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ORIGINAL EMPIRICAL RESEARCH

Human brands and mutual choices: an investigation of the marketing assistant professor job market

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Abstract We present a two-sided matching framework to investigate the entry-level marketing assistant professor job market. Under this framework, candidates' and departments' decisions to mutually choose one another are driven by the matching value produced by the pair, which is in turn determined by observable department brand cues and candidates' human brand cues such as field of research, research productivity, and ranking status. Our results suggest that matches between candidates and faculty trained in the same field do not always generate the highest matching value. Candidates' publications in top marketing journals enhance their likelihood of matching with research-oriented hiring departments, and this effect is moderated by their field of research. In general, the ranking status of candidates boosts their chance of being matched with research-oriented hiring departments. However, this effect differs across fields, and it also interacts with candidates' own research productivity. In particular, publications by candidates from top-ranked degree-granting departments are taken as three to four times more valuable by research-oriented hiring departments. Our work extends the current research on the marketing job market and, most importantly, quantifies and compares the significance of various human brand cues in influencing mutual choices in the job market.

Keywords Human brands · Mutual choices · Two-sided matching · Job market · Research productivity · Academic stratification

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Introduction

Marketers often wrestle with the task of finding suitable business partners, suppliers, endorsers, and employees. Individuals face a similar problem when searching for a job or a life partner. The concept of the human brand (Thomson 2006) is critical in that respect. Especially important is the realization that a person's observable attributes, or "human brand cues," can be strategically managed. One example of a human brand cue is a person's attractiveness, important in situations ranging from romantic matching (Hirschman 1987; Hitsch et al. 2010a, b) to celebrity endorsements (e.g., Kamins 1990). Other applications to human brand cues include studies on celebrities (Fournier 2010), students' advocacy for professors (Jillapalli and Wilcox 2010), political candidates (Hoegg and Lewis 2011), marketing scholars (Close et al. 2011), and fashion models (Parmentier et al. 2012).

Human brand cues that influence mutual choices are typically examined for each party separately in the literature, although both parties make decisions on whether they want to partner. For instance, in the celebrity endorsements market, Agrawal and Kamakura (1995) and Ding et al. (2011) investigate firms' financial returns from hiring a

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celebrity endorser without incorporating the celebrities' perspective on these hires. The separate study of mutual choices has two potential drawbacks. First, one of the parties is often left unstudied, which limits our understanding of the determinants of these mutual choices. Second, this approach treats market agents such as celebrities and job candidates as differentiated goods to be bought and sold. However, mutual agreement is required for these choices to be observed, and rejections from these market agents are more the norm than an exception. This requires a model of strategic interaction among agents on both sides of the market to better characterize how the market operates and to reveal new insights into partnership formation.

This paper extends the work of Close et al. (2011) on the entry-level marketing assistant professor job market (hereafter referred to as the marketing job market). The contribution here is in developing a two-sided theoretical framework to investigate mutual choices. In this framework, the mutual choice, or match, is the dependent variable of interest. Mutual choices are driven by the expected utility jointly produced by the two partners when matched together, also known as the matching value of a partnership (Yang et al. 2009). Agents use observable brand cues of potential partners to assess the expected matching value. We conduct our empirical analysis using a large dataset of observed matches between marketing job candidates and hiring departments during a nine-year period from 1997 to 2005.

Building on the growing literature on the marketing academic job market (e.g., Coughlan and Rao 2003; Close et al. 2011), we extend this stream of literature by simultaneously considering the perspectives of both candidates and hiring departments. Following Close et al. (2011), we focus on the human brand cues of job candidates, which can be categorized into intrinsic cues—candidates' attributes that provide direct evidence of their quality—and extrinsic cues—attributes that provide indirect evidence of candidates' quality.

We find that although "likes are more likely to match" (e.g., Watts and Dodds 2007; Hitsch et al. 2010b), in the marketing job market, matches that involve scholars from different research fields sometimes produce higher values than matches that involve similar scholars. Second, we find that the research productivity of a degree-granting department serves as an extrinsic cue for the candidates it places on the market. However, compared with the candidates' intrinsic cue such as their own publications, department research productivity is a weaker cue for the market. Third, we find that the school ranking of a degree-granting department serves as an important extrinsic cue for the candidate, and it shapes matching outcomes by interacting with the candidate's research productivity. In particular, we observe the Matthew effect (Hunt and Blair 1987; Merton 1968) in that publications by candidates from top-ranked degree-granting departments are taken as three to four times more valuable by hiring departments as compared to those published by other candidates. This demonstrated Matthew effect relates the effect of candidates' research productivity (the most important intrinsic cue) to ranking status (arguably the most important extrinsic cue). This interaction between intrinsic and extrinsic cues has far-reaching implications.

We further contribute to the existing literature by paying special attention to fields of research. Wilkie and Moore (2003) and Lehmann (2005) suggest that marketing has become increasingly compartmentalized along field of research specializations (consumer behavior, modeling, and strategy), and Basil and Basil (2006) argue that, as a consequence, mismatches between the field of research specialization that departments seek versus what job candidates specialize in can have an adverse effect on the research production and perceptions of fit among marketing scholars. We extend this stream of research by assessing and comparing the matching values of partners with similar or dissimilar field of research.

Lastly, our work contributes to the broader literature on the value of academic publications. Mittal et al. (2008) and Seggie and Griffith (2009) investigate how publishing in different research outlets impacts a tenure-track scholar's salary and tenure opportunities. We add to this literature by assessing how different publications influence placement in the entry-level marketing job market. We find that candidates' publication in top marketing journals serves as an important intrinsic human brand cue, which enhances candidates' likelihood of matching with research-oriented hiring departments. Furthermore, the size of this effect seems to differ across field of research.

The rest of the paper is organized as follows: the next section presents the theoretical framework, followed by a section presenting the dataset. We then describe the structural two-sided matching model used in this study. Next we present and discuss results, finally concluding with suggested areas for future research.

