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Acquired taste or acquired knowledge? Experience, talent and popularity in creating French superstar Cuisine

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Abstract

Creating novelty is vital for the long-term survival of firms, yet what are the foundations of the ability to do so? Where the importance of learning for innovation has been demonstrated extensively, competing paradigms explaining novelty and success – most notably the notion of ‘creativity’ – also become more accepted nowadays.

Since in many industries the distribution of success or performance is highly skewed, the question arises what relative contribution knowledge and/or experience, talent and popularity make to the success of so-called Superstars. This paper therefore aims to disentangle these explanations in the case of French star-rated chefs. Based on a unique dataset consisting of 569 biographies of French chefs the paper argues that due to the skills needed in order to cook professionally, ‘high quality’ experiences at the early stages of a career are important. Popularity, however, seems to be most important, while talent only seems to matter in the exceptional case of true superstars.

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Abstract: Creating novelty is vital for the long-term survival of firms, yet what are the foundations of the ability to do so? By choosing a more extensive notion of human capital over the classical focus on learning, the paper aims to explore the relative contribution knowledge and/or experience, talent and popularity make to the success of so-called Superstars. Aside from the known importance of learning or know-what and tacit knowledge acquisition or know-what, this paper argues for the importance of know-who to become really successful in the case of French star-rated chefs. Based on a unique dataset consisting of 569 biographies of French chefs the paper argues that due to the skills needed in order to cook professionally, ‘high quality’ experiences at the early stages of a career are important. Popularity, however, seems to be most important, while talent only seems to matter in the exceptional case of true superstars.

Introduction

In the increasingly creative economy, human capital is undisputedly important for the competitiveness and hence performance of firms. The knowledge, competences, skills and abilities that people bring into an organisation is the key factor explaining differences in firm performance. Understandably, the notion of human capital in general – and knowledge as most important yet more specific dimension – has generated a vast body of literature including strategic management (Barney, 1991; Prusak, 1997), economics (Pavitt, 1984; Cowan, David, & Foray, 2000; Lockett & Thompson, 2001), economic geography (Maskell & Malmberg, 1999; 2007; Gertler, 2003), organisational sciences (Nonaka & Takeuchi, 1995) among others. This literature, however, “*quickly converged on knowledge embedded in human capital as perhaps the most universally valuable and imperfect imitable resource*” (Crook et al., 2011; p. 443).

Although considerable ambiguity exists, it is commonplace nowadays to reappraise Polanyi’s original distinction between tacit and explicit knowledge – although the exact phrasing may vary (Polanyi, 1966; Gertler, 2003). The emphasis on the knowledge dimension of human capital has generated a lot of insight about how people, organisations and even regions ‘learn’ (Nelson & Winter, 1982; Nonaka & Takeuchi, 1995; Boschma, 2004). Learning mechanisms such as social networks, spin-off dynamics and co-location have all been revealed as mechanisms for *how* economic agents learn, yet often focus on codified forms of knowledge and assume learning to take place when these mechanisms are in place. When it comes to human capital as a broad principle, its relation to firm success remains ambiguous (Newbert, 2007; Crook et al., 2011). The re-examination of tacit knowledge (Gertler, 2003) has reversed some of this convergence on learning. Talent and creativity are among those highly tacit assets that are said to be important too instead of or alongside with the classical learning arguments (Florida, 2002; Florida, 2012). With the increasing popularity of these latter notions, this paper aims to explore whether different forms of knowledge – as principle dimensions of human capital – contribute (equally) to firm success arises, thereby contributing to understanding the evolution of successful firms.

Aside from the distinction between tacit and explicit knowledge, this paper argues there is a third sort of knowledge that is crucial for individuals and firms to excel. Whereas know-what, or procedural knowledge, and know-how – the implicit ability to understand a situation – have shown to be important the success of firms also depends on ‘know-who’. Irrespective of the degree of tacitness, the apprecia-

tion or implications of the ability to know-what or -how is highly contextual (Gertler, 2003). Such context dependency is especially relevant in the so called creative or cultural industries as these firms activities are based on adding value through leveraging knowledge (HOWKINS). When producing experience goods in general, the knowledgeability of (end-) consumers can be an issue: Are customers 'equipped' to fully appreciate the symbolic representation that an experience good embodies? To avoid sub-optimal outcomes, Akerlof (1970) show the need for third party intermediation that is able to bridge the information asymmetry between producer and consumers. Such intermediation needs, however, the ability from a producer that makes him/her distinct from competitors. A considerable part of the distinctiveness capability is believed to be defined by one's popularity. In some industries, the ability to attract attention or signal oneself amongst others may be similar to what the abilities needed to produce novelty (in advertising for instance), but in most cases, it is not.

Moreover, the question arising in the context of creative industries is not so much about the effect of creative processes on firm performance, but the constituents of creativity itself. Know-what is needed to acquire the entry-level skill to produce the highest quality. Know-how is the tacit understanding of the market, where know-who is the ability to cope with vicarious selection that is intrinsically needed when dealing with experience goods. But what is their relative contribution to the performance of firms over time? Hence this paper explores what the relative contribution of learning (know-what), talent (know-how) and popularity (know-who) is to the success of French superstar chefs.

The choice to study the phenomenon in a sample of French chefs is inspired by 1) the rather clear definition of success set by restaurant critics such as Michelin (and their star-system) 2) the suggested importance of both learning, talent and popularity in the profession, and 3) the seemingly creative nature of the industry. Additionally, the focus on superstar chefs allows to theorize along similar lines as the ongoing debate is characterized by talent-based explanations on the one hand and popularity externalities on the other.

