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Finding a good job: Academic network centrality and early occupational outcomes in management academia

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Summary

The impact of universalistic versus particularistic criteria on academic hiring has been receiving growing attention in recent years. Yet, most studies conducted on hiring norms in academy and management academy have ignored the impact of social capital, particularly structural social capital, a particularistic attribute, on occupational outcomes. This could lead to a partial if not misleading view of the sociology of hiring in management academy. We utilize a novel approach, focusing on academic departments' structural social capital in the form of network centrality (based on cumulative PhD exchange networks), and explore how this type of centrality impacts job seekers' occupational prestige for new academic jobs in management departments and early career quality publications. We find that although merit-based criteria such as publications matter somewhat, academic network centrality explains significant variance in obtaining prestigious jobs. Paradoxically, we find that academic network centrality does not explain early career publications. We discuss the implications of our findings for management science. Copyright © 2011 John Wiley & Sons, Ltd.

Keywords: universalism; particularism; hiring; network centrality

Introduction

What do academic institutions look for when hiring new faculty? Although one can argue that job seekers' merit such as their publications and nonpersonal factors such as the prestige of their graduate programs matter, the relative impact of these criteria is unclear and continues to be the focus of academic labor market research (Burris, 2004; Turner, 1960). More recently, management scholars have also begun to explore the normative dynamics of academic hiring, as a part of larger interest in the sociology of hiring (Glick, Miller, & Cardinal, 2008a, 2008b). A central issue for this research revolves around the impact of universalistic hiring norms versus particularistic hiring norms on access to academic careers (Long & Fox, 1995). For example, Cable and Murray (1999) note that universalistic or merit-based criteria such as publications are key to obtaining a prestigious academic job. On the other hand, other academic labor market scholars (Bedeian, Cavazos, Hunt, & Jauch, 2010; Miller, Glick, & Cardinal, 2005) observe that job candidates are often pre-selected by members of professional elites primarily on the basis of non-merit criteria, such as departmental prestige (D'Aveni, 1996). Indeed, scholarship has consistently indicated that the academic prestige of one's PhD department (a particularistic variable) in management academia matters for obtaining initial prestigious jobs (Judge, Kammeyer-Mueller, & Bretz, 2004). Given that management science represents a developing, but not yet mature, paradigm (Glick

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et al., 2008a; Pfeffer, 1993), relying on a particularistic criterion is not surprising.¹ Graduating from a prestigious PhD program should provide students with better human capital, that is, an individual's skills, reputation, experience knowledge (Coleman, 1988; Haynes & Hillman, 2010), and social capital—that is, actual and potential resources that are available to an individual because of a network of relationships he or she possess or by an affiliation he or she has (Nahapiet & Ghoshal, 1998), which should improve one's future scholarship, especially in the early years (Bedeian et al., 2010; Miller et al., 2005).

However, we argue that this consistent reliance on the prestige of one's PhD department as a selection criterion can only provide a partial picture of hiring norms in management; therefore, studies need to focus on other factors that actually impact such hiring procedures. Here, we posit that an important factor in the hiring process is the academic network centrality (ANC) of the PhD-granting department. ANC can be defined as the network location of departments based on their reciprocal PhD hiring and placing history. We argue that this type of network centrality provides us with a new and distinct measure of identifying structural social capital and its possible instrumental benefits (such as unique access to information) that should impact occupational outcomes, such as obtaining a prestigious job, because it captures a fundamental and underlying process of creating status distinctions in different arenas (Bourdieu, 1986).

Academic prestige of a department is the collective scholarly accomplishments of the faculty and the graduate students (Burris, 2004). Yet, the way studies have focused on academic prestige is questionable because of several reasons. First, PhD academic prestige may not be predictive of one's future scholarship such as high-quality post-graduation publications. Long, Bowers, Barnett, and White (1998) found that in management, the prestige of one's PhD-granting department did not predict the number of high-quality post-graduation publications. Second, different viewpoints regarding prestige exist (D'Aveni, 1996), reflecting the subjective interpretation of different constituencies (Bedeian, 2002). Thus, prestige maybe more "noisy" than scholarship assumes; it may not be sufficient to understand the normative dynamics impacting occupational outcomes. In fact, by focusing on ANC, we can examine how social structure and positioning of academic departments in management may provide additional explanations for both occupational outcomes and performance outcomes in management, for new job seekers. Specifically, Burris (2004) has argued that the prestige of an academic department is one that is produced and sustained over time through the cumulative placing and hiring of PhD students. He shows that in the field of sociology, about 84 per cent of the concurrent variance of departmental academic prestige can be attributed to such exchanges as they convey relational wealth to their members. Given the impact of network centrality on academic prestige in other disciplines, these exchanges may be more important than scholarship acknowledges also in predicting the academic placement prestige of new graduates. Hence, in this study, we explore how the ANC of PhD-granting departments in management impacts entry into prestigious initial academic jobs, above and beyond traditional measures of prestige. Ignoring the impact of network centrality as a social resource not only will provide a highly partial depiction of labor norms and occupational outcomes (i.e., Podolny & Baron, 1997) but will also ignore how the dynamics of structural social capital specifically ANC (based on regulated personnel exchanges) impact career outcomes. Although our paper explores the influence of ANC on occupational prestige similar to that of Burris (2004), our work is unique in several ways. First, Burris was concerned about predicting the general impact of the ANC of a department on its own prestige, whereas we aim to establish the association between the ANC of a department and new academic job prestige. Second, we go beyond Burris (2004) to explore how ANC may impact early career scholarship in the form of high-quality publications. The latter issue is important, because we know centrality strongly impacts prestige hierarchies in other academic fields. However, it is unclear if such an effect is based on the ability of job seekers from centrally located academic units to instrumentally use their position to achieve better scholarship (in the form of future publications). In other words, we wish to find out if the supposed impact of network centrality on occupational outcomes is justified from a scholarship viewpoint. Third, we study the relationship between ANC and prestige in the context of management departments in the U.S.—a dynamic

