FROM ORDINARY CULINARY STUDENTS TO STARRED CHEFS. PRELIMINARY EVIDENCE FROM THE ITALIAN CONTEXT

Tindara Abbate
Marta Meleddu
Fabrizio Cesaroni
Angelo Presenza

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Abstract
Purpose – The paper focuses on the profile of chefs, whose job is considered as one of the most challenging professions as it involves scientific mastery, as well as creativity, and innovation.
Design – Based on a sample of 264 individuals (both starred Italian chefs listed on Michelin Red Guide and students from six Italian culinary high schools), the study assesses which factors affect chefs' innovative performance.
Findings – Results show that success in haute cuisine depends on several factors, which involve chef's creativity, culinary innovation process, and the restaurant service offering (restaurantscape). The differences between chefs in training and top chefs in terms of creativity are underlined. The study offers suggestions on chefs' innovative process and provides a better understanding of how success in the chef profession is influenced by both individual features and environmental/social characteristics. Furthermore, results indicate which capabilities chefs in training should possess in order to succeed and, in turn, which capabilities should be developed by professional high schools of cooking in order to stimulate innovativeness in their educational programs.
Originality of the research – This research contributes to the literature by suggesting which key factors promote creativity and innovation and a continuous flow of innovative ideas in haute cuisine.
Keywords chef, haute cuisine, innovation, creativity, culinary students

INTRODUCTION

Prior literature has broadly addressed the problem of what drives success in the hospitality industry (Cooper et al. 2017), even though more analysis is needed to understand which job-specific features are required in this industry. This is the main motivation that supports this paper, whose goal is to deepen knowledge about the conditions that professional chefs have to fulfill in order to achieve success.

Within the hospitality industry, the job of chef mixes together two key distinct capabilities, namely the ability to master scientific knowledge and scientific techniques, and the ability to add an artistic and esthetic layer to final products (Zopiatis 2010). Indeed, in reinventing gastronomy, chefs act as professional artisans and artists (Stierand and Lynch 2008; Vargas-Sanchez and López-Guzman 2015) and are therefore expected to possess and exploit a proper mix of intuition, aesthetic sensitivity, know-how and other tacit resources that are difficult to acquire and replicate (Blackman and Sadler-Smith 2009). In fact, their key competence refers to an extraordinary deep knowledge of ingredients and their neat combinations along with advanced cooking methods (Dornenburg and Page

1996). In this respect, Pratten (2003, 455) maintained that "the opportunity to become a famous chef is probably easier now than ever before, even though the road to the top is difficult", by underlining that training paths – including college courses in food preparation – are considered fundamental as well as the ability to work constantly under pressure and with high levels of stress.

Understanding what customers expect, and consequently experimenting with novel recipes, developing original proposals and organizing an adequate service delivery arrangement is typically the goal of any famous chef (Dornenburg and Page 1996). But the pursuit of such a goal implies the coexistence of both culinary training and managerial competences, along with a specific tendency to appreciate tastes, flavors, and esthetic elements (Ruhlman 1999). Additionally, these managerial abilities are necessary to supervise staff demands, define and develop a good communication strategy and improve leadership qualities (Pratten 2003). For example, it has been observed (Presenza et al. 2018) that the possibility to offer a pleasant dining experience to customers depends on the chefs' ability to combine creativity and passion (Ruhlman 1999). Because of these conditions, chefs often represent the main core competence (Prahalad and Hamel 1997) of restaurants, which they exert by both actively participating in the decision-making and strategy-formulation processes and taking proper managerial responsibilities. Additionally, the chef is often the person in charge of managing the company by assuming an important role in several activities, such as stock control, interaction with the work context, management of several operations such as ordering and budgeting (Pratten 2003; Allen and Mac Con Iomaire 2017). In this respect, Harrington (2005) underlines that the chef can be observed as CEO who specifically define strategic business and is more oriented to obtain successful outcomes.

Chefs who reach the top level of culinary excellence make part of the so-called haute cuisine (HC), which represents the high-end of professional cooking industry. HC is observed as a craft industry characterized by professional organizations in which long and arduous training (Gomez et al. 2003), discipline, and tremendous exercise of cooking assume relevance and allow to meet specific and ambitious goals.

As well summarized by Markowska (2018, 50) "the work of HC chefs often combines elements of the work of artists, scientists, and entrepreneurs with that of a chef". This means that HC chefs are effectively creators oriented to the exploration of new and old methods and techniques and the experimentation of innovative combinations in dedicated labs, with the aim to create a personal culinary style and to change constantly their value propositions and restaurants. In this respect, they address efforts and synergies to the creation of a memorable and unique "restaurantescape", derivating by the harmonious combination of restaurant's atmosphere, food taste and scent, and service quality. In this sense, the value proposition of HC chefs is not limited to the original gastronomic dishes but is essentially linked to any element of the restaurantescape to provide a complete extraordinary experience involving customers' five senses.

Previous research has underlined the main features of the current competitive environment, where high-end restaurants are characterized by a unique atmosphere that conveys to customers superior value with respect to the offering of mid-scale restaurants (Lee et al. 2016). Furthermore, in order to maintain a competitive edge over the latter,

top restaurants are required to constantly reinvent themselves and promote continuous change, by constantly upgrading their business model (Svejenova et al. 2010). This process allows them to confirm and, very likely, reinforce their leading position in the industry (Hallak et al. 2018; Presenza and Messeni Petruzzelli 2019). As expressed by Ottenbacher and Harrington (2007, 3), HC chefs must "adapt and evolve if they want to be successful in the short- and long-term." Although several contributions have examined the different components linked to the success of HC chefs, by underlining mainly that creativity and innovation are essential in this changing and complex setting (Abecassis-Moedas et al. 2016; Albors-Garrigós et al. 2018), the component related to restaurantscape is scarcely explored as well as the overall impact of these components on HC's success.

