long-term program, four to six week stand-alone modules, and an executive faculty development program. The researchers found that self-reported competencies in academic skills (e.g., teaching, research) rose from 2.7 to 4.1 (out of 5), and that over ten years, the numbers of underrepresented minorities in the faculty rose from 33 to 81%. O'Brodovich, Beyene, Tallett, MacGregor, and Rosenblum (2007) evaluated the effectiveness of a 7-year career development program at a health science center. The program entailed a review of job expectations, benchmarks for career development, and peer assessments of performance. The researchers found that participation in the program positively predicted promotions, independent of gender and academic rank. A study by Domino and Reynolds (2010) showed that an academic career development program for obstetrics and gynecology fellows, which included training in research idea development, grant writing, and presentation skills, led to an increase in confidence regarding academic skills and a greater rate of utilization of departmental research support.

Bruce et al. (2011) reported the results of an evaluation of a national career development program created to facilitate the transition to an independent research career. Part of the program involved individual coaching to improve grant preparation and time management, along with consultation with statistical and other experts. The researchers found that program participants were more than twice as likely to receive grant funding as academics who did not participate. Another study showed that awards and associated funding given to early-career scientists resulted in higher grant funding received by awardees (62%) as compared to unsuccessful applicants for the award (42%; Escobar-Alvarez & Myers, 2013). Finally, DeRosier, Kameny, Holler, Davis, and Maschauer (2013) evaluated the success of early- and mid-career academics who participated in a career development conference. Results showed that the conference led to increases in publications, research projects, honors and grant awards, collaborations, and scientific presentations assessed nine months later, particularly among female participants.

Another group of studies examined the effects of programs designed to improve teaching practices of academics. Williams et al. (2007) compared the activities and outcomes of 10 academic medical centers that had received funding to introduce positive changes in geriatrics clinical training, to 11 of the highest-ranked unfunded centers. Results revealed that even moderate funding, targeted effectively, could aid clinical educators in developing more effective teaching practices. Another program designed to improve teaching skills at a dental school increased retention rates, helped academics develop social networks for dealing with teaching issues, and led to the creation of academic projects (McAndrew, Motwaly, & Kamens, 2013).

Considering research on career development interventions other than mentoring, it is clear that a diverse array of strategies can be effectively employed in service of academic career development. On the one hand, such diversity suggests that there may not be any "one size fits all" program or intervention for successful academic career development. On the other hand, studies have not compared the efficacy of more-or-less structured or formalized programs and interventions against one another as a means to gauge their relative (i.e., comparable) efficacy. Regardless of this, the studies reviewed here do suggest that there are multiple mechanisms beyond mentoring through which career-related self-efficacy may be developed, and it appears that interventions which specifically focus upon learning new skills may likewise bolster outcome expectancies which, according to social cognitive career theory, are an important mechanism linking self-efficacy beliefs to career development behaviors and outcomes.

4.2.3. Academic disciplines

Several studies focus on career development in specific academic disciplines, including nursing, engineering, geography, business, political science, and tourism. However, by far the largest number of studies on academic career development originates from the medical field. Accordingly, journals that published most research on this topic included *Academic Medicine*, *Academic Psychiatry*, and *Academic Emergency Medicine* (see Table 1). One possible explanation for the strong interest in career development in this discipline is that, over the past decades, medical schools have become very complex organizations in which research, teaching, and clinical practice are increasingly pursued independently, requiring new approaches to academic career development (Whitcomb, 2004).

Most of the articles described specific career development programs, and did not focus on a particular subgroup of medical academics. However, some studies focused explicitly on academic psychiatrists. For example, Halpain et al. (2001) introduced a week-long research training program followed by ongoing mentoring for academics working in geriatric psychiatry. Similarly, O'Hara et al. (2010) described a training program for young psychiatry investigators designed to help them pursue independent academic careers. Other articles described career development programs designed for academics working in emergency medicine and surgery. The second largest group of articles on academic medicine in our review examined various resources (e.g., feedback) and constraints (e.g., lack of communication) that may influence the academic career development of medical professionals (e.g., Weinert, Billings, Ryan, & Ingbar, 2006).