The definition of what success is in the restaurant industry has been defined by Michelin for decades. Their annual red guide has been the bible for gastronomes, especially since the re-instatement of the star-system in 1951. Each year, Michelin awards restaurants a one-star rating if restaurants are "*good in their category*", two stars to those restaurants that are "*excellent and worth a detour*" or the elusive three-stars indicating that "*the cuisine is exceptional, worth a special journey*;

one always eats extremely well here and sometimes superbly” (Michelin,1933). The criteria for gaining stars mainly involve the quality, skill and creativity in the preparation of the meal. Although stars are awarded to restaurants – the preparation of food is a team-effort in most kitchens nowadays – the ‘chef de cuisine’ remains to be the pivotal point creating the experience (Rao, Monin, & Durand, 2003). Furthermore, the highest obtainable rating has only been awarded to 50 restaurants in France since WWII, making Michelin stars the most sought-after form of personal recognition in the industry and the definition for superstars adopted in this paper.

Aside from the personal recognition, the criteria “the skill in the preparation” and “the level of creativity” imply that both learned skill and creativity are vital to succeed. Knowledge spill-overs are considered to be the principle mechanism for learning skills through a system of apprenticeships. On the typical career ladder chefs climb ranks from ‘commis de cuisine’ to ‘chef de cuisine’ by advancing through the (predefined) ranks after graduating culinary school. While many make it to the rank of chef de cuisine, few gain the three star rating and are recognised to be the absolute top. Learning may matter, but only partially explains ability. Ability-based explanations of (disproportionate) success can be traced in the literature by two competing theories: Rosen's theory of amplification (Rosen, 1981) or Adler's argument about positive popularity-based network externalities (Adler, 1985; 2006). Rosen's theory suggests that minor differences in ability accumulate over time as a process much akin to evolution. Adler, on the other hand, argues that even when equally endowed with capacity, the ability to create network externalities through consumer capital is what makes a superstar (Adler, 1985). With the addition of more conventional learning approaches there are three prominent theories that could explain the disproportionate success of the lucky few.

In this paper, the biographies of 569 French chefs are analysed to gain more insight in the success of chefs and the role of learning versus talent and popularity. Since talent is notoriously hard to quantify (Krueger, 2005), this paper suggests an indirect approach to approximate talent used alongside more classical approximations of learning-by-doing and popularity. Aside from a general comparison of success factors, it is also likely that the relative impact of the three explanations may differ between the levels of success. The different degrees of success (Michelin stars) allow to not only to account for success, but also to discriminate superstars (three-star chefs). Such more detailed analysis of the different levels of success is provided to

further understand the differentiation within the Michelin system itself. The paper continues by explaining the theory behind superstars in general and how such theories may apply to the case of French gastronomy specifically. The data and methods are then described in more detail in section Three. Section Four provides the results of the analyses, followed by conclusions and discussion in section Five.

Theory

Theories relevant for understanding the performance of restaurants can be roughly divided into two strands that seem to run parallel to the knowledge versus ability divide sketched above. The first strand focusses on the restaurant as service-provider thereby emphasising mainly the **production** of knowledge, learning effects and craftsmanship (Fine, 1992; Gomez, Bouty, & Drucker-Godard, 2001; Gergaud, Smeets, & Warzynski, 2009; Di Stefano, King, & Verona, 2011). A second type of literature reflects more specifically on creative **talent** and hard-to-grasp abilities that may be needed to become successful, amplifying the artistic side of creation (Hornig & Hu, 2008; 2009; Ehrmann & Meiseberg, 2009; Stierand, Dörfler, & MacBryde, 2009; Lane, 2010). The reason for such ambivalence in the literature is because chefs “*are able to take on the dual role of business-person and creator at the same time*” (Balazs, 2001, p. 135); thereby embodying both productive knowledge and creative knowing. More recent talent-oriented literature, furthermore, suggests the superstar effect gaining importance as “*chefs are starting to be considered like artist, genius of a world that has its own rules, boundaries and gatekeepers*” [sic] (Cerea & Rurale, 2010, p. 1) and the industry becoming more creative than knowledge oriented; or more artistic than craft. These multiple roles being embodied by a single person indicates an intricate relation between classical ideas of knowledge production versus creativity. Nonetheless, regardless the interrelatedness and ambiguity, there are some distinguishable differences in their importance and relative contribution to the success of chefs that need to be explored.

Knowing how to cook and the role of experience

The dominant mode of accumulating knowledge in the restaurant industry is learning-by-doing. Through a system of apprenticeships, chefs gradually climb the career ladder, starting from ‘commis’ and finally achieve the ranks of ‘head’ or ‘executive chef’. At each rank,

they practice skills acquired so far and often extent their capabilities, both in terms of skills and creativity or style (Gillespie, 1994; Gomez, Bouty, & Drucker-Godard, 2001). Although recipes may be written down, this particular way of learning habitually involves knowledge that is high in its degree of tacitness, since there is a certain touch to cooking that just cannot be learnt other than by doing (Gomez, Bouty, & Drucker-Godard, 2001; Stierand, Dörfler, & Lynch, 2008). Where the learning-by-doing is an important learning mechanism for individuals, the labour mobility of chefs causes knowledge to disseminate between firms. The subsequent success of firms therefore depends heavily on the learning trajectory of individuals, most notably the leading chef in the kitchen, as he or she is the prime source of creative knowledge to spill over into the organization (Ehrmann & Meiseberg, 2009; Gergaud, Smeets, & Warzynski, 2009; Bouty & Gomez, 2010). Moreover, in a system of apprenticeships, the places and people a chef worked with in the past are often decisive for the success of his or her own business. Partly, this effect is due to reputation and word-of-mouth advertising, but empirical evidence shows that the better the master, the better the apprentice (Gergaud, Smeets, & Warzynski, 2009; Di Stefano, King, & Verona, 2011).