Against this background, this paper intends to comprehend the main factors that determine the success of HC chefs. Specifically, the research is developed to address to the following research question: which factors related to the three components of creativity, innovation and restaurantscape impact on the likelihood for a HC chef to obtain success?

This goal is achieved by analyzing differences that exist between culinary students and HC chefs. Such a comparison offers the opportunity to analyze similarities and differences between these two related groups and, in so doing, to highlight the main factors that allow culinary students to become successful HC chefs. The paper is mainly focused on three different components that characterize the professional profile of HC chefs, namely creativity, innovation and restaurantscape, recognized as the key drivers of restaurants' competitive advantage.

The study contributes to a deeper understanding of the factors that promote, facilitate and support new product and service development in HC and, in turn, the chefs' success, by expanding the academic research focused on creativity and innovation in this specific industry. It has managerial implications for HC chefs and culinary education and training paths.

1. THEORETICAL BACKGROUND

1.1. The chef creativity process

Anderson et al. (2014) defined the exercise of creativity as the process of proposing innovative and improved solutions. Stierand and Dörfler (2016) added that creativity is the process of generating and using novel ideas. Csikszentmihalyi (1997, 28) underlined that creativity is "any act, idea, or product that changes an existing domain, or that transforms an existing domain into a new one".

Creativity can be conceptualized from a cognitive perspective as "the interplay between motivation, intentions and the capacity to transform sensory information received from the objective world into original interpretations, paired with the ability to evaluate whether an interpretation will be considered useful or not in a given context or domain" (Stierand 2015, 4).

Creativity represents a pre-condition of culinary innovation (Presenza et al. 2017) and introduces originality and novelty for product differentiation and/or to defy norms and practices for successful high-class restaurants (Vargas-Sánchez and Lopez-Guzman 2015). In fact, in the restaurant industry, new dishes, menu proposals and unusual recipes are the concrete result of original and unusual combinations of traditional and untraditional ingredients (Capdevila et al. 2015). This outcome is the result of a clear division of labor between head chef and related kitchen team (Bouty and Gomez 2013): the former is responsible for generating innovative ideas, while the latter transforms such creative ideas into dishes. Names assigned to new dishes are often evocative of emotions in customers' minds. In turn, creativity can be considered an essential pre-requisite for business success in HC. As a matter of facts, in the assessment of chefs and restaurants promoted by independent guides such as the Michelin's (Bouty and Gomez 2013), external reviewers often adopt creativity as their main evaluation parameter (Jones et al. 2016).

However, creativity entails both individual and collective components, by activating an interesting social and communication process, whereby interactions, individuals, network and learning mechanisms impact on the development and implementation of novel ideas (Sigala and Kyriakidou 2015). In turn, creativity implies a tension between a constant search for novelty and unfamiliar characteristics, and a need to include or recall elements of tradition that would confer some sort of familiarity to the innovative products in order to increase acceptance by customers and employees (Hesmondhalgh 2002; Alvarez et al. 2005).

Therefore, promoting creativity is not an easy task. On the one hand, concerning the idea generation stage (Albors-Garrigós et al. 2013), it is worth understanding from where and how chefs get inspiration to develop extraordinary culinary experiences. In this respect, Vargas-Sánchez and Lopez-Guzman (2015, 35) underline the existence of a continuum where one extreme contemplates the informal and spontaneous nature of the process of experience development, and the other extreme considers the formal and systematic character of this process, by asserting that it can be observed at two different levels (individual and collective).

Along with the learning process (Albors-Garrigós et al. 2018) derived by rigorous training activity, repetitive practices and accumulated experience, chefs' creative capacity can be stimulated by different indispensable means and inputs (Bouty and Gomez 2010). For example, they consider a new dish as "a combination of ingredients, techniques, and presentation, embedded in traditions culinary conventions, technical knowledge and fad" (Leschziner 2015, 64), by searching alternative uses and improvements for the creation of successful innovation (Messeni-Petruzzelli and Saviano 2014). Similarly, they often use analogies, for the generation of an artistic product that provides emotional connections and curiosity. Additionally, inspiration plays a key role in stimulating creativity, which can be obtained from presentations at culinary and gastronomy conferences, participation in the cuisine workshops and professional exhibitions (Albors-Garrigós et al. 2013) and trade fairs (Svejenova et al. 2007), with the aim of exploring and deriving useful inputs from external actors. In this respect, chefs leverage inputs from multiple sources, such as key customers (Lane and Lup 2015), competitors and suppliers (Bockelmann and Braun 2014; Albors-Garrigós et al. 2018), but also scientific researchers, who may provide

both information on new fragrances and ingredients, and technical solutions to practical problems (Albors- Garrigós et al. 2013). Finally, in their ideas' generation process, chefs are often used to convert their thoughts into codified knowledge (such as recipes and cooking notes), which thus become an additional source of creativity (Bouty and Gomez 2010).

Based on these considerations, the study advances the following hypothesis:
Hypothesis 1: Factors of creativity may explain the success of HC chefs with respect to culinary students.

1.2. Transformation of ideas into culinary innovations

Following traditional new product development approach (Cooper 1990), idea generation only represents the first stage of a process that then concerns the selection and transformation of ideas into innovative products, irrespective of whether the product novelty contemplates an incremental or a radical innovation (Johannesson et al. 2001). In cuisine, innovation is not solely a cognitive work, but involves emotions, feelings, aesthetic judgments, style and chef's social position (Bouty and Gomez 2010). It emerges that innovation in restaurant refers not just to the product itself, but to "the transformation of that idea into value, thanks to the talents and work of the culinary team itself" (Vargas-Sánchez and Lopez-Guzman 2015, 34), thus becoming the complex result of tangible and intangible aspects, or better, of new products and services.

