Factors related to knowledge creation and career outcomes in French academia

As accepted by the *Academy of Management Learning & Education*

Reference:

Abstract

In response to the increasing discourse on academic careers and knowledge creation, we develop and test a model predicting research performance in the field of management outside the Anglo-Saxon countries. Based on comprehensive data of French academics, we examine various factors – career-related and demographic factors like gender – that play a role in determining academic research performance in an increasingly global academia. The role of the English language is positively related to citations but not to the volume of papers or their global/national recognition. Higher institutional reputations were positively associated to number of papers, citations, and national recognition. Strikingly, there was no relationship with *global* recognition, suggesting that the reputation of institutions plays a role, but only insofar as the national context and without spillover into the global academic scene. Finally, men were over-performing in both publications' quality and quantity. Career experience had a positive effect, although this reduced gradually over time. Our findings can help individuals' career decision-making and institutional investment in human-capital. We offer an original contribution to facilitate the understanding of factors that may influence research performance outside the Anglo-Saxon academia by opening of the black box of knowledge development, exposing the role of academic publications and recognition.

Key words

Academic career, publications, H-index, scholarship, France, HRM

Introduction

Research performance is a critical factor for gaining prestige and impact in academic careers. The cliché 'Publish or Perish' reflects the nature of academic careers (Caplow & McGee, 1958; Baruch & Hall, 2004; McGrail, Rickard, & Jones, 2006; Valle & Schultz, 2011). Indeed, generating new knowledge is the ultimate role of academics (Huff Sigismund, 2009), and the litmus test for knowledge creation lies in its publication and use (e.g., citation) within the academic community (Helmreich, Spence, Beane, Lucker, & Matthews, 1980; Hollenbeck, 2008; Segalla, 2008).

Context is also an important issue for the progress of academic knowledge and in relation to global conversion of knowledge creation when dealing with scholarship from geo-cultural realms which have values, practices, and career system that differ from the Anglo-Saxon model, such as in France (Dameron & Durand, 2017) or in Canada (Finch, Deephouse, O'Reilly, Foster, Falkenberg, & Strong, 2017). Practical application is another important indicator of the worth and contribution of academic knowledge (Avenier & Cajaiba, 2012). These points reflect a longstanding debate about the rigor and relevance of management research to practice (Bartunek & Rynes, 2014; Kieser, Nicolai, & Seidl, 2015) as well as the legitimacy of management education in general (Alajoutsijärvi, Juusola, & Siltaoja, 2015).

Publishing may be a less salient element of the academic career in some countries or types of institutions though, and the question of what is considered a worthy publication varies across academic disciplines and national contexts. For example, some disciplines highly value books as the ultimate outlet whereas others emphasize journal papers. In some countries (e.g., Germany, Italy, France), publishing in the local language has historically been valued; in others (for example, The Netherlands and the Scandinavian countries), publishing in English has become common practice and highly relevant for career progress.

The factors that may influence academic performance remain unclear. Certainly, individual competencies such as a high IQ level, analytical thinking and written communication

skills have important roles to play, but it is important to test the impact of PhD education and early-career experience too. Early-career success is critical for the whole working career (Maranto & Streuly, 1994); thus, studying factors that may influence academic success is highly relevant and important. With the growth of the higher education sector, the academic labor market has grown (Baruch & Hall, 2004). Despite this, the global reach of the academic labor market remains unclear, along with how academic communities who use languages other than English perform, as well as what models generate career progression.

Academic performance, in terms of research output, influences individual as well as institutional and national reputations (Finch *et al.,* 2017). Accreditation processes (such as those run by EFMD and AACSB) encourage academic institutions to excel in every aspect of their mission – including research – and gain legitimacy (Julian & Ofori-Dankwa, 2006; Thiétart, 2009) as well as relevance to practice. Institutions that aspire to global recognition realize that research outputs are a significant criterion in acquiring such reputation, and invest efforts in improving the publication levels of their staff (Baden-Fuller, Ravazzolo, & Schweizer, 2000), alongside other criteria such as successfully bidding for research funds (Gulbrandsen & Smeby, 2005). Factors such as institutional reputation and holding editorial roles influence productivity (Adler & Harzing, 2009; Helmreich *et al.,* 1980; Jensen & Wang 2018; Metz & Harzing, 2009). Reputation (ranking) of the journal in which work is published counts higher than the actual contribution does (Starbuck, 2005) and citations count as a measure of recognition. While citations can be biased to a certain extent – either via self-citations (Hyland, 2003) or due to coercive citation (Wilhite & Fong, 2012) – they are traditionally considered robust and accepted measures of academic impact and performance.

Testing factors that may influence academic productivity in publishing is of growing interest to the global academic community. In order to understand scientific productivity, there is a need to explicitly assess how different factors may be associated with academic research performance (Fox & Mohapatra, 2007), and to extend such investigation beyond the Anglo-

Saxon realm (Thomas, Billsberry, Ambrosini, & Barton, 2013). French academia offers an interesting alternative to the Anglo-Saxon model against which to consider differences in publishing practices for academic careers. French academia faces a changing global competitive environment, an increased need for accreditations, and a dynamic environment. It is highly structured, with a clear sectorial differentiation between the Business Schools and the universities (Altman & Bournois, 2004; Harker, Caemmerer, & Hynes, 2016).

We contribute to the literature in three main ways. First, we test similarities and differences in academic performance and careers outside the Anglo-Saxon/US career system, adding input from human capital theory (Becker, 1964; Schultz, 1961). Human capital underpins the study of career outcomes of academics (for example Hong & Honig, 2016). Recent work (Fleming, 2017) questioned the value and relevance of human capital theory and we contribute to current discourse by exploring its relevance to academic careers. We distinguish global- and national-related ratings and identify differences in their antecedents. We also answer the call of Ployhart and Moliterno (2011) to study human capital resources beyond the individual level such as psychological attributes, and move to different types of human capital linked to the local culture and system. Further, we explore the relationships between human capital and social capital to check if they are competing or complementary (Lin, 2017). Second, we examine factors that are critical for academic career success, where the academic global labor market is increasing in relevance and importance (Baruch & Hall, 2004). Lastly, we provide insights into how a range of antecedents – career-related and demographic factors like gender – relate to academic performance. The latter is important in understanding the issue of the "leaky pipeline" (Minefee, Rabelo, Stewart, & Young, 2018).

Our study helps to advance the fields of career studies and knowledge management by highlighting factors that could influence academic research performance. Research performance is the main factor influencing academic career progression and future knowledge creation (Antonacopoulou, 2009). By exploring the status of the academic career system outside the

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Anglo-Saxon environment, we contribute to the debate around the role of institutional position and legitimacy of management education (Pettigrew & Starkey, 2016). This way, we contribute to both career and knowledge management fields.

The purpose of this paper is to present and validate a model for academic research performance in an increasingly globalized academia and to explore the factors influencing it. To accomplish these objectives, we first present the context of the study – French academia, a well-developed Western system with its specificities and which is not fully embedded within the dominant Anglo-Saxon system (cf. Johnston *et al.,* 2013). We draw on the career and human capital literature to develop a model which we then test empirically. Finally, we draw conclusions and discuss the meaning of our findings.

