Investigating the moderating role of education on a structural model of restaurant performance using multi-group PLS-SEM analysis

ABSTRACT

This study investigates the role of education as a moderator of the network of relationships among entrepreneurial self-efficacy (ESE), innovation, and restaurant firm performance. Data was collected through online surveys from 198 restaurant owners in Australia. Results of the PLS-SEM analysis revealed that the owners' ESE and the firms' innovation activities have direct, positive effects on performance. Furthermore, ESE has a positive direct effect on the innovation activities of the firm, including product, service, process, management, and marketing innovations. The structural model was also examined across two groups determined through the owners' level of domain-specific education (Grp 1: Owners with industry related and entrepreneurship specific education; Grp 2: No industry related and no entrepreneurship specific education). Results found the model of ESE-Innovation-Performance remained invariant between the groups. The study presents new contributions to drivers of firm performance in the restaurant sector and the moderating effects of education.

Keywords: Restaurant SME, education, innovation, ESE, performance, PLS-SEM multi-group analysis

1. Introduction

The restaurant sector is a major contributor to national economies, and is often the largest employer in the tourism workforce. In the United States, the restaurant sector employs 14.4 million people (about 1 in 10 working Americans), and generates almost $78.3 billion (National Restaurant Association, 2016). Similarly, in Australia the restaurant sector

generates $23.5 billion to the national economy (Restaurant & Catering Australia, 2014), and employs the second largest share of the tourism workforce (Tourism Research Australia, 2016).

The worldwide expansion of this industry has witnessed a proliferation of research on restaurants and performance. Studies have examined organizational strategy (Chathoth & Olsen, 2007), service quality (DiPietro, Parsa & Gregory, 2011), menu engineering (Fang, Peng & Pan, 2013), marketing strategies (Ham & Lee, 2011), CEO duality (Guillet et al., 2013), and customer satisfaction (Gupta, McLaughlin & Gomez, 2007). The restaurant sector predominantly consist of independently owned, small and medium sized enterprises (SMEs). For example, the United States' National Restaurant Association reports that more than 9 in 10 restaurants have fewer than 50 employees, and more than 7 in 10 restaurants are single-unit operations (National Restaurant Association, 2016). Similarly, in Australia 99% of businesses in this sector are categorized as SMEs (ABS, 2016).

Recent studies on restaurant entrepreneurship have found the owners' entrepreneurial self-efficacy (ESE), defined as an individual's belief in his/her ability to undertake the tasks of entrepreneurship (Chen, Greene & Crick, 1998), has a direct, positive effect on innovation, defined as "the generation, acceptance, and implementation of new ideas, processes, products, or services" (Kanter, 1984, p.20), and restaurant performance (profitability, sales volume, growth, and success [see Lee, Hallak & Sardeshmukh, 2016a]). However, the extent to which the entrepreneur's education and training (also referred to as human capital investments [Unger et al., 2011]) affect performance in the restaurant sector remains unclear. Education can be domain-specific (i.e. industry or task-related) or general (i.e. total years of schooling) (Van der Sluis, Van Praag & Vijverbeg, 2008). Education is vital for entrepreneurs as it provides them with, among other things, business management skills, the ability to identify and pursue profitable markets, and the capacity to better source external

funding, all of which are important for business growth and success (Ganotakis, 2012; Goedhuys & Sleuwaegen, 2000). Human capital factors related to the tasks of entrepreneurship (e.g. specific vocational training, business education) demonstrated stronger effects on business performance compared to non-task related human capital factors (e.g. general education as measured by level achieved, years in education) (Unger et al., 2011). Despite this, evidence supporting a direct relationship between education and performance in restaurant firms remains inconclusive. For example, in a study of independent restaurants, Lee et al. (2016a) were unable to demonstrate a direct relationship between a restaurant owner's levels of education and restaurant performance. Similarly, a study of small and medium sized tourism enterprises (inclusive of restaurant firms) by Hallak, Lindsay, and Brown (2011) also failed to detect a direct influence of the entrepreneur's education on the performance of their firm.

In this study, we expand the literature on entrepreneurship by examining the extent to which education (both industry related and entrepreneurship specific) has an impact on the network of relationships among ESE, innovation, and restaurant performance. We test the theoretically derived model on a sample of 198 restaurant entrepreneurs across Australia to determine variances in the model relationships by examining the effects across two groups determined through the owners' level of education (Grp1: Owners with industry related and entrepreneurship specific education; Grp2: Owners with no industry related and no entrepreneurship specific education). This study will contribute to the drivers of performance in restaurant firms, and extend the literature on entrepreneurial self-efficacy and innovation. In addition, the study presents new empirical insights on the role of education (both industry related and entrepreneurship specific) in exerting a moderating effect on the relationships among ESE, innovation, and restaurant performance. Through this approach, the study responds to previous research on entrepreneurship and human capital that emphasize the need

to examine moderator variables (Unger et al., 2011). The study also presents implications for industry and practice by understanding how entrepreneurial capabilities and business strategies may be shaped through education and training initiatives.

