



## Toward a taxonomy of career studies through bibliometric visualization <sup>☆</sup>



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### ABSTRACT

One of the greatest strengths and liabilities of the career field is its diversity. This diversity allows for wide coverage of relevant career dynamics across the lifespan and across levels of analysis. However, this diversity also reflects fragmentation, with career scholars failing to appreciate how the insights from other thought worlds can advance their own work. Using advanced bibliometric mapping techniques, we provide a systematic review of the 3141 articles on careers published in the management literature between 1990 and 2012. In doing so, we (1) map key terms to create a systematic taxonomy of career studies within the field of management studies, (2) provide a synthetic overview of each topic cluster which extends prior reviews of more limited scope, and (3) identify the most highly influential studies on careers within each cluster. Specifically, six local clusters emerged – i.e., international careers, career management, career choice, career adaptation, individual and relational career success, and life opportunities. To classify a broad range of research opportunities for career scholars, we also create a “global” map of 16,146 career articles from across the social sciences. Specifically, six global clusters emerged – i.e., organizational, individual, education, doctorate careers, high-profile careers, and social policy. We describe and compare the clusters in the map with an emphasis on those avenues career scholars in management have yet to explore.

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## 1. Introduction

Career studies is an active area of inquiry which cuts across a variety of disciplines, domains of work, and levels of analysis. CEOs, surgeons, politicians, actors, scientists, and line workers all have careers, where a “career” is defined as an “evolving sequence of work experiences” (Arthur, Hall, & Lawrence, 1989a, p. 8). The career literature draws from and contributes to a variety of disciplines, with clear links to management, psychology, sociology, economics, and education. This diversity of research reflects the reality that peoples’ careers are determined by multiple factors at various levels, with various stakeholders involved.

Despite a plethora of strong scholarship, the very virtue of conceptual and methodological diversity within career studies is also an obstacle to accretive progress. Critics have pointed out that the career field includes various disjointed research streams, which do not systematically connect to each other even when they concern the same phenomena (Arnold & Cohen, 2008; Arthur, 2008). This suggests that serious attention should be paid to evaluating the extent to which career findings from across research communities

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might be integrated (Arthur, 2008; Arthur et al., 1989a; Gunz & Peiperl, 2007). Importantly, we do *not* advocate reducing the variety of approaches or presenting a single over-arching theory on careers. Instead, we posit that a systematic taxonomy of career studies, which groups together related concepts, would go a long way toward providing the intellectual architecture for bridging thought worlds. In other words, we believe that it is possible to make accretive intellectual progress and retain diversity, but only within a framework that facilitates the exchange of concepts, methods, and findings across streams.

The purpose of this paper is to present a systematic overview of the career literature using the bibliometric technique known as *science mapping*. Science mapping offers a visualization of the relationships between scientific objects, such as research topics (Callon, Courtial, Turner, & Bauin, 1983). We employ science mapping to create local (i.e., management) and global (i.e., all of social science) maps of the research topic clusters of peer-reviewed journal articles on careers. This allows us to provide a structured overview and synthetic taxonomy of the state of the career literature in management and in the social sciences more broadly.

## 2. Reviewing the literature through science mapping

Several past reviews provide a high quality overview of the streams of career studies within management (e.g., Baruch & Bozionelos, 2010; Feldman, 1989; Sullivan, 1999). In addition, a small number of reviews go beyond the field of management (e.g., Maranda & Comeau, 2000; Özbilgin & Tatli, 2011). In both cases, however, the reviews rely on the authors' subjective view of the field. Other notable contributions to understanding career studies come from edited volumes (Arthur, Hall, & Lawrence, 1989b; Gunz & Peiperl, 2007; Inkson & Savickas, 2013a,b,c,d). These collections let the structure of the field emerge from the input of several selected scholars. Still, such contributions are dependent upon how the scholars are selected and on the idiosyncrasies of these scholars' sensemaking. In an effort to achieve standards of rigor comparable to primary researchers (Cooper, 1989; Fitzgerald & Rounds, 1989, p. 106) we use science mapping to conduct a comprehensive analysis of thousands of studies on careers and develop a *taxonomy* of the career literature. A taxonomy is a classification based on *empirical* evidence of correspondence between characteristics (Bailey, 1994). Taxonomies can be contrasted with typologies, which are based on the comparison of *conceptual* categories across more than one conceptual dimension (c.f., Baruch & Bozionelos, 2010). As such, our scientific mapping approach reveals topics and relationships between topics that have been absent from others' frameworks.

Science mapping employs innovative bibliometric techniques to create visual representations of academic research. Much like an architectural drawing, maps of academic literatures can help create shared understanding and bridge diverse knowledge domains (Carlile, 2002). Science maps can help scholars with highly specialized knowledge overcome barriers to discussion and collaboration across disconnected research communities, which can advance theoretical and conceptual progress (Börner, Boyack, Milojevic, & Morris, 2012; Fitzgerald & Rounds, 1989, p. 107; Rafols, Leydesdorff, O'Hare, Nightingale, & Stirling, 2012). Finally, science maps provide a tool for creating synthetic reviews and complement meta-analyses. Indeed, whereas meta-analyses focus on a particular research topic, science maps have the capability to zoom out further, and empirically capture the relationships between multiple topic areas.

Science mapping has been around for several decades. However, early science mapping generally relied on manual coding of articles (e.g., Fitzgerald & Rounds, 1989). This introduced evaluative criteria into the process and was laborious; limiting the number of articles that could be incorporated into a map. Recent advances in information technology enabled the introduction of text extraction and normalization techniques for science mapping, which has removed these limitations. Within the field of management, novel mapping techniques have been used to visualize research in areas like international management (Acedo & Casillas, 2005), strategy (Ramos-Rodríguez & Ruiz-Navarro, 2004), and business ethics (Özmen Uysal, 2010). While these science maps are still relatively rare, those published have been well received within the academic community.