The context – French academia

Context is important to the understanding of career advancement, and it plays a key role in scholars' career orientations (Dries, 2011). In particular, national and institutional contexts play significant roles in directing the performance efforts of scientists (Bui & Baruch, 2012; Finch *et al.,* 2017; Mallon, Duberley, & Cohen, 2005). Studying various parts of French higher education, Bourdieu developed the seminal notions of "cultural capital", "field", "symbolic power" and "*Habitus*" (Bourdieu, 1989; Schneidhofer, Latzke, & Mayrhofer, 2015, p. 19) that explain the processes of social reproduction and the established order of power and hierarchy in academia. Top French Business Schools which Bourdieu (1989) referred to as "elite reproduction systems" are institutions that largely influence how French managers are molded (Barsoux & Lawrence, 2013). There is a differentiation between the micro-level where individuals acquire social capital, the meso-level of the *Habitus*, and the macro-level of society, culture, and political economy (Bourdieu, 1977).

French academia is fairly structured, and within the field of management studies there is a clear sectorial differentiation between the Business Schools system and the universities (Altman

& Bournois, 2004; Harker *et al.,* 2016). Table 1 presents the major differences between the two systems. Key differences are discussed below.

Insert Table 1 About Here

The first system includes nearly 200 Business Schools, typically private, formerly vocational-oriented, and aiming to compete in the global education marketplace (Fotaki & Prasad, 2014; Kumar & Usunier, 2001). Around 80 Business Schools are accredited by the French government to award Master's degrees and are listed in several national ranking systems. Some of these are private but most belong to the local Chambers of Commerce or are associated with the Ministry of Education (Thiétart, 2009). Students are selected based on a national competitive examination after two years of intensive training in preparatory classes after their baccalaureate (end of secondary school exam). This selection process has allowed these schools to develop an increasingly elitist character (Durand & Dameron, 2008), which they also maintain through the relatively small number of Business Schools graduates (Harker *et al.,* 2016).

Over the years, competition among Business Schools on the international scene has boosted both management education and research efficiency (Durand & Dameron, 2011). The role of accreditation bodies (such as AACSB and EQUIS) is also important in explaining the visibility and development of French academia in recent years (Dubois & Walsh, 2017; Kodeih, 2013; Thiétart, 2009; Thomas *et al.,* 2014) as well as financial constraints (Pon & Lichy, 2015). As French Business Schools face the challenges of a highly global competitive environment, they constantly adapt and transform themselves to develop and remain sustainable. To reach critical mass and compete in a global market, a number of mergers have taken place between French Business Schools in recent years – with varying levels of success.

To facilitate the accreditation process, research has been recently positioned as a priority in most Business Schools and has over the years become a pull factor for faculty: imposing more

pressure for research activities, salary increases, and promotions (Thiétart, 2009). Before 2000, only a few academics produced research. However, the number of articles published by scholars affiliated to French Business Schools has risen constantly over the last decades, and this trend coincides with the beginning of the accreditation process (Dubois & Walsh, 2017). Originally, Business Schools were supposed to be closer to companies than universities are, as they were considered to be trade schools more than academic institutions (Thiétart, 2009): research was more applied and Business Schools have always maintained a strong link with industry by valorizing firms' chairs sponsored by a company and focused on its particular demands. Despite large disparities among Business Schools, most require and expect their staff to be – concurrently – a good researcher, a great teacher and a competent program administrator.

To attain and reinforce widely accepted recognition, individuals and institutions use metrics, like league tables. There is a long tradition in the French system – characterized by elitism (Barsoux & Lawrence, 2013) – to clearly identify which institution is top of the list, and various rankings lists were introduced in France to achieve this. These rankings are slightly different from one source to another; but there is strong consensus about the very top of the list. Some magazines exploit this niche with a yearly series of issues that sells well (Durand & Dameron, 2011), and such metrics aim to associate level of quality and achievement worth (Beed & Beed, 1996; Pidd & Broadbent, 2015). In France, some Business Schools, most notably the leading ones, remunerate their academic staff based on a financial bonus system to motivate publication in leading journals.

While many managers are trained primarily in the Business Schools, university studies represent a second major segment of French higher education (Musselin, 2013). The French university system – which is an almost free education system – is highly regarded nationally, but few French universities are included in top global rankings, possibly because French scholars tend to favor publications (books and journal papers) in French. There are approximately 75 universities in France; fewer universities are accredited, compared with business schools, and the

process of accreditation is often led by "Instituts d'Administration des Entreprises" (a university department specialized in management studies).

Career structures in the university are typically more traditional, linear, secure and predictable, but offer lower salaries than Business Schools do (Witte, Van der Wende, & Huisman, 2008). Scholars completing their PhD in management studies can choose between a career in the national civil service system of the university, or in the dynamic and competitive labor market of the Business Schools. There are very few cross-movements between these two sectors.

French academic institutions compete for global reputation and a number of them appear in top ranking lists (Kumar & Usunier, 2001). Internationalization has largely impacted the French Business Schools in their quest for global legitimacy via accreditations such as EQUIS or AACSB (Thiétart, 2009), nowadays depicted as a necessary precursor for international competition, and no longer as a form of competitive advantage (Julian & Ofori-Dankwa, 2006; Thomas *et al.,* 2014). Internationalization has had consequences though, not least for research activities (Thiétart, 2009); however, research is closely linked to the specific social-historical context of the country, which can lead to three main explanations.

First, there has been a long tradition in French academia to publish books and book chapters. Indeed, historically, the rich Francophone intellectual tradition within the social sciences has always privileged books and books chapters over journal articles (Chanlat, 2014a). Things are changing with the current trend and pressure to publish in peer-reviewed journals, moving slowly away from books and monographs.

Second, for French researchers, a key debate is which language to prefer for publications in management research (Chanlat, 2014b). Despite the importance of the French national language, reading and publishing in English has increasingly become an implied compulsory requisite in academia and represents a model that is recognized, respected and promoted (Durand & Dameron, 2008). By attempting to publish globally, namely in English, French-speaking

researchers face a socio-cognitive challenge (Chanlat, 2014a). This also highlights the question of productivity and diffusion: some researchers publish aiming simply "to publish" (multiplying publications in French and low-ranking journals) whereas others publish less but in top journals (a few but more notable and citable). There are changes in scientific fields and institutional ideas in organizational analysis, where a focus – even dominance – of European perspective enables French researchers to play a significant role in knowledge creation, as European authors (Üsdiken, 2010).

Third, there is increasing institutional pressure to publish in top (typically Anglo-Saxon) journals to gain national and international accreditation. The context is thus important to understand 'what counts?' – where different schools have different criteria of publication success. Location counts: In the USA, schools tend to develop their own list of target journals; the ABS list established in the UK is accepted much beyond the British system, whereas in Australia the dominant list is the Australian Dean's list. In the French system, the CNRS Journal Ranking list in Economics and Management has been developed by the National Center for Scientific Research, (or CNRS), which is a public organization under the responsibility of the French Ministry of Education and Research. Highly correlated with the ABS in terms of English-written journals, this ranking includes many French-written journals. However, these high expectations for publishing may cause tensions regarding other activities that the faculty is involved in (e.g., teaching, coordinating programs, participating in diverse committees, and tutoring students, among others) (Durand & Dameron, 2011; Thiétard, 2009).