Research background

The marketing job market for assistant professors is a typical example of two-sided matching markets (Roth and Sotomayor 1990) where both the hiring departments and the job candidates make their individual decisions on whom to match with.[1] To increase the chance of a successful match, candidates and hiring departments carefully evaluate potential partners. Fundamentally, this mutual assessment of desirability is based on the benefits one can receive as a result of a potential

[1] For a detailed overview of the hiring process in the marketing job market for assistant professors, see Close et al. (2011).

match (Yang et al. 2009). A candidate or a department observes and evaluates the brand cues of a potential partner and forms expectations on how much joint utility, or "matching value," they can produce once they match with each other. A match that generates higher matching value is more desirable for both the department and the candidate as each can obtain higher benefits. Thus, in theory, the outcome of a matching market (i.e., who matches with whom) is driven by the potential matching values of pairs of agents (Fox 2010).

Two equilibrium properties of two-sided matching markets are relevant to our study.

Equilibrium property 1: Pair-wise stability

In equilibrium, matches satisfy pair-wise stability. This property means that for any two pairs of observed matches, agents would not be willing to exchange their partners with each other given the information available to them at the time of the decision (Fox 2010). In other words, pair-wise stability means that, given the information they have at the moment they make a choice, market participants prefer their current match to any other match that would be willing to pair with them instead of its partner. Therefore, the observed matches in the job market provide valuable information for estimating matching values and uncovering how the human brand cues of agents determine these matching values.

Equilibrium property 2: Positive assortative matching (PAM)

PAM is similar to the concept of homophily from research in social networks (Watts and Dodds 2007), i.e., the notion that "birds of a feather flock together." Matching outcomes should be positively assortative, because unless the traits of matching parties are close substitutes, optimal matching should occur among agents with similar traits such that likes are more likely to match, and dissimilar agents are less likely to match (Becker 1973). PAM is commonly observed in the marriage market (Hitsch et al. 2010b), although not necessarily in other markets, such as the NBA free agency market (Yang et al. 2009) and corporate alliances (Amaldoss and Staelin 2010).

The concept of PAM is a theoretical property of two-sided matching markets that allows researchers to test the extent to which similar agents in a specific market are likely to partner with each other with respect to each of their brand cues. In our particular context, PAM may shape the matching outcomes of the marketing job market with respect to field of research, research productivity, and ranking status. Basil and Basil (2006) have conjectured that job candidates trained in a particular field should be more likely to join a hiring department that specializes in the same field, because these partners are qualitatively similar and thus should be most productive when together. Furthermore, hiring departments consider publications and working papers as strong signals of research productivity available by the time hiring occurs (Williamson and Cable 2003). Likewise, productive candidates may seek departments with strong research proclivity or prestige. Hence, well published candidates may be more likely to match with research-oriented departments. Finally, a department's prestige—as manifested by publicly available rankings—can play a significant role in shaping the outcomes of the marketing job market. For example, candidates who graduate from prestigious departments tend to match with prestigious departments because of academic stratification (Bedeian et al. 2010). As will be shown, our modeling approach allows us to simultaneously estimate and contrast the relative effects of PAM across different sets of intrinsic and extrinsic human brand cues.

Data

We compiled a large dataset of matches from the marketing job market. The dataset records the first placement of fresh doctoral graduates in a nine-year period from 1997 to 2005, and it consists of 677 matches between job candidates from 112 doctoral degree–granting departments and 232 hiring departments. There are about twice as many hiring departments than degree-granting departments, because not all hiring departments have doctoral programs. This dataset is comprehensive, and it features the candidates that were hired in the years under examination.

Data were obtained from "Who Went Where" surveys, individual marketing department websites, and directories. Note that the number of matches in our data may be smaller than the actual number of hires due to a number of factors. For example, we did not include hires of non-marketing departments or placement of non-marketing candidates. We also did not include candidates who held a faculty position prior to obtaining a doctoral degree in marketing.

The data were then divided into individual "job markets," defined by the year in which newly hired marketing PhDs started their first job. For example, the "2005 job market" includes marketing doctoral graduates who started to work as assistant professors in the year 2005, as well as the hiring departments involved in those matches.[2] To study the effects of field of research, research productivity, and ranking status, we collected information on each candidate's publication record and research interests; for each hiring or degree-granting department, we collected publicly available rankings, university financial endowments, faculty mix in terms of research field, and department research productivity. For

[2] We defined the job market in this manner because, although the market for 2005 positions started interviewing in August of 2004, campus visits and offers continued until the spring of 2005. Thus, the labeling of that market could go either way, and we opted to go with the later date.

control purposes, we also collected other information such as country of origin for marketing scholars and cost of living for the city where the university is located. Table 1 presents a summary of all job candidate and hiring department brand cues that we investigate in this study. Web Appendix C presents a table of correlations. A detailed description of how we coded these variables is presented next.

Job candidate human brand cues

As explained in the introduction, human brand cues are observable characteristics of individuals that provide evidence of their quality. In the context of job market matches, brand cues are possibly valuable due to the information they convey about candidates. The concept of market signaling (Spence 1973) implies that the visible activities and characteristics of individuals convey valuable information in the job market. In other words, what we refer to as human brand cues could be viewed as market signals with valuable informational content. Though brand cues and market signals overlap on meaning, the difference between them is not merely semantic. For human brand cues to be signals, they have to be intrinsic—under the control of the individual. Thus, following Close et al. (2011), we classify brand cues into intrinsic and extrinsic. Second, signals convey information only if individuals of different ability levels will find it optimal to separate themselves into different activities. That is, an individual with a higher ability might pursue a dissertation topic which involves greater mental rigor. We are unable to assess the second point given the data we have, and it is therefore outside the scope of the current investigation.