¹As reviewed by Long and Fox (1995), studies show that in scientific fields characterized by weaker paradigms, performance-based criteria such as publications explain less variance in career outcomes compared with particularistic variables (see also Hargens & Hagstrom, 1982; Zuckerman, 1988). Weak paradigm development is further characterized by higher levels of uncertainty regarding what constitutes scientific contributions and which theoretical contributions are meaningful (Glick et al., 2008a). As such, reliance on publications compared with other attributes may be less likely.

that has not been explored before.² We investigate these questions by analyzing the ANC of over 100 PhD-granting departments in management academia and by exploring its impact on the career placement and future scholarship of 602 new PhD graduates, who received their degrees from these departments between 2005 and 2007.

Academic Career Mobility: Empirical Findings

What are the factors that impact job seekers' chances of obtaining an academic job? Academic labor market scholarship recognizes the impact of two distinct hiring criteria categories: universalistic and particularistic. Universalism refers to merit-based contributions to science as the main criterion for career mobility, regardless of a person's affiliation or individual characteristics (Cole & Cole, 1973); whereas particularism, or sponsored-based labor mobility (Turner, 1960), focuses on personal considerations unrelated to scientific contributions that nonetheless impact placement (Long, Allison, & McGinnis, 1979). Such considerations can reflect personal, social, or otherwise ascriptive attributes of individuals such as prestige (Long & Fox, 1995). In addressing the question which norm is more prominent in academia (and particularly in management academia), we reviewed the academic literature spanning the last 42 years (1969–2011) to examine studies carried out on occupational placement and its prestige, of which we found 25. Overall, these studies indicate that particularistic variables consistently matter for occupational outcomes. First, the prestige of job seekers' doctoral-granting departments or institutions is a major predictor of getting a job and the prestige of that job (20 of 25 studies report a significant effect for this variable; e.g., Allison & Long, 1987; Barbezat, 1992; Bedeian et al., 2010). Second, PhD dissertation chairperson eminence matters across different disciplinary areas of science, such as management, economics, and chemistry (e.g., Judge et al., 2004). Third, of the 19 studies that included publications as an independent variable, only nine found a significant effect for this variable on occupational outcomes (e.g., Allison & Scott, 1987), whereas five found mixed results (e.g., Miller et al., 2005), and five found no effect of publications on their career-related dependent variables (e.g., Hurlbert & Rosenfeld, 1992). Fourth, whereas some studies discussed social capital, only one study of the 25 explicitly explored the impact of ANC on career outcomes such as being able to enter better jobs and having access to resources not available to others (Burris, 2004). In summary, it appears that particularistic variables loom larger in academic labor markets compared with universalistic ones. The six studies that exclusively focused on management graduates indicated that prestige matters for PhD graduates in most cases (Bedeian et al.; D'Aveni, 1996; Miller et al.), but not all (cf. Cable & Murray, 1999). Hence, although Burris' (2004) work shows us the importance of ANC as a variable when it comes to understanding academic prestige, no study (to our knowledge) has explicitly examined how network centrality with its social capital-related implications impacts occupational outcomes.

Network Centrality: Social Capital Implications

Although definitions vary, traditional sociology scholarship views social capital as a structural function of social networks and positions within them, which translate into relational resources and possible instrumental outcomes (Adler & Kwon, 2002; Burt, 1992; Nahapiet & Ghoshal, 1998). One important structural aspect is network centrality, which refers to the structural position or location of individuals, groups, departments, or organizations, within a larger institutional network of ties connecting them to each other (Ibarra & Andrews, 1993). Theoretically, centrally located units, actors, or actors

²Burris (2004) examined the relationship between prestige and ANC in sociology, whereas our focus is on management. Although there can be some overlap between the two disciplines, they are distinct in their core theoretical assumptions, in their administrative setting within universities, and in their paradigmatic development, as management science draws on a variety of theoretical sources distinct from sociology and is also a newer discipline.

embedded in these units have access to resources others lack (Hardy et al., 2003), such resources that represent social or relational wealth (Brass, 1992; Burt, 2001).