Hypotheses development

Academics aim to generate new knowledge, and the two main indicators of success or impact are level of publication (number and quality of outputs), and recognition through citations. Measures of citation level exist, although none are perfect (Adler & Harzing, 2009; Harzing, 2011). Both indicators confer prestige on individual academics as they progress in their careers (Seggie & Griffith, 2009), and on their employing institutions. We draw on the career and human

capital literature, where individuals aim to reach career success, both intrinsic and extrinsic (Ng, Eby, Sorensen, & Feldman, 2005). The major criteria for success in research-oriented environments are publications and citations (Townsend & Rosser, 2007), which are measure of human capital. Individuals move in a dynamic labor market based on their competence and reputation and under different influential factors that cause them to stay or move across academic institutions, negotiating and generating new psychological contracts with their institutions (Baruch & Rousseau, 2018). The major currency for academic human capital is research output, which can be measured via specific evaluations, as explained below.

A number of measures have been designed to evaluate academic impact in terms of research and knowledge creation, of which the H-index (Hirsch, 2005). The H-index is considered one of the most robust, reliable and valid measures globally (Aoun, Bendok, Rahme, Dacey, & Batjer, 2013; Hodge *et al.,* 2017; Mingers, 2009; Rad, Shahgholi & Kallmes, 2012). It combines the quantity of publications and their quality (on the basis of citations) by counting the first *h* most-cited papers that received at least *h* citations. The H-index is typically used to evaluate research performance (Ball, 2005; Hodge, Lacasse, & Bean, 2017; Ponce & Lozano, 2010), and is "widely used in many decision-making tasks, like in evaluation of individual scientists" (Mesiar & Gagolewski, 2016). It is becoming an accepted measure, critical for individual reputation (Sorenson, 2014; Stern, Dukerich, & Zajac 2014).

Research outputs

The ability to generate new knowledge is an individual, institutional and a national asset, influencing competitiveness and reputation (Feldman, 2001). As research is an asset for attracting faculty (Thiétard, 2009), institutions invest substantially to improve the research output of their academic staff, with significant success outcomes (McGrail *et al.,* 2006). In some systems, financial bonuses serve as a motivator for successful publication, as is the case of the private sectors in France (Chevaillier, 2001), Germany, Pakistan (Shoaib & Baruch, 2018; Wilcox, 2008)

or China (Franzoni, Scellato, & Stephan, 2011). In other institutions, there is neither direct remuneration nor rewards for successful publications, but these nevertheless influence promotion decisions and career success (Judge, Kammeyer-Mueller, & Bretz, 2004).

Research outputs have different levels of prestige and importance, depending on the academic system one works in (Clemens, Powell, McIlwaine, & Okamoto, 1995). The higher the journal in the rankings, the higher the perceived achievement, and the higher the propensity for the article to be cited. Citations are a critical measure of academic outcomes across academic disciplines (Leiter, 2000) as significant contributions are typically more often cited.

The challenges and impact of language

English is considered a global language (Altbach, 2007; Perkins & Vartiainen, 2010) and the language of science (Ammon, 2001), although it is only the third global spoken language (after Mandarin-Chinese and Spanish). Writing in English is a global trend, and scholars within various disciplines and countries realize the need and expectations to publish in English (Curry & Lillis, 2004). Exceptions to this exist, not least for example in a French context with scholars such as Bourdieu. Nonetheless, the relevance of French as a global language is in decline (Maurais & Morris, 2003, p. 17) and, within academia, papers published in French journals are not widely read and, consequently, not well cited globally. A clear example is the case of the *Canadian Journal of Administrative Science*, which is required to publish a similar number of papers in both languages, but where articles published in English are cited far more than those written in French (personal communication with the Editor). In France, the use of English in academic writing is contentious, although recognized as important nevertheless (Deneire, 2008). In the past, French authors tended to avoid English journals (Engwall, 1998), but the trend is changing in line with global competition and the contemporary academic labor market (Baruch, 2013). Most journals highlight at least a summary in English, and some top-ranked French journals impose a requirement on authors that a full translation of their accepted papers is

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submitted in English before publication. For instance, *M@n@gement* and *Recherche et Applications en Marketing* (known as *RAM*), well-regarded French journals respectively in strategy and marketing, clearly mention in the submission policy that authors must provide a full English translation of their contribution if accepted for publication. However, for French scholars, publishing in French journals remains important for their national and local recognition (Aalbers & Rossi, 2007). Academic scholars face a dilemma over whether to publish 'locally' or globally. Scholars with a global orientation target English-based journals, since the propensity to be read and cited is higher.

Publishing in one's mother-tongue might be easier for scholars, but the citation level is expected to be lower, as fewer global scholars will be able to read it. The vast majority of high-impact factor journals are published in English (ABS, 2018). As clearly stated, *"The dominance of English used as a* lingua franca *in international business contexts is now seemingly beyond dispute"* (Nickerson, 2005). Journal editors and reviewers frown on references that are not in English since most scholars have no access to or ability to understand these references. Scholars who build on the extant literature (mostly English) will then benefit from a stronger knowledge base. To sum up, even European scholars for whom English is a second language have a propensity to publish in English (Phillipson, 2004). As a result of having to also publish in the local language, the total volume of publications may therefore increase as scholars aim to achieve an impact that is both 'local' and global. Further, we argue that propensity to publish in English can be related scholarly reputation both at the global and 'local' levels. This is because it increases the scope for citations from global scholars, but also has a spillover effect at the national level since many of the highest ranked publications are in English even within the national classifications. We thus hypothesize:

Hypothesis 1a: *Publishing in English will be positively related to the number of papers.*

Hypothesis 1b: *Publishing in English will be positively related to the number of citations.*

Hypothesis 1c: *Publishing in English will be positively related to the research global ranking.*

Hypothesis 1d: *Publishing in English will be positively related to the research national ranking.*

Role of reputation: Institutional level

We posit that a number of factors need to be accounted for when examining the propensity to publish in English in relation to research performance. The first factor of interest is the prestige of the graduate school, which endows human and social capital on the graduate (Baruch & Hall, 2004; Macfarlane, 2011). Reputational rankings of graduate schools and current institutions were significantly related to citations of scholars in the USA (Helmreich *et al.,* 1980), and forming a system where schools operate in a way that is more unified and thus enables fair and equitable comparisons within the same reputational system (Wedlin, 2007). Graduate program quality and the first faculty appointment are positively related to their scholarly performance; i.e. number of publications and citations by others (Maranto & Streuly, 1994). The prestige of the graduate school has a significant impact on the future career of the graduate (Austin, 2002; Judge *et al.,* 2004) due to the social capital (networks) gained via PhD studies and beyond (Burris, 2004). Graduating from a prestigious university is also a factor in being selected for a tenure track in one's early academic career and, the better the graduate school, the higher the prestige of the employing university, although the relationship may be indirect (Maranto & Streuly, 1994).