Similarly, to other industries, also in the case of HC the application of that approach often follows a trial-and-error process (Stierand 2015), which allows chefs to learn from their own errors. It follows that the HC chefs' process is "more organic, less formal, less reliant on explicit financial and market analysis, and more iterative in nature than models provided in the new product development and food product development literatures" (Ottenbacher and Harrington 2007, 457). In this respect, Ottenbacher and Harrington (2007, 458) considered that much of the successful outcomes are linked to chefs' possessed tacit knowledge and a specific sense of casual ambiguity to those who are effectively on the outside looking in, by concluding that those features became barriers to imitation for competitors.

As mentioned by Opazo (2012), innovation is not only related to having or implementing an original idea, but it means developing new ideas that are effectively accepted within a specific community of people. This recognition is importantly related to the positioning of novel ideas within a social and cultural context.

The transition from ideas to products presents features identified as part of firms' organizational routines, which represent the set of activities and processes that firms perform to address problems and that confer to firms both stability and opportunities to change (Feldman and Pentland 2003). Specifically, these features include: the relationship with external interest groups; the techniques used for production and conservation, etc., which assume relevance when evaluating new product's costs and its price. As the last step of this stage, new product testing – by means of diverse market linkage mechanisms – allows chefs to check the correspondence of the innovative product with customers' preferences, mediated by chefs' accumulated experience, with the possibility

of introducing modifications to it (Vargas-Sánchez and Lopez-Guzman 2015).
According to such considerations, the study claims the following hypothesis:
Hypothesis 2: Factors related to the transformation of novel ideas into culinary innovations may explain the success of HC chefs with respect to culinary students.

1.3. Relevance of "restaurantscape"

Subjectivity is a core and inner feature of any food-consumption experience (Björk and Kauppinen-Räisänen 2017), which could be affected either by the presence of new and unexpected ingredients into a recipe, or by a different preparation (cooking) process based on traditional and known ingredients (Quan and Wang 2004). In the case of the restaurant industry, the concept of experience obviously recalls and is strictly connected to that of taste, even though aspects related to the servicescape – such as the restaurant's atmosphere, the support and information received from the restaurant's staff for each course, or the possibility to enjoy dishes in due time – may play a key role as well (Taar 2014). In fact, "for some travellers, positive and memorable food experiences require culinary-gastronomic dining in a fine-dining restaurant or experiences characterized not only by uniqueness and newness, but also being extraordinary once in a lifetime experience" (Björk and Kauppinen-Räisänen 2017, 11).

Yang (2018) supports the assertion that the activities of celebrity chefs go beyond the preparation of unique dishes, by underlining their undisputed power to define and develop products and services using complex activities and strategic resources. Their goal is to achieve a holistic view of the business, where tangible and intangible elements (such as products and services) become a complete and memorable experiences enjoyed by the customer (Vargas-Sánchez and Lopez-Guzman 2015).

Customers' gastronomic experience can be conceived as composed of three main dimensions (Taar 2014): (i) individual factors, which relate to the customer's cognitive and affective characteristics; (ii) appearance of the food, which includes aspects such as flavor, color or texture; and (iii) situational factors, which refer overall to the context where food consumption takes place, with its atmosphere and aesthetic elements. Based on such considerations, Björk and Kauppinen-Räisänen (2017) coined the concept of "restaurantscape" to underline how gastronomy and restaurant's atmosphere are strictly intertwined to an extent that affects customers' experience. Restaurantscape synthetizes numerous elements such as restaurant atmosphere, food taste and scent, and service quality (Björk and Kauppinen-Räisänen 2017). All of them can generate excitement and expectations, by determining passions and controversies (Vargas-Sánchez and Lopez-Guzman 2015).

Accordingly, the study considers whether factors related to the restaurantscape do play any role in conferring success to HC chefs. In turn, the following hypothesis is proposed:
Hypothesis 3: Constitutive factors of restaurantscape may explain the success of HC chefs with respect to culinary students.

2. METHODOLOGY

2.1. Research design

To test the three hypotheses, a self-administrated questionnaire based on the contribution of Vargas-Sanchez and Lopez-Guzman (2015) has been developed. The questionnaire was pretested at two levels for enhancing external validity. Firstly, three academic experts provided comments on the questionnaire. Then, feedbacks from two Italian 3-star Michelin chefs have been collected. Feedbacks were obtained iteratively through different rounds of interviews (ranging from 25 to 50 minutes each).

Two versions of the same questionnaire were developed in Italian language, each version targeted to the specific category of chefs or students. Both versions were administered anonymously and by observing the research ethical standards. The questionnaire includes two main parts. The first includes several questions related to demographic profile of the respondent (i.e., gender, age and, in the case of starred chefs, their Michelin rating and the year of assignment of the first star). The second part includes some questions related to the three main areas of investigation: creativity, innovation, and restaurantscape.1

The assessment of the 'Creative Process' is based upon eleven statements and respondents indicated their level of agreement using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Among these statements, four statements specifically addressed the process of generation of new ideas in terms of individual and external factors. In order to better account for them, a Principal Component Analysis was performed on the pooled sample and the results suggested to retain only Component 1, which we named within-individual creativity.2

As for Culinary Innovation, the questionnaire presents six questions based on a five-point Likert scale and related to the transformation of ideas into innovative products. Restaurantscape has been assessed by means of seven statements proposed to respondents in a ten-point scale concerning the importance of attributes related to the gastronomic experience itself, as perceived by chefs, and proposed by Vargas-Sánchez and López-Guzmán (2018).

2.2. Sampling and data collection

The analysis has addressed a sample composed of both starred chefs and culinary students. The two groups represent the extremes of a continuum ranging from those who have not entered yet the market of chef profession – even though they are acquiring competences and skills to become future entrants – to those who have reached the maximum success – i.e., the three-star chefs. In turn, the analysis consists in the identification of which factors allow chefs to move along this continuum and to progress in their career.