## 3. Methods

As stated above, we created maps of "local" (management) and "global" (social science) career topics. Our sample for both maps includes all articles published between 1990 and 2012 containing the term "career" (plus any suffix) in the title or abstract. Studies published before 1990 were excluded because these rarely have an abstract in the Web of Science database. Studies after 2012 were left out in order to prevent preprint bias. The local map is based on all journals listed under the management category in the Web of Science (hereafter WoS) or under the Harzing (2013) category "Organization Science/Organization Behavior, Human Resource Management/Industrial Relations". The search resulted in 3141 publication abstracts and titles related to careers within management journals. For the global map, we obtained the articles published in any social science journal from the WoS containing the term "career" in the title or abstract. Articles that used the term "career" in ways that were unrelated to work (c.f., Arthur et al., 1989a, p. 8) were excluded by discarding those containing terms that signify non-work careers — i.e., the terms "treatment careers", "drug", "abuse", "diagnosis", "illness", "cancer", or "AIDS". This article identification process resulted in 16,146 relevant journal articles in social science journals. The interested reader can find both search phrases online (<http://dx.doi.org/10.1016/j.jvb.2014.08.008>) where they are provided as Supplementary material.

We created the science maps using the VOSviewer software developed by van Eck and Waltman (Van Eck & Waltman, 2011; Waltman, van Eck, & Noyons, 2010). Various studies have successfully utilized the VOSviewer software for science mapping, including visualization of the research on renewable energies (Rizzi, van Eck, & Frey, 2014), the relations between journals in the business field (Rafols et al., 2012), and the topics covered in the editorials of Nature and Science (Waaijer, van Bochove, & van Eck, 2010, 2011). Indeed, VOSviewer combines the most advanced and valid techniques for every step in the science mapping process, including: (1) term extraction and selection, (2) visual mapping of relatedness, and (3) clustering of science objects. Across our maps, we use the default settings in the software, which generally represent the best practice in the science mapping literature.

In the first step of the process, *noun phrases* (i.e., groups of nouns and preceding adjectives) that occur in the abstract or title of at least 10 different documents are extracted. This method is effective for the extraction of technical terminology, regardless of the domain of the text (Justeson & Katz, 1995). The next step is to remove generic noun phrases like “research” or “method” using the Kullback–Leibler distance (Van Eck & Waltman, 2011, p. 2). Such phrases co-occur indiscriminately across the corpus and thus are not helpful for distinguishing specific topic areas. In addition, drawing from the conceptual scheme developed by Brinberg and McGrath (1982) we manually coded terms into six categories: concept, data collection, data analysis, substantive actor, substantive industry, and substantive geography. Terms that do not denote a concept, a method, or a sample are removed (e.g., *Elsevier*, *Academy*, and *Administrative Science Quarterly*). This term-identification process produced 400 terms for the local map and 1780 terms for the global map.

After computing the relevance and coding the terms, the relatedness of the terms was determined using the *association strength measure* (Rip & Courtial, 1984; Van Eck & Waltman, 2009). The association strength between two terms is the ratio between the observed number of co-occurrences of two terms and the expected number of co-occurrences of the two terms. A key technical advantage of the association strength measure over alternative measures of (dis-)similarity (e.g., *Jaccard index*, *cosine*) is in the way it corrects for the number of times objects occur (Luukkonen, Tijssen, Persson, & Sivertsen, 1993; Van Eck & Waltman, 2009; Zitt, Bassecoulard, & Okubo, 2000). The association strength values were used as input for the “Visualization Of Similarities” (VOS) mapping technique, which creates a two-dimensional representation of term relatedness (Van Eck, Waltman, Dekker, & Van den Berg, 2010). The VOS mapping technique has been shown to be especially effective in a) dealing with large numbers of null values (which is typical of term co-occurrence data) and b) big differences in frequency of term occurrence (Van Eck et al., 2010). The distance between any two terms reflects their relatedness, such that terms located close together tend to occur in the same article abstracts and titles relatively frequently. This also means that terms at the center of the map co-occur with a wider range of terms than terms at the periphery of the map.

The last step is to assign terms to *clusters*. The VOS clustering technique is based on the same assumptions as the VOS mapping technique (Waltman et al., 2010). Terms that are strongly associated are placed in the same cluster, and colored accordingly. As such, the VOS clustering technique provides the basis for an emergent taxonomy of the literature.

#### 4. Results

The results of our analysis are presented visually in Figs. 1 and 2. In each map, terms that occur more frequently are presented as larger than terms occurring less frequently. The local map (Fig. 1) shows the terms divided into six clusters, identifiable by the different colors. To gain a more refined view and dynamically explore the figure in more detail, the reader can access the map via the