One valuable tacit principle to learn is to continuously cook the same high-quality food; an important criterion for Michelin to award stars (Ottenbacher & Harrington, 2007). One way of assuring such continuity is to secure stability in the kitchen brigade (Bouty & Gomez, 2010). Many ‘new’ chef de cuisines have worked under the previous chef for a considerable period (Yannai, 2005). That observation not only implies continuity of standards to persist between generations of chefs, but also corroborates the suggestion that interpersonal proximity is important for learning and possibly success. The performance of previous chefs is thus anticipated to be important (**Hypothesis 1**), with a stronger effect as star-ratings increase (**Hypothesis 2**). In general it seems logical to also think that the better the master, the better the apprentice is likely to be. The accumulated stars as an indication of a job’s quality is therefore believed to have a positive effect: the more stars a chef has experienced before becoming chef de cuisine, the higher the chance of gaining stars (**Hypothesis 3**).

Hypotheses

1. The accumulated star-rating of the restaurant has a positive effect on the current chef’s chance of obtaining any star-rating
 2. The positive effect of accumulated stars on the chef’s chance to obtain stars will increase as star-ratings increase
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Although the exposure to learning experience may have a positive effect on what is actually learned, individuals – like organisations – are subject to constraints in their learning capacity; one’s ability to absorb knowledge is not unlimited (Hayek, 1945). As the ability to use new knowledge is related to related knowledge learned before, the conventional absorptive capacity argument would hypothesise a curvilinear effect of amount of experiences on his/her success (Cohen & Levinthal, 1990). Moreover, the relatedness of prior knowledge is also reflected in the way expert opinions – most notably the Michelin guide – affect the industry and support the creation of superstars (Olders, 2013). Although the lower ratings reflect more variety in cuisine and Michelin issues guides for many European countries, their standards and preferred cuisine are still believed to be French (Dixon, 2008). Another example concerns Michelin’s seeming reluctance to degrade three-star chefs; they often maintain their top-rating for decades.

While past masters are assumed to be crucial, not all dimensions of the work experience are anticipated to have a similar role for the different degrees of success. One-star restaurants nowadays are not clearly characterised in terms of their cuisine – but are rather “exceptional **in their category**”. Gastro-pubs, Asian, French or fusion restaurants are all able to gain the one-star rating (Economist, 2000). Hence there will be no evident experience related factor contributing to their success apart from the accumulated qualities of the chef as generalized in hypothesis 3.

In a two-star restaurant, the chef’s signature becomes more relevant albeit less than for three stars. In addition its cuisine needs to be significantly better than what is served in one-star restaurants. Even though they serve the same market to a large extent (Economist, 2000), the main distinction is more refinement. Carefully selecting the restaurants to work in to complement personal development is believed to be important in distinguishing two-star restaurants from lower rated ones. In that respect, the more diverse the previous experiences have been, the less likely a chef is to acquire the skill-specialisation needed to gain a two-star rating.

Chefs aiming for a three-star rating emphasise the importance of creating their own style (signature) within these high standards. Aside from experiences at the absolute top, achieving such a personal cuisine is mainly a matter of focus on a limited set of dishes, techniques and ingredients. While the ‘quality’ of work experiences may count,

the diversity should be limited. As such, the focus on a chef's signature, especially for two and three star chefs, is believed to come with an intermediate amount of different experiences (**Hypothesis 4a**); or alternatively it is anticipated that the amount of different experiences has a negative effect on the success of chefs (**Hypothesis 4b**).

Hypotheses

4a. The amount of experiences has a curvilinear effect on a chef's chance of obtaining a star-rating

4b. The amount of experiences has a negative effect on a chef's chance of obtaining a star-rating

The innate ability to create cuisine

Superstar excellence in general entails the creation of non-linear externalities or increased returns to ability (Franck & Nüesch, 2012). Disproportionate excellence is thereby seemingly related to both innovation and creativity as it concerns the assemblages of various inputs into an outcome that is considerably more than its parts. This generalization may explain why the most common theories of superstars are different but not mutually exclusive. Rosen's theory is in that regard endogenous to the superstar, as initial minimal differences in ability create larger returns to scale that re-iterate over time; much akin to a Polya-urn model of development (Arthur, 1989). As Rosen explains (1981, pp. 846-847):

“Convexity of returns and the extra skew it imparts to the distribution of earnings can be sustained by imperfect substitution among different sellers, which is one of the hall-marks of the types of activities where Superstars are encountered. Lesser talent often is a poor substitute for greater talent... hearing a succession of mediocre singers does not add up to a single outstanding performance....Imperfect substitution alone implies convexity and provides a very general explanation of skewed earnings distributions. ...However, preferences alone are incapable of explaining the other aspect of the Superstar phenomenon, the marked concentration of output on those few sellers who have the most talent... Thus a performer or an author must put out more or less the same effort whether 10 or 1,000 people show up in the audience or buy the book. More generally, the costs of production (writing, performing, etc.) do not rise in proportion to the size of a seller's market.”