Intrinsic brand cues for candidates

Research productivity Using online vitas and Google Scholar, we gathered all identifiable journal articles that

Table 1 Hiring department and candidate brand cues

Variables		Coding
Job candidate human brand cues		
Intrinsic cues	Research productivity	
	Publications in top marketing journals	Counts of publications by the candidate in top marketing journals.
	Publications in other marketing journals	Counts of publications by the candidate in other marketing journals.
	Publications in non-marketing journals	Counts of publications by the candidate in non-marketing journals.
	Field of research	
	CB candidate	1 if specializing in consumer behavior; 0 otherwise.
	Modeling candidate	1 if specializing in modeling; 0 otherwise.
	Strategy candidate	1 if specializing in strategy; 0 otherwise.
Extrinsic cues	Top-ranked candidate	1 if graduated from a top-ranked department; 0 otherwise.
	Department research productivity	Counts of publications in top marketing journals by all faculty members in the degree-granting department.
	Country of origin (control)	
	Europe	1 if country of origin belongs to Europe; 0 otherwise.
	Asia	1 if country of origin belongs to Asia; 0 otherwise.
	North America	1 if country of origin belongs to North America; 0 otherwise.
	Cost of living (control)	Continuous index
	Degree-granting dept.'s university endowment	Continuous
Hiring department brand cues		
	Research-oriented hiring department	1 if the department has a PhD program; 0 otherwise.
	Faculty mix	
	Number of CB faculty	Counts, number of CB faculty members
	Number of Modeling faculty	Counts, number of modeling faculty members
	Number of Strategy faculty	Counts, number of strategy faculty members
	Country of origin (control)	
	Number of Europe faculty	Counts, number of faculty whose country of origin is Europe
	Number of Asia faculty	Counts, number of faculty whose country of origin is Asia
	Number of North America faculty	Counts, number of faculty whose country of origin is North America
	Cost of living (control)	Continuous index
	Hiring department's university endowment	Continuous

every candidate had published by the end of the next year following his or her job market year. For example, if a match between a candidate and a hiring department took place in the 2005 job market (meaning that the scholar started his or her position in the hiring department in 2005), then all of his or her publications dated on or before December 31, 2006, are included. We set this cutoff point for two reasons. First, academic journals typically have a long lead time between accepting a manuscript and publishing it in print. Adding an additional year for each candidate's publications allows forthcoming papers, which cannot be observed retrospectively, to be counted. Second, hiring departments usually judge good quality working papers as signals of high research productivity. Therefore, during the hiring process, a working paper that may have already passed a journal's first-round review serves as an indication of high productivity, and it should be counted as well.

The candidates in our dataset published in over 200 different academic journals. We classify these journals into three categories to understand how publications in different types of journals affect matching outcomes differently. The first category is "top marketing journals." The list of top marketing journals combines the top two categories defined by Mittal et al. (2008). These are the *Journal of the Academy of Marketing Science* (JAMS), the *International Journal of Research in Marketing* (IJRM), the *Journal of Consumer Psychology* (JCP), the *Journal of Consumer Research* (JCR), the *Journal of Marketing* (JM), the J*ournal of Marketing Research* (JMR), the *Journal of Retailing* (JRET), *Marketing Letters* (MLETT), and *Marketing Science* (MKSC), plus *Management Science* (MNSC). The second category, "other marketing journals," consists of marketing journals outside of the top category described above. The third category, "non-marketing journals," includes journals outside of marketing, such as economics and psychology journals. Web Appendix A shows the full list of journals. Interestingly, although a slightly higher percentage of modeling candidates have no publications (44.37%) as compared to those in the field of consumer behavior (CB) (36.45%) or strategy (38.54%), the percentage of candidates with top marketing publications is much higher for modeling candidates (39.07%) than for CB (22.11%) or strategy (14.15%) candidates (p=.0001 comparing modeling candidates vs. CB and strategy candidates).

Field of research Candidates are classified as CB, modeling, or strategy based on the research methods they use, the journals they publish in, and their stated research interests, as discussed in Appendix B. In the data, modelers represent the smallest fraction of candidates in the market (23.79% on average from 1997 to 2005), and their number is relatively stable across time. In contrast, the number of CB (45.91% on average) and strategy (30.3% on average) candidates is larger and exhibits greater variation across time.

Extrinsic brand cues for candidates

Top-ranked status To classify the ranking status of marketing departments, we use the Financial Times (FT) worldwide MBA rankings and the University of Texas at Dallas (UTD) Top 100 Business School Research Rankings. These represent two key aspects of departmental human brand cues: research rankings may be interpreted as a cue of the productivity that the candidate may attain in that department, whereas MBA rankings may be separately viewed as a measure of prestige (Trieschmann et al. 2000). A marketing department is defined as top-ranked if its business school was listed at least once at any of the top 30 spots in the FT or the UTD rankings during the years 2000–2005. Our list of top-ranked marketing departments consists of 48 departments, as shown in Appendix A. Top-ranked status is a binary variable that takes the value of 1 if a candidate graduated from a top-ranked department (as defined above), and 0 otherwise. In our data, 337 candidates (50.52%) have top-ranked status.[3]

Department research productivity To capture the potential advisor effect, we use the degree-granting department's research productivity as a proxy. Thus, instead of gathering each individual advisor's productivity, we have the effect of the "average advisor" for each department. Department research productivity is coded as a count of publications in top marketing journals by all faculty of the degree-granting department. We then lag this variable by 1 year such that for 2003 job market (for which the interviews started in 2002), department research productivity reflected their 2002 performance.

Hiring department brand cues

Research-oriented department This binary variable takes the value of 1 if a hiring department has a PhD program, and 0 otherwise. Among all 677 hires in our dataset, 362 hires were made by research-oriented departments (53.47%) vs. 315 from other departments (46.52%).

Faculty mix For each department in each market year it participated, we create three variables to record the number of faculty members working in the fields of CB, modeling, and strategy, respectively. Faculty members are classified in the same manner as job candidates (see Appendix B). Our faculty data is biennial and was obtained from the Hasselback directories (1997, 1999, 2001, 2003, 2005). Table 2 shows the distribution of faculty mix for a selection of top-ranked marketing departments. The table shows a substantial degree of heterogeneity in the faculty mix across departments.

[3] As a robustness check, we re-ran the models using only the top 20 schools as top tier. The results remain qualitatively the same. Details are available in Web Appendix D.

Table 2 Average faculty mix in a sample of top-ranked marketing departments

Department	Hires in sample	% CB faculty *Avg. '97-05*	% Mod. faculty *Avg. '97-05*	% Str. faculty *Avg. '97-05*
Carnegie Mellon University	5	0	100	0
Georgetown University	2	28.5	0	71.5
MIT	3	26.11	73.89	0
Michigan State University	5	22.72	4.38	72.90
Northwestern University (Kellogg)	5	44.77	32.10	23.13
University of Maryland at College Park	4	40.73	37.59	21.68
University of Michigan at Ann Arbor	4	58.02	24.10	17.88
University of Pennsylvania (Wharton)	4	32.77	62.20	5.03
University of Texas at Dallas	4	0	100	0

Control variables

For both candidates and hiring departments, we use a few common variables to control for the potential effect of cost of living, country of origin, and university endowment.