Hypotheses 2a/b/c/d: *The reputation of the qualifying university will be positively related to (a) the number of papers, (b) the number of citations and (c) global/ (d) national research performance.*

Hypotheses 3a/b/c/d: *The reputation of the current university will be positively related to (a) the number of papers, (b) the number of citations and (c) global/ (d) national research performance.*

Role of gender

A second factor to take into account is gender, as there is a clear disparity in gender representation in academia, particularly in the higher echelons (Bendl & Schmidt, 2012). Women's representation in academia is slowly increasing (Bell & Bentley, 2005; European Commission, 2016) and so is their contribution to publications in the scholarly literature (Mauleón, Hillán, Moreno, Gómez, & Bordons, 2013; Metz & Harzing, 2009). In France, women represented 33% of researchers in higher education in 2012 but only 19% of grade A – the highest grade in a 'typical' academic career – in 2013. This compares with 41% and 21%, respectively, in the EU-28 (European Commission, 2016). Women also tend to achieve a lower level of article production (Duch *et al.,* 2012; McDowell & Smith, 1992). This may be related to factors such as representation on editorial boards, as was found for the case of management journals (Metz & Harzing, 2009). To explain the difference, the literature tends to focus on external and discriminatory factors such as lack of networks, socialization, the dual-role burden, masculine organizational culture, and gendered power imbalance in the workplace (Schmitt, Branscombe, Postmes, & Garcia, 2014; Todd & Bird, 2000; Van den Brink, & Benschop, 2014). Overall, the persisting gender gap in academia leaves a void that remains unaccounted for (Ginther & Kahn, 2004), suggesting that academia as an institution is biased and produces a culture that is not congenial to the experiences of women particularly in relation to those that have care responsibilities (Kahn & Ginther, 2012). We thus suggest:

Hypotheses 4 a/b/c/d: *Women academics will have fewer (a) papers, (b) citations and lower (c) global/ (d) national research performance.*

Career stage

A third factor of interest is the extent to which experience influences performance. The stage or tenure in academic career (years since completion of the PhD) reflects acquired knowledge. With growing experience, we expect an increase in the number of papers, their citations and global/national recognition. While scholars would expect an inverted U-shaped relationship

between time and performance for physical related roles (Sturman, 2003), this is less clear for non-physical work. Cognitive ability may not decline at a later working age (Baltes & Lindenberger, 1988), professional vitality can pick up towards the end of the professional career (Baruch, Grimland, & Vigoda-Gadot, 2014; Viggiano & Strobel, 2009), and adaptability is of critical importance (Zacher, 2014). Furthermore, there is a tendency for scholars to aim for and to become global (Pilkington, 2012; Thietart, 2009). This reinforces strong recognition processes and future publications and their citations. Thus, we hypothesize that;

Hypotheses 5a/b/c/d: *Career tenure in academia will be positively related to (a) numbers of papers, (b) numbers of citations, and (c) global/ (d) national research performance without declining over time.*

Role of qualification

Finally, we are also interested in the effects of a specific qualification which has significant meaning in many EU systems (e.g., French, German/Austrian), that of *Habilitation*, with particular relevance to the French system (Dany, Louvel, & Valette, 2011). *Habilitation* – in French "*Habilitation à Diriger des Recherches*" (HDR) – is an accreditation to supervise doctoral research. Career-wise, it is required to apply for Professorship (Altman & Bournois, 2004). The *Habilitation* can only be gained after acquiring experience in research, and necessitates a portfolio of publications. It recognizes mature researchers capable of leading an independent program of research and developing younger scholars. This is likely to lead to greater collaboration, particularly internally, but also externally when younger scholars take up positions in other universities. We therefore argue that:

Hypotheses 6a/b/c/d: *Habilitation will be positively related to (a) numbers of papers, (b) numbers of citations, (c) global and (d) national research performance.*

Based on the above discussion we offer the following model.

Insert Figure 1 About Here

Method

Sample

We studied the research history and outcomes of all the early-career French scholars who were awarded their doctorate between 1998 and 2011, in one representative field within management studies (HRM). Data were collected during 2016. This period was chosen to study academics with some career experience. We used a database to retrieve and identify all PhDs in management awarded over this period (<http://www.theses.fr/>). We utilized keywords, and had a closer look at the examining jury and the area of expertise of the supervisor to determine whether the thesis was in the HRM field or not, as HRM falls within our specific expert knowledge. We collected information about 326 scholars but excluded 23 persons who opted for careers outside academia or started working abroad. We ended up with a sample of 303 academics. Of them, 155 were women and 148 were men, with an average age of 32.76 (SD = 8.31). In total, 118 individuals were employed by Business Schools compared with 185 by universities.

Measures

For each scholar, we identified the university where the PhD was awarded, current employer (university or Business School), sex (as a proxy for gender), and years from graduation (career tenure). We then identified the number of publications by 2016, including book chapters, books and journal papers. We used the software Publish or Perish (Harzing, 2011) to retrieve and analyze academic citations. To evaluate the research quality of the institutions (both granting and current) we used the H-index as proposed by Hirsch (2005) for almost every institution based in France as calculated by Courtault, Hayek, Rimbaux and Zhu (2010). We follow an increased tradition in using this index in academic evaluations of performance and reputation. While difficulties may exist when comparing the H-index in different scientific fields, as suggested by Harzing, Alakangas and Adams (2014), our full sample is from the same field; thus the H-index should be accepted as an appropriate measure.

We drew on four research outcomes. We measured both the number of papers published and the number of overall citations, as outcomes in their own right. We also focus on two measures of research quality, one that focusses on the national level and the other a more global measure. First, we used the French CNRS list to calculate the number of "stars" gained by each scholar regarding their publication output (4* for each paper published in a journal ranked 1; 3* for rank 2; 2* for rank 3, and 1* for rank 4). The National Center for Scientific Research (CNRS) is a public organization under the responsibility of the French Ministry of Education and Research whose mission is to develop, promote and support research. Another list was created in 2013 by the FNEGE (The French Foundation for Management Education) in partnership with all the French Management scientific associations. We nonetheless rely on the CNRS list to provide information about national performance since we expect French scholars to pay more attention to the CNRS than to other global rankings. This is because these global rankings include mostly English-written outlets, while the CNRS ranking is a measure that includes French journals. The scope of the CNRS ranking is wide, including journals in other related areas such as economics.