Considering the research reviewed above, it is clear that discipline-specific attempts at career development are of value, but the predominant focus of this work within medicine may present limits to the generalizability of these studies to other academic fields. This observation consequently begs for more attention to be paid to those factors that, more broadly and generally, impact career development outcomes regardless of disciplinary specificity. Indeed, there are notable differences in the work done within academic medical contexts compared to, for example, more traditional schools of liberal arts and sciences. In terms of the more practical considerations of the research that falls within this subtheme, we would argue that academic institutions may pay more attention to the value of academic career development initiatives if the broader efficacy of more general interventions could be demonstrated, regardless of discipline.

4.2.4. Work conditions and resources

Only a few articles focused on contextual factors related to specific workplaces. A study by Bryson (2004) found that the increased use of fixed-term contracts, as opposed to permanent employment, creates significant disadvantages for both female and male academics. Another study found negative effects of fixed-term contracts on several career development outcomes, including publications and development of collaborations (Broadbent & Strachan, 2016). Bickel (2007) discusses how academics in medicine can use professional societies to support their career development, and that particularly women and members of underrepresented minority groups struggle more with this process. Saleem and Amin (2013) found positive effects of supervisory and organizational support for career development on academics' performance. Finally, Robinson, Schwartz, DiMeglio, Ahluwalia, and Gabrilove (2016) highlighted the importance of organizational factors (e.g., protected research time, institutional resources and support) for subjective and objective academic career success.

Research is still scant in this area, and more evidence is needed before more certain conclusions can be drawn about the role of work conditions and resources in academic career development. What is apparent, and consistent with social cognitive career theory, is that there are several factors that serve as "contextual affordances" that may either promote or hinder academic career development. Of note, suggestions that the uncertainty associated with short-term employment arrangements may serve as a barrier to career development begs for future empirical elaboration. For example, more research must be conducted to ascertain whether this occurs via reduced self-efficacy and outcome expectations, as might be predicted by social cognitive career theory. This latter idea seems particularly relevant given trends for increased reliance on adjunct faculty, particularly in North America (e.g., Dobbie & Robinson, 2008).

4.2.5. National culture

Our review yielded several studies conducted outside of the United States, including Australia, Austria, Israel, Jamaica, Jordan, Malaysia, Mexico, New Zealand, Nigeria, Portugal, Saudi Arabia, Slovenia, South Africa, Spain, Sweden, Switzerland, and Turkey.

However, very few studies have compared academic career development across national cultures. For instance, Poole and Bornholt (1998) compared academics' assessments of their working conditions, research and teaching activities, community service, governance, and internationalization activities in Australia, Germany, Hong Kong, Israel, Mexico, Sweden, Great Britain, and the United States. A more recent study by Vajoczki et al. (2011) compared professional development practices and associated problems in higher education in Great Britain, Canada, Nigeria, and the United States. In summary, although research concerning academic career development occurs in various national contexts, very little research has considered the process of academic career development from a cross-national perspective.

4.3. Active regulation of behavior

The role of active career behavior and associated psychological process variables, such as goals, self-efficacy, and outcome expectations, is a central aspect of social cognitive career theory (Lent et al., 2002). We identified only a few studies on actions that academics may take to shape their career development. For example, Green and Ridenour (2004) discuss how university deans can influence their careers by actively reflecting on their goals and challenges, developing necessary leadership skills, and defining possible career pathways. Lieff (2009) argued that active career decision making is facilitated by academics' reflection on their strengths, passions, and values in relation to their work. In this regard, a study suggested that the decision to take a sabbatical could take academic careers into new directions (Carraher, Crocitto, & Sullivan, 2014). Another article argued that early-career academics need to define clear goals, carefully negotiate their employment terms, and use time management strategies to optimize their chances of success (Applegate & Williams, 1990). As part of a career development workshop, du Plooy and Vansteenkiste (2012) introduced a concept called "career sculpting," which refers to "the creative involvement of individuals in the shaping of their own lives and careers" (p. 89).