In contrast, Adler's proposition on the formation of superstars is not entirely endogenous, but suggests that that superstar status increases through the accumulation of consumer capital or popularity. The main reason for an alternative explanation is that Rosen's model im-

plies that if a star is both disproportionately popular and rich, his/her talent must be similarly greater by exactly the right amount.

The basic principle of Adler's theoretical explanation is that the more popular a chef is, the more attention he will receive. This in turn informs consumers better which is essential as Adler argues that the marginal utility of superstar consumption increases with the ability to appreciate it. Customers thus need to be informed, which exponentially grows according to this argumentation as consumers prefer to consume what others also consume. There is, therefore, no need for talent differences to exist to become a superstar in the Adler model, making it a more dynamic and stochastic process in contrast to Rosen's relatively linear theory of superstar growth. Who becomes a superstar can in Adler's theory depend on chance or luck (Adler, 1985). Hence the question central to the Rosen-Adler debate is whether initial differences are innate to the chef or coincidental. If a generalized theory of talent does play any role in the career success of chefs, irrespective of the exact explanation, then the star-rating of the first job experience and an increase in star-rating during the first job move should have a positive and significant effect on the star rating chefs obtain in their position as chef de cuisine (**Hypotheses 5 & 6**).

Hypotheses

5. The higher the star rating of the first job experience is, the better the star-rating as a chef de cuisine.
 6. The higher the star increase between the first job and second experience, the better the star-rating as a chef de cuisine
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With respect to the relative contributions of talent and popularity versus experience, some propositions can be theorized as well. In general, some literature suggests that considerable parts of the creative process are affected by a positive learning environment (Sawyer, 2006). Following the literature on the culinary creative process, it becomes evident that there is a learning-based technical prerequisite that needs to be met in order to fully transform ideas into dishes. "*Professional cooking is situated amid demands for aesthetic choices, consistency, efficiency, autonomy and highly skilled labour*" (Fine, 1992, p. 1271). Those skills are the foundation of the culinary profession; "*without professional knowledge and skills, it is difficult to learn cooking professionally and properly*" (Peng, Lin, & Baum, 2012). Competence specialization based on such professional knowledge increase as chefs climb the ladder in the kitchen hierarchy as tasks become more complex (Gomez, Bouty, & Drucker-Godard, 2001). Finally, in team-based settings there is emerging evidence that the performance of the leader's success may

depend on the level of expert knowledge (Goodall, Kahn, & Oswald, 2011).

It does, however, appear unlikely that talent and knowledge are equally important as star-rating increases. A one-star rating is given to restaurants that are good in their category, implying a more skilful but not necessarily creative cuisine. The main reason to suspect is based on the need to create a signature as a chef, as it will potentially imply a bigger need to be creative and distinctive. Developing a distinct signature in cooking becomes more important for the higher levels of star-rating. In particular for three star restaurants, the process of incubating and developing ideas, "*imagination plays a more vital role than pre-existing knowledge*" (Hornig & Hu, 2009, p. 377), or the talent for taste is anticipated to become most important. Higher star-ratings are believed to be more depending on such talent related skills than lower ones. As such, **Hypothesis 7** postulates an increasing effect of talent as star-rating increases. More importantly, if it is indeed a cumulative process of initial differences, then the interaction between talent and time should prove positive (**Hypothesis 8**)

Likewise, Adler's explanation of superstar formation would suggest similar trends for popularity. The more you know, the greater the enjoyment is the most concise statement of the Adler's theory. Accumulating such consumer capital occurs in three ways: 1) exposure to the art itself; 2) word of mouth advertising and discussions; and 3) the media. "*[W]hen the artist is popular, it is easier to find discussants who are familiar with him or to find media coverage about him. This is why consumers prefer to consume what others also consume*" (Adler, 2006, p. 898). Marshal likewise explained that the taste for 'good' music was an acquired taste that is likely to increase over time through exposure: "*It is therefore no exception to the Law (of diminishing marginal utility) that the more good music a man hears, the stronger is his taste for it likely to become*" (Marshal, 1891, p. 151). Regardless of the exact theoretical underpinnings, it seems reasonable to assume that similar to talent, more recognition increases the probability of generating such network externalities (**Hypothesis 9**) and that the longer a chef is in his position, the greater the effect of popularity (**Hypothesis 10**).

Hypotheses

7. The higher the star-rating, the more important talent becomes.

8. The longer a chef 'chef de cuisine', the bigger the effect of talent on star-rating

9. The higher the star-rating is the more important popularity is

10. The longer a chef is in his position as chef de cuisine, the greater the effect of popularity on star-rating

Data and Methodology

Data

The data used to explore the hypotheses consists of the biographies of French ‘chefs de cuisine’ that were taken from ‘*Les Etioles de la Gastronomie Française 1998-1999*’ (Bottin Gourmand, 2000) and ‘*The International Who’s Who of Chefs*’ (Yannai, 2005). Although the latter is more recent and covers chefs until 2004, only those chefs that were in the position of ‘chef de cuisine’ were taken. The database consists of 569 chefs that meet this requirement. All biographies have been quantified to the most detailed extent possible (Table 1).