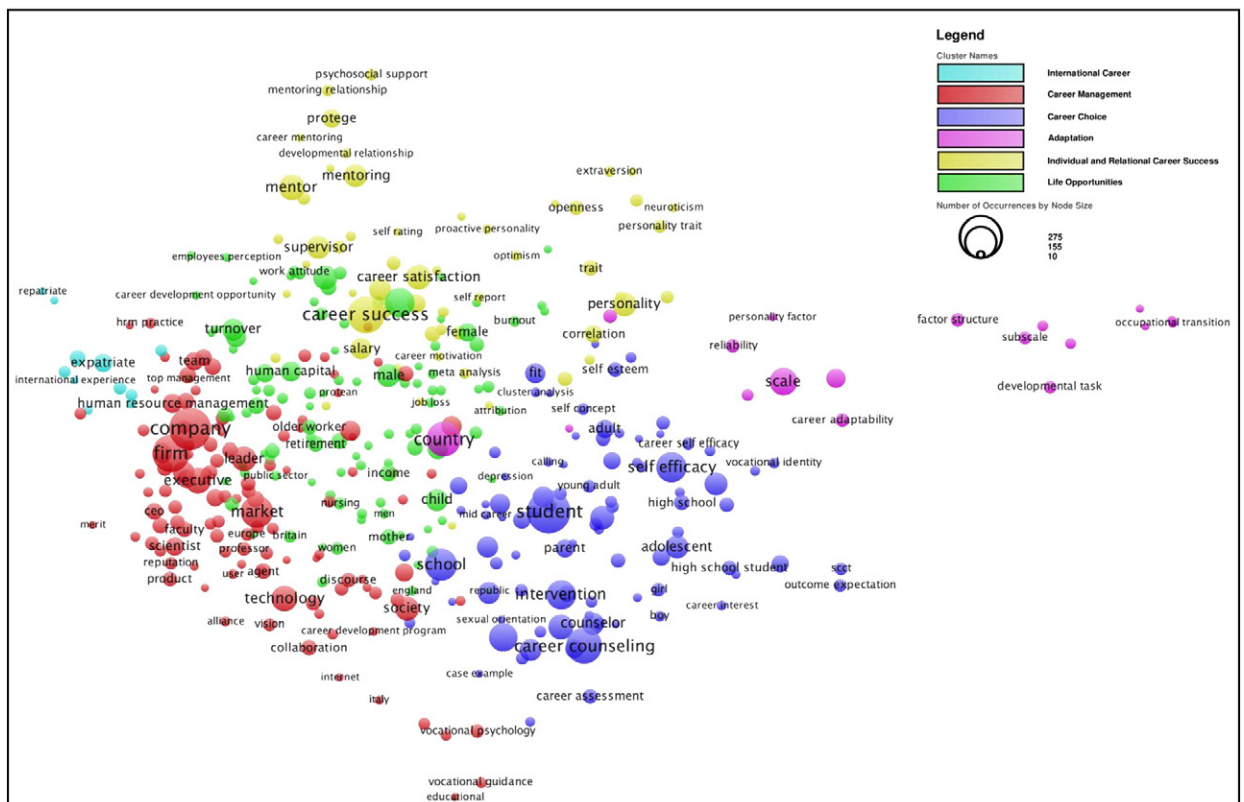


Fig. 1. Local map of the management literature on careers.

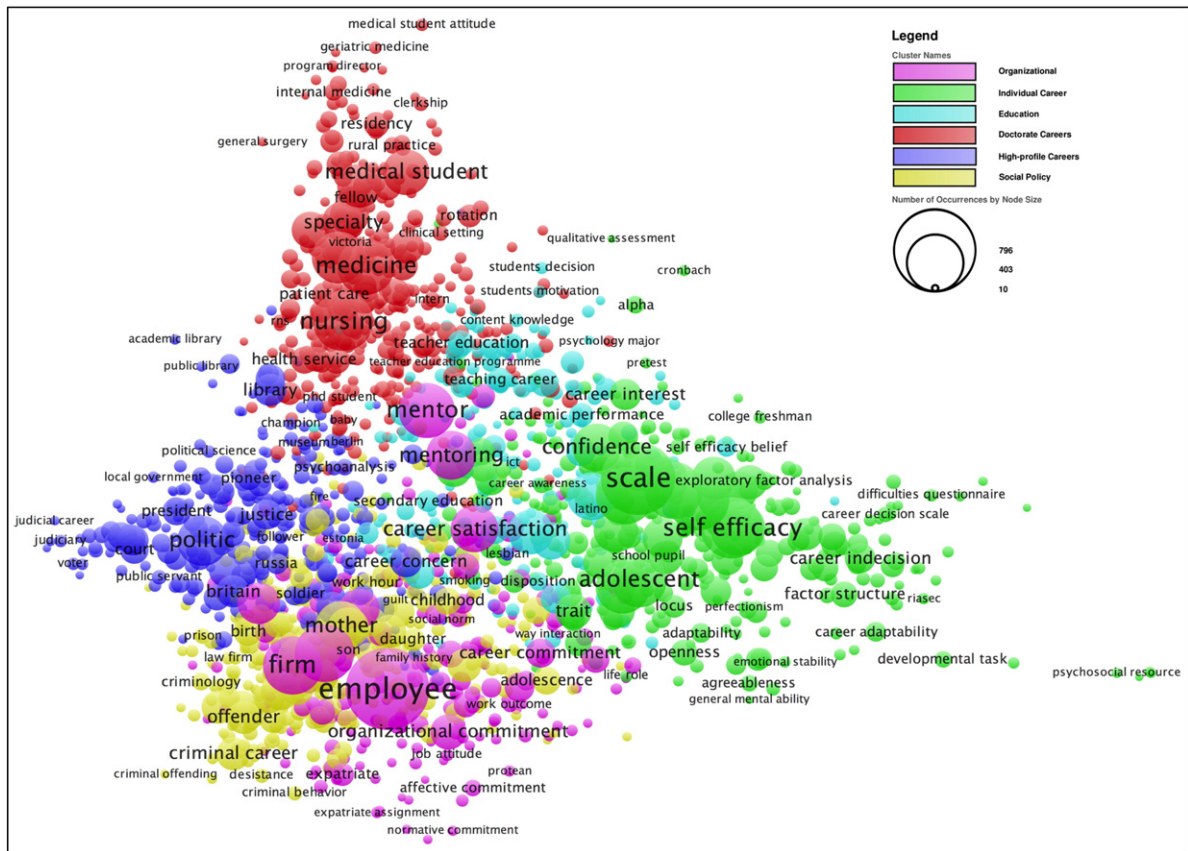


Fig. 2. Global map of the career literature across the social sciences.

following link: <http://bit.ly/CareerLocal>. The global map (Fig. 2) shows a visual representation of the career literature across the social sciences and also contains six clusters. This map, including the terms with smaller nodes, can be explored at: <http://bit.ly/CareerGlobal>.

In analyzing these maps, we will discuss the most prominent areas of research, selectively review developments in each area, and compare our maps to prior classifications, noting points of overlap and departure.

#### 4.1. Local map: the career field within management

The map in Fig. 1 provides a descriptive overview of the term clusters in career studies in management. In order to provide insight into the clusters, we carefully reviewed the top 50 most highly cited publications of which more than 50% of the terms are located in one cluster (see Table 1 for the top five per cluster). Using the terms from the map as a guide, we identified recurring themes.

##### 4.1.1. International careers

The international career cluster (cyan) is the smallest cluster on the map. It focuses on the career effects of international assignment (both organizational- and self-initiated). This includes questions regarding motivations to engage in international assignment (Dickmann, Doherty, Mills, & Brewster, 2008), benefits of international assignment (Jokinen, Brewster, & Suutari, 2008), and repatriation (Suutari & Brewster, 2003).

In the recent literature in this cluster, many studies have looked at the aims and expectations of both parties in the international assignment. Evidence suggests that career benefits of expatriate assignment are conditional on the alignment between the motivations of the organization, the characteristics of the assignment, and the expatriate's career orientation (Dickmann et al., 2008; Jassawalla & Sashittal, 2009; Richardson, McBey, & McKenna, 2008). How precisely to align these three factors has been considered in a number of recent studies (Bolino, 2007; Cerdin & Pargneux, 2009; Haslberger & Brewster, 2009).