In summary, research on the active regulation of behavior speaks to the role of agency in shaping the process of academic career development. Such agentic forms of self-regulation are core to the social cognitive tradition (e.g., Lent et al., 2002). For other thematic clusters and topics discussed so far, such tie-ins are less apparent (e.g., the role of work conditions and cross-cultural differences as contextual factors). We should also note that social cognitive career theory offers a rather broad acknowledgement of the role of more stable individual characteristics, tending to treat any number of factors as such (e.g., predispositions; Lent et al., 2002). This lack of specificity makes explicit tests of social cognitive career theory more challenging, thus it is likewise difficult to characterize existing literature against the backdrop of this theory.

4.4. Career stages

Moving on to the thematic clusters derived from life-span, life-space theory (Super, 1980), we now review studies that focus on different stages of academic career development. The majority of articles focused on career development programs designed for early career academics. These are typically academics within the first five years of their first appointment, and they are in the establishment phase (i.e., approximately 25–44 years). For example, Farley, Casaletto, Ankel, Young, and Hockberger (2008) surveyed early career academics in emergency medicine to identify their developmental needs. These needs included lecture development, business and managerial skills, mentorship and career counseling, leadership skills, and knowledge of the faculty development process. Sutherland and Taylor (2011) organized a special issue on "The development of identity, agency, and communion in the early stages of the academic career." The six articles included in this issue suggested that despite difficulties (e.g., career anxiety, ambiguous messages), most early career academics "survive" and many "thrive."

Foran-Tuller et al. (2012) described the goals, development, implementation, and assessment of the "early career boot camp," a career development workshop designed for early career psychologists working in academic health centers. In the workshop, topics such as professional effectiveness, clinical supervision, career planning, and academic research were addressed. A qualitative study by Hemmings, Hill, and Sharp (2013) identified a number of individual and contextual factors that support the development of early career academics in institutions with "lower-order research profiles" (i.e., institutions that are not "research intensive"). This study concluded that academics differ widely in their needs for redirection, support, challenge, and inspiration, particularly at turning points in their careers. Flores et al. (2016) describe a program for young academic pediatricians from ethnic minority groups, including an annual career development and leadership conference, as well as help with creating a personal "survival guide" to ensure their career success. Finally, Ranieri, Barratt, Fulop, and Rees (2016) reviewed studies on factors that influence postdoctoral career progression among early-career clinical academics. They identified six key success factors: intrinsic motivation, work-life balance, inclusiveness, facets of the work environment, mentorship, and funding.

We found very little research on the career development of mid- and late-career academics who are in the maintenance (45–65 years) and possibly decline (65 years and older) stages of their careers. Campion, Bhasin, Beaudette, Shann, and Benjamin (2016) evaluated a medical faculty development program for mid-career academics and reported increases in knowledge, skills, attitudes, and social networks of participants. Stearns, Everard, Gjerde, Stearns, and Shore (2013) surveyed senior medical faculty (i.e., 50 years and older) on their career development needs and concerns. The researchers suggested that institutions should invest effort to provide mentoring to senior faculty and address their retirement planning needs. Finally, based on questionnaire and interview data, a study by Katz and Coleman (2002) categorized faculty members of a school of education into different career stages. Consistent with life-span, life-space theory, the "young and ambitious" are in the exploration and establishment career stages, whereas "teacher educators" are in the maintenance and decline stages of their careers.

Considering research on career stages, it is clear that a majority of studies in this thematic cluster have focused on early career

development, while largely ignoring later career stages. To this end, life-span, life-space theory (Super, 1980) is only partially reflected in this body of work. Given noted trends in workforce age demographics (i.e., an increasing number of older workers, generally), the lack of attention paid to the development of later career academics seems like a missed opportunity. In many countries, such as the United States, academics can feasibly work well past the traditional/normative retirement age. With the vast amount of human capital present in this older academic workforce, it would seem prudent to focus attention on those factors that might support continued life-long career development. Given the wealth of research concerning mentoring programs to facilitate academic career development that we noted above, and emerging knowledge regarding the benefits of intergenerational mentoring and knowledge exchange/transfer programs (Gerpott, Lehmann-Willenbrock, & Voelpel, 2016), it would seem natural to consider how matching early and late career stage academics in such mentoring relationships might mutually support career development across various career stages. Indeed, such programs may simultaneously satisfy younger academics' needs for growth, while promoting generativity and fostering a sense of legacy among the ranks of older academics.