Cost of living This variable is the cost of living prevalent in the city where the degree-granting department or the hiring department is located. The COLI measurement is a continuous index variable. It compares each city's cost of living against the average in the U.S., which is assigned a value of 100. In our data the minimum COLI is about 70 and the maximum is about 230.

Country of origin We gathered the country of origin for each candidate and every faculty member in each hiring department, following Stremersch and Verhoef (2005). This is coded as a set of dummies for the candidates and as counts for the hiring departments. The categories are Europe, Asia, and North America.

University endowments The financial endowment of the universities to which marketing departments belong is useful for model identification, as will be explained below. For each department in the dataset, and for each year in which the department is observed to participate in either side of the job market, a different endowment figure is recorded. We obtained yearly data on the financial endowment of U.S. and Canadian universities from the National Association of College and University Business Officers (www.nacubo.org).

Method

We apply a structural two-sided matching model (as applied in Yang et al. 2009) to estimate the effects of various human brand cues on the matching outcome of the marketing job market.

Two-sided matching

The model assumes that observed matches are pair-wise stable. To illustrate pair-wise stability, consider two job candidates C_1 and C_2, and two hiring departments D_1 and D_2.. The function $f(C_1, D_1)$ represents the matching value of C_i with D_j. Suppose matches $\{C_1, D_1\}$ and $\{C_2, D_2\}$ are observed. The observed matches imply the following structural condition:

$$f(C_1,D_1)+f(C_2,D_2)>f(C_1,D_2)+f(C_2,D_1) \tag{1}$$

This inequality implies that counterfactual matches $\{C_1, D_2\}$ and $\{C_2, D_1\}$ did not take place because the sum of the matching values from the observed matches ($\{C_1, D_1\}$ and $\{C_2, D_2\}$) was higher. It follows that any two pairs of matched agents that we observe in the market would be unwilling to exchange partners between them.

Specification

For any match, such as $\{C_1, D_1\}$, a production function $f(\bullet)$ can be specified as

$$f(C_1,D_1)=\alpha X_{C_1}+\gamma Y_{D_1}+\beta X_{C_1}Y_{D_1}+\varepsilon_{C_1D_1} \tag{2}$$

where X_{C_1} is a vector that includes job candidate C_1's human brand cues, and Y_{D_1} is a vector that includes marketing department D_1's brand cues. Substituting Eq. 2 into Eq. 1 yields a specification for the local production maximization condition,

$$\begin{aligned}\alpha X_{C_1}+\gamma Y_{D_1}+\beta X_{C_1}Y_{D_1}+\varepsilon_{C_1D_1}+\alpha X_{C_2}\\ +\gamma Y_{D_2}+\beta X_{C_2}Y_{D_2}+\varepsilon_{C_2D_2} \;>\alpha X_{C_1}\\ +\gamma Y_{D_2}+\beta X_{C_1}Y_{D_2}+\varepsilon_{C_1D_2}+\alpha X_{C_2}\\ +\gamma Y_{D_1}+\beta X_{C_2}Y_{D_1}+\varepsilon_{C_2D_2}\end{aligned} \tag{3}$$

Fixed effects cancel out, allowing only interaction parameters to be estimated. The condition in Eq. 1 then reduces to

$$\beta X_{C_1} Y_{D_1} + \varepsilon_{C_1 D_1} + \beta X_{C_2} Y_{D_2} + \varepsilon_{C_2 D_2} > \beta X_{C_1} Y_{D_2} + \varepsilon_{C_1 D_2} + \beta X_{C_2} Y_{D_1} + \varepsilon_{C_2 D_1} \quad (4)$$

Inequalities of the form shown in Eq. 4 serve as the basis for estimation. We resort to semiparametric estimation for computational feasibility (Fox 2010).

Estimation and identification

The model parameters are estimated by maximizing Manski's (1975) maximum score estimator. Let $m=1,\ldots,M$ index M job markets, and $\{C_i, C_j, D_m, D_n\}$ denote quartets of agents within market m. Job candidates $\{C_i, C_j\}$ belong to one side of the market; hiring departments $\{D_m, D_n\}$ belong to the other side. The estimator can be written as:

$$\max_f Q_m(f) = \frac{1}{m} \sum_{m \in M} \left\{ \sum_{\{C_i, C_j, D_m, D_n\} \in m} 1\left[f(C_i, D_m) + f(C_j, D_n) > f(C_i, D_n) + f(C_j, D_m) \right] \right\} \quad (5)$$

where 1[•] is an indicator function which takes the value 1 if the inequality holds and 0 otherwise. The Manski (1975) maximum score estimator thus yields the highest percentage of matches for which the structure in Eq. 4 holds, given optimal parameters. Using subsampling, we generate confidence intervals for the parameter estimates (Politis et al. 1999). Web Appendix B presents estimation and identification details.

Results

We estimate three models to explore how human brand cues influence the matching values produced in the marketing job market. Model 1 is a base model that explores the main effects of field of research, research productivity, and ranking status. In Model 2, we explore whether the Matthew effect is present by estimating the value of publication across candidates with different ranking status. Model 3 investigates the effect of candidates' publications across different research fields. We include country of origin and cost of living in all three models as control variables. With different specifications, these models consistently reveal robust and interesting patterns in our data. In the following, we call each year of hiring a "market." Our analysis includes all nine markets in our dataset (1997~2005).

Model 1: Base model

Model 1 characterizes job candidates by their intrinsic human brand cues such as field of research and research productivity (i.e., publications), as well as their extrinsic human brand cues such as top-ranked status, and department research productivity. Extant literature suggests that these candidate human brand cues are the most important determinants of their placement. Table 3 presents the results of the base model.

Within the framework of our model, several sets of interactions are simultaneously estimated. An estimate is significant if the 95% confidence interval of its empirical distribution does not contain zero. Any non-significant estimate should be interpreted as the interaction having no significant effect on matching value as compared to the baseline cases and, thus, as not significantly impacting the outcomes of this market. For identification, the interaction between university financial endowments was computed and its coefficient set to 1.