The study is focused on the Italian culinary context both because it represents an area where the "Italian style" has always been considered trendy, and because of its increasing economic and social relevance. As maintained by Sassatelli (2019, 3) this sector shows "relatively high annual growth rates, a strong openness to migrant entrepreneurship a flourishing of new and different places of consumption, a real boom of gastronomic

publishing, and, last but not least, a flourishing of a myriad of local association and of educational or promotional initiatives". The long tradition in Italian gastronomy is highlighted by the massive number of restaurants spread over the country as well as by the long history of culinary schools. Italian HC industry is characterized by a relevant growth rate. The total number of Italian starred restaurants has reported an interesting increase of 58.50%, moving from 224 in 2005 to 355 in 2018. In this respect, Italy is the second country in the world for awarded Michelin stars restaurants, after France. Almost 70% of the executive chefs of Michelin starred restaurants in 2011 were either the restaurant's main owner or a business partner (Leone 2018).

Concerning starred chefs, many classifications, awards and quality standards have been developed to prove celebrity of chefs. Among all, one of the most accepted internationally is the Michelin star system (Bernardo et al. 2017). The Michelin Guide is a gourmet guide, accepted by the entire gastronomy industry and internationally acknowledged as one of the most detailed culinary books (Bouty and Gomez 2013).

This Guide renders a complete picture of restaurants, by utilizing different symbols to provide insights of a restaurant's ambiance, speciality, wine list, hospitality, and services, etc. Restaurants are evaluated each year and can (or cannot) renew the award or achieve a higher recognition (Bernardo et al. 2017). A relevant criterion for obtaining stars is the 'renewal' – i.e., the ability to provide continuously original formulas. Obtaining a Michelin star rating is a sign of creativity, quality and innovation. Indeed, the Michelin's criteria are originality and high quality, by referring to both creativity and successful implementation of innovative ideas. The symbols, considered within the guide, judge not only plates, but involve quality of products, flavors and cooking, style of the cuisine, value for the money and the restaurant proposals. The rating defined by the Michelin guide derives from the culinary critics and experts, restaurant owners, and customers (Durand et al. 2007). The Michelin rating (expressed on a one- to three-star scale) strongly influences the reputation and economic well-being of a restaurant (Woodward and Stierand 2014). Although stars are assigned to the restaurant, and not to the chef, restaurant's success is mainly linked to the chef. Indeed, when a chef leaves a restaurant, the stars are effectively suspended for a next examination by Michelin experts.

As far as culinary students are concerned, the increased exposure of celebrity chefs has rejuvenated this job with regards to its vocational capabilities and to the future of this profession (Zopiatis and Melanthiou 2019), so that it represents a growth factor for culinary education (Müller et al. 2009) and for youth vocational aspirations. Despite the increased interest in this profession, little attention has been paid by prior literature on to the culinary students as a population, even if they do differ from other students (Edens 2011). They are part of a larger population of vocational students, which are academically under-prepared for college (Müller et al. 2009) and under-considered in the higher education marketplace (Gray and Herr 1998).

The programs of culinary educational paths are defined to provide theoretical and technical competences (Müller et. al. 2009). This means that culinary programs aim at training cookers who can plan control of costs, menus, produce healthy and safe food, and use culinary skills. Continuous transformations in the food technology, processes in agriculture and educational requirements have pushed organizations to consider

different educational programs (Mesch 2012). Furthermore, the increased diffusion of food-related programs on the web has determined the popularization of the chef profile and profession. In turn, today's culinary students are more subject to messages from the media, increasing the awareness of the fashion and viability of this profession (Lane and Fisher 2015).

The analysis is based on primary data gathered in two steps. The first phase has been carried out during the period May-September 2017 and focused on all the 334 starred chefs included in the Italian part of the 2016 Michelin Red Guide. An email has been sent to all the 334 starred chefs, containing a cover letter explaining the research's main goal and including the link to the online questionnaire, and instructions to filling it in. After the first sending, the same email has been sent twice every twenty days. Eventually, the sample is composed of 132 Italian Michelin starred chefs, which represents the 39.52% of the entire population.

Among HC chefs, 87% are males and 13% are females. On average, respondents are 46 years old: 40% are 40-49 years old; 33% are over 50, while chefs under 40 represent the rest of the sample (27%). As for Michelin star rating, 81% of sampled chefs (N=107) have one star, 10% (N=14) have two stars, and 6% (N=8) have three stars.

The second phase lasted from January to April 2018. The target has been students of six Italian culinary schools. A detailed cover letter with the objectives of the research has been sent to the headmasters of the selected high schools. To each of them it has been required to meet their last year students. Six meetings have been organized, one for each school. During each meeting, after having explained the goal of the survey and the instructions to follow, the link to the questionnaire has been distributed to each student that filled it in directly using his/her smartphone connected to the Internet. Each meeting lasted about 60 minutes, including 20 for filling in the questionnaire. At the end, 146 questionnaires have been collected. Twelve questionnaires have been discarded because incomplete. Two further questionnaires randomly selected have been withdrawn in order to guarantee a sample size similar to that of starred chefs (132 questionnaires). Among culinary students, 66% are males and 34% are females and are on average 18 years old, ranging from 17 to 21.