##### 4.1.2. Career management

The literature on career management is wide, and covers several issues and perspectives. The main focus of the career management cluster (red) is on how individuals plan and manage their own career. A complementary perspective deals with the way organizations plan and manage the careers of their employees. Very few discuss the wider system at a national or global level (Higgins, 2005).

**Table 1**

Overview of the clusters in the management literature on careers.

Cluster	Definition	Prominent papers <sup>[a,b]</sup>
International careers	Research focusing on the career effects of international assignment.	Bolino, 2007 Dickmann, Doherty, Mills & Brewster, 2008 Jokinen, Brewster & Suutari, 2008 Lazarova & Cerdin, 2007 Suutari & Brewster, 2003
Career management	Research on the management of careers.	Bechky, 2006 Briscoe & Hall, 2006 Hedlund, 1994 Lee, Trauth & Farwell, 1995 Sullivan & Arthur, 2006
Career choice	Research on how (young) people choose their careers.	Duffy & Sedlacek, 2007 Hall & Chandler, 2005 Lent, Brown & Hackett, 1994 Savickas, 1997 Schoon & Parsons, 2002
Career adaptation	Research focusing on individuals' adaptation to change.	Brown, Bimrose, Barnes, & Hughes, 2012 Frese, Fay, Hilburger, Leng, & Tag, 1997 Koen, Klehe, van Vianen, Zikic, & Nauta, 2010 Savickas & Porfeli, 2012 van Vianen, Klehe, Koen, & Dries, 2012
Individual & relational career success	Research on individual and relational determinants of career success	Allen, Eby, Poteet, Lentz, & Lima, 2004 Greenhaus, Parasuraman, & Wormley, 1990 Judge, Higgins, Thoresen, & Barrick, 1999 Ng, Eby, Sorensen, & Feldman, 2005 Seibert, Kraimer, & Liden, 2001
Life opportunities	Research on exogenous factors that constrain and enable people to achieve their career related goals.	Anderson, Coffey, & Byerly, 2002 Parasuraman, Purohit, Godshalk, & Beutell, 1996 Tharenou, Latimer, & Conroy, 1994 Thompson, Beauvais, & Lyness, 1999 Wang, Zhan, Liu, & Shultz, 2008

<sup>a</sup> Five selected papers from the 50 most highly cited per cluster with more than 50% of the extracted terms in the cluster.

<sup>b</sup> References from Tables can be found in the Supplementary Archive.

Within the individually oriented literature, a major focus is [Arthur and Rousseau's \(1996\)](#) boundaryless career theory. This theory was developed to address how people navigate their careers given changes in the nature of the economy and employee–organization relationship. While some wholeheartedly subscribe to this theory, others question its validity ([Inkson, Gunz, Ganesh, & Roper, 2012](#); [Rodrigues & Guest, 2010](#)), and still others call for a balanced view ([Baruch, 2006](#); [Lips-Wiersma & Hall, 2007](#)). Two other leading concepts are employability ([Kanter, 1990](#)) and the protean career ([Hall, 2004](#)). Linking theories of boundaryless careers, employability, and protean careers is the assertion that individuals must take proactive ownership of their careers given decreased job security in many sectors and countries at the same time that job opportunities have become more dynamic, diverse, and global ([Arthur, 2008](#); [Sullivan & Baruch, 2009](#)).

Within the career management cluster, a complementary organizational-level perspective considers how HRM practices create internal labor markets that enable and constrain careers ([Birdi, Allan, & Warr, 1997](#)). These different HRM practices vary in their level of sophistication and level of involvement ([Baruch & Peiperl, 2000](#)).

#### 4.1.3. Career choice

The career choice cluster (dark blue) pertains to how people choose their careers. Seminal in this cluster is [Holland's \(1973\)](#) occupational themes theory. The theory distinguishes six personality types, each of which is suited for a different kind of work and occupational environment.

In the contemporary literature, the Social Cognitive Career Theory (SCCT) is studied particularly often. SCCT argues that people's career goals and career choices are a function of the interaction between their confidence in their success in a profession and the estimated benefits and costs associated with each occupation ([Lent, Brown, & Hackett, 1994, 2000](#)). Importantly, several scholars in this area contend that women, ethnic minorities, and those from lower socioeconomic status may be culturally conditioned to have artificially low expectations of success in several “advanced” occupations, which can be self-limiting ([Correll, 2004](#); [Lent et al., 2005](#); [Spelke, 2005](#); [Whiston & Keller, 2004](#)).

Another major career choice theme is the role of career counselors. A striking feature of the recent research on counseling is that it explicitly considers the “whole person” in helping people to find a career they will enjoy, find meaningful, and have success within ([Young et al., 2011](#)). Relatedly, career counselors are urged to help individuals find their “calling” ([Duffy & Sedlacek, 2007](#)). Calling can be defined as “work that a person perceives as his [or her] purpose in life” ([Hall & Chandler, 2005, p. 160](#)). Recent research has considered the antecedents ([Hirschi, 2011](#); [Hunter, Dik, & Banning, 2010](#)) and consequences of having a calling or searching for a calling ([Duffy, Allan, & Dik, 2011](#); [Duffy & Sedlacek, 2007](#); [Elangovan, Pinder, & McLean, 2010](#); [Hagmaier & Abele, 2012](#)).

#### 4.1.4. Career adaptation

The career adaptation cluster (purple), close to the career choice cluster, only recently developed into a succinct area within the local career literature. The literature in this area focuses on the adaptation of individuals to change. The core literature in this cluster originated from career construction theory (Savickas, 2002, 2005). This elaborate theory considers the causes and consequences of individuals' vocational self-concepts, which are constructed over the life-course as individuals attempt to adapt themselves and their environments in order to evolve toward occupational success and career satisfaction.

Prominent in this area is the research on the Career-Adapt Abilities Scale (CAAS). In a cross-national collaborative endeavor, a group of 29 scholars operationalized the "individual's ability to adapt" (i.e., career adaptability resources) as a hierarchical construct with four reflective components: *concern, control, curiosity, and confidence* (Savickas & Porfeli, 2012). The scale was tested in 13 different countries. The results provide considerable support for its validity and reliability.