Second, we employed the H-index as an indicator of global performance. The H-index has the advantage that it takes all publications into account, i.e. those written in French or in English (or in other languages – as some French scholars write in Spanish) as well as journal articles, books, and book chapters. The H-index is a performance measure for academic research impact, suggested by Hirsch (2005), to evaluate the performance of academics across scientific disciplines. It is used globally in the evaluation of research performance (Ball, 2005) of individuals, institutions, and journals, including within the French system (Courtault *et al.,* 2010). It is considered robust (Harzing & Van Der Wal, 2009; Mingers, Macri, & Petrovici, 2012), and it mitigates against self-citations (Rad *et al.,* 2012). No measure is perfect though, and the H-index has been the subject of some academic criticism too (Bar-Ilan, 2008; Gaster & Gaster, 2012). Other complementary measures to evaluate the specific impact of scholars do exist (e.g., De Visscher, 2010), but the H-index is well accepted and is considered valid within single

disciplines (Bornmann & Daniel, 2009). We replicated our analyses with the G-index, achieving similar findings.

We calculated the H-index for each member of the whole study population. For many cases this required identifying a specific scholar (i.e. not to erroneously count works of other scholars with the same names). Table 2 gives an overview of the top universities' and Business Schools' performers according to Google Scholar ranking while Table 3 highlights the top ten researcher performers according to the H-index ranking.

Insert Tables 2 & 3 About Here

We tested inter-rater agreement on a sub-sample of 96 scholars with a high level of fit: the inter-rater agreements for 'total number of papers', 'total citations', and 'H-index' for the first 96 were tested by the first two authors. The correlations between the two were .94, .97 and .94 ($p <$ 0.01) agreements, respectively. We also included measures for sex (0 for women, 1 for men) and career tenure (since PhD was awarded). We added a quadratic term for career tenure to test for our hypothesized inverted-U relationship. We controlled for whether individuals are accredited to lead research (HDR – coded as 1 when present and 0 otherwise). As all the variables were taken from valid and reliable secondary data or calculated via hard data, this study is not subjected to the limitation of common method bias (Podsakoff & Organ, 1986). In Tables 4 and 5, we present descriptive statistics and zero-order correlations across the variables of the study. None of the correlation coefficients exceeds the level of 0.70 among the dependent variables, which is a strong indicator for the absence of multicollinearity. This was verified by checking Variance Inflation Factors, with no values above 2, confirming the absence of multicollinearity.

Insert Tables 4 & 5 About Here

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Model fitting

The hypothesized model was examined using two-stage least square (2SLS) estimation because of concerns over endogeneity (Antonakis, Bendahan, Jacquart, & Lalive, 2014). Endogeneity occurs where a predictor in a regression model – here, propensity to write in English – is correlated with the error term. Publishing in English might be related to a host of factors that cannot be accounted for by our dataset, but which have a bearing on research performance. It might be that some French scholars acquire global experience, which can be a factor contributing to collaboration and wider success (Ou, Varriale, & Tsui, 2012). Furthermore, scholars who publish in English may be more likely to work in institutions that are more exposed to international research networks, with such influence greater in institutions such as Business Schools which are more subject to market forces and pressure to conform to the global market. Academics may also self-select themselves or target institutions that they feel better "fit" with their professional research goals and aspirations. Thus, institutions with higher research reputations could be more attractive to applicants who wish to focus primarily on research.

To address endogeneity and the resulting potential bias from omitted variables, the analysis introduces an instrumental variable. Whether an individual is working in the university system (coded as 1) or in a Business School (coded as 0) is used as an instrument since it is not correlated to any of the responses (numbers of papers, number of citations, H-index, CNRS stars) or error terms in respective regressions, while it is correlated with the propensity to publish in English. This correlation, although highly statistically significant ($p < 0.01$), is weak with a correlation coefficient of -0.24. This provides less precision that a stronger instrument would, but nevertheless offers more consistent estimates than OLS would. Furthermore, an F-test was conducted, resulting in a value of 18, well above the cut-off point of 10 suggested by Stock and Watson (2003). The 2SLS model used here is as follows:

$$y_1 = y_2' \beta_1 + x_1' \beta_2 + u,$$

where y_1 are our respective responses (in turn number of papers, number of citations, H-index and CNRS stars), y_2' are the fitted values arising from first-stage least square estimation regressing our response on both the instrument and control variables, x_1' are the control variables (reputation of the PhD granting institution, reputation of the current institution, sex, career tenure, HDR), and finally u is the error term. While 2SLS estimation is generally conducted using a linear model, because the responses are count variables with evidence of over-dispersion, the second stage of the estimation used a generalized linear model with a negative binomial link.

Results

Our first hypothesis examined the relationship between the proportion of papers published in English and a range of research outcomes: number of papers, the number of citations, and the quality of the output globally and nationally. Hypothesis 1 stated that publishing in English will be positively related to the number of papers, of citations, the research global ranking and the research national ranking.

The results show that publishing in English is not associated with a higher number of papers (no support for H1a), nor is it associated with research quality as measured by global or national measures (no support for H1c and H1d). However, there is some evidence of a positive relationship between the proportion of papers published in English and the number of citations. Every 10 percentage points increase in the proportion of papers published in English is associated with an increase of about 17 percent in citations ($\beta = 2.458$, p = 0.06), providing support to H1b. Publishing in English is therefore not linked to an increased volume in the number of papers, but increases citations possibly because it increases the scope of their readership. However, publishing in English does not appear to be associated with better quality outputs, whether that is measured globally or nationally.

Next, we turn to the effects of the research performance of the PhD-granting institution and the current institution to examine Hypotheses 2 and 3 (a/b/c/d). Hypotheses 2 and 3 suggested that the reputation of the qualifying university and of the current university will be

positively related to (a) the number of papers, (b) the number of citations and (c) global/ (d) national research performance. The research reputation of the PhD institution is not related to the number of publications, but the current institution is ($\beta = 0.117$, $p = 0.01$). This might be the result of equal requirements to publish across institutions during the doctoral period, followed by greater pressure to produce outputs while working in institutions with higher global research reputations. Furthermore, only the reputation of the current institution's research reputation is associated with citations ($\beta = 0.135$, $p = 0.09$) although this is only statistically significant. This might be explained by the fact that researchers work within institutions that have higher research performance, in which their works are more visible and therefore more likely to be cited. The reputation of the current institution also seems to be slightly positively related to national research performance ($\beta = 0.138$, $p = 0.1$), although this is not the case of global research performance. This might be indicative of the geographically nested nature of (French) academia: the reputation of universities is somewhat recognized nationally, but fails to spillover at global level.