Specifically, social network scholarship has utilized resource dependence theory (RDT) to explain some of the instrumental outcomes associated with network centrality (Pfeffer & Salancik, 1978). RDT argues that by virtue of their structural position among other units, and specifically based on the existence of stable social ties among the units, centrally located organizations benefit from access to valued resources and information. These, in turn, increase not only the focal unit's chances of obtaining information faster but also the likelihood of controlling the flow of information to other units it is connected to (Powell, Koput, & Smith-Doerr, 1996). Such positions also result in higher institutional or unit visibility (Pfeffer & Salancik, 1978). Moreover, RDT argues that being centrally located may leverage dependencies on other units in the network, given the flow of resources to the centrally located organization (Brass, Galaskiewicz, Greve, & Tsai, 2004). Empirically, studies have supported the leverage and power implications of network centrality for social units or individuals therein; studies have shown how access to information, knowledge, and control over such resources are impacted by a unit's structural position in a network (Brass & Burkhardt, 1993; Brass et al., 2004). Others have shown, in a variety of contexts that network centrality not only increases access to different resources but may also increase legitimacy, or perceived social status (i.e., Baldwin, Bedell, & Johnson, 1997; Mehra, Kilduff, & Brass, 2001; Settoon & Mossholder, 2002; Reagans & Zuckerman, 2001).

The notion that network centrality translates into higher social status is based on Bourdieu's (1986) work, arguing that a social unit's position within its field impacts the resources and power the unit has. Specifically, Bourdieu argues that these networks and the exchanges that are conducted therein become the marker of an individual or organization's social capital, which is akin to being a member of an exclusive group or social unit. He also explains that it is these exchanges between members of groups that create and sustain the network and re-produce their social capital over time. The social ties created via such reciprocal exchanges are often stable and produce a highly regulated or circumscribed social boundary, whose exclusivity signals higher social status to its members and to outsiders (Bourdieu, 1986) as well as increase members' visibility. Hence, he highlights two related benefits associated with the position of units in their network—regulated exchanges that signal uniqueness and exclusivity and the existence of enduring social ties—serving as conduits of resource transfer, such as information and communication. In this way, social capital of units becomes a key strategic resource. Burris (2004) extends this argument to show how this social capital within academic departments is produced out of the continuous processes of mutual hiring and placement of PhD students. These exchanges, in turn, produce and sustain close-knit ties between departments, creating an exclusive group that becomes part of the foundation for the academic prestige of these departments. In fact, he finds that PhD exchange network centrality is strongly predictive of traditional measures of academic prestige, a dynamic that supports the view that ANC provides a behavioral and objective basis for prestige. Hence, Bourdieu's thesis regarding regulated social exchanges serves as the foundation for understanding ANC and consequently its instrumental outcomes. Combining the findings of the network studies and RDT, we argue that the ANC of a department becomes a key resource that helps in hiring and placing PhD students in high-prestige departments. We build on this notion and focus on the informational advantages and visibility associated with this type of social capital.

Network Centrality: Academic Career Outcomes

Network centrality and its associated social capital impact individual job seekers through the membership benefits bestowed by an exchange-regulated social system—providing benefits to its members—including information, access to resources, and visibility (Ibarra, 1993). On the basis of the dependency dynamics posited by RDT, centrally located departments control or accrue valuable resources because of their relative structural position and associated reciprocal ties that allow them to stand out in their institutional network (Swaminathan & Moorman, 2009). For instance, studies have shown centrally located social units, such as departments within organizations or organizations within their field, receive more information and can control information flow to other connected units, by virtue of their central location

and their legitimacy (Hardy, Phillips, & Lawrence, 2003; Inkpen & Tsang, 2005). In the context of hiring, being at a nexus of information flows and having faster access to premium information can improve job seekers' occupational outcomes, an effect consistently documented for the general labor market (Brown, 1967; Burt, 1992; Hezlett & Gibson, 2007). Following these studies, we believe that in the context of academic labor markets, graduates from centrally located departments should also have an information premium above other job seekers, given the established reciprocal ties associated with PhD exchanges and the communication flow transmitted via such ties.

Moreover, from the perspective of hiring institutions, ANC may represent a powerful decision-making heuristic that can reduce labor market search costs, particularly in management academia. This can prove valuable because, when decisions are made under conditions of uncertainty or limited information, individuals are more likely to rely on simplified decision rules or heuristics that provide cognitive shortcuts (Kahneman, Slovic, & Tversky, 1982; Tversky & Kahneman, 1973). Of several heuristics suggested by scholars, we argue that reliance on network centrality reflects the heuristic of availability used to estimate the saliency or memorability with which associations or instances come to mind (Tversky & Kahneman, 1973). For example, when people make judgments about the success or failure of a particular business strategy, business leaders often rely on their knowledge about the probability of success from their experiences. This heuristic reflects the ease with which people predict the frequency of events or the proportion of a category within a population (Tversky & Kahneman, 1974). The ease of recall of more vivid or visible associations is representative of this heuristic (Kahneman & Tversky, 1984; Tversky & Kahneman, 1973). The impact of this heuristic on decision makers in a variety of settings has been widely supported (Hayibor & Wasieleski, 2009; McKelvie, 1997; O'Guinn & Shrum, 1997).