4.5. Work and nonwork roles

In his life-span, life-space theory, Super (1980) proposed that work and nonwork roles are an essential aspect of career development. Surprisingly, we did not identify studies that focused on nonwork roles (e.g., parent, spouse, homemaker) and, thus, the work-nonwork interface. However, we identified several studies that examine academics' experiences in particular occupational roles. Most of these studies focus on leaders in academic institutions, such as deans and other senior university administrators, and on doctoral and postdoctoral researchers. For example, Fairchild, Benjamin, Gifford, and Huot (2004) observed that many academic physicians view management and administrative leadership “as outside their purview” (p. 214). However, they suggest that these specialized roles offer opportunities for shaping the interface of clinical medicine, health care, finance, and management in important ways. Similarly, Green and Ridenour (2004) lamented the low number of aspiring academic leaders (e.g., deans) in the nursing profession, even though these roles might offer an “exciting and rewarding leadership opportunity” (p. 489). Finally, a study suggested that awarding endowed chairs to female academics could be a useful strategy to advance their status and leadership in academic medicine (Carnes, Johnson, Klein, Jenkins, & Merz, 2017).

A few studies focused on the roles and experiences of doctoral researchers and postdoctoral fellows. For example, Zubieta (2009) found a positive effect of international postdoctoral mobility on the number of publications produced. As this study explains, these positions provide researchers with access to prestigious institutions, affording them larger networks and greater knowledge transfer. Lawson and Shibayama (2013) caution that postdoctoral positions might be an indicator of a researchers' difficulty in securing a permanent position after completing their doctoral degree. Nevertheless, the researchers recommend international research visits, as they are associated with a shorter waiting period for promotion and tend to increase the chances of obtaining a chaired position earlier.

In summary, the lack of research concerning nonwork roles, and their influence on academic career development is a notable gap in this research stream. While most research focuses on different occupational roles within academia, there was also surprisingly little research concerning transitions between different roles across one's career (e.g., transitions from teaching to administration, or from administration to teaching). Many academics switch between various roles throughout their careers, and such transitions may present distinct opportunities for additional career development. Also with respect to such transitions throughout one's academic career, it is important to note that life-span, life-space theory posits that people can and do cycle through various developmental stages (and are thus faced with various tasks) across their careers.

5. Discussion

The higher education landscape is changing due to increased globalization and competition (Bessette & Burton, 2014). This suggests that the topic of academic career development is likely to further gain in importance in the future. We reviewed the literature on this topic based on broad themes suggested by two well-established career development theories. Importantly, our focus was the research literature on academic career development, which emphasizes the process by which scholarly-trained individuals and their employers manage careers over time. Thus, our search strategy (i.e., the terms academic, career, and development had to be present in title, abstract, or keywords) did not include studies on academic careers in general (see Baruch, 2013; Baruch & Hall, 2004). In the following, we summarize major insights from our review, critically evaluate how well this literature addresses the tenets of these theories, and outline an agenda for future research. Throughout our discussion, we also point to additional relevant literature from the broader area of academic careers, more generally defined, that could be used to inform future research on the topic of academic career development.

5.1. Summary and critical discussion of major findings

We initially proposed the research question: To what extent has conceptual and empirical research on academic career development captured central constructs and processes outlined by social cognitive career theory and life-span, life-space theory? What is clear from our literature review is that academic career development research has captured some, but far from all of the central constructs and processes outlined by these two theories. Thus, there remains a great need and opportunity for future theory-driven research in this area.

With this in mind, several conclusions can be drawn from our review, which help set the stage for a discussion of how a future

research agenda might be built to support theory-driven inquiries into academic career development. Perhaps most apparent across many of the articles on academic career development we reviewed is the focus of on gender and women's experiences. This focus reflects inequities and barriers faced by women in academia that have been noted elsewhere, particularly in the literature on academic careers in general (e.g., Ash, Carr, Goldstein, & Friedman, 2004; Carr, Gunn, Kaplan, Raj, & Freund, 2015; Clauset, Arbesman, & Larremore, 2015; Ginther & Kahn, 2004; Jagsi et al., 2012; Kahn, 1993). This literature is broader in scope and goes above and beyond our specific focus on individual and contextual factors that influence people's career development process over time (e.g., different combinations of work and family roles at a single point in time). Importantly, the research we reviewed suggests that academic career development efforts can be an important mechanism for addressing and rectifying such inequities and barriers.