Our analysis also considers the effects of a range of variables that include career tenure, sex, and HDR status. Hypothesis 4 suggested that women academics will have fewer (a) papers, (b) citations and lower (c) global/ (d) national research performance. Being a man is associated with a higher number of papers published ($\beta = 0.199$, $p = 0.04$) and number of citations obtained ($\beta = 0.399$, $p = 0.02$). Being a man was also associated with increased research performance particularly at the national level ($\beta = 0.348$, $p = 0.05$) compared with the global level ($\beta = 0.190$, $p = 0.05$). The effects of sex on research quantity and quality are significant. Being a man is associated with a 22% increase in number of papers and 49% increase in citations. In turn, being a man is associated with a 21% higher H-index and 42% higher number of CNRS stars. Hypothesis 5 suggested that career tenure in academia will be positively related to (a) numbers of papers, (b) numbers of citations, and (c) global/ (d) national research performance without declining over time. The effects of career tenure were significant in terms of both quantity and

quality of research. The number of years of experience since the PhD were both positively related to number of papers ($\beta = 0.152$, $p = 0.05$) and number of citations ($\beta = 0.600$, $p < 0.01$). Similarly, both measures of research performance globally ($\beta = 0.289$, $p < 0.01$) and nationally ($\beta = 0.400$, $p < 0.01$) increased with experience. This confirms that both quality and quantity of research publications increases over time. However, the significant coefficient associated with the quadratic term for career tenure does not support our hypotheses (H5) that there is no inverted U-shaped relationship with the exception of number of papers: citations ($\beta = -0.021$, $p = 0.01$), H-index ($\beta = -0.010$, $p = 0.03$) and CNRS stars ($\beta = -0.016$, $p < 0.04$) all show a decrease over time. This provides support to H5 b/c/d but not H5a. Despite these results, it is not clear whether this is indicative of lower cognitive abilities or publishing vitality at more mature stages of a career, or that of a generational effect. Because of the cross-sectional design, it may be that this represents different cultures in French academia, with pressures to publish less prominent among older cohorts of academics coupled with less exposure within global research journals.

Finally, Hypothesis 6 suggested that *Habilitation* will be positively related to (a) numbers of papers, (b) numbers of citations, (c) global and (d) national research performance. We examine the effects of *Habilitation* and find that the only apparent effect is a positive association with the numbers of papers published ($\beta = 0.445$, $p = 0.01$). This provides support for H6a, but not H6 b/c/d. This may be the result of having an increased number of publications by increasing the number of collaborations with younger scholars, but which, because of this group's lack of scholarly maturity, fail to be widely cited and thereby recognized through national and global measures of research quality. The results are presented in Table 6 whereas Table 7 lists the level of support (or otherwise) for the hypotheses.

Insert Tables 6 & 7 About Here

Discussion

Academia is defined as a social "field" with its own logic and rules (Bourdieu, 1988) as well as career system (Baruch & Hall, 2004). For example, knowledge creation is a critical element for academic scholars, where publications and their use (citations) reflect the level of achieved knowledge creation. Although this is not always the case – see, for example, Learmonth, Lockett and Dowd (2012) – academic scholarship is measured by its outputs, and publications are the main indicators of such outputs (Aguinis, de Bruin, Cunningham, Hall, Culpepper, & Gottfredson, 2010). Although teaching is often perceived as the essence of academics' work, research is what distinguishes scholars within their own disciplines; it plays a substantial role in forming hierarchies within institutions (Bourdieu, 1988). Either directly or indirectly, there is a significant impact of managerialism, which has become very strong in some Anglo-Saxon countries (Clarke & Knights, 2015), but is penetrating more institutions globally. Further, the outcomes of academic publishing also relate to the careers of academics (Austin, 2002; Baruch, 2013).

The importance of early-career success for overall future career is a well validated point (Maranto & Streuly, 1994), and the study of influencing factors is highly relevant for conceptual understanding and practical purposes. Most of our knowledge is based on the Anglo-Saxon model, although the academic labor market is global. The academia "field" is an arena where institutional actors – for example, in our case, universities and Business Schools – strive towards similar objectives (Bourdieu, 1988). They usually attempt to position themselves in the center of the field, which often leads to standardization on a global scale (Thomas *et al.,* 2014). This convergence is further strengthened by accreditations (Durand & Dameron, 2011; 2017) and rankings (Wedlin, 2007). These two systems enable us to compare positioning and construct hierarchies in management education, as well as generating homogenizing effects by developing global templates. In this paper, we further our understanding of academic careers beyond this cultural boundary, by exploring the case of France.

We developed and tested a model which offers explanatory factors for academic research performance (quantity and quality) in the French context. The case of France is singular and

unique, because it is the only country in Western Europe that has a dual system for higher education – universities and Business Schools. It means that when considering contextual aspects, our study signals the existence of a diversity of approaches. The case of the French academia represents a 'geographically nested' approach, but at the same time, the results signal that there is an emergent globalization of standards changing and defining the academia. Thus, our results are important for better understanding research performance in academia.

Because of the increased globalization of academia, and ensuing pressure to publish in a global 'market', we focus our analysis on the effect that writing in English has upon both the quantity and quality of publications in this context. We find that increased propensity to write in English increases citations slightly, which we suggest is related to widening global readership. It may also reflect the pressure of global accreditation bodies. For example, the CNRS classification includes a high number of French journals, which, albeit arguably of high quality, are less appreciated and rarely cited globally compared with English-written journals. The lack of translation is clearly a first explanation for this invisibility, and major works written in French rarely appear in the bibliographies of Anglo-Saxon academics (Chanlat, 2014a). However, the proportion of papers written in English does not increase the overall number of papers published, suggesting that this does not represent an additional activity for French academics; instead there is a substitution effect. We did not find that writing in English was related to greater global recognition of one's research (through the H-index) or to national recognition (CNRS stars).

We also controlled for the reputation of the PhD-granting institution and current institution, career tenure, sex and *Habilitation*. We found some limited support for positive relationships between the reputation of the current institution and increased number of papers, citations and CNRS stars. The effect of the PhD-granting institution was not positively associated with any indicators of academic performance. In line with the literature, the quality of the current institution is important, but unlike current knowledge, both US-based and French-based (Bonnal

& Giret, 2010), the reputation of the university from where the PhD was awarded played no role as an explanatory factor, in contrast to previous findings based on the US system. This makes the case of France particularly unique. We were surprised by the lack of relationships between the reputation and standing of the granting institution and later performance of the PhD graduates, although certain evidence does support this (Fogarty & Jonas, 2013). This might be due to the fact that French universities are not subject to a ranking system (all universities are considered of equal value), or for reasons related to the choice of PhD program. Godechot and Louvet (2008) found that, in management, local candidates are twenty times more likely to be recruited by the university from where they graduated than external candidates are. This might have influenced our results: The recruitment process is probably biased and the local network for the first academic job is more important than the publication potential in some institutions. A striking result here is that neither appeared related to global impact, in the form of the H-index. This suggests that the reputation of institutions plays a role, but only insofar as the national context and without spillovers into the global academic scene.

In line with much of the literature on gender and academia (e.g., see Morley, 1994), men were over-performing in both quantity and citations of publications. Social values and norms relating to women's careers might be responsible for a lower level of productivity for women (Hochschild, 1997). Compared with other countries, women in France have a more favorable system that enables them to work, even when they have young children, but child-rearing remains a traditional expectation (Guillaume & Pochic, 2009; Herman, Lewis, & Humbert, 2013). However, as Aiston and Jung (2015) have contended, merely pointing out the potential negative effects of families on academic careers masks structural and systemic inequalities in academia (cf. Baruch & Vardi, 2016). Evidence suggests that the 'pipeline is leaking' even after care responsibilities are controlled for (Heijstra, Bjarnason, & Rafsdóttir, 2015). Instead the gender gap can be explained by the fact that academic careers tend to conform to the norm of the 'ideal scientist' (Veldkamp, Hartgerink, van Assen, & Wicherts, 2017), a masculine archetype that is

able to make significant research contributions by the time they reach their 30s, largely unencumbered by caring responsibilities (Beddoes & Pawley, 2014). Previous research has shown that women are more likely to accept high-demand service roles that constrain their academic careers and scope to publish (Barrett & Barrett, 2011). These dynamics affecting women's progression are similar in the French system (Sabatier, Carrere, & Mangematin, 2006).