#### 4.1.5. Individual and relational career success

The literature on the individual-level and relational determinants of career success (yellow) include factors like personality (Seibert & Kraimer, 2001) and proactivity (Fuller & Marler, 2009; Kim, Hon, & Crant, 2009). Relational determinants of career success include network structure (e.g., Seibert, Kraimer, & Liden, 2001) and relationship quality (e.g., Dutton & Ragins, 2007).

As an extension to the literature on the relational determinants of career success, the yellow cluster also contains literature on social support and mentoring (e.g., Eby, Allen, Evans, Ng, & DuBois, 2008). This body of work focuses on workplace mentoring in particular (rather than youth and academic mentoring) and the different types of mentoring relationships that one can have in and around the workplace (Carragher, Sullivan, & Crocitto, 2008; Parker, Hall, & Kram, 2008). In recent years, an increasing number of the mentoring studies have focused on the mentors themselves, including the role of the mentor (O'Brien, Biga, Kessler, & Allen, 2010; Parker et al., 2008) and the effect mentoring has on the mentor's career (Lentz & Allen, 2009).

Another key focus of this cluster is the distinction between extrinsic/objective career success (such as salary and promotion) and intrinsic/subjective career success (such as career satisfaction and meaningful life) (Abele & Spurk, 2009; Heslin, 2005). An open question is the relative importance of each type of success (e.g., King & Napa, 1998).

#### 4.1.6. Life opportunities

The life opportunity cluster (green) focuses on the relationship between one's career and larger life ambitions and trajectories. A number of studies focus on the way careers unfold as life progresses (Duffy, Dik, & Steger, 2011), and in particular, the relationship between work and family life (Valcour, Ollier-Malaterre, Matz-Costa, Pitt-Catsouphes, & Brown, 2011).

An important theme in this cluster is that one's demographic background and family characteristics influence career perceptions, progress, and power. There are unique career constraints associated with being divorced, a dual career couple, a parent, or aging (Hammer, Allen, & Grigsby, 1997; Parasuraman, Purohit, Godshalk, & Beutell, 1996; Wang, Zhan, Liu, & Shultz, 2008). These constraints affect the individual's ability to accumulate human capital and can limit career success (Probert, 2005).

### 4.2. Global map: the study of careers across the social sciences

In order to facilitate links with wider areas of career research we also provide a taxonomy of the field of career studies across the social sciences. To show the relationship between the local and the global map, we created an *overlay map* (Rafols, Porter, & Leydesdorff, 2010) which indicates the extent to which the management literature is related to other clusters in the global map. In this map, depicted in Fig. 3, the node of each term is colored according to the relative frequency of occurrence of the term in the management literature. The overlay map reveals that the management literature is most concentrated at the bottom and right of the global map, focusing on organizational and individual psychological factors associated with careers.

A striking finding from our analysis is that overall, less than one fifth of the career literature was published in management journals – i.e., 3141 articles out of 16,146 articles. This implies that research by management scholars should benefit from the exchange of insights and findings with the broader social sciences (e.g., psychology, sociology, labor economics, political science, education, scientometrics) in order to fully understand career dynamics inside and outside organizations (Arthur, 2008). We develop the global map to systematically identify such opportunities.

To discover themes within clusters, we a) consider the top terms in each cluster (Table 2) and b) carefully review the 50 most highly cited publications of which more than 50% of the terms are located in one cluster (Table 3). In our discussion of the global clusters, we focus on scholarship that goes beyond topics and approaches usually considered by the management literature on careers. Similarly, we do not review the organizational cluster (in purple at the right lower half of Fig. 2), since the associated literature was already covered in the local map discussion.

#### 4.2.1. Individual

The individual cluster (green) has a number of characteristic themes. First, virtually all of the top 50 papers belonging to this cluster are resolutely individual. Their methodological designs use individual level surveys and variables. Indeed, this uniformly individual-level approach is the rationale behind labeling it the *individual* cluster. Three research issues dominate the articles belonging to this cluster: (a) the determinants of career choices, (b) the individual-level determinants of career success (e.g., personality), and (c) career counseling.

The majority of the articles associated with this cluster are published in psychology journals, although a substantial minority are in career journals (e.g., Lent et al., 1994; Savickas & Porfeli, 2012; Seibert & Kraimer, 2001; Tokar, Fischer, & Subich, 1998). The overlay