While this focus on women's experiences is noteworthy, little research to date has adopted an intersectional (Cole, 2009) perspective on academic career development. This lack of research concerning intersectional category membership is unfortunate, given that social cognitive career theory posits multiple relevant person inputs beyond gender (e.g., race, ethnicity, disability, health status, see Lent et al., 2002), and the importance of focusing on career development and related issues for minority female academics (e.g., Hackett & Byars, 1996). Again, an additional exploratory literature search revealed that the broader literature on academic careers in general, which was not captured by our search strategy that focused on academic career development, has devoted some attention to this issue and should be included in future research. For instance, Ginther, Kahn, and Schaffer (2016) explore the “double bind” for women of color in being awarded RO1 grants from the National Institutes of Health (see also Pololi et al., 2013; Turner & González, 2011; Turner, González, & Wood, 2008).

Additionally, a number of studies we reviewed point to the ubiquity and influence of formal mentoring programs as a means of facilitating academic career development, and this seems to be particularly true within the medical sciences. As mentoring is likely to benefit self-efficacy, this focus is consistent with social cognitive career theory. However, the underlying mechanisms of the effects of mentoring programs used to facilitate academic career development require more attention. This also applies to mentoring studies from the broader literature on academic careers in general, which we did not identify with our search terms (e.g., Feldman, Arean, Marshall, Lovett, & O'Sullivan, 2010; Lindholm, 2004; Richardson & Zikic, 2007; Sambunjak, Straus, & Marušić, 2006). Across studies, academic career development is typically conceptualized and applied as an early career endeavor. For example, in many cases, academic career development is implemented to “jump start” the careers of those entering into academic fields. Despite this, and in contrast to the tenets of life-span, life-space theory, the narrow focus on the career development of early career academics presents an incomplete account of career development across the lifespan.

Additionally, as one would expect, a variety of subjective (e.g., perceived career success), but also notably various objective (e.g., grants success, publications, awards) career success outcomes are studied in relation to academic career development. Indeed, a broad array of outcomes that have been noted as important indicators of career success (Ng et al., 2005; Ng & Feldman, 2014) can be found across the academic career development studies reviewed here. However, studies using these career success outcomes generally do not consider the role of career interests, self-efficacy, outcome expectations, or performance goals as intermediary mechanisms within a larger phased sequence, despite the central positioning of these variables within the performance-based framework of social cognitive career theory (Lent et al., 1994).

Our review also suggests that academic career development occurs across countries and cultures. Although multiple countries were represented in our review, we also noted that very little cross-cultural comparative research has been conducted in this area. Thus, whether the academic career development practices applied within one country or culture could be readily applied to another country or culture remains to be seen. This is of particular importance, given that the structure and organization of higher education institutions varies greatly within country, and in many cases even more so between countries (see Clark, 1986, for a comprehensive analysis). Likewise, while a great deal of emphasis has been placed on academic career development in the medical sciences, we found evidence for such practices in the applied sciences, business, and social sciences as well. With their focus on intraindividual career development, it could be argued that social cognitive career theory and life-span, life-space theory need to be extended to better account for context-based differences in career development.

As with the noted cross-cultural concerns, little work has been done on the crossover generalizability of academic career development practices across fields. This is relevant to note, as the intended outcomes of career development (e.g., research productivity, teaching excellence), and thus the features of a given academic career development initiative, must by necessity vary (to some extent) as a function of the particular discipline. For instance, career development interventions that are designed for the arts and humanities may not readily generalize to fields of basic science or medicine. Indeed, our review showed that existing career development programs include a broad variety of contents (e.g., coaching, skills training) and designs (e.g., single time point, longitudinal). That said, it would still be important from a practical perspective to consider factors that have broad and positive influences on academic career development outcomes regardless of disciplinary specificity. Again, further theoretical development is needed to better account for the role of context in academic career development.