2.3. The empirical model

To address the three hypotheses, a dependent variable – stars – has been created by counting the number of stars awarded to chefs, with the baseline case represented by culinary students who have been granted zero stars. The test of differences and similarities between culinary students and HC chefs has been performed choosing an exogenous control that considers the number of stars awarded by chefs versus the zero stars of students. To analyze such a variable, an ordered logit model can be employed. Such model considers an observed ordinal variable, Yi (in this case, the number of stars), which is a function of a non-measured latent variable, Y*i. Its values determine the observed ordinal variable Yi. The latent variable Y*i is continuous and has various threshold points (. This model is based on the cumulative probabilities of the response variable; in particular, the logit of each cumulative probability is assumed to be a linear function of the covariates with regression coefficients constant across response categories. To

assess whether more than one regression must be estimated instead, the Brant test can be employed, where the null hypothesis is that the parallel regression assumption holds. Considered that culinary students have no stars and that chefs have a maximum of three stars, and following the theoretical framework, the empirical model can be specified as follows:

$$
\begin{aligned}
&Y\_i^{*}=\beta\_0+\beta\_1 X\_i+\varepsilon\_i \\
&Y\_i=0 \ \text{ if } \ Y\_i^{*}\leq 0 \\
&Y\_i=1 \ \text{ if } 0< Y\_i^{*}\leq \kappa\_1 \\
&Y\_i=2 \ \text{ if } \kappa\_1< Y\_i^{*}\leq \kappa\_2 \\
&Y\_i=3 \ \text{ if } \kappa\_2< Y\_i^{*}
\end{aligned} \tag{1}
$$

Following the theoretical background in section 2, the empirical model can be written as:

$$Stars_i=\beta_0+\beta_1 CP_i+\beta_2 CI_i+\beta_3 R_i+\beta_4 D_i+\varepsilon_i \tag{2}$$

where are regressors related to the creative process, to the culinary innovation, to the restaurantscape, and Di the demographic controls of the chef i.

In the sample, the number of fine dining chefs awarded with 2 Michelin stars is N=14, while those with 3 is N=8. For the purposes of the analysis, the two groups were collapsed into one, due to the very low number of observations. To understand if it was feasible from a statistical point of view, each independent explanatory variable has been carefully checked for the equality of means (t-test) and for the equality of variances (Levene's test) between groups. Among all explanatory variables, only for Kindness, – control for restaurantscape – the null hypothesis that the means (t=-2.86, P (|T| > |t|) = 0.009) and the variances are equal (Levene's F=12.74, P>F=0.001) could not be accepted. However, it was included in the empirical model for completeness.

3. FINDINGS

Provided that the Brant test did not reject the null hypothesis (All: Chi2=34.07; P> Chi2= 0.064), the ordered logit regression model could be run. Table 1 reports three specifications: the first model (Model 1) tests chefs' creative process only, Model 2 adds regressors for innovation in cuisine process, and Model 3 includes also factors related to restaurantscape controlling for the three concepts all together. The latter performs better than the others, as the diagnostic statistics underlined at the bottom of the table show, thus stressing the importance of all the elements.

Table 1: **Ordered logit estimations.**

	Model 1	Model 2	Model 3
Demographics			
Age	0.185***	0.193***	0.203***
	(0.0218)	(0.0252)	(0.0297)
Gender	1.358**	1.451**	1.315*
	(0.612)	(0.672)	(0.725)
Creative Process			
Within-individual creativity	0.235	0.336	0.385*
	(0.182)	(0.213)	(0.226)
Combination	0.0440	0.0442	0.0180
	(0.219)	(0.253)	(0.312)
Analogy and mimicry	-0.212	-0.332	-0.498**
	(0.180)	(0.211)	(0.240)
Alternative uses	0.202	0.331	0.309
	(0.239)	(0.276)	(0.326)
Points for improvements	-0.310	-0.0512	-0.201
	(0.233)	(0.283)	(0.317)
Training	-0.547*	-0.786**	-1.144***
	(0.318)	(0.351)	(0.414)
Professional events	0.0668	0.305	0.190
	(0.217)	(0.253)	(0.279)
Repository of ideas	0.0394	0.0611	0.0490
	(0.202)	(0.231)	(0.247)
Culinary Innovation			
Economic sustainability		-0.297	-0.342
		(0.234)	(0.259)
Availability of necessary techniques		-0.577**	-0.665**
		(0.282)	(0.308)
Relationship with suppliers		-0.310	-0.342
		(0.276)	(0.312)
Testing through trial and error		0.662***	0.573**
		(0.236)	(0.271)
Accumulated knowledge		-0.246	-0.0641
		(0.249)	(0.280)
Adaptation to circumstances		-0.187	0.0939
		(0.202)	(0.247)

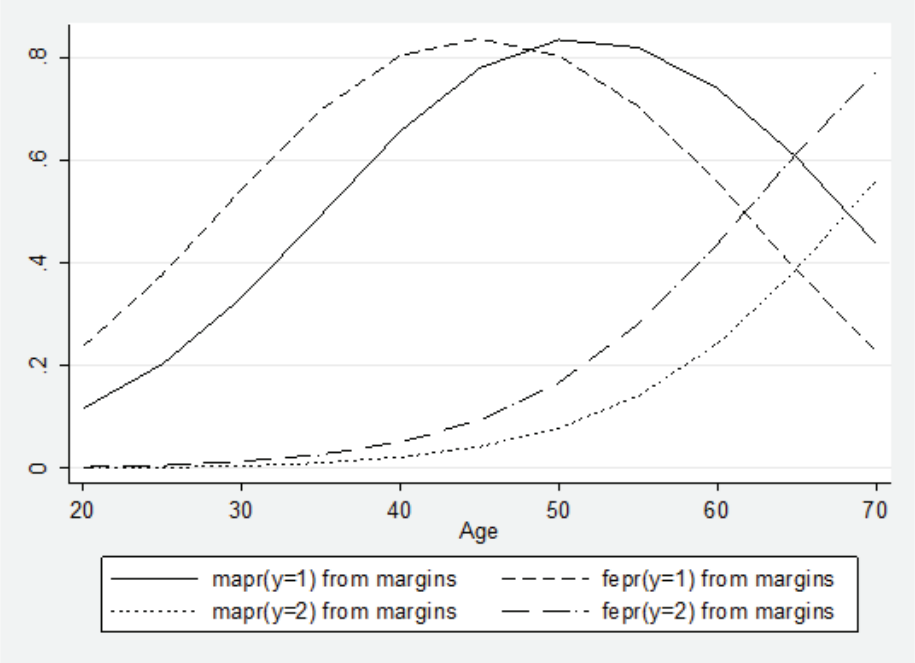
	Model 1	Model 2	Model 3
Restaurantscape			
Kindness			0.667*
			(0.348)
Carefulness			-0.152
			(0.171)
Attention to detail			0.223
			(0.334)
Decoration			0.103
			(0.185)
Price			-0.118
			(0.161)
Surprise			0.305
			(0.192)
Service			-0.735***
			(0.236)
N	191	186	179
pseudo R^2	0.494	0.554	0.601
AIC	204.9	192.0	184.8
BIC	244.0	250.1	264.5