Although decision makers assessing job seekers' credentials are not faced with a typical probabilistic assessment of event frequency probability, they still need to assess an unknown quantity—the scholarship and skills of potential new faculty, and that involves significant uncertainty (Judge et al., 2007). This is more significant in disciplines such as management, (Pfeffer, 1993; Van Maanen, 1995) which has a weaker paradigm (Glick et al., 2008a, 2008b). As noted before, network centrality of social units induces a certain level of visibility and legitimacy (Deephouse & Suchman, 2008). Further, ANC also reflects the uniqueness or the exclusivity of a department or a unit (i.e., Bourdieu, 1986), thereby increasing its visibility. Such a dynamic is more likely to set PhDs of high ANC departments apart from other job seekers, as implied by the heuristic of availability that views visibility or salience as increasing the ease of recall of an event or an item and that increases the decision makers' perceived familiarity with the object under scrutiny (Kahneman & Tversky, 1974). Thus, given that centrally located departments are more visible in their field (as implied by RDT), by association, graduates of these departments are likely to be perceived as more salient or more memorable in the minds of decision makers. Hence, graduates are likely to be given more attention compared with other job seekers, which can help them crowd out other job seekers.³ Similar trends can be seen in the hiring patterns in S&P 500 firms (Williamson & Cable, 2003a), where the board tends to rely on their established network ties when hiring for top management positions. In this way, we believe that under conditions of uncertainty, network centrality can act as a signaling mechanism that reduces uncertainty associated with differentiating between many job seekers with potential but no history to rely on—a situation common for prestigious jobs at academic institutions. Finally, departments that have high prestige may also want to maintain or enhance their positions. If departments recognize how reciprocal hiring between high-prestige departments helps develop stronger ties with other prestigious departments—subsequently helping maintain their prestige (Burris, 2004)—they are more likely to look into their networks to hire.

Thus, we propose,

Hypothesis 1: PhDs graduating from more centrally located departments are positively associated with obtaining an academic job with higher departmental prestige.

³Given decision makers' limited time and oftentimes many job seekers competing for few or a single position receiving more attention can prove beneficial.

Network Centrality: Academic Scholarship Outcomes

Although it is important to explore the impact of network centrality on the ability to get prestigious jobs, the question remains as to whether ANC also translates into better academic outcomes—such as scholarship. In the context of academic life, the relevant literature views high-quality publications as a central measure of successful academic outcomes (Bedeian et al., 2010). Indeed, the positive relationship between network centrality and academic prestige, measured by the National Research Council's prestige rankings (Burris, 2004), raises the possibility that the relational dynamics associated with network centrality also impact one's scholarship because the National Research Council's rankings include (although not solely focus on) high-quality publications. Thus, there is indirect evidence to support such a notion.

A major dynamic that may explain why ANC should impact publications has to do with the nature of high-quality journals themselves. Specifically, publishing in top or high-quality journals involves, among other issues, having original, innovative, or creative ideas that often come from being exposed to new or unique ideas (Judge et al., 2007), as noted by social network scholarship, given their ties centrally located units are in the middle of information exchanges from connected units. Such access to information can lead to the creation or combination of new ideas, in particular for units with more stable or reciprocal ties to others, giving a strong exposure to a diversity of ideas for a sustained period (Oh, Chung, & Labianca, 2004; Tsai & Ghoshal, 1998). Such exchanges allow members of a unit to tap into network resources, without necessarily having participated in their creation, and also expose them to new ideas (Kostova & Roth, 2003). In fact, studies (Walter, Lechner, & Kellermanns, 2007) show that when organizations or units have reciprocal ties, these ties give rise to more opportunities for information exchanges (Marsden & Friedkin, 1993) and over time foster and facilitate the development of norms related to such information exchanges, such as joint problem-solving, fine-grained information transfer, and other benefits (Uzzi, 1997).

Consequently, centrally located units and their members can benefit instrumentally by using this new information or ideas in achieving their goals to improve their outcomes (Gupta & Govindarajan, 2000; Hansen, 2002). For example, several studies have shown that network centrality positively facilitates the creation of new ideas and positively impacts innovation (Burton, Sørensen, & Beckman, 2002; Hansen, 2002; Ibarra, 1993). Extending this logic to management academia, we argue that by virtue of membership in a centrally located unit with a relatively stable pattern of personnel exchange and their impact on information exchanges, as conduits for communication (Burris, 2004), PhD students by association are also at the center of more communication and information exchanges between their department and those connected to it. They are, for instance, more likely to be exposed to more working papers through visiting lectures or conferences organized in the field (Burris, 2004) that can give them insights into cutting-edge ideas before they come into print. Such exposure, in turn, can foster the creation of new or original ideas (i.e., Burton et al., 2002; Mehra et al., 2006; Tsai, 2001) that is likely to matter for high-quality publications (i.e., Judge et al., 2007). This dynamic is distinct from prestige, which may enhance one's perceived quality but is not based on such social dynamics (Cable & Murray, 1999). This would particularly make a difference in early career publications because the ideas generated during the graduate program often lead to the first set of publications (Miller et al., 2005). Hence, we suggest,

Hypothesis 2: PhDs graduating from more centrally located departments are positively associated with early career quality publications.