5.2. Agenda for future research

Considering these major insights, it is clear that, although we know already quite a bit about academic career development from the existing literature, there is still much room to improve this area of research to further inform our understanding of the various processes involved. We discuss such areas of improvement here in detail and likewise summarize them in Table 2. For example, although our definition of academic career development focuses on scholars working in research, teaching, and/or administrative roles in higher education, academic career development research tends to focus on those working in research and teaching, rather than in administrative roles. Future work should therefore address how academic career development efforts can support various

Table 2
Agenda for future research on academic career development.

1. Consider academic career development across a variety of academic roles (e.g., research and teaching, but also administration and support).
2. Establish an intersectional perspective on academic career development that considers multiple social category memberships (e.g., age, gender, national background).
3. Adopt a lifespan perspective that considers career development across the working lifespan (i.e., early, middle, and late career development).
4. Focus on a broader array of individual characteristics and personal resources that affect academic career development processes directly, indirectly, or conditionally.
5. Unpack the "psychological black box" and test hypotheses on the mechanisms of assumed links between demographics and academic career development outcomes.
6. Contrast the efficacy and utility of individual versus group academic career development practices and interventions.
7. Investigate the relative efficacy of formal and informal mentoring programs; consider the overlooked role of peer-to-peer social interactions for academic career development.
8. Test the broader generalizability, applicability, and transferability of similar academic career development interventions across domains and fields.

academic roles, and determine how academic career development programs may have differential or common benefits across such roles.

Moreover, while it could be said that research has, for good reason, focused quite a bit on academic career development for women, such research has thus far not adequately adopted an intersectional perspective (Cole, 2009; Ledwith & Manfredi, 2000, for an exception). For example, future research may consider academic career development programs for female minorities, older females, or possibly "double disadvantaged" groups, who are historically underrepresented in academia (Czarniawska & Guje, 2008; Ginther et al., 2016). As noted, future research should likewise incorporate insights from the literature on academic careers in general to better understanding role of intersectionality in academic career development (e.g., Pololi et al., 2013; Turner & González, 2011). Related to this point, there is a lack of attention regarding mid- and late-career academic career development. This gap between research on aging and career development has been noted elsewhere (Ng & Feldman, 2012), and this seems to hold particularly true within the academic career development literature.

Thinking a bit more broadly on a related issue, it could be said that academic career development studies that focus on individual characteristics have often failed to explicate the psychological mechanisms at play, which are assumed to link such characteristics to career development outcomes. For example, studies of differences in career patterns for males and female have assumed and tested for gender differences, while inferring those psychological mechanisms that might account for observed differences. Such research runs contrary to suggestions to avoid unfounded gender comparisons (e.g., Hyde, 2005), without the ability to "unpack" this demographic "black box" (Lawrence, 1997). Thus, future studies must address not only demographic differences in academic career development outcomes, but also provide good theoretical rationales to account for why such differences are (hypothesized to be) observed. A similar critique could be levied against this literature as a whole, where specific theoretically-derived mechanisms (e.g., self-efficacy, outcome expectations) are not directly operationalized. In terms of studies of personal resources, thus far a very narrow range of such resources has been studied. At this time, only few exceptions have used established career theories (e.g., social cognitive career theory) to develop hypotheses (Anderson et al., 2016). Our hope is that, by organizing our review around social cognitive career theory and life-span, life-space theory, we will inspire future research to do the same. This grounding should lead to more consistent operationalizations of personal constructs in research on academic career development.

While a great deal of research speaks to the important role of formal mentoring for academic career development, far less research has focused on informal mentoring relationships. Accordingly, there is a need for more research on how informal mentoring relationships influence and support academic career development (Ragins & Cotton, 1999). Moreover, research has suggested that mentoring outcomes may differ as a function of both mentor and protégé gender (O'Brien, Biga, Kessler, & Allen, 2010). However, this observation from the general mentoring literature has not been adequately studied within the academic career development and mentoring literature. Furthermore, this literature focuses on the benefits of mentoring for early career development of protégés, but should likewise focus on the benefits of these mentoring programs for the later career development of protégés and mentors themselves. To this end, research on generativity (i.e., motives and behaviors to support the next generation) and mentoring relationships (Ragins & Scandura, 1999) may be quite informative.