Table 1: Variables included in the regressions

<i>Dependent variables</i>	
MAX_PRICE^a	Maximum price for a meal in the restaurant (1999- Francs)
CITATIONS^b	Total number of a chef’s citations in French press until 1999
HIGH_RANK^c	Star-rating of the restaurant in years 2 - 4 as chef de cuisine
<i>Variables related to the restaurant</i>	
STAR_RATING	Star rating in 1999
COMFORT	Comfort Rating (1-5)
PARIS	Restaurant located in Paris
HOTEL_REST	Hotel-restaurant dummy
RED	Peaceful atmosphere and setting (red forks) dummy
ROOMS	Number of rooms
QUIET	Indicated as (Very) quiet
VIEW	Indicated to have an exceptional view
A_LA_CARTE	Whether the price indicated is a la carte or not
PREV_STAR	Previous stars*years at start of chef’s position
<i>Variables related to the chef</i>	
NB_EXP	Total numbers of different experience
STARS_EXP	Total amount of stars*years during career
AWARDS	Number of awards won by chefs
STAR_1	Star rating of chef’s first experience
DIFF_1	Difference in star rating of chef’s first job-move
PARIS_1	First experience in Paris dummy
TIME	Years since appointment as Chef de Cuisine
TALENT	Residuals from EQ1 (talent proxy ‘e’)
POPULARITY	Residuals from EQ 2 (popularity proxy ‘u’)

^a: dependent variable in hedonic regression; ^b: dependent variable in negative binomial regression; ^c: dependent variable in logit-regressions

As both the introduction and theory sections reveal, superstardom in this paper is defined according to the Michelin star-rated system. Hence, a considerable addition to the biographical data identifying excellences comes from the annual Michelin red-guides. Cross-referencing the work experience with restaurant-level data derived from the red guides enables to assess the ‘quality’ of the working experiences experience. Several other indicators are also based on the red guide that will be explained in the next section. The final source of data is the Lexis-Nexis newspaper database which has been used for press-citations as will be explained.

The use of four different sources of data inevitably comes with limitations. In particular the use of Michelin guides over a prolonged period of time to approximate experience limits the spatial scope of this paper to France. Although it may seem as a considerable downside, French cuisine has long been considered the apex of excellence, making it not just an informative, but most likely case to study.

Variables

The paper uses three dependent variables in three separate analyses. These dependent variables are the price for a meal as listed in the 1999 Michelin Guide (MAX_PRICE), the total number of citations in the national and regional French press (CITATIONS) taken from LexisNexis and, the highest Michelin star rating awarded in the second to fourth year since a chef took the position of chef de cuisine (HIGH_RANK) taken from the respective Michelin guides. The reason to choose years two to four is because the average time chefs have a position during their careers is 3.5 years. The first year is, used to adopt to the new working environment and does not indicate a chef’s personal contribution to the star rating of the restaurant; a chef has a year to prove skilful when taking over a star-rated business.

The rest of the variables can be divided into two categories: 1) those that relate to the restaurant and 2) indicators that identify characteristics of the chef’s working experience. Restaurant variables include the star rating in the 1999 Michelin guide (STAR_RATING), the luxury rating of the restaurant in the same year as indicated in the guide (COMFORT), whether or not the restaurant is located in Paris (PARIS), if the restaurant is part of a hotel (HOTEL_REST), how many rooms the hotel/restaurants offer (ROOMS) and if the meal price indicated is a la carte or not (A_LA_CARTE). Additionally, some indicators of the restaurants’ surroundings are included; if it indicated to have a peaceful atmosphere (RED); if the restaurant is

indicated to have a (very) quiet environment (QUIET) or an exceptional view (VIEW). These variables are all based on whether or not these indications are given by the Michelin guide. A final variable at restaurant level is the total amount of stars awarded to the restaurant before the chef takes a position as chef de cuisine (PREV_STAR).

Variables that relate to the chef either come from the biographies directly, or in combination with the restaurant data. This category includes: the total number of workplaces a chef has worked before his position as chef de cuisine (NB_EXP) and the squared term (NB_EXP²), the quality of his experience as the total number of stars accumulated over his previous job positions (STARS_EXP) as well as the number of awards the chef has won during his career (AWARDS). Several variables are included that characterize a chef's first job position specifically: the star rating of the chef's first job experience (STAR_1), the difference in star-rating between the first and second job position (DIFF_1) and whether that first position was in a Parisian restaurant (PARIS_1). Finally, the two time-related controls are CHEF_TIME and TRAIN_TIME. The first measures the number of years between 1999 and the year the chef took his position as chef de cuisine, while the latter (TRAIN_TIME) is the number of years he or she trained on the job.

Methodology

The above variables are used in a multi-step methodology. The first step is to account for chefs' talent irrespective of the restaurant's or chef's identifiable expressions of appraisal. The regression method here is inspired by the hedonic regression, which is a method that can solve for the problem of appraisal (Coulson, 2008). Hedonic regressions are mainly used for housing prices, but has also been used for instance for wine (Oczkowski, 1994; 2000; Combris, Lecocq, & Visser, 1997; 2000) and restaurants (Chossat & Gergaud, 2003; Gergaud, Guzman, & Verardi, 2007). However, the exact specification of the hedonic function is not the goal of the method, but a means to account for several effects known from the literature so that the unexplained variance (ϵ) approximates a chef's talent. This strategy is thus very similar to the approach of Frank and Nüesch (2012) as it also starts with a regression on an alternative performance indicator; in this case price (MAX_PRICE). The rationale applied here is that in a hedonic regression, the appraisal of the food experience as a whole can be disentangled into three components; the restaurant as a place, the chef as a person and the food as product. The talent to

create appraised food is most interesting, yet difficult to approximate. However, by proxying for most of the measurable restaurant's and chef's dimensions of appraisal that are reflected in pricing, the resulting error component (ϵ) captures mostly the talent to create food experiences that finds appraisal by customers, critics and peers (Eq. 1).