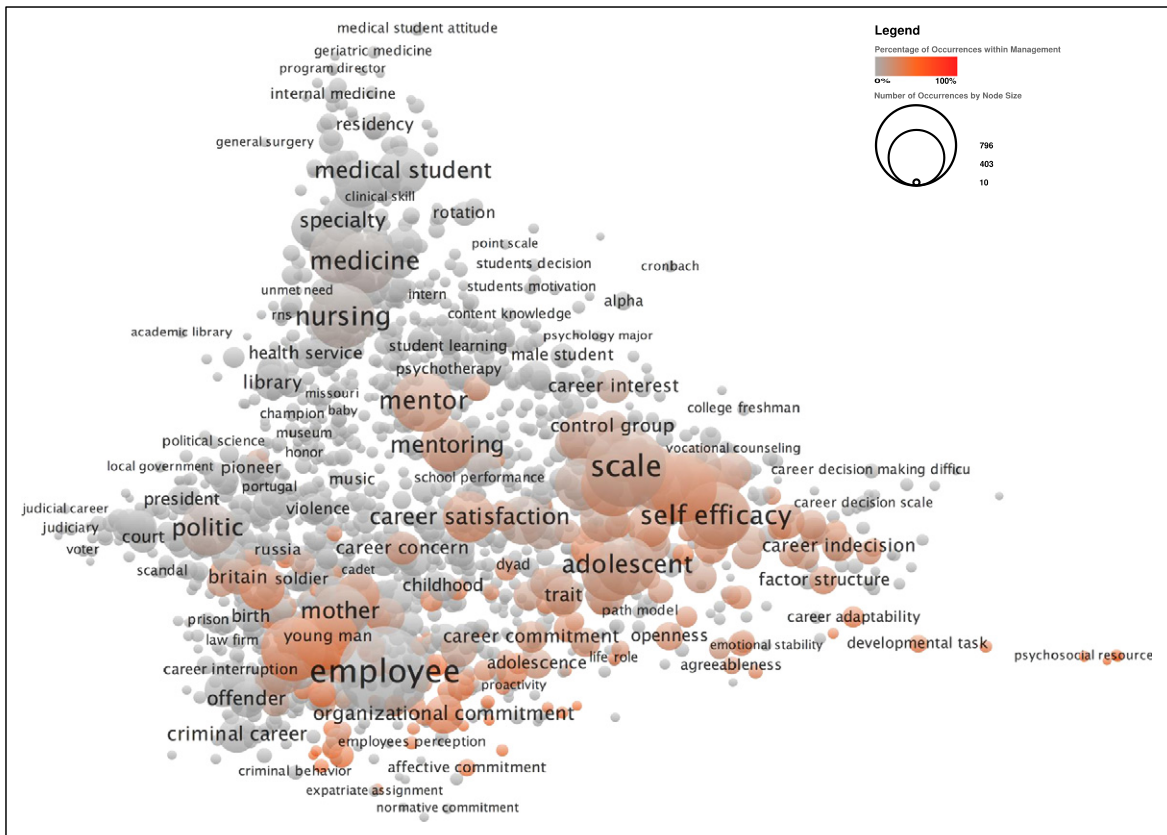


Fig. 3. Overlay map indicating the position of the management literature according to the WoS classification.

map (Fig. 2) reveals that management career journals publish on these topics as well, to some extent. Moreover, this cluster has substantial overlap with research found in the local map's clusters on career choice (blue) and the personality component of the mentoring cluster (yellow).

#### 4.2.2. Education

The education cluster (cyan) concerns the relationship between education and careers. There are two key streams within this cluster. The first stream is premised on the notion that educational factors serve as key mediators between a host of factors and ultimate career success. Some studies in this stream focus on psychological factors, like goals and self-efficacy (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Harackiewicz, Barron, Tauer, & Elliot, 2002). Other studies adopt a sociological approach, explaining differences in academic achievement in terms of opportunity structures and barriers (Aschaffenburg & Maas, 1997; Else-Quest, Hyde, & Linn, 2010; Hillmert & Jacob, 2010; Hindman, Skibbe, Miller, & Zimmerman, 2010; Tyson, Castellino, & Darity, 2005). Of particular interest is the question of why certain demographic groups are less inclined to engage in science, technology, engineering, and mathematics (e.g., Archer et al., 2010; Else-Quest et al., 2010; Stout, Dasgupta, Hunsinger, & McManus, 2011), since these domains are often associated with rewarding career opportunities.

The second stream within this cluster considers teaching careers. A key focus is how processes of identity development shape teachers' career paths (Alger, 2009; Beijaard, Verloop, & Vermunt, 2000; Day, Elliot, & Kington, 2005). For example, Kelchtermans (2009) suggests that successful teachers take teaching “personally”, in that they use their personal commitments and vulnerabilities to perform their jobs. This stream of research is reminiscent of the scholarship on work as a calling, which has received a surge of interest within the management discipline (Elangovan et al., 2010).

#### 4.2.3. Doctorate careers

The doctorate career cluster (red) focuses on the careers of highly educated individuals, exemplified by those with doctorates – e.g., physicians and academic researchers. In the main, the journals publishing research on this topic are either medical (e.g., JAMA – Journal of the American Medical Association) or devoted to understanding academics (e.g., Journal of Higher Education, Scientometrics). The main research questions in this cluster include: a) developing sound conceptualizations and measures of career satisfaction and extrinsic success in doctoral careers (Egghe, 2006; Williams et al., 1999), b) identifying the determinants of career satisfaction and success in doctorate careers (e.g., Kaplan et al., 1996; Linzer et al., 2000), and c) using labor force projections to predict

**Table 2**

Terms associated with the six global cluster of the career literature.

Cluster	Concepts	Data collection	Data analysis	Substantive actors	Substantive industry/work environment	Substantive geography
Organizational	Firm, mentoring, career satisfaction, turnover, organizational commitment	Longitudinal design, self rating, longitudinal investigation, cross sectional design, archival data	Structural equation modeling, structural equation, hierarchical regression analysis, LISREL, hierarchical multiple regression analysis	Employee, mentor, executive, CEO, expatriate	Company, multinational corporation, manufacturing, hotel, large organization	Home country, Chinese context
Individual	Career counseling, self efficacy, career decision, personality, confidence	Scale, correlation, subscale, interest inventory, predictive validity	Reliability, factor analysis, confirmatory factor analysis, factor structure, coefficient	Client, college student, adolescent, counselor, high school student	Career counselor, sport, career center, football, elite sport	Mexican American
Education	Educational career, socioeconomic status, academic achievement, school career, teacher education	Mixed methods study, control condition	Structural equation model, structural model, chi square analysis, multilevel analysis, constant comparative method	Girl, boy, female student, pupil, male student	High school, secondary education, teaching profession, chemistry, teacher education program	Asian American, urban school, Asian, Massachusetts, mainland China
Doctorate careers	Nursing, medicine, specialty, clinical practice, research career	Citation, cross sectional survey, postal questionnaire, h index, action research	Chi square test, beta, chi square, univariate analysis, thematic analysis	Physician, medical student, resident, trainee, psychiatrist	Medical school, psychiatry, health service, surgery, primary care	Rural area, rural community, American college, Victoria, New South Wales
High-profile careers	Politic, career concern, justice, political career, election	Ethnography, ethnographic research, life history interview, natural experiment	Discourse analysis, exploratory analysis, post hoc analysis	Entrepreneur, elite, politician, librarian, president	Library, court, film, army, military	Britain, Russia, Poland, German, Brazil
Social policy	Marriage, wage, human capital, earning, criminal career	Longitudinal data, panel study, national longitudinal survey, panel data, longitudinal sample	Event history analysis, odds ratio, confidence interval, hierarchical level, dynamic model	Mother, spouse, father, offender, wife	Prison, law school, baseball, vocational school	Household, Spain, Belgium, Denmark, Great Britain

whether a societally beneficial number of people will choose careers in under-served occupational specialties (e.g., [Bodenheimer & Pham, 2010](#); [Rabinowitz, Diamond, Markham, & Paynter, 2001](#)).