The first set of results shows the estimates on the interaction of candidates' field of research and hiring departments' faculty mix. These estimates should be interpreted with respect to the benchmark value of 0, which was assigned to matches involving strategy candidates. That is, as compared to the benchmark matches, the estimates measure how much more (or less) matching value is produced by a certain field interaction.[4] The results show that for any type of candidate specialty, matching with hiring departments whose faculty specializes in the same field of research always generates significantly higher matching value (e.g., 1.36 for CB and 17.76 for modeling, both significantly positive) as compared to the baseline. However, the market is not strictly positively assortative, as the *highest* matching value seems to be generated by matches that involve modeling faculty, irrespective of the candidate's own research field. This pattern may suggest that modeling scholars have high complementarities with other fields. It may also reflect the additional value generated by a mixed faculty when they collectively provide a comprehensive marketing curriculum that spans across fields.

In the second set of interactions, we categorize candidates by an intrinsic cue—their field of research (CB, modeling, or strategy) and an extrinsic cue—their top-ranked status (top-ranked or others). We look at how these cues affect the candidates' chances of landing a position in research-oriented departments. The category of "other strategy candidates" serves as the benchmark. Positive (negative) matching values in these interactions indicate that candidates in a certain

[4] Web Appendix B provides details about model identification.

Table 3 Model 1: the base model

			Hiring department's faculty mix		
			CB (#)	Modeling (#)	Strategy (#)
Candidate's field		CB	1.36*	3.44*	−2.79*
		Modeling	−2.11*	17.76*	−0.88*
		Strategy	0 (base)	0 (base)	0 (base)
			Research-oriented hiring departments		Other hiring departments
Candidate's field by ranking status	Top-ranked candidate	CB	12.95*		0 (base)
		Modeling	10.00*		0 (base)
		Strategy	12.32*		0 (base)
	Other candidate	CB	−6.82*		0 (base)
		Modeling	10.10*		0 (base)
		Strategy	0 (base)		0 (base)
	Candidate's publications	Top marketing journals	10.31*		0 (base)
		Other marketing journals	−0.18		0 (base)
		Non-marketing journals	0.36*		0 (base)
	Dept. research productivity	CB	0.47*		0 (base)
		Modeling	0.81*		0 (base)
		Strategy	0.01		0 (base)
			Hiring department's country of origin mix		
			Europe (#)	Asia (#)	N. Ame. (#)
Candidate's country of origin		Europe	5.52*	1.84*	−1.07*
		Asia	3.09*	8.13*	−0.87*
		North America	0 (base)	0 (base)	0 (base)
			Hiring department's COLI		
Degree-granting department's COLI			12.01*		
			Hiring department's endowment		
Degree-granting department's endowment			1		
Subsamples			200		

Candidate human brand cues displayed in rows; department brand cues displayed in columns

N=677. Significant estimates indicated with * (p<0.05)

category have an advantage (disadvantage) when targeting research-oriented hiring departments as compared to the benchmark category. The results show that top-ranked candidates, in general, enjoy a significant advantage over other candidates (estimated as 12.95 for CB top-ranked, 10.00 for modeling top-ranked, and 12.32 for strategy top-ranked, all significantly positive). CB candidates from "other" departments appear to be at a disadvantage as compared to the baseline (Other strategy) because their estimate is significantly negative (−6.82). Interestingly, modeling candidates who graduated from "other" departments seem to do well in matching with research-oriented hiring departments (estimated as 10.10). However, one caveat is that, unlike in the other two fields, in our data only a very small proportion (11.26%) of modeling candidates graduated from "other" departments.

The third set of interactions explores the effect of an important intrinsic cue, candidates' research productivity. Because we use counts of publications for all three publication outlets (top marketing journals, other marketing journals, and non-marketing journals), each estimate should be interpreted as the value of having one additional paper published in that outlet. The results show that publications in top marketing journals significantly increase a candidate's chance of matching with a research-oriented hiring department, as for such matches one publication in a top marketing journal is estimated to bring an additional value of 10.31. Candidates with multiple publications in top marketing journals would further increase their chance of landing a job in research-oriented hiring departments. Publications in non-marketing journals seem to only slightly affect a candidate's matching outcome (estimated at 0.36), and publications in other marketing journals bring no significant benefit, as the estimated matching value is not statistically different from zero.

We then look at an extrinsic human brand cue that has been shown by previous studies (e.g., Close et al. 2011) to affect candidates' market performance: the degree-granting

department's research productivity. We investigate how it may affect a candidate's chance of being matched with a research-oriented hiring department, and we allow this effect to vary across fields by estimating it separately for CB, modeling, and strategy candidates. We find that, in general, higher department research productivity indeed improves candidates' chances of being matched with research-oriented hiring departments. However, this effect seems to differ across fields: each top marketing publication by the degree-granting department is estimated at 0.47 for CB candidates, and 0.81 for modeling candidates. Both estimates are significantly positive. However, for strategy candidates, department productivity as an external cue does not seem to affect their matching.

Estimates for the control variables reveal reasonable patterns. For example, the set of interactions between countries of origin suggests that a more diverse hiring department (having some faculty from Europe and Asia) tend to continue to be diverse in their future hiring. This may reflect the culture of the university or the city the department is located in.

Model 2: The Matthew effect

Model 2 is similar to Model 1, and further explores whether the effect of candidates' research productivity (the most important intrinsic cue) is different for individuals with different ranking status (arguably the most important extrinsic cue). The results of this section thus indicate whether the Matthew effect—research accomplishments of scholars from top-ranked departments being seen in a more favorable light as compared to similar accomplishments from other scholars (Hunt and Blair 1987; Merton 1968)—exists in the marketing job market. We also quantify the strength of this effect. All model estimates are reported in Table 4.

The results of Model 2 are qualitatively similar to those of Model 1 for various sets of interactions. Interestingly, we find that one publication in a top marketing journal increases matching value by 22.78 for top-ranked candidates when they match with research-oriented hiring departments, as compared to 6.66 for other candidates. Thus, research productivity as an important intrinsic human brand cue can affect matching differently for candidates with different external cues, such as degree-granting department's ranking. This finding seems to confirm that the Matthew effect exists in the job market for marketing PhDs and that the size of the effect is quite large.