$$MAX_PRICE = \alpha + \beta \cdot \text{restaurant's attributes} + \gamma \cdot \text{chef's attributes} + \epsilon \quad (\text{Eq.1})$$

The errors (ϵ) are estimated in a quantile-regression with 1,000 bootstrap repetitions for robustness (Koenker & Hallock, 2000) and used as a variable (TALENT) in subsequent model. The choice for a quantile-regression technique is based on the semi-parametric specification. Where conventional OLS imposes a parametric assumption on the errors (ϵ), quantile-regression (Koenker and Basset, 1978) assumes “*no parametric distributional form for the random errors in a model*” (Cade & Noon, 2003). As such, quantile-regression allows to estimate the model under the conceptual and statistical link between the errors and covariates.

In a similar way, a second model is estimated to approximate a chef's popularity independent of his performance (Eq2.):

$$\ln(CITATIONS) = \alpha + \beta \cdot \text{restaurant's attributes} + \gamma \cdot \text{chef's attributes} + TALENT + u \quad (\text{Eq.2})$$

All regressors used in the previous model (Eq.1) and the talent proxy are OLS-regressed on the dependent variable, which is the log-transformed number of citations a chef gets in the French press (CITATIONS). The resulting error of this model (u) reflects as chef's popularity independent of his performance and talent. Both the estimations for talent and popularity are calculated in hindsight. The maximum price of a meal is measured in 1999 and so are the citations. The main reason to do so is because an ex-post assessment of such factors seemed more sensible; it is easier to indicate who is talented and who is less so in hindsight.

The third model estimates the effects of chefs' individual characteristics on the level of success (HIGH_RANK), which is the main aim of this paper. Because the Brant's test¹ for the parallel regression assumption did not hold, a multinomial regression was deemed most informative. As the Hausman and Wald tests helps the validation of

¹ $\chi^2(20) = 68.64, p < .0001.$

the categories that are of thematic interest to this paper, the multinomial regression is considered more insightful than other alternatives to the ordered logit. The descriptives of the variables used in all regressions are reported in Table 2.

Table 2: Descriptives of the variables in the regression

Variable	N	Min	Max	Mean	SD
MAX_PRICE	528	98	1520	437.758	187.524
CITATIONS	569	0	380	6.916	29.076
HIGH_RANK	527	0	3	0.512	0.757
STAR_RATING	569	0	3	0.592	0.802
COMFORT	528	1	5	2.837	0.882
PARIS	556	0	1	0.164	0.370
HOTEL_REST	528	0	1	0.313	0.464
RED	528	0	1	0.248	0.432
ROOMS	527	0	943	22.996	80.911
QUIET	527	0	2	0.349	0.664
VIEW	527	0	2	0.243	0.546
A_LA_CARTE	569	0	1	0.559	0.497
NB_EXP	569	0	15	3.712	1.898
STARS_EXP	569	0	61	10.350	11.087
PREV_STAR	529	0	136	8.540	19.297
STAR_1	540	0	3	1.009	1.008
AWARDS	569	0	8	0.369	0.990
DIFF_1	569	-3	3	0.071	1.206
PARIS_1	569	0	1	0.218	0.413
CHEF_TIME	526	2	55	12.797	8.936
TRAIN_TIME	516	0	41	10.412	6.087
TALENT	464	-342.925	1003.07	4.399	107.252
POPULARITY	464	0.238	345.662	7.456	24.393
VALID	464				

Results

The results of the hedonic regression are presented in Table 3. Although the results are mainly instrumental, some interesting effects about restaurant pricing can be mentioned. In line with expectations, a star rating has the biggest impact on price. For each additional star,

the price of a meal increases by approximately 17 euros². Not surprisingly, the luxury (comfort) of a restaurant also has a considerable positive and significant effect, while Parisian restaurants tend to be circa 11 Euros more expensive just because of being located there. Likewise, restaurants offering an a la carte menu or with a peaceful atmosphere (RED) charge significantly more. Other amenities, such as the quiet environment or view do not matter.

Table 3: Results of the hedonic regression estimation

Variable	Coefficient (SE)
INTERCEPT	116.149*** (21.192)
STAR_RATING	104.954*** (8.821)
COMORT	60.106*** (5.982)
PARIS	71.329*** (14.784)
RED	34.860*** (12.864)
HOTEL_RESTAURANT	5.476 (11.987)
ROOMS	-0.080 (0.098)
QUIET	7.657 (8.200)
VIEW	4.834 (10.629)
A_LA_CARTE	28.805*** (10.698)
PREV_STAR	0.997*** (0.294)
NO_EXPERIENCES	2.770 (3.377)
STARS_EXPERIENCED	0.3887 (0.601)
STAR_1	-1.841 (6.526)
DIFF_1	-8.239 (5.429)
PARIS_1	-16.178 (9.029)
CHEF_TIME	1.853*** (0.558)
N	464
R ² (Pseudo)	0.501

*significant at the 90%-level; **significant at the 95%-level; ***significant at the 99%-level; standard errors in parentheses;

Contrastingly, the specific characteristics of chefs do not seem to matter, except when it entails the reputation of a restaurant, calculated as the amount of stars gathered before the chef became chef de cuisine. Overall, the model explains half of the variance in price, which is a high given the limitations of the data in comparison to other reported values of hedonic regressions in the culinary field (Oczkowski, 1994; Chossat & Gergaud, 2003). Finally, it seems that

² Prices listed are in Francs; 1 Euro = 6.56 F (fixed conversion rate of December 31st 1998)

mainly restaurant attributes are reflected in the price, as none of the chef's attributes prove significant except for the years the chef is in his/her position.