Method

Data and sample

Our sample includes 602 new doctoral graduates in business administration or management, all of whom graduated between 2005 and 2007 and were hired for their first academic positions in 2006, 2007, and 2008. The construction

of this sample involved several steps over a period of several months. First, we closely followed the procedures used by Miller et al. (2005) and scanned the UMI dissertation abstract service for dissertations published between May 2004 and September 2007 to collect data on PhD graduates in management science only. UMI was also used to assess information regarding the graduates' dissertation chairperson (Miller et al., 2005). Second, following Miller et al., we used the Academy of Management (AOM) online membership archive and Google to determine if these graduates were employed, the details on their new position, and their CVs (if posted online). Combining our sources of data, we attained a final sample of 602 employed PhD graduates in management science who graduated from 102 PhD-granting institutions in the U.S.

Dependent Variables

New job prestige

The measurement of academic prestige varies by different stakeholders; the academic community assesses prestige at both the department level (Cable & Murray, 1999) and the university level (Clark, Warren & Au, 2007). Given this complexity, we decided to include four related, yet distinct, measures of academic prestige. These reflect academic prestige at the department level, the business school level, and the university level to capture different aspects of prestige. The first measure reflects department level academic prestige and was based on the methodology of Long et al. (1998), who conducted factor and cluster analyses on several published ranking systems of management departments. This system ranked 105 different management departments into three broad categories: high, middle, and low status. We followed the same approach and conducted a cluster analysis on the relative rankings of management departments on the basis of the following sources: (i) the final list generated by Long et al. (1998, p. 707); (ii) *Business Week's* ranking of graduate programs at U.S. business schools as of 2004; (iii) *U.S. News & World Report's* ranking of U.S. graduate business schools as of 2004; and (iv) *The Financial Times's* ranking of U.S. graduate business schools as of 2004. Whereas Long et al. (1998) had three categories of status differentiation, we decided to include four (high, middle, low, and very low status) to increase status variance.

The second was the departmental rankings of management departments as compiled by Gourman (1997). This measure has been used consistently in studies examining job offer prestige for management PhDs (Cable & Murray, 1999; Miller et al., 2005; also Judge et al., 2004) and is considered a robust measure of the quality of management departments (Judge et al., 2004). Although it has been criticized (Bedeian, 2002), it has also been independently validated (Cable & Murray, 1999). Of all management departments, the report identifies 25 management departments as the top departments in the field. As our sample includes 102 different doctoral-granting departments, we dichotomized this measure.

The third measure of new academic job prestige reflects the resources available to new faculty members, which was assessed on the basis of the budget per faculty in business schools. The Association to Advance Collegiate Schools of Business (AACSB) provides us with a proxy for such resources, as each member school lists their budget per faculty at their business school. This budget is the average school allocation for faculty members, which is highly variable across schools. This measure applies only to business schools that are AACSB accredited. A large majority of our sample (71 per cent) was AACSB accredited; the rest (29 per cent) were not accredited.

The fourth measure utilized to assess job prestige was the university-wide Carnegie Classification of Institutional Characteristics. The Carnegie Classification system provides in-depth descriptions of higher education institutions in the U.S. on the basis of differentiating between the focus and the research activity of these institutions. This classification, amended in 2005, includes several categories—ranging from institutions that offer only associates' degrees and do not have research activity, to institutions that provide a bachelors' degree, to master's degree and doctoral-granting institutions. Several studies have used this approach (Barbezat & Hughes, 2001; Hahn et al., 2007), and it is considered a powerful classification system with regard to the research orientation of higher education institutions. We coded this scheme on the basis of the level of education provided by the focal university: associate's degree-granting institutions were the first

level, followed by bachelor's degree-granting institutions, master's degree-granting institutions, and doctoral degree-granting institutions (which also include three levels: research, high research, and very high research).

Early career high-quality publications

We measured early career high-quality publications on the basis of Thomson Reuters ISI impact factors for business and management journals, based on graduates' publications between their hiring dates and May 2011. For most graduates, this reflects a period of between 3.5 and 4 years after obtaining a new job. We chose this window given that if a faculty member is awarded tenure, it is typically within six to seven years of obtaining new employment; our measurement also reflects the definition of early career utilized by other research on career outcomes (i.e., Bedeian et al., 2010). Journal impact factors are an important indication of the scientific importance and relevance of journals (Ireland, 2009). Other studies have relied on this measure to assess quality of publications (Gomez-Mejia & Balkin, 1992; Long et al., 1998). To ensure that we capture more influential journals, we included only those publications that have an impact factor at or above the median for business and management journals.

Independent Variables

PhD-granting departments' network centrality

Our approach to the measurement of ANC closely follows Burris' (2004) methodology. Burris does so by looking at the cumulative exchange networks of PhD hires from one department to the other (and vice versa) for the universe of doctoral-granting departments in a specific discipline. Methodologically, the network centrality of department i (SC $_i$) is given by the following formula:

$$SC_i = a_1c_1 + a_2c_2 + a_3c_3 + a_4c_4 + \dots + a_n c_n = \sum a_{ij}c_j$$

where a_{ij} represents the ties department i has with department j , c_j is the social capital possessed by department j , and a_{ii} is set to zero (because ties to oneself do not capture social capital; Burris, 2004, p. 251). Thus, we are presented with a set of n simultaneous equations for each of the doctoral-granting departments in our sample of job seekers. Given the number of possible reciprocal ties between one department and another, we potentially face a problem of infinite convergence. Yet, Burris notes that a well-designed solution exists to this problem, as given by the Bonacich's (1987) eigenvalue centrality measure. The eigenvalue centrality measure captures the adjacency matrix A_{ij} , representing ties among all departments i and j . Here, the centrality of department i , c_i is notated by $\alpha \sum A_{ij}c_j$, in which α is the reciprocal of the largest eigenvalue and c_1 to c_n represent the centralities of the corresponding eigenvector (Burris, 2004, pp. 251–252). We used this approach on our sample of PhD-granting departments in management. On the basis of our sample, we first identified all PhD-granting departments, 102 in total. We then calculated the Bonacich eigenvalue centrality measure for the cumulative PhD exchange networks among all the departments representing all cumulative faculty hires in management or management-related fields as of and up to 2004, 2005, and 2006. With each department included, this resulted in a matrix of approximately 1000 individual faculty members. We utilized UCINET 6 (Analytic Technologies, Lexington, KY 40513, USA) to analyze our matrix and to obtain the Bonacich centrality measure for each management department.

Control Variables

Annual effects

Given the different graduation years in our sample, we included a year dummy to account for possible annual effects.

Job seekers' gender

Following Judge et al. (2004), we included job seekers' gender. This was measured via self-reported information and gathered from either job seekers' faculty websites or CVs.

Universalistic Criteria Controls

Job seekers' academic credentials

On the basis of previous research, we looked at the number of high-quality publications published five years prior to obtaining the new job (Bedeian et al., 2010), based on the journal impact factor in the Thomson ISI citation service (above the median impact factor score for management and business administration journals).

PhD teaching-related experience

Given the possible impact of teaching experience on getting a new job (Stock & Alston, 2000), we added a dichotomous measure for teaching experience. For each doctoral graduate, we examined information available on their websites or verified if their PhD program requires doctoral students to engage in teaching responsibilities.

Conference presentations

We scanned the AOM conference programs and similar publications for the AOM's annual conference five years prior to the graduation date of each doctoral graduate to determine the number of AOM-related conference presentations.

Particularistic Criteria Controls

Job seekers' academic prestige

We used two complementary measures to assess the prestige of one's PhD-granting department. First, we applied the aforementioned cluster analysis conducted on business schools and management departments and used the relevant rankings applied to graduates' PhD programs (based on four categories ranging from high status to very low status). Further, to ensure that our measure of prestige was not duplicated, we regressed the Bonacich centrality measure (discussed earlier) on this measure and used the residuals in our analyses. Second, we also used the Carnegie

Classification distinctions among the three types of doctoral-granting institutions. Third, we counted the number of graduates' publications with their dissertation chair.

Dissertation chairperson's academic credentials

We determined this by utilizing three measures. First, we looked at the number of high-quality publications ranked at, or above, the median impact factor of the Thomson ISI impact factor scale for management and business administration journals. Second, we included a measure of academic visibility (a proxy for reputation). To do so, we counted the number of times the dissertation chair's articles were cited using both ProQuest/Abinform and Google scholar for articles published up till the graduation date of the job seeker. Third, we looked at the business journal media visibility of the dissertation chairperson by analyzing references to or his or her or citations in general media outlets and magazines such as *Fortune*, *Financial Times*, *Wall Street Journal*, or *Business Week*.

Analyses

We utilized ordinary least squares regressions for the measures of departmental prestige on the basis of the Long et al. (1998) approach, the Carnegie Classification, budget per faculty, and number of high-quality publications. We used logistic regression for the second measure of departmental prestige (based on the Gourman report) as it is a dichotomous variable.

In all our regressions, we used a two-step procedure. Step 1 included our demographic controls, universalistic controls, and particularistic controls. Step 2 included network centrality (the Bonacich eigenvector centrality measure).

Results

Table 1 provides the means, standard deviations, and correlations among the variables. With regard to some of the variable, we see that 60 per cent of job seekers are men, that approximately 74 per cent of doctoral graduates have some teaching experience, and that (on average) each of them has had 1.31 AOM (national and regional) conference presentations. Table 2 provides our regression analyses.

Hypothesis 1 posited a positive association between the department's ANC for a PhD graduate and his or her obtaining an academic job with higher departmental prestige. This hypothesis was supported for the first measure of departmental prestige ($\beta = .47$, $p < .0001$, Model 1, Step 2), for the second measure of departmental prestige ($\beta = 6.39$, $p < .0001$, Model 2, Step 2), for the AACSB measure of budget per faculty ($\beta = .36$, $p < .0001$, Model 3, Step 2) and for the Carnegie Classification measure of institutional prestige ($\beta = .23$, $p < .0001$, Model 4, Step 2). Overall, Hypothesis 1 was supported. (The incremental R^2 ranged between 3 and 14 per cent.)

Hypothesis 2 posited that PhDs graduating from more centrally located departments will be positively associated with early career quality publications. This hypothesis was not supported ($\beta = .05$, $p < .10$, Model 5, Step 2). The incremental R^2 was 0 per cent.

With regard to our control variables, the number of high-quality publications at graduation was consistently associated with our different dependent variables, whereas the measure of departmental prestige of graduates' PhD departments was partially associated with our different dependent variables.