The difference in the value of publication may reflect different quality in candidates' published research—it may be that top-ranked candidates' publications are of higher quality than others', even when both appear in top marketing journals. Alternatively, hiring departments may simply take publications by top-ranked candidates as a stronger signal of their research productivity. It is possible that they interpret publications by top-ranked candidates as a confirmation of their worthiness and discount others as a fluke. These alternative explanations, however, cannot be tested using our data. Indeed, both explanations could co-exist in the marketing job market, causing top-ranked candidates' publications to be seen in a more favorable light than those from other candidates.[5]

Model 3: Publication effect by field

Model 3 investigates whether the effect of candidates' research productivity is different across different fields. The results of the model are shown in Table 5. Model 3 confirms that all effects from the main interactions we show in Model 1 continue to be robust.

From model estimates, we see that publications in top marketing journals greatly enhance candidates' likelihood of matching with research-oriented hiring departments. Furthermore, top marketing publications appear to impact matching value somewhat differently across different fields, as each publication is estimated to be valued at 11.99 for CB candidates, 25.62 for modeling candidates, and 8.28 for strategy candidates. This difference is not caused by scarcity of signals, as in our data, 44 (29.14%) modeling candidates had at least one top marketing publication as compared to 46 (14.33%) CB candidates and 14 (6.83%) strategy candidates. This suggests that strategy as a field sees the least top-marketing publications among their job candidates and yet its value is also the lowest. One possible explanation of this finding is that most modeling candidates (88.74%) graduated from top-ranked departments, whereas only 53.58% of CB candidates and 31.71% of strategy candidates were top-ranked. The Matthew effect could cause the pattern we observe here, as publications from top-ranked candidates (many of whom are modeling candidates) were valued more than those from other candidates.

Another important finding is that candidates from different fields seem to benefit differently from publishing in other journal outlets as well. For example, modeling candidates cannot benefit from publishing in other marketing journals or non-marketing journals, yet such publications can boost strategy candidates' chances of being matched with research-oriented departments (valued as 2.87 and 1.83 respectively, both significantly positive).

Other robustness checks

Hiring department ranking status In our models we categorize hiring departments based on whether they have a PhD program. This method identifies hiring departments that are research oriented. We used alternative categorizations, such as

[5] We ran a series of robustness checks discussed in the next section. The Matthew effect persists in each of these checks, and the size of the effect is also robust.

Table 4 Model 2: the Matthew effect

			Hiring department's faculty mix		
			CB (#)	Modeling (#)	Strategy (#)
Candidate's field		CB	1.29*	3.60*	−2.71*
		Modeling	−2.18*	20.97*	−0.92*
		Strategy	0 (base)	0 (base)	0 (base)
			Research-oriented hiring departments		Other hiring departments
Candidate's field by ranking status	Top-ranked candidate	CB	11.37*		0 (base)
		Modeling	7.45*		0 (base)
		Strategy	9.20*		0 (base)
	Other candidate	CB	−4.98*		0 (base)
		Modeling	11.84*		0 (base)
		Strategy	0 (base)		0 (base)
Candidate's publications by ranking status	Top-ranked candidate	Top marketing journals	22.78*		0 (base)
		Other marketing journals	1.60*		0 (base)
		Non-marketing journals	0.23		0 (base)
	Other candidate	Top marketing journals	6.66*		0 (base)
		Other marketing journals	−1.02		0 (base)
		Non-marketing journals	0.40*		0 (base)
	Dept. research productivity	CB	0.50*		0 (base)
		Modeling	0.79*		0 (base)
		Strategy	0.21		0 (base)
			Hiring department's country of origin mix		
			Europe (#)	Asia (#)	N. Ame. (#)
Candidate's country of origin		Europe	5.29*	1.82*	−1.04*
		Asia	3.04*	7.86*	−0.83*
		North America	0 (base)	0 (base)	0 (base)
			Hiring department's COLI		
Degree-granting department's COLI			11.55*		
			Hiring department's endowment		
Degree-granting department's endowment			1		
Subsamples			200		

Candidate human brand cues displayed in rows; department brand cues displayed in columns

N=677. Significant estimates indicated with * (p<0.05)

using top-30 hiring department or top-20 hiring department (versus others), and our model results remain very consistent.

Candidate ranking status Although we treat the ranking status of degree-granting departments as an extrinsic cue of the candidates, one could argue that the ranking status is intrinsic as it reflects the innate ability of the candidates. That is, only candidates with higher capabilities would be admitted to top departments in the first place. To investigate this competing explanation, we used each university's average MBA GMAT score in 2009 as a proxy for the ability of marketing doctoral students. The results of both (1) a model using GMAT scores instead of ranking status and (2) regressing ranking status on GMAT to create an instrumental variable yield essentially the same results as those reported here. Due to the high correlation between ranking status and GMAT scores, we cannot include both variables in the same model.

Faculty mix In addition to the current coding of this variable (raw counts of faculty by field of research), we estimated our models using the relative proportion of faculty in each field within each department. This results in fewer estimates (see Web Appendix B) but our main results are robust.

Research productivity To assess the robustness of our results regarding research productivity, we explored two additional specifications. The first specification includes the research productivity in a subset of top marketing journals (JAMS, JCR, JM, JMR, JRET, and MKSC) for every hiring department in the market, and the matching value between these and

Table 5 Model 3: publication effect by field

			Hiring department's faculty mix		
			CB (#)	Modeling (#)	Strategy (#)
Candidate's field		CB	1.29*	3.78*	−2.61*
		Modeling	−2.81*	21.01*	−1.08*
		Strategy	0 (base)	0 (base)	0 (base)
			Research-oriented hiring departments		Other hiring departments
Candidate's field by ranking status	Top-ranked candidate	CB	14.11*		0 (base)
		Modeling	11.88*		0 (base)
		Strategy	12.88*		0 (base)
	Other candidate	CB	−3.24*		0 (base)
		Modeling	18.24*		0 (base)
		Strategy	0 (base)		0 (base)
Candidate's publications by field	CB candidate	Top marketing journals	11.99*		0 (base)
		Other marketing journals	2.63*		0 (base)
		Non-marketing journals	−0.45		0 (base)
	Modeling candidate	Top marketing journals	25.62*		0 (base)
		Other marketing journals	4.93		0 (base)
		Non-marketing journals	−1.78*		0 (base)
	Strategy candidate	Top marketing journals	8.28*		0 (base)
		Other marketing journals	2.87*		0 (base)
		Non-marketing journals	1.83*		0 (base)
	Dept. research productivity	CB	0.39*		0 (base)
		Modeling	0.88*		0 (base)
		Strategy	−0.38		0 (base)
			Hiring department's country of origin mix		
			Europe (#)	Asia (#)	N. Ame. (#)
Candidate's country of origin		CB	4.81*	1.41*	−0.94*
		Modeling	2.90*	7.87*	−0.74*
		Strategy	0 (base)	0 (base)	0 (base)
			Hiring department's COLI		
Degree-granting department's COLI			11.32*		
			Hiring department's endowment		
Degree-granting department's endowment			1		
Subsamples			200		