Lower performance for individuals with longer careers may reflect a reminiscence of the past where, for many employees still in the system, publication was not a major factor in their careers, particularly within French Business Schools which were more vocational institutions (Harker *et al.,* 2016) and only moved to become academically competitive in recent decades (Dubois & Walsh, 2017).

Theoretical contributions

In terms of knowledge creation, we help with the opening of the black box of knowledge development and exposing the role of academic publications and recognition within it (Perriton & Hodgson, 2013). We show how ingredients of individual human capital contribute to performance and career success, extending the relevance of human capital theory (Becker, 1964) beyond the US career system (see also Townley, 2015, p. 188). We manifest how human capital vary and can be measured in different ways in different systems. Further, we identified the role of institutional reputation as a factor relevant to academic performance, bringing together human capital and social capital as discussed by Lin (2017). The findings extend the knowledge of academic careers (Baruch & Hall, 2004) to a global context. Looking at the idea of 'research care', recently introduced by Schwarz, Cummings and Cummings (2017), the growing passion of some French scholars to follow the French route and publish in French rather than in English might be a major factor for the relatively low representation of French scholarship in global outlets. In this way, we contribute to a refinement of theory, which is an essential stage for theoretical progress in organization and management research (Edwards, 2010).

Limitations and future research

This study used a specific group of scholars – early-career academics in one country (France) – within the HRM field. Replications in different nations (particularly non-Anglo-Saxon countries), different languages and other fields of science would further validate our model. Otherwise, at a time when the academic market continues to become more and more global and less bounded (Baruch, 2013), further research needs to be conducted in French institutions where the rise of international standards has accelerated the recruitment of international professors (Kodeih, 2013) and given more salience to the propensity to use English for publications. Given that proactive strategies of networking and mobility between institutions provide a better access to social capital and make scholars become more productive (Ryazanova & McNamara, 2016), further research calls for a deeper understanding of career aspects (mobility, networking, collaboration behavior) that increase research performance. Furthermore, the H-index may not be the sole measure for research performance, and some alternatives can be considered: other research output criteria can be used such as the number of papers in peer-reviewed journals or the number of papers written in English and published in Anglo-Saxon peer-reviewed journals. It may also be worth studying the increasing trend of French scholars to collaborate with international peers to publish in top journals. Lastly, a knowledge gap that deserves further exploration is why certain women succeed, and others do not in despite language proficiency, institutions reputation, and the role of the supervisor, to mention a few.

Conclusions and implications for management education

Our findings are of particular relevance for global management of academics and should be useful for policy-makers, particularly outside North America. Improving research outcomes is important for individual, institutional and national reputations. Some of the factors are fixed, and considered limited resources – such as the reputation of universities and of specific prospective supervisors. Others, though, can be influenced, like sponsorship of PhD studies in prestigious institutions as well as improving competence in the English language. Moreover, measuring the

impact of research can be done indirectly and is still problematic (see the Business School Impact Survey: Kalika, Shenton & Dubois, 2016).

We contribute to the literature of academic careers by studying factors that may influence career outcomes in academic environment that is not Anglo-Saxon, exploring the role of English as a global publication language has in relation to research performance in French academia, and, by extension, to other non-Anglo-Saxon academic communities. Antecedents such as the reputation of the scholar's university, tenure in academe, and the aim to publish in peer-reviewed English journals all associated with research performance both in terms of H-index and CNRS measures. Our sample gathers the French scholars who were awarded their doctorate between 1998 and 2010, in one representative field within management studies (HRM). Our findings also confirm the critical role of early-career input as well as gender in determining academic research performance in the French academia context.

Academic careers in France seem to be quite bounded (Dowd & Kaplan, 2005), compared with the Anglo-Saxon system of academic careers (Baruch & Hall, 2004). Promotions tend to follow scripts and conventions rather than mostly rely on publication achievements (Dany *et al.,* 2011). The results of our study may be applicable to other national systems that do not follow the USA model within the EU (Germany/Austria; Italy; Spain) and globally.

Our results point out the responsibility and role of management in facilitating global platforms for learning (i.e., exchange of faculty with prestigious institutions, continuous academic writing training, mentoring of young researchers, team building culture). This support is particularly relevant for women, such as the need to continue to work to create change in institutions and systems that produce and reproduce (gender) inequalities. Our results indicate that publishing more in English increases citations but does not increase overall research performance as measured globally (H-index) or nationally (CNRS). This problematizes the growing requirement for English to be used within an academia that is becoming global. The meaning of these findings for management education globally reflect certain conversion in the

way management scholars and educators create their reputation and future careers. Publications and their recognitions are critical for the career of scholars, and by implication, important for the understanding of the management education system. These results are relevant beyond French-speaking academic communities, as global competitiveness has become relevant to any scholars concerned about increasing their human capital, a critical factor for career progress.

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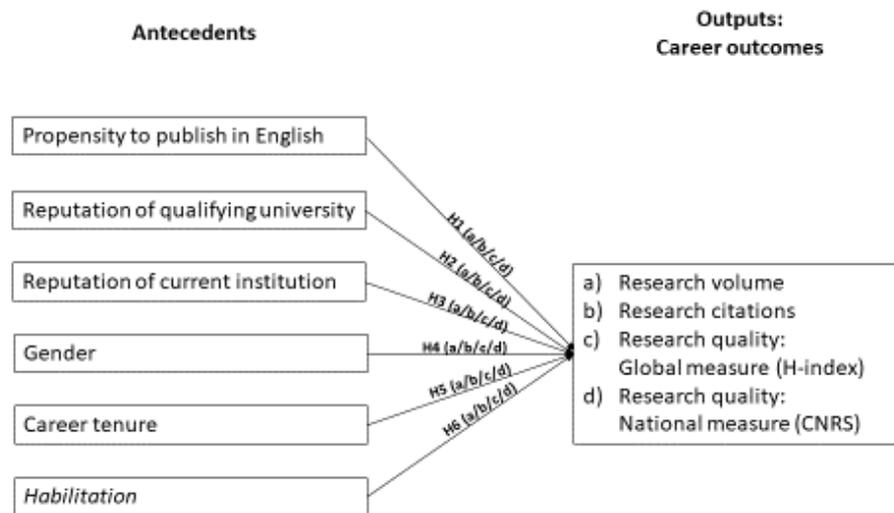
Figure 1. Research Model