Table 1. Means, standard deviations, and correlation.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. New job departmental prestige (Gourman Report top schools)	0.09	0.29	—														
2. New job institutional prestige (Carnegie Classification)	3.72	1.97	.08	—													
3. New job departmental prestige (Long et al.)	3.22	0.934	.44	.60	—												
4. Budget per faculty	307127	209548	.62	.41	.67	—											
5. Early career high quality publications	0.42	0.89	.11	.20	.18	.08	—										
6. Gender	0.60	0.36	.03	.01	.01	.03	.06	—									
7. PhD program prestige (Gourman Report residual)	0.33	2.09	.34	.14	.33	.34	.10	-.03	—								
8. PhD graduates' overall academic prestige (Carnegie Classification)	3.44	0.78	.20	.25	.29	.20	.13	.01	.58	—							
9. Number of high-quality publications at graduation	0.41	0.99	.12	.18	.20	.14	.47	-.09	.12	.15	—						
10. Conference presentations	1.31	3.08	-.03	.08	-.03	-.13	.07	-.03	-.01	.10	.07	—					
11. PhD teaching experience	0.74	0.36	-.09	.02	.11	-.19	.11	-.03	-.04	.22	.09	.10	—				
12. Number of publications with dissertation chair	0.20	0.61	.01	.03	.12	.02	.29	-.11	-.01	.03	.45	-.10	.08	—			
13. Dissertation chairperson high-quality publications	5.10	0.95	.03	.11	.15	.12	.14	.00	.23	.20	.25	-.01	.08	.24	—		
14. Dissertation chairperson academic visibility	266	444	.12	.15	.17	.11	.13	.02	.20	.21	.16	.04	.03	.04	.29	—	
15. Dissertation chairperson media visibility	0.55	3.17	.01	.01	.08	.04	.04	-.06	.04	.10	.02	.23	.03	.04	.16	.12	—
16. PhD departments' network centrality	2.18	2.25	.45	.13	.29	.33	.17	-.05	.73	.32	-.02	-.12	-.22	-.01	.12	.06	-.03

All correlations greater than .12 are significant at the $p \leq 0.05$ level or above.

Table 2. Logit, ordinal, and ordinary least squares regression results.

Independent variables	Dependent variables				
	Model 1: new departmental prestige (Long et al.)	Model 2: new departmental prestige (Gourman Report)	Model 3: business school prestige (AACSB budget per faculty)	Model 4: new initial job institutional prestige (Carnegie Classification)	Model 5: early career high-quality publications
Step 1: control model					
Year (dummies)					
Gender	-.03	.36	.01	.00	-.10
PhD program prestige (Gourman Report residual)	.13*	.21*	.10	.14**	.29
PhD graduates' overall academic prestige (Carnegie Classification)	.12*	1.2*	.58	.25**	.51
Number of high-quality publications (at graduation)	.14*	.33*	.17***	.15***	.39***
Conference presentations	.03 [†]	-.02	-.12*	.04	.04
PhD teaching experience	.16	-.51	-.12*	.14*	.05
Publications with dissertation chairperson	.09	.18	.01	.05	.12*
Dissertation chairperson	.01	-.04	.03	-.05	-.53
high-quality publications					
Dissertation chairperson	.02 [†]	-.02	.06	.04	.30
media visibility					
Dissertation chairperson	.03*	.01	.00	.01	.98
academic visibility					
Pseudo R ² /Δ Adj R ^{2a}	.16	.29	.19	.26	.21
Step 2					
PhD departments' network centrality	.47****	6.39****	.36****	.23****	.05
Δ pseudo/Adj R ² /(full model R ²)	.14(.30)	.06(.35)	.06(.25)	.03(.29)	.0(.21)
-2 log likelihood/F ratio	20.368****	232.159****	10.371****	17.334****	13.334****

Note: Models 1, 3, 4, and 5 utilized ordinary least squares regression; Model 2 utilized a logistic regression for which a pseudo R² was calculated. AACSB, Association to Advance Collegiate Schools of Business.
^aFor the first step overall adjusted model R² or pseudo R² reported; in Steps 2 and 3, the delta R² is outside the parentheses, and the full model R² is inside them.
[†]p < .10.
 *p < .05.
 **p < .01.
 ***p < .001.
 ****p < .0001.

Discussion

This study set out to examine how ANC impacts the career outcomes of new PhD recipients in management. Following Bourdieu (1986) and other scholars (Burris, 2004), we argue that ANC arises out of a fundamental exchange process in the form of PhD students' exchanges, through hiring and placement, over time. Our premise is that students associated with departments with higher ANC would have greater access to resources—information, visibility—that could impact their careers in ways different from those who do not have access to a similar source of social capital. In particular, we investigated if the ANC of a department would result in the department's ability to place PhD students in prestigious departments and also if it might impact their early career publications. Overall, our measure of ANC (based on cumulative PhD exchanges in management departments) was a significant predictor of four separate measures of academic prestige measured at both the departmental and institutional levels. ANC explained an additional variance of 3, 6, 6, and 14 per cent for the dependent variables, when significant. However, the study failed to support the notion that ANC matters when it comes to early career publications. It is interesting to note that the impact of dissertation chair characteristics (academic and media visibility) was limited to our first dependent variable but not to the others. We believe the impact of this person (training and guidance) may have already been captured via the graduates' own or shared publications and via the overall prestige of their department.