Standard errors in parentheses
* p < 0.10, ** p < 0.05, *** p < 0.01
Source: our elaboration

The coefficients for Age and Gender are statistically significant across models; the positive coefficient for Age implies that the number of stars increases as chefs get older, while the positive coefficient for Gender indicates that male chefs achieve more stars than their female counterpart.

To get a feel for how large and important these differences are, one can consider the marginal effects or predicted probabilities. Graph 1 reports predicted probabilities of awarding one or more stars, separately for males and females by age. The two lines at the middle left (mapr(y=1) from margins and fepr(y=1) from margins) show that the probability to be awarded one star is at its maximum (about 84%) at around 45 years for females and at 50 years for males (about 83%). For both groups, this probability decreases with age, even though, on average, it remains higher for males. Conversely, the lines that start at the bottom left (mapr(y=2) from margins and fepr(y=2) from margins) show that barely nobody under the age of 40 is likely to be awarded two or three stars, and that instead it is most likely at the age of 70 for both females (77%) and males (56 %).

Figure 1: **Predicted probabilities to award one or more stars by age and gender.**



Source: our elaboration

In Model 1, the coefficients for Training are statistically significant and negative, meaning that starred chefs do not consider it as fundamental for their creative process. This result is confirmed in Models 2 and 3, signalling its robustness. Still on the creative process, Model 3 shows also that a determinant role to achieve stars is played by the Within-individual component, while chefs that as a technique for the generation of new ideas and products use Analogy and mimicry – essentially culinary students – have a lower probability to succeed. Model 2 shows that the probability to get more stars increases if chefs do not prioritize the Availability of necessary techniques, as students do, but strongly rely on testing new products through trial and error. Model 3 confirms these findings and adds that Kindness and Service go in the opposite direction: Kindness is important for starred chefs while Service for culinary students. Table 2 reports the marginal effects for Model 3 in order to provide better insights on these findings. Chefs that strictly rely on Training for their creative process are 5% less likely to be awarded a star. By contrast, those who rely on the Within-individual component increase the probability of 2%, while it decreases of the same amount when chefs rely on Analogy and mimicry. As for the innovation stage, the probability to get more stars increases of 3% if chefs do not prioritize the availability of necessary techniques but rely on testing new products (3%). Showing sympathy (Kindness) with customers increases the probability to get two-three stars by 3%, while to be careful with the service decreases it by the same amount.

Table 2: **Ordered logit estimations (margins)**

	Culinary students	Fine-dining chefs 1 star	Fine-dining chefs >1 stars
Demographics			
Age	-0.0131***	0.00314	0.00996***
	(0.00131)	(0.00201)	(0.00165)
Gender	-0.0849*	0.0203	0.0645*
	(0.0468)	(0.0180)	(0.0351)
Creative Process			
Within-individual component	-0.0248*	0.00595	0.0189*
	(0.0146)	(0.00536)	(0.0110)
Combination	-0.00116	0.000278	0.000883
	(0.0201)	(0.00483)	(0.0153)
Analogy and mimicry	0.0322**	-0.00771	-0.0245**
	(0.0158)	(0.00676)	(0.0114)
Alternative uses	-0.0200	0.00478	0.0152
	(0.0210)	(0.00613)	(0.0158)
Points for improvements	0.0130	-0.00311	-0.00986
	(0.0205)	(0.00539)	(0.0156)
Training	0.0738***	-0.0177	-0.0561***
	(0.0267)	(0.0136)	(0.0201)
Professional events	-0.0122	0.00293	0.00930
	(0.0180)	(0.00482)	(0.0136)
Repository of ideas	-0.00316	0.000758	0.00241
	(0.0160)	(0.00387)	(0.0121)

	Culinary students	Fine-dining chefs 1 star	Fine-dining chefs >1 stars
Culinary Innovation			
Economic sustainability	0.0221	-0.00529	-0.0168
	(0.0169)	(0.00555)	(0.0126)
Availability of necessary techniques	0.0429**	-0.0103	-0.0326**
	(0.0198)	(0.00837)	(0.0151)
Relationship with suppliers	0.0220	-0.00528	-0.0168
	(0.0202)	(0.00616)	(0.0151)
Testing through trial and error	-0.0370**	0.00886	0.0281**
	(0.0175)	(0.00745)	(0.0130)
Accumulated knowledge	0.00414	-0.000992	-0.00315
	(0.0181)	(0.00447)	(0.0137)
Adaptation to circumstances	-0.00606	0.00145	0.00461
	(0.0160)	(0.00395)	(0.0121)
Restaurantscape			
Kindness	-0.0430*	0.0103	0.0327**
	(0.0226)	(0.00910)	(0.0167)
Carefulness	0.00979	-0.00235	-0.00744
	(0.0111)	(0.00320)	(0.00833)
Attention to detail	-0.0144	0.00345	0.0109
	(0.0214)	(0.00538)	(0.0166)
Decoration	-0.00668	0.00160	0.00508
	(0.0122)	(0.00336)	(0.00896)
Price	0.00761	-0.00182	-0.00579
	(0.0104)	(0.00277)	(0.00788)
Surprise	-0.0197	0.00472	0.0150
	(0.0121)	(0.00409)	(0.00950)
Service	0.0475***	-0.0114	-0.0361***
	(0.0152)	(0.00874)	(0.0110)