The results of the second estimation needed to construct the popularity residuals are reported in Table 4. Although the restaurant related variables are of less interest, it is analytically reassuring to see the influence of star- and comfort-ratings being significant as well as the importance of Paris in attracting attention.

Table 4: Estimation results for the OLS-regression

Variable	Coefficient	(Standard error)
Intercept	-0.258	(0.237)
STAR_RATING (ref =0 stars)		
1 Star	0.463***	(0.106)
2 Star	1.463***	(0.190)
3 Star	2.091***	(0.278)
COMFORT (ref =1 fork)		
2 forks	0.356*	(0.183)
3 forks	0.307	(0.184)
4 forks	0.651***	(0.229)
5 forks	1.229***	(0.338)
PARIS	0.554***	(0.135)
HOTEL_REST	0.107	(0.118)
RED	0.121	(0.132)
ROOMS	-0.001**	(0.001)
QUIET (ref= no quiet surrounding)		
Quiet surroundings	-0.098	(0.141)
Very quiet surroundings	-0.274	(0.182)
VIEW (ref = no exceptional view)		
Exceptional view	-0.045	(0.141)
Very exceptional view	-0.132	(0.197)
A_LA_CARTE	-0.098	(0.100)
NB_EXP	-0.046	(0.029)
STARS_EXP	0.014***	(0.005)
PREV_STAR	-0.011***	(0.002)
START_STAR	-0.166***	(0.064)
AWARDS	0.045	(0.053)
DIFF_1	-0.056	(0.046)
PARIS_1	0.387***	(0.104)
CHEF_TIME	0.000	(0.005)
TRAIN_TIME	0.027***	(0.008)
TALENT	-0.000	(0.000)
N	464	
R² (Adjusted)	0.426	

*significant at the 90%-level; **significant at the 95%-level; ***significant at the 99%-level; standard errors in parentheses;

It is, however, also a suggestion of considerable bias from the media towards awarded and luxurious places in the Parisian food scene and perhaps even reproducing the Michelin principle.

A more surprising result concerns the negative significance of the variables that approximate a chef's success in the early stages of his/her career (START_STAR) as well as the reputation of the restaurant (PREV_STAR). Being successful early on, or taking over seems to have a negative effect on getting media attention. Perhaps more important, the talent to create appraised food (TALENT) does not seem to have any effect either. Similarly, the recognition of peers during training, expressed in the number of culinary awards (AWARDS) does not matter.

Finally, the results of the multinomial models are presented in Table 5 (next page). A first thing to notice is that the stars are exclusive indeed. In comparison with the omitted no-star category, the baseline chances to obtain a star rating are slim; 11% for the one star category, 1% for two stars and a chance close to zero for the highest category. Undisputedly important and, moreover, persistent regardless of category is the reputation of the restaurant, approximated by the star-performance of previous proprietors. Apparently, a considerable part of a chef's success is created not by him/herself, but by the previous chef(s) de cuisine.

In relation to the learning experience versus talent debate, it seems initially that in order to achieve a one star status, high-quality experience matters; the better the masters, the better the apprentice. However, the inclusion of popularity diminishes any effect of the job history except the quality of the first experience. Those chefs that started their career in a star rated restaurant (mostly as commis) seem to have a significantly higher chance of obtaining stars when they are at the apex of their careers. For three-star chefs – the superstars of French Cuisine – the hard-to-understand X-factor seems to come into play: both the talent residual and time being positive and significant implies a tentative indication of the necessity to accumulate some innate talent related ability over time to become really successful. Popularity is even more important, although it wears off over time, significantly decreasing the chances of becoming a star.

Table 5: Estimation results for the multinomial regressions.