Table 1. Comparing Business Schools with Universities in France

	Business Schools	University
Origins	Vocational schools, first established in the early 1900s to prepare future managers.	Academic institutions, some existing for generations, for teaching and research.
Role of research	Was almost inexistent some decades ago, and then became tangential. Now considered significant for acquiring global reputation and accreditations.	Critical, *'raison d' être'*. Only universities-run PhD programs with some rare exceptions among Business Schools.
Size	Can be about 100 members of staff, but only one School. In recent years, they have tended to merge with one another to reach critical mass.	Management Departments can be fairly small, as one School in a large institution with many Schools. Departments are becoming even smaller now that some Universities from the same city are merging with one another. For instance, three universities from Aix-Marseille merged together to reach critical mass.
Ownership/employer	By 'Chamber of Commerce' – an institution that belongs to the regional association of industry and private pension funds.	French government – public service.
Promotion/career	Was teaching related, now research is also essential. Each institution has its own criteria for career progression.	Research outputs. Automatic, linear, national-based and transparent career progression.
Salary and pension	Fairly high compared to the public sector, private.	Fair, with public service scales and public pensions.
Can confer degrees	Traditionally a Master's degree. Recently some offer consortium PhDs, others collaborate with adjacent universities.	Able to confer UG, PG, and PhD. In addition, they can also confer the highest level of *Habilitation* (HDR) - approval for PhD supervision.
Focus	Was regional, now aiming global.	National.
Accreditation	The goal for the first top tier is to get the triple accreditation (EQUIS, ACCSB, AMBA).	Some management departments are involved with EQUIS.

Table 2. Top Management departments (university) and Business Schools performers according to Google Scholar ranking, 2016

	Faculty	Documents	Citations	h°h
INSEAD	121	4420	76270	13
HEC	106	2031	13948	9
ESSEC	106	2003	10200	7
Edhec	74	913	10168	6
Paris 9	63	1026	4954	6
Toulouse BS	64	733	4510	5
EM Lyon	76	581	2184	5
ESCP-EAP	113	772	2143	5
Grenoble 2	76	689	1725	5
Toulouse 1	39	512	2700	4
Aix-Marseille 3	46	577	1851	4
Grenoble EM	81	626	1481	4
Aix-Marseille 2	24	294	946	4
Paris 1	63	622	1331	4
Rennes 1	53	406	901	4
Sophia-Antipolis	50	260	640	4

Adapted from Courtault et al., 2010

Table 3. Top ten researcher performers according to the h-index ranking, 2016

Current Institution	Year of PhD	Books	FT list	CNRS ****	CNRS ***	CNRS **	CNRS *	Total *	No of papers	Proportion in English	Citations	H-index
PR Bordeaux	2000	3	3	2	6	13	6	58	50	58%	731	15
PR Toulouse	2001	3	2	2	5	11	3	48	42	52%	462	12
PR Lorraine	2002	2	0	2	3	12	3	44	60	42%	549	10
PR Nanterre	2001	3	2	2	3	7	3	34	40	35%	342	10
PR Strasbourg	2001	3	1	0	3	17	10	53	46	24%	336	10
ESCP Europe	2001	0	2	2	2	2	4	22	29	38%	313	9
MCF Paris Est Créteil	1998	22	0	0	0	3	3	9	59	5%	270	9
ESCP Paris	2002	0	0	0	5	3	0	21	20	90%	707	9
Toulouse Business School	2000	1	0	0	0	4	0	8	39	26%	241	8

Table 4. Zero-order correlations

		1	2	3	4	5	6	7	8	9	10	11
1	Proportion in English	1										
2	Number of papers	.15*	1									
3	Citations	.33**	.61**	1								
4	H-index	.27**	.78**	.84**	1							
5	Total CNRS stars	.24**	.68**	.78**	.79**	1						
6	H-Index of the PhD granting institution	.18**	0.07	.16**	0.11	0.06	1					
7	H-Index of the current employing institution	.25**	.20**	.18**	.20**	.14*	.25**	1				
8	Proportion of men	0.07	.17**	.12*	.15**	.13*	0.02	-0.05	1			
9	Years of experience since PhD	-0.05	.35**	.29**	.43**	.27**	-0.03	.13*	0.07	1		
10	Proportion with *Habilitation*	-0.01	.31**	.13*	.21**	.14*	0.03	0.06	0.06	.30**	1	
11	Proportion working in a university	-.24**	.13*	0.03	0.11	0.10	-.15*	0.05	-0.02	.31**	0.04	1

** significant at the 1% level
* significant at the 5% level

Table 5. Descriptive statistics

	Mean	SD	n
Proportion in English	.14	.21	301
Number of papers	14.01	12.23	301
Citations	39.04	87.52	300
H-index	2.45	2.14	301
Total CNRS stars	4.52	7.50	301
H-Index of the PhD granting institution	4.02	1.43	292
H-Index of the current employing institution	3.07	1.30	244
Proportion of men	.49	.50	303
Years of experience since PhD	8.58	3.57	303
Proportion with *Habilitation*	.08	.27	303
Proportion working in a university	.64	.48	303

Table 6. Two-stage least squares (2SLS) estimation models

Response	No of Papers				Citations				H-index				CNRS Total Stars			
	Coeff.	SE	Sig.		Coeff.	SE	Sig.		Coeff.	SE	Sig.		Coeff.	SE	Sig.	
Intercept	1.200	0.367	<0.01	**	-1.353	0.664	0.04	*	-1.341	0.434	<0.01	**	-1.425	0.688	0.04	*
Proportion in English	0.229	0.733	0.75		2.458	1.308	0.06	†	0.601	0.747	0.42		0.416	1.331	0.75	
H in PhD institution	0.001	0.038	0.98		0.076	0.067	0.26		0.041	0.036	0.26		0.031	0.068	0.65	
H in current institution	0.117	0.045	0.01	**	0.135	0.081	0.09	†	0.070	0.048	0.14		0.138	0.083	0.10	†
Sex	0.199	0.099	0.04	*	0.399	0.176	0.02	*	0.190	0.099	0.05	*	0.348	0.178	0.05	*
Years since PhD	0.152	0.078	0.05	*	0.600	0.141	<0.01	**	0.289	0.088	<0.01	**	0.400	0.144	0.01	**
Years since PhD ^2	-0.005	0.004	0.26		-0.021	0.008	0.01	**	-0.010	0.005	0.03	*	-0.016	0.008	0.04	*
Habilitation (HDR)	0.445	0.162	0.01	**	0.305	0.296	0.30		0.145	0.144	0.32		0.215	0.293	0.46	
n	236				235				236				236			
AIC	1686				2052				884				1231			

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$

Table 7. Summary of hypotheses

Hypotheses	a: number of papers	b: number of citations	c: H-index	d: CNRS stars
1: propensity (in %) to publish in English positively related to…	Not supported	Marginally supported	Not supported	Not supported
2: reputation of the PhD granting institution positively related to …	Not supported	Not supported	Not supported	Not supported
3: reputation of the current institution positively related to …	Supported	Marginally supported	Not supported	Marginally supported
4: being a man positively related to …	Supported	Supported	Supported	Supported
5: career tenure positively related to…	Supported	Supported	Supported	Supported
6: *Habilitation* positively related to …	Supported	Not supported	Not supported	Not supported