The doctorate career cluster may have several implications for management career scholars. Articles in this cluster tend to focus on a subset of professional occupations. There are several benefits to this approach. First, it allows for the development of very precise measures of internal and external career success (e.g., [Egghe, 2006](#); [Williams et al., 1999](#)). This is in contrast to management career studies that tends to develop omnibus measures of career satisfaction and success, which imperfectly cover a wide variety of occupations (e.g., [Spurk, Abele, & Volmer, 2011](#)).

Second, focusing on a specific range of occupations encourages descriptive accounts of the level of career success associated with different specialties (e.g., primary care versus surgeon; social scientist versus physical scientist). These descriptive differences between specialties are documented in large-scale studies, which allow for population-level inferences ([Landon, Reschovsky, & Blumenthal, 2003](#); [Leigh, Kravitz, Schembri, Samuels, & Mobley, 2002](#)). This sort of data should be incredibly helpful for people engaged in making career choices.

A third benefit of focusing on a narrow range of occupations is that it facilitates developing labor force projections. Thus, there are a number of papers that carefully estimate the number of workers in different occupations and the competencies demanded of these future professionals ([Lee, Trauth, & Farwell, 1995](#); [Rabinowitz et al., 2001](#)). Several of these papers then suggest concrete reforms to educational and public policy in order to effectively manage the supply and demand of professionals across specialties. Management career scholars might consider engaging in similar estimating exercises, as the implications for education and policy could be profound.

#### 4.2.4. High-profile careers

The high-profile career cluster (dark blue) represents a collection of work from political science, law, sociology, and labor economics. By simply looking at the terms on the map, the underlying nature of this cluster is not immediately clear. However, upon reading the articles associated with this cluster, it becomes apparent that this cluster focuses on high-profile careers — e.g., securities analysts ([Hong, Kubik, & Solomon, 2000](#)), elite executives ([Maclean, Harvey, & Chia, 2012](#)), politicians ([Desposato, 2006](#); [Fiorina, 1994](#)), judges ([Gennaioli & Rossi, 2010](#)), artists ([Menger, 1999](#)), and entrepreneurs ([Carter, Gartner, Shaver, & Gatewood, 2003](#)). By “high-profile”, we mean careers that are intentionally conspicuous, where positive attention is the key to career success.

A preoccupation of individuals in high-profile careers is what economists and political scientists call “career concerns”. Career concerns involve career behaviors that are not currently valued but that are predicted to be valued in the future ([Gibbons & Murphy,](#)



**Table 3**

Overview of the clusters in the career literature across the social sciences.

Cluster	Definition	Prominent papers <sup>[a]</sup>
Organizational	Research on the interplay between the careers, management, and organization.	Allen, Eby, Poteet, Lentz, & Lima, 2004 Ashforth, Harrison, & Corley, 2008 Crant, 2000 Greenhaus, Parasuraman, & Wormley, 1990 Higgins & Kram, 2001
Individual	Research on the individual-level determinants that influence career progression.	Judge, Higgins, Thoresen, & Barrick, 1999 Lent, Brown, & Hackett, 1994 Judge, Thoresen, Pucik, & Welbourne, 1999 Nosek, Greenwald, & Banaji, 2005 Savickas et al., 2009
Education	Research on the relationship between education and careers.	Else-Quest, Hyde, & Linn, 2010 Harackiewicz, Barron, Tauer, & Elliot, 2002 Lankford, Loeb, & Wyckoff, 2002 Tschannen-Moran & Hoy, 2007 Tyson, Castellino, & Darity, 2005
Doctorate careers	Research on the careers of highly educated individuals.	Buerhaus, Staiger, & Auerbach, 2000 Hojat et al., 2002 Landon, Reschovsky, Pham, & Blumenthal, 2006 Sambunjak, Straus, & Marusic, 2006 Willis-Shattuck et al., 2008
High-profile careers	Research on careers in professions that are prominent or conspicuous.	Gibbons & Murphy, 1992 Hong & Kubik, 2003 Lerner & Tirole, 2002 Simonton, 2003 Walder, 1995
Social policy	Research on careers with implications for social policy.	Heilman, Wallen, Fuchs, & Tamkins, 2004 Kalev, Dobbin, & Kelly, 2006 Laub, Nagin, & Sampson, 1998 Nagin & Land, 1993 Neal & Johnson, 1996

<sup>a</sup> Five selected papers from the 50 most highly cited per cluster with more than 50% of the extracted terms in the cluster.

1992). A practice, for example, that can be explained by career concerns is open source software development (Lerner & Tirole, 2002). This type of software development is not remunerated directly, but it can lead to future job offers and shares in open source-based companies. In academia, volunteering to be a journal editor or on an editorial board might be rationalized in terms of career concerns – i.e., such service raises one's profile in the academic community, leading to future opportunities (Baruch, Konrad, Aguinis, & Starbuck, 2008). Career concerns have been incorporated into elegant mathematical models of career behavior (Dewatripont, Jewitt, & Tirole, 1999; Tirole, 1994). This sort of formal theory is rarely seen in the study of careers within management. As such, career concerns is a concept that management career scholars could benefit from attending to.

#### 4.2.5. Social policy

The social policy cluster (yellow) draws from sociology, and the related specialty of criminology. The cluster studies careers in relation to three broad subthemes: a) work–family policy, b) inequality, and c) deviant behavior.

Research on work and family life from the social policy cluster is closely related to studies on work–family issues in the management literature (Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005). The areas of overlap include the effects of family life factors such as dual earning and family formation on career success (Parasuraman et al., 1996). However, the scope of the social policy research on work and family life is broader. For example, the social policy cluster considers how the timing of marriage and children hinges upon career factors (Blossfeld & Huinink, 1991; Griskevicius, Delton, Robertson, & Tybur, 2011; Sweeney, 2002). A particularly interesting finding within this cluster is the phenomenon of “scaling back”, where both individuals in a dual career couple attempt to moderate their work commitments in order to buffer the family (Becker & Moen, 1999).

A second theme in this cluster is inequality. Processes that produce career inequalities include (implicit) biases (Nosek, Banaji, & Greenwald, 2002; Schmader, Johns, & Barquissau, 2004), ineffective organizational diversity policies (Kalev, Dobbin, & Kelly, 2006), an underprivileged childhood (Neal & Johnson, 1996), and cumulative disadvantage (DiPrete & Eirich, 2006).