Standard errors in parentheses
* p < 0.10, ** p < 0.05, *** p < 0.01

Source: our elaboration

3. DISCUSSION

This research advances our understanding on culinary creativity and innovations and provides insights about the culinary training sector and HC field. It examines the main factors that characterize the chef's profile and profession – creativity, innovation, restaurantscape – by underlining their impact on the likelihood for success. Moving from the idea that a professional chef is "seen as a culinarian, artisan and showman who has amassed an encyclopedic level of knowledge of ingredients, flavor combinations, and cooking techniques" (Baldwin 2018, 66), the paper matched the two extreme cases of this profession that are culinary students and HC chefs.

Findings reveal how age and gender are strictly connected with the process of achieving stars, since the number of stars tends to increase with age and professional cooking, even if it is still a profession in which men prevail. Coherent with previous literature (Allen and Mac Con Iomaire 2016), the findings highlight how, in the professional kitchen, cooking is related to hard masculinity, as it requires strong work for many hours (16-18 hours during the training phase) and is characterizing by continuous pressuring conditions and aggressive environments. However, a further result looks interesting and is related to the fact that women obtain the first star at a younger age than men, although the gap tends to disappear over time. This outcome highlights how the discussion about women's place in professional kitchens is a complex issue in a field still dominated by males (Pratten 2003). Additionally, about age, findings show that the first star comes quite late (45 years for women and 50 years for men) because it is linked to the accumulation of experience, learning paths and development of a bundle of competences and capabilities, such as managerial capabilities.

Concerning the first hypothesis related to creativity, analyses revel that only some specific factors affect the possibility for chefs to be awarded with starts and, therefore, to gain success in the restaurant market. First, Training seems to play a negative role in this respect, since HC chefs do not consider it as fundamental for their creative process. This result is in line with Stierand and Dörfler (2016), who have discussed the role assumed by intuition in the creative process. It confirms the proposals by Leone (2018), who suggested four patterns of creation – improvisation, experimentation, trial-and-error, and imagination – all of them no directly related to a formal training path.

Second, chefs' success also depends on the adopted techniques for the generation of new ideas and products, as culinary students refer mostly on analogy and mimicry. In this respect, even though novel information in innovative formulas cannot be copyrighted, top chefs make use of different approaches to protect their creativity (Presenza et al. 2017).

Finally, still on the creative process, findings highpoint the determinant role assumed by the Within-individual component to achieve stars. This outcome is consistent with previous studies (Presenza et al. 2018) showing how novel ideas derive directly from the chef, thus emphasizing the centrality of individual characteristics (e.g., talent, motivations, passion, intuition, etc.) for the innovation process, and the strong hierarchical routes of cuisine creation. Indeed, a chef can be considered as an "innovator, flavour expert and artist by many both inside and outside the culinary field" (Baldwin

2018), becoming excessively meticulous in the masterly fusing of creativity and passion to render a memorable culinary experience to its clients.

The second hypothesis finds mixed support, since only a few factors related to it appear to significantly affect chefs' likelihood of success. On the one hand, findings confirm the importance of experimentation, and particularly of testing through trial and error. On the other hand, culinary students prioritize the Availability of necessary techniques. It emerges how "the role of science and technology appears as a tool that supports a chef's creativity but does not substitute for it or drive it" (Albors-Garrigós et al. 2018). Therefore, science and academy can assume a supportive role, resolving the symbolic needs of chefs, which conjugate analytic and/or synthetic knowledge (Abecassis-Moedas et al. 2016).

Finally, concerning restaurantscape, two factors – namely, Kindness and Service – emerge to be relevant to explain success of chefs, thus providing weak support to the third hypothesis. Indeed, while starred chefs put emphasis on Kindness, culinary students seem more oriented to stress the relevance of Service. As a matter of facts, the interesting relationship that emerges between gastronomy and the atmosphere of the establishment is a significant element (Björk and Kauppinen-Räisänen 2017) to generate extraordinary experiences with meals and dishes.

CONCLUSION

This study contributes to the existing academic literature about creativity and innovation processes applied to the gastronomy field, in general, and the HC, in particular. It sheds new light on the three components (creativity, innovation and restaurantescape) that characterize HC chef profile and profession, by investigating the differences existing between two extreme categories represented by HC chefs and culinary students. In this respect, to fill the research gap underlined in literature, mainly focused on the creativity and innovation components and their impact on chefs' success, the research introduces the additional component of restaurantescape, considered as a refined and harmonious combination of restaurant's atmosphere, food taste and scent, service, and quality. Additionally, this research can be considered a first attempt to present an unexplored comparison of two opposite categories: HC chefs and culinary students. In this direction, the category of culinary students is an under-examined area in the gastronomy literature that requires further investigations and analyses to consider better the students' profile, their peculiarities and concrete experiences of training and education. Therefore, this study becomes a first step toward the understanding of origins, characteristics and drivers of creativity and innovation in the restaurant industry, by highlighting some insights for formal education programmes and training processes of future professional chefs.

This study also offers interesting managerial implications to both HC chefs and culinary students/schools.