Candidate human brand cues displayed in rows; department brand cues displayed in columns

N=677. Significant estimates indicated with * (p<0.05)

candidates' publications in different outlets is estimated. The second specification divides top marketing journals into two categories: (1) JCR, JM, JMR, MKSC, and MNSC and (2) JAMS, JCP, JRET, IJRM, and MLETT. Qualitatively, the results of research productivity across all models are robust to these specifications as well.

Discussion

In this paper we investigate the determinants of matching outcomes in the entry-level marketing assistant professor job market using a comprehensive dataset of matches that took place during 1997–2005. Our approach and findings advance the growing literature on the marketing job market in several ways. To our knowledge, this is the first study to classify marketing scholars along fields of research for both sides of the market. This allows us to empirically observe complementarities among research fields. Furthermore, using a two-sided matching framework, we extend the work of Close et al. (2011) by quantifying the effects of both intrinsic and extrinsic human brand cues on matching outcomes. We also establish the Matthew effect—an interaction between a candidate's research productivity (an intrinsic

cue) and the degree-granting department's ranking status (an extrinsic cue)—in the marketing job market. These findings have important implications for marketing academia and potentially change the way we think about the marketing job market and successful strategies therein.

Implications for the marketing job market

All the models we estimated confirm that academic stratification exists in the marketing job market. That is, candidates who graduate from top-ranked departments tend to have a better chance of matching with research-oriented hiring departments as compared to other job candidates, all else being equal. At the same time, candidates with publications in top marketing journals enjoy a significant advantage over others in obtaining a position in research-oriented hiring departments. Interestingly, ranking status (an extrinsic human brand cue) interacts with candidates' productivity (an intrinsic cue), such that the value of publishing in top marketing journals is about three to four times more substantial for candidates who graduate from top-ranked degree-granting departments as compared to other candidates, even when the main effect of ranking status is already accounted for. Therefore, ranking status not only influences matching directly via a main effect, but it also significantly moderates the effect of job candidates' publications via the Matthew effect.

Ideally the highest-value candidates to the department should be the most qualified candidates, regardless of the rank of their degree-granting department. In reality, the value of the candidate to a hiring department might be related to the relationship between the hiring department and the degree-granting department, and this might be the source of the stratification. That is, top deparments want to hire from other top deparments as part of the department-to-department value building effort, which may be status-driven rather than solely focused on the specific candidate. If this is indeed the case, actions might be taken to improve the matching process to ensure objective matching decisions that are less rank-dependent. This might decrease department-to-department value creation but improve overall efficiency in the system.

We also find that positive assortative matching (i.e., that similar candidates and hiring departments tend to match) does not always hold in terms of field of research. Interestingly, a higher matching value is produced when candidates are matched with modeling faculty in the hiring department, irrespective of the candidates' own specialty. This might suggest that modeling scholars have high complementarities with other fields. It may also reflect the additional value generated by a mixed group of faculty when they provide a comprehensive marketing curriculum that spans across fields. In light of this finding, job candidates who are not in the modeling field probably should not shy away from departments with a high proportion of modeling faculty. Furthermore, marketing departments without modeling faculty may find it worthwhile to recruit senior modeling faculty in order to attract stronger junior candidates and build synergies across different fields in the long run. It is important to stress that if higher value is produced between faculty of different research fields in hiring, it may or may not translate directly to retention. That is, if junior job candidates do not have senior faculty in similar fields, they may not wish to stay, and this is something that can be examined in future research.

A closer examination of candidates' research productivity reveals different patterns across the three subfields in marketing. Our analysis suggests that publication in top marketing journals may be a more substantial signal of research productivity for modeling candidates as compared to CB or strategy candidates (Model 3). On the other hand, publishing in the category of "other marketing journals" seems beneficial for consumer behavior and strategy candidates, but not for modeling candidates. Publishing in non-marketing journals seems beneficial only for strategy candidates, although the effect is relatively small.

Taken together, we find that the effect of research productivity on matching outcomes depends not only on the specific type of journals the candidates publish in but also on the research field they specialize in. As faculty from different fields and different types of departments tend to have different expectations for job candidates, it is critical for doctoral students to determine which journals to target in order to succeed in the job market. We believe our research serves as a first step in uncovering interesting patterns across subfields in marketing and offering suggestions for job candidates in this regard. It also shifts current thought on the advantages of focusing on publishing in any journal, or only on top journals, to a richer portfolio view of a candidate's research that depends on his or her ranking status, field of research, and targeted journals.

We also confirm that the research productivity of the degree-granting departments serves as an important extrinsic cue that affects placement. In general, candidates from more productive degree-granting departments would appear more competitive in the job market. But this is a relatively weaker human brand cue for the market as compared to a candidate's own publication record.

Implications for human brands research

We contribute to the human brands literature by showing how a two-sided conceptualization can be used to investigate the effect of human brand cues on matching outcomes. Similar conceptualizations could be used to investigate other markets where human brand cues are prevalent, such as the market for celebrity endorsements and online dating markets.

The two-sided empirical model yields new insights that cannot be uncovered using traditional methods such as hierarchical and logistic regressions, because it allows the researcher to examine how the human brand cues from both sides of the market simultaneously interact and influence the matching value of the pair. In addition, this approach circumvents the need to gather data on salaries or other internal transfers, which are often unobserved by researchers.

Two of our empirical findings may resonate in other settings in which human brands are prevalent. First, we find evidence that positive assortative matching may not always take place, and value produced by matching complementary parties may sometimes trump the value produced by matching similar parties. This insight may be relevant in other markets. Second, our study highlights the importance of moderating effects in human brands research given our findings of the Matthew effect and the differential value of publications across research fields. In particular, we highlight the interaction between intrinsic and extrinsic human brand cues which substantially influence the matching outcomes.