Deviant career behavior is the third theme. Studies on deviant behavior include research on the effects of low socioeconomic status on careers, the effects of substance abuse, and criminal careers. The criminal career is by far the most studied subtopic within this theme (DeLisi & Piquero, 2011; Piquero, Farrington, & Blumstein, 2003). Topics covered within this research stream include crime cessation and recidivism (Laub, Nagin, & Sampson, 1998; Warr, 1998) and negative effects of criminal behavior on salary (Western, 2002). The research in this area has also put considerable effort into methodological issues related to the estimation of career effects. For instance, studies within the cluster use panel data, event history analysis, semi-parametric group-based models, corrections for endogeneity, and within-individual Hierarchical Linear Modeling (Blokland & Nieuwbeerta, 2005; DiPrete & Eirich, 2006; Piquero et al., 2003; Western, 2002). These analytic techniques allow for stronger empirical claims. Each of these techniques could be put to use by management career scholars.

## 5. Revealing gaps

The maps depict the research areas covered by the local and global literature on careers. In order to provide insight into what areas remain to be explored, Table 4 organizes the research clusters in terms of three research focuses (i.e., pre-work career, career development, and career outcomes) by three levels of analysis (i.e., individual, organizational, and societal/economic).

The table reveals that career development at the individual level is well studied, both within and outside of the management literature. This is not a surprise, since a career is an individual level phenomenon. Striking, however, is the lack of any major body of work on career outcomes at an organizational level, while it is accepted that the organization is a major stakeholder in the career of its employees. With the exception of the work on the benefits of expatriation for the organization (e.g., Dickmann & Baruch, 2001; Dickmann & Doherty, 2008; Jassawalla & Sashittal, 2009) and a handful of publications looking at the benefits of career related HR policies for the organization (e.g., Baruch, 1999), there is little research that looks at how career systems affect organizational performance or survival. This is a major opportunity for future management research.

## 6. Discussion

Using a novel science mapping approach, we created a map of the career literature within the field of management, as well as a map of career studies across the social sciences. On the basis of term co-occurrence in the abstracts and titles of scientific publications, distinct topic areas have emerged.

To the best of our knowledge, this article provides the first empirically grounded taxonomy of career studies. We identified six career topics within management journals: international careers, career management, career choice, career adaptation, individual and relational career success, and life opportunities. Importantly, less than one fifth of the studies on careers are found in management journals, which implies that career scholars may also benefit from looking outside of management for insights, concepts, and ideas. To aid in that effort, we also identified six broader clusters of career topics from across the social sciences, namely: organizational, individual, education, doctorate careers, high-profile careers, and social policy.

Our taxonomy provides a framework that can be a helpful tool to outsiders trying to learn what career studies is about as well as clarifying the matter for those already engaged in career studies. Accordingly, our schema can guide interested practitioners in their search for actionable knowledge on careers and help aspiring career scholars navigate the literature and find ways in which to contribute. Moreover, the maps can help established career scholars in the design of new endeavors. The current fragmentation hinders the exchange of valuable insights between career researchers in different sub-fields. Familiarity with the concepts, methods, and objects of study in near and distant career literatures allows career scholars to leverage the insights of fellow career researchers.

Of particular value for future research, our review of the global map highlights a number of concepts, methods, and approaches that could be productively imported and adopted by management career scholars. To recap, the education cluster has an under-appreciated body on work as an identity-based calling. The doctorate career cluster highlights the value of studying specific

**Table 4**

Overview of the career research focuses and levels of analysis covered by the topic areas in the careers literature.

	Pre-work career	Career development	Career outcomes
Societal/economic	Social policy (e.g., work-family policy and criminal careers) <sup>[a]</sup>		Work force planning in skilled occupations <sup>[a]</sup>
		Life opportunities	[Missing as a major area of inquiry]
Organizational	Career counseling <sup>[b]</sup>	Relationships and mentoring <sup>[c]</sup>	
		HRM policies <sup>[d,e]</sup>	
		International careers	
Individual	Degree choice and academic achievement <sup>[f]</sup>		Career success <sup>[h]</sup>
		Career choice	
		Life opportunities	
		Career self management <sup>[g]</sup>	
		Career adaptation	
		Individual differences (e.g., personality) <sup>[c,e]</sup>	
		High profile careers	
		Teacher careers <sup>[f]</sup>	Performance quality <sup>[i]</sup>
	Doctorate careers		

<sup>a</sup>Social policy cluster.

<sup>b</sup>Career choice cluster.

<sup>c</sup>Individual and relational career success cluster.

<sup>d</sup>Career management cluster.

<sup>e</sup>Organizational cluster.

<sup>f</sup>Education cluster.

<sup>g</sup>Individual career cluster.

<sup>h</sup>Studied in all clusters, but most prominent in the individual and relational career success cluster, the organizational, and the individual cluster.

<sup>i</sup>Doctorate careers cluster.

occupations, in particular the ability to create tailored measures, provide guidance about the most rewarding careers, and develop labor force projections. The high-profile career cluster not only provides rich descriptive detail about a number of interesting careers, it also develops rigorous formal theories around the insightful concept of “career concerns”. Finally, the social policy cluster not only identifies intriguing work-family dynamics (e.g., “scaling back” amongst dual-career couples), but also employs sophisticated statistical techniques, which allow for more precise estimates of causal relationships.

We do wish to call the reader’s attention to several of the limitations of our study. While the clusters are empirically grounded, some subjective judgment is involved in their naming and interpretation. In addition, the precise number of clusters (but not term placement) depends on the clustering parameter. We chose the default VOS settings (i.e., with a clustering coefficient of 1), but there is no guarantee that other insights might come from setting a resolution parameter that leads to more or fewer clusters. However, in contrast to other forms of reviewing and categorization, science mapping provides transparency regarding the basis on which these inferences are drawn and the maps hopefully pave the way to informed discussion regarding the “true” nature of the field. Interested readers can alter the resolution parameters themselves in the online version of the maps.

These science maps are likely to be particularly helpful for making sense of the career literature, because research on careers is diverse and studied across many fields (Arthur et al., 1989a, pp. 9–10). More broadly, we believe that term mapping is a helpful tool for reviewing a field’s major themes and underlying structure. It is more systematic and disciplined than traditional narrative reviews, and may represent the future of literature reviews.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jvb.2014.08.008>.

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