First, it has to be outlined the importance of HC chefs' personal characteristics, by emphasizing that professional chefs are continually engaged in the activities of testing and experimenting in order to add knowledge and value to their gastronomic proposals and develop innovations. In this respect, HC chefs are mainly oriented to explore different

contexts to obtain inputs, ideas and inspirations, with the desire to learn innovative methods and techniques that would allow them to enhance competences and processes to be converted into novel menu proposals and culinary advancements. This propensity by HC chefs to acquire new knowledge and competences underlines the importance of learning by doing mechanisms in a context where knowledge, competencies, beliefs and behaviours play a relevant role in the pursuit of enabling innovative processes.
Second, this study has highlighted that the restaurantescape component assumes relevance in the definition of accurate gastronomy proposals, representing essentially an inimitable dimension that effectively improves customers' experience with dishes and services.

Moreover, insights from this study suggest that culinary schools should adequate their educational programs to foster the development and/or improvement of such key competences and capabilities acquired in a rigorous process of training. On the one hand, if creativity process is positively driven by chefs' personal attitudes and negatively affected by formal training and imitation, then training courses should allow students to exploit their inner characteristics, rather than just teaching them cooking methods. On the other hand, if the transformation of creative ideas into innovations depends positively on trial-and-error processes and negatively on the availability of specific techniques, then tacit knowledge accumulated through experience seems to be more important than accessing codified specialized knowledge. In turn, culinary schools should devote a consistent part of teaching programs to stages and internships, as preferred means to gain experience and accumulate skills.

It is worth mentioning that this paper also suffers from some limitations. The analysis has been performed in a single country. Albeit Italy is among the most relevant countries within the world restaurant industry, it does not necessarily represent the whole category of HC restaurants. The study should be replicated in other countries to explore and assess the existence of country-specific conditions that could influence the creativity of HC chefs and the innovation development process. Among such conditions, the cultural elements should be investigated because they could affect individuals' creativity aptitudes, approaches and relationships with different entities (i.e., internal staff, clients and suppliers, networks and scientists), which could provide original ideas and knowledge for driving HC chefs in the development of novel gastronomic proposals.

Some additional information might have allowed to control for other dimensions that affect the creativity process. For example, the questionnaire did not ask to HC chefs whether they graduated in culinary schools, or not. By possessing this specific information, a more direct test of the influence of formal culinary education and training on creativity could be performed. Similarly, the study had no clue about the amount of experience of HC chefs (that is, the number of years they operated as chefs), even though the results show that experience plays a relevant role in fostering creativity and innovation. Then, future studies should include specific items linked to HC chef work and experience that could influence their capacity to bring new items to menus, to develop innovative dishes and to characterize the restaurantescape. Finally, future analyses could consider the teaching programs of culinary schools in order to assess whether, how and to what extent practical training is offered to culinary students aimed at stimulating and facilitating their creative ideas and innovative abilities.

ENDNOTES

[1] The complete questionnaire is available upon request.
[2] Results and descriptive statistics are available upon request while Table A1 in the Appendix reports the statement in the survey and corresponding label.

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APPENDIX

Tables A1: **Statement in the survey and corresponding label**

Label	Statements
Creative process	
Within-individual component	The creative process and the generation of new ideas is spontaneous or informal, with ideas that can arise at any time
	The creative process and the generation of new ideas is an individual process, which is influenced by personal characteristics such as my emotional state, curiosity, observation
Combination	As a technique for the generation of new ideas and products I use the combination, mixture, and fusion of ideas
Analogy and mimicry	As a technique for the generation of new ideas and products I use analogy and mimicry
Alternative uses	As a technique for the generation of new ideas and products I try to identify alternative uses
Points for improvements	As a technique for the generation of new ideas and products I use the analysis of the points for improvements of existing products
Training	Training, experience and learning are fundamental in our case
Professional events	Participation in professional events (fairs, competitions, conferences, congresses, etc.) is very important
Repository of ideas	I have created a repository of ideas that I systematically improve

Label	Statements
Culinary innovation	
Economic sustainability	In the process of transforming ideas into gastronomic products, I give priority to the economic sustainability of the new product by controlling costs
Availability of necessary techniques	In the process of transforming ideas into gastronomic products, I prioritize the availability of necessary techniques (processing, storage, etc.)
Relationship with suppliers	In the process of transforming ideas into gastronomic products, I prioritize the relationship with suppliers
Testing through trial and error	In the process of transforming ideas into gastronomic products, testing new products through trial and error is imperative
Accumulated knowledge	In the process of transforming ideas into gastronomic products, the accumulated knowledge (through learning and experience) on clients and their behaviour is a key factor
Adaptation to circumstances	In the process of transforming ideas into gastronomic products, adapting to the circumstances of the moment (for example, crisis) is of primary importance when it comes to inserting a new product in the menu
Restaurantscape	
Kindness	How important is the following attribute for the gastronomic experience: kindness
Carefulness	How important is the following attribute for the gastronomic experience: carefulness
Attention to detail	How important is the following attribute for the gastronomic experience: attention to detail
Decoration	How important is the following attribute for the gastronomic experience: decoration
Price	How important is the following attribute for the gastronomic experience: price
Surprise	How important is the following attribute for the gastronomic experience: surprise
Service	How important is the following attribute for the gastronomic experience: service

Source: our elaboration

Tindara Abbate, Associate Professor of Management (Corresponding Author)
University of Messina
Department of Messina
Piazza Pugliatti, Messina, Italy
E-mail: abbatet@unime.it

Marta Meleddu, Assistant Professor of Political Economy
University of Sassari
Via Muroni, 25, Sassari, Italy
E-mail: mmeleddu@uniss.it

Fabrizio Cesaroni, Full Professor of Management
University of Messina
Department of Messina
Piazza Pugliatti, Messina, Italy
E-mail: fabrizio.cesaroni@unime.it

Angelo Presenza, Assistant Professor of Management
University of Molise
Department of Economic - Tourism Research Centre
Viale Duca Degli Abruzzi, Termoli, Italy
E-mail: presenza@unimol.it

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