More generally speaking, current research on academic career development is overwhelmingly medical-centric. While it seems obvious that more research in other non-medical fields is required, it is also important to note that these findings from medicine may not readily generalize to other non-medical fields (e.g., the humanities). Thus, comparative studies across disciplines are necessary to establish the limits and possible situational specificity of academic career development efforts. Additionally, it is important to establish the extent to which these approaches to academic career development represent "one-size-fits-all" interventions against the need to tailor specific approaches to a given field or discipline. Related to this, extant academic career development intervention studies tend to focus narrowly on only one type of intervention (e.g., interventions to increase career resources; Spurk, Kauffeld, Barthauer, & Heinemann, 2015). Future studies should consider how paired combinations of academic career development interventions (e.g., short-term career planning and long-term mentoring) can complement one-another.

5.2.1. Ideas for theoretical advancements

Future research on academic career development would greatly benefit from using established career theories to systematically study academic career development. For instance, social cognitive career theory could be used to investigate the role of individuals'

beliefs (e.g., self-efficacy, outcome expectations) for career-relevant behaviors. Life-span, life-space theory could be used to study the efficacy of intergenerational knowledge exchange and mentoring programs for the purposes of dually benefiting the career development of relatively younger and older academics. Given that we have called for increased attention to be placed upon academic career development for middle and later career stages, broader frameworks such as boundaryless and Protean careers (Sullivan & Arthur, 2006) may be particularly useful. These models emphasize the need for both physical and psychological career mobility, as a mean of encouraging a focus on long-term employability.

5.2.2. Ideas for methodological advancements

In terms of potential methodological improvements, we observed that a majority of studies are based on qualitative, cross-sectional, and intervention designs. To better capture career development within persons and over time, we suggest that more longitudinal studies should conducted (Wang et al., 2017). Career development refers to an evolving *process* that is said to *occur over time* (Brown, 2002; Super, 1984). Thus, to be able to appropriately model this progression (i.e., which implies a causal ordering) and the dynamics in developmental trajectories (i.e., which implies the ability to measure and model within-person changes), the adoption of longitudinal research designs with three or ideally more measurement points is required (Ployhart & Vandenberg, 2010).

One special type of longitudinal research design – experience sampling – involves the repeated sampling of psychological constructs and subjective experiences over relatively short periods of time, such as several days or weeks (Hektner, Schmidt, & Csikszentmihalyi, 2007). Experience sampling methods allow for the modeling of both within-person trajectories of short-term experiential processes and the between-person effects on such within-person processes. To our knowledge, no studies of academic career development have adopted such methods. We would encourage future research to consider this approach to research design, particularly because many career development approaches involve such (relatively) short term, momentary processes (e.g., networking, mentoring) that could be well captured by this methodology.

Additionally, academic career development intervention studies rarely use “true” evaluation designs (i.e., experimental designs, with random assignment to conditions; e.g., Solomon, 1949), and instead favor pseudo-/quasi-experimental research designs. Accordingly, the degree to which strong causal inference can be gleaned from this literature is limited by a number of possible threats to validity (Shadish, Cook, & Campbell, 2002). Future research must endeavor to adopt more rigorous methodologies to account for such issues.

Finally, many studies of academic career development, and particularly qualitative studies, rely on typically small, convenience samples. This reliance on small and non-representative samples calls into question issues of the generalizability of findings across context, even within the same academic domain. Broader-scale empirical investigations, based upon large samples are necessary to consider our call to explore the broader applicability of academic career development practices across various contexts, and for various constituents.

5.3. Conclusion

The literature on academic career development is theoretically and methodologically diverse, and it has yielded numerous interesting and important insights and findings. We used five content and process themes derived from social cognitive career theory and life-span, life-space theory to review and structure this literature. Major topics identified included the role of gender and women's experiences, mentoring and other career development interventions, as well as academic career development in the field of medicine. Future research would benefit from adopting established career development theories and from considering the broader literature on academic careers in general to study additional and hitherto neglected topics in the area of academic career development. The neglected topics include individual and work-related resources, active regulation of behavior and associated psychological processes, middle and later career stages, and the work-nonwork interface. In terms of methodological recommendations, future research should make use of longitudinal research designs to capture changes in people's experiences and behavior over time, and randomized controlled designs to draw firmer conclusions regarding causal effects of career development interventions.

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