Limitations

As discussed, mutual choices are the foundation of the observed placements in the market. However, our work abstracts from the process by which these decisions are made, as data in this regard is difficult, if not impossible, to gather retrospectively. Some human brand cues were not included in the analysis. For example, job candidates' teaching evaluations, which may be important for hiring departments, could not be observed in most instances. Also, unmatched individuals (i.e., marketing job candidates who took a position outside of academia upon graduation) or unmatched departments (i.e., marketing departments that did not hire successfully, although they planned to) cannot be identified retrospectively, although having this information can potentially improve model estimates. In addition, the potential influence of job candidates' individual advisors (Close et al. 2011) is not addressed in this study. Lastly, department culture is often an important determinant in the decision of a candidate to accept or reject an offer. In future research, we aim to collect data on some of these variables.

Second, due to the nature of the matching model we utilize, substantially increasing the number of human brand cues in a model can interfere with the robustness of findings. Thus, while our key findings are robust across different specifications (as shown in the analysis), we cannot identify parameters for a larger, encompassing model that explores all possible determinants of matching value (as well as all their interactions) simultaneously.

Third, the joint nature of the production function allows us to estimate the joint productivity of candidates and hiring departments, but not individual agent considerations. This is a promising venue for future research.

Fourth, the data do not include an important period in the job market: the recession period that started in late 2008 and affected the 2008, 2009, and 2010 job markets. The demand of positions was higher than the supply in consecutive years and due to this fact, some doctoral candidates may have extended their study time. We expect but cannot confirm that hiring patterns changed during this period.

Fifth, the matching process clearly involves a large measure of randomness. We have examined the issue of model specification with regard to error structure, but more could be done on this question. For example, we suspect that the error terms follow a pattern that would be as important to explore as the coefficients on the brand cues themselves.

Appendix A: List of top-ranked marketing departments

Table 6 Financial Times and UTD Top 30, 2000–2005

Arizona State University	University of California at Irvine
Carnegie Mellon University	University of California at Los Angeles
Columbia University	University of Chicago
Cornell University	University of Florida at Gainesville
Dartmouth University	University of Illinois at Urbana-Champaign
Duke University	University of Iowa
Emory University	University of Maryland at College Park
Georgetown University	University of Michigan at Ann Arbor
Harvard University	University of Minnesota at Twin Cities
Hong Kong University of Science and Technology	University of North Carolina at Chapel Hill
Indiana University at Bloomington	University of Pennsylvania
IMD	University of Rochester
INSEAD	University of Southern California
London Business School	University of Texas at Austin
Massachusetts Institute of Technology	University of Texas at Dallas
Michigan State University	University of Toronto
New York University	University of Virginia
Northwestern University	University of Washington at Seattle
Ohio State University	University of Western Ontario
Penn State University at University Park	University of Wisconsin-Madison
Purdue University at West Lafayette	Washington University in St. Louis
Southern Methodist University	Vanderbilt University
Stanford University	Yale University
University of California at Berkeley	York University

Appendix B: Assigning marketing scholars to a research field

We used the procedure shown in Fig. 1 to assign marketing scholars to a field of research.

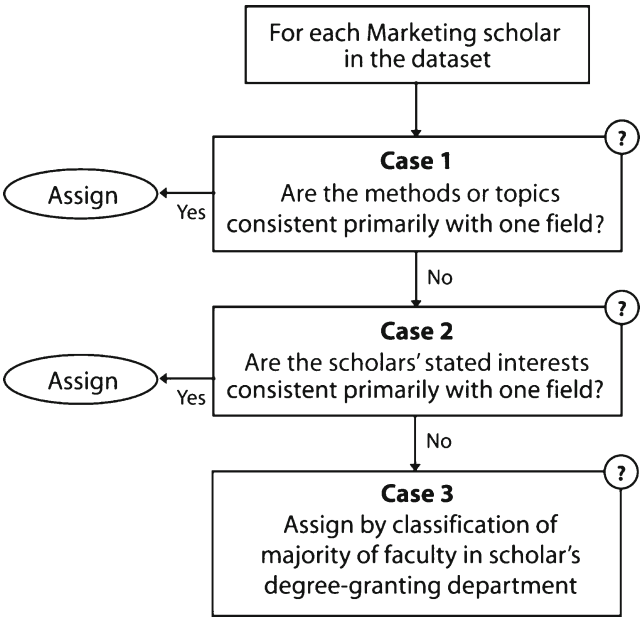

Fig. 1 Algorithm for categorizing marketing scholars by field

As shown in Fig. 1, three cases can arise when classifying marketing scholars by their field of research. These fields are CB, modeling, and strategy, and they are largely distinguished by their methodologies and research topics, in that order.

Case 1

Research methods can sometimes be associated with a particular field. For example, articles focusing on analytical derivations and econometric contributions were categorized as modeling methods, articles relying primarily on experimental manipulation were categorized as CB methods, and articles developing managerial conceptual frameworks were categorized as strategy methods. A marketing scholar was assigned to a field if all research methods used in his or her publications can be attributed to a single field. If a method did not result in classification, then the topic of the publication was used to categorize the scholar. For instance, a paper that examines the success of joint ventures is considered a strategy paper, whereas a paper that relates visual stimuli to advertising recall is considered a CB paper. The marketing scholar was categorized accordingly.

Case 2

Whenever it was not possible to classify marketing scholars based on research methods or publication topics, we turned to the topics of interest for the scholars as stated by them in their website or CV. For example, some scholars used both CB and strategy methods in their research. If the stated interests were "marketing strategy" and "marketing management" they were then classified as strategy; if the research interests were stated as "consumer behavior" and "consumer psychology," they were then considered CB researchers. In ambiguous cases, the first stated interest on the scholar's webpage was used for categorizing the scholar.

Case 3

If neither web pages nor publications were found for a marketing scholar, then we identified all faculty members who worked in the scholar's degree-granting department at the time of his or her graduation. We categorized these faculty members by field of research using the methods above, and the most common field of research among the department's faculty was assigned to the scholar. Cases in which no information was available for the scholar were rare: in our dataset, only 36 (6.8%) job market candidates had neither university webpage nor searchable information on publications.

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