Variable	Model 1			Model 2			Model 3		
	1-star	2-star	3-star	1-star	2-star	3-star	1-star	2-star	3-star
Intercept	-2.200*** (0.609)	-3.797*** (1.087)	-9.267*** (2.174)	-2.098*** (0.661)	-4.529*** (1.489)	-12.983*** (3.707)	-3.335*** (0.774)	-4.465** (1.784)	-14.295*** (4.474)
NB_EXP	-0.059 (0.241)	-0.809** (0.323)	-0.594 (0.454)	-0.201 (0.245)	-1.288** (0.592)	-1.235 (0.866)	-0.235 (0.258)	-1.479** (0.594)	-2.130* (1.182)
(NB_EXP) ²	-0.015 (0.028)	0.049* (0.028)	0.056* (0.030)	0.007 (0.027)	0.091 (0.062)	0.141* (0.078)	0.015 (0.029)	0.116** (0.059)	0.210* (0.120)
STARS_EXP	0.032** (0.015)	0.076*** (0.023)	0.038 (0.032)	0.010 (0.016)	0.041 (0.031)	-0.063 (0.062)	-0.026 (0.025)	-0.027 (0.052)	-0.285** (0.140)
PREV_STARS	0.077*** (0.012)	0.123*** (0.015)	0.145*** (0.017)	0.086*** (0.013)	0.160*** (0.020)	0.211*** (0.028)	0.100*** (0.015)	0.178*** (0.022)	0.231*** (0.029)
STAR_1	0.461*** (0.175)	0.213 (0.322)	1.193** (0.496)	0.508*** (0.191)	0.126 (0.477)	1.372* (0.824)	0.615*** (0.206)	0.0005 (0.492)	1.194 (0.886)
DIFF_1	0.228* (0.127)	0.282 (0.222)	0.655** (0.326)	0.249* (0.139)	0.167 (0.310)	1.029** (0.506)	0.271* (0.147)	0.443 (0.328)	1.059* (0.565)
CHEF_TIME	0.019 (0.014)	0.034 (0.027)	0.112** (0.045)	-0.0002 (0.016)	-0.051 (0.041)	0.023 (0.068)	0.080*** (0.025)	-0.084 (0.108)	0.226 (0.169)
TRAIN_TIME	0.042*** (0.020)	0.075** (0.038)	0.161*** (0.060)	0.006 (0.023)	-0.019 (0.053)	-0.024 (0.088)	-0.014 (0.025)	0.041 (0.057)	-0.062 (0.094)
TALENT				-0.0003 (0.001)	0.005** (0.002)	0.011*** (0.004)	0.002 (0.002)	0.005 (0.004)	0.016** (0.008)
POPULARITY				1.506*** (0.260)	3.656*** (0.497)	5.119*** (0.824)	4.253*** (0.619)	5.978*** (0.906)	10.408*** (1.807)
EXPERIENCE × TIME							-0.0001 (0.0001)	0.0001 (0.0003)	-0.0006 (0.0006)
TALENT × TIME							-0.153*** (0.030)	-0.102** (0.044)	-0.285*** (0.078)
POPULARITY × TIME							0.002 (0.002)	0.005 (0.004)	0.017** (0.008)
N			507						464
R ² (Pseudo)			0.255						0.452

*significant at the 90%-level; **significant at the 95%-level; ***significant at the 99%-level; standard errors in parentheses; omitted reference category: no stars.

Overall, the relative contribution seems to be primarily built on developing popularity over time. Talent is what sets the exceptional category of three stars apart from the other categories. Learning-by-doing is important, but supposedly more as a threshold function; the initial experience are significantly indicative for a chef's further success, but there seems no evidence that accumulation over time is effective.

Conclusions and Discussion

The fundamental distinction between experience and learning-by-doing on the one hand versus talent and popularity on the other, relates to a larger discussion of human capital contributes to the performance of firms. A general division between ability based explanations (acquired taste) or learning (acquired knowledge), both seem to matter, but the taste more than the knowledge. When further disentangling the concept of human capital, it becomes evident that the consistent importance of popularity indicates the necessity of know-who. Similar to science, success is not defined by what you know, but dependant on who you know.

In the specific case of restaurants, the same discussion translates into whether the chef's profession should be understood as an example of craftsmanship or artistic expression. By and large, the performance of a craftsman is more subject to learning (-by-doing), while the artist is more likely to be determined by the innate ability to create. As talent and popularity are deemed most important for specifically the highest obtainable rating, there is good reason to consider this part of the industry as an enterprise that is artistic or creative; more so than being a craft. This discussion is not only vivid in the industry, but also visible in the academic debates of the restaurant industry. While the results presented here are no definite proof – they are explorative – they do reveal some initial guidance.

Across the sector as a whole, performance at the level of stars also seems to require a skill-level to enter, determined by the quality of initial experiences and the ability to apprentice under the best masters in the industry. However, there are two important reservations to note. First, where the various dimensions of chefs' learning trajectories can be more easily approximated, the innate ability is much less so. With the most important aspects of learning included, the explained variance by the model remains low. Hence, the less well represented idea of talent may to a reasonable extent be expressed

through the unexplained variance; cautioning the interpretation and claims. Secondly, in a theoretical sense, knowledge and talent are both related to knowing. In the development of chefs' careers, the first is more relevant as ubiquity or procedural skills: knowing *how* to cook, whereas talent refers more to an aesthetic appeal or knowing *what* to cook. Regardless of their relative contribution to success, they both show that accumulation over time is very important not just for the chef, especially when his/her predecessors in the kitchen also did. Time is therefore essential to include into the analysis, which also creates more room for theorizing, hypothesising and modelling the evolution more explicitly. Another avenue to pursue is the producer-consumer interaction. The question about culinary novelty – and inherently, what causes it – can be approached from the producer's perspective, making it a question of techniques and ability which has been the focus of this paper. On the other hand, relating it to the consumer's viewpoint would phrase it as an interest in culture, society and aesthetics.

The approach adopted here is undeniably tied to the production side of the story, as most superstar and talent studies tend to be. As the analyses in this paper suggest, the stars of French cuisine do need the talent – and popularity even more so – to become superstars. Further studies into disproportionate success may be helped with the introduction of consumers, their perceptions, heterogeneity and the way they affect appraisal. Doing so would require concepts of valuation beyond monetary ones that are used in almost any superstar or talent related analysis, which this study tried to explore. Some alternative indications of appraisal have been used in the case of restaurants which mainly rely on expert opinion (see for instance Chossat & Gergaud, 2003), but bringing in more of those value dimensions seems the way forward to unpacking the complexity of economic excellence. In doing so, a more robust theory of drivers of superstar emergence can be compared to classical theories of learning and potentially spill over to other creative industries in order to understand what it is that makes them successful and creative.

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