Our findings echo Bourdieu's (1986) assertion that central locations of organizations within a network are not only reflective of status distinctions, acquired through their position, but may also provide unit members with unique relational benefits, independent of other criteria. We also find that merit-based achievements (such as high-quality publications) also matter, but less so than network centrality. Paradoxically, whereas the benefits of ANC matter for getting new jobs in prestigious departments, it seems they matter much less for getting quality early career publications. Thus, it appears that graduates from such departments are more attractive hires than those who originate from departments with lower network centrality, regardless of the lack of association of ANC on scholarship outcomes. This counterintuitive finding, despite a strong pattern indicating a heavy reliance on ANC for hiring, can be indicative of three dynamics: (i) that hiring departments have a perceptual bias for preferring hires from departments with higher network centrality that reflect visibility or exclusivity. Encountered by uncertainty in the environment, they rely on ANC as a heuristic or a shortcut as we see in the case of other hiring contexts (Williamson & Cable, 2003a); (ii) departments continue to hire within their networks despite the fact that it may not always necessarily result in high-quality publications of the new hires. This could be because they may have a need to maintain the position within the social network and for other kinds of possible social benefits that can be gained from strong connections, which emerge from such hiring patterns; and (iii) given that management is a field with a developing paradigm, characterized by low consensus on important research questions and methodology (Pfeffer, 1993), it is less surprising that ANC may not be sufficient to impact one's publications, given lower consensus and associated scholarship uncertainty. On the one hand, if this is the case, some graduates with high scholarly potential may miss out. These graduates may not come from departments with high ANC but may nonetheless have good potential for high-quality publications, which may not have been maximized in departments with lesser resources. Moreover, high-status departments may hire graduates who eventually do not publish as expected and, consequently, do not get tenure, thereby increasing turnover costs for the department. Thus, there can be different kinds of costs associated with hiring at least partly based on ANC. On the other hand, looking at the amount of variance explained in our study, we see that, at best, ANC explains an additional 14 per cent in occupational outcomes but as little as 3 per cent, so the impact of ANC and its dynamics is qualified.

As noted earlier, developing paradigmatic fields tend to rely more on particularistic criteria (such as social capital) than universalistic ones (Long & Fox, 1995) when compared with more developed fields. Given the paradigmatic weakness of management science (Ferris, Ketchen & Buckley, 2008), it would seem that management academia would probably exhibit this over-reliance on particularistic criteria. However, when viewed in comparison with some other fields, management science does not seem as extreme. Our findings, thus, provide indirect support for the argument that management science is a field whose paradigm is still developing but mature enough to not have excessive reliance on particularistic criteria for hiring.

Limitations

One of our limitations is that we measured only one kind of network of a department, that is, the hiring network. Although scholars have argued (Burris, 2004) that the essential basis of ANC comes from the exchange of students, there can be other forms of academic networks too such as editorial networks (formed through having editors who are connected to a community of reviewers) or publication networks (formed through the coauthors networks scholars have). Another limitation is that we did not look at how individuals utilize the social resources associated with network centrality. For instance, do they gain access to influential others such as editors or prominent scholars? Do they gain access to unique datasets? We also did not examine possible moderation effects of social networks on the value of merit-based criteria (e.g., see Bedeian et al., 2010). Such an analysis can expose the boundary conditions under which ANC matters more or less.

Future research and conclusion

In this study, we attempt to contribute to a better understanding of how network centrality of PhD-granting departments impacts initial job placement and future research outcomes of graduates, as part of a larger exploration of the sociology of hiring in management academia. We also consider the impact of both particularistic and universalistic criteria on the eventual decision to hire these graduates and extend previous research by examining how these criteria and network centrality impact early career scholarship. There are several research questions that one can explore in the future on the basis of this paper. First, studies can examine how individuals use the social resources embedded within their centrally located departments to achieve occupational outcomes in academia; opening the “black box” of social network capital may be warranted, by use of surveys. Second, studies can look at psychological outcomes of new hires in terms of social fit and adjustment on the basis of the characteristics of their PhD origin and those of the hiring institutions, to explore the notion of prestige or status fit on the basis of network centrality. Third, although we do find that there is a notion of social closure (Burris, 2004) that is implied in the positive relationship between ANC and new job prestige, we did not test it. Social closure reflects the preference for maintaining a highly selective unit on the basis of social or ascriptive criteria that can signal prestige (Bourdieu, 1986). This could potentially be an avenue for future research, for example, by use of interviews.

To summarize, at best, we see a mixed picture regarding hiring norms for management departments. Although academic departments do appear to consider the achievements of doctoral graduates, they also rely on departmental network centrality and other particularistic criteria when making hiring decisions. Our findings also indicate that although network centrality matters for hiring institutions, it does not explain future publications. This is a very important finding in the field of management because it uncovers a trend of hiring in management academia that is not actively recognized. Moreover, the results of this study should be something that departments should consider when thinking about the placement of their graduate students. It is also important for hiring departments to understand and make decisions on what would be some of the best criteria for them to hire. From a normative viewpoint, in the terms used by Merton (1942), the field of management does not seem to clearly follow universalistic norms; it may well use a hybrid norm—combining universalistic and particularistic considerations.

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