2. Theoretical framework

Figure 1 presents our conceptual model of firm performance that integrates the four main theories from entrepreneurship and social psychology: Self-Efficacy Theory (Bandura, 1997), Schumpeter's (1952) Entrepreneurship Theory of Innovation, Human Capital Theory (Becker, 1995), and Endogenous Growth Theory (Nelson & Phelps, 1966). These theories are integrated through the overarching "Knowledge-Based Theory of the Firm" (Grant, 1996).

[INSERT FIGURE 1 HERE]

The Knowledge-Based Theory of the Firm holds that the primary role of a firm is to integrate knowledge that resides within individuals to produce goods and services, and the main task of management is to establish the mechanisms and coordination necessary for this knowledge integration (Grant, 1996). This creates a competitive advantage and firm success because a manager's fundamental objective is to sustain above-normal profits by continually discovering new knowledge or solutions that can be combined with existing knowledge to produce innovative goods and services (Nickerson & Zenger, 2004). ESE, innovation, and human capital are critical knowledge bases from which an owner draws upon to create a competitive advantage. For example, innovations are developed from new ideas that stem from a combination of new and existing knowledge, and when implemented in the form of new products (e.g. a new menu item) or new production methods (e.g. a more efficient cooking technique), confer advantages to the firm such as increased sales and/or reduced

costs. The following section explains the linkages among these four theories within our conceptual model.

2.1 The ESE-Innovation-Performance relationship

Entrepreneurial self-efficacy (ESE) measures a person's confidence in developing new product and market opportunities, building an innovative environment, initiating investor relationships, defining core purpose, coping with unexpected challenges, and developing critical human resources (De Noble, Jung & Ehrlich, 1999). ESE is an extension of Bandura's (1997) Self-Efficacy Theory, which explains that individuals who have confidence in their abilities to perform specific tasks are more likely to successfully achieve those tasks. This is because high levels of self-efficacy influences upwards levels of effort, motivation, perseverance, and stress coping, driving individuals to pursue success in the face of difficulties (Bandura & Locke, 2003). Evidence shows ESE to be a distinguishing factor for high performing firms (Lee, Hallak & Sardeshmukh, 2016b). Higher ESE increases the ability of entrepreneurs to identify and pursue profitable opportunities, be more resilient in overcoming difficult challenges and recovering from failure, and more keen to face challenges (Hallak et al., 2011). As a result, they set higher goals for their business, and are motivated to achieve their lofty ambitions leading to higher firm performance (Lee et al., 2016a). This forms the basis of our first hypothesis.

H_1: ESE has a positive effect on restaurant performance

Schumpeter's (1952) Entrepreneurship Theory of Innovation puts innovation as the central function of an entrepreneur, who is responsible for disturbing or destroying economic structures and creating new ones in place by putting innovations into practice. Entrepreneurs implement new products, services, and processes through innovation. This breaks the status quo, creates shifts in industry and consumer expectations, and increases the barriers against

imitation, all of which results in the creation of a competitive advantage (Hébert & Link, 2006; Home, 2011). Innovation is considered essential for SMEs to anticipate and react to changes in consumer demand, leading to a competitive advantage (O'Dwyer, Gilmore & Carson, 2009). Studies of ESE have found that the capacity for an individual to be "innovative" distinguished "entrepreneurs" from "business managers" (Chen et al., 1998). Thus, we propose that restaurant owners with higher ESE are more capable of fulfilling the role of an entrepreneur, leading to increased development and implementation of innovations within their business.

H_2: ESE has a positive effect on innovation

The implementation of innovation in the restaurant sector can increase revenues and reduce costs. For example, product, service, and marketing innovations can increase sales revenues by attracting new customer segments. This also creates added value for a restaurant's existing customers, and encourages repeat purchase and loyalty. Innovations in technology, management, and processes can increase operational efficiency and effectiveness, driving performance by reducing restaurant costs (Lee et al., 2016a). Businesses with a process of continuous innovation are able to heighten the barriers to imitation, keeping their portfolio ahead of the competition, which creates a long-term competitive advantage (Ottenbacher & Harrington, 2007).

Previous studies in the restaurant sector has conceptualized innovation to comprise of product, service, process, management, and marketing innovation (Lee et al., 2016a). However, in examining the effect of innovation on restaurant performance, Lee et al. (2016a) specified the relationship between the latent variable for innovation and its indicators as reflective. In a reflective measurement model, the indicators are influenced by the latent construct, and the direction of causality is from the construct to the indicators (Jarvis,

MacKenzie & Podsakoff, 2003). The underlying assumption is that the covariation among the indicators is caused by variation in the underlying latent factor. In addition, all measures are assumed as equally valid indicators of the latent construct, and the construct validity is unchanged when a single indicator is removed because all indicators are interchangeable. However, in this study we propose that that the construct of innovation should be specified as formative, where the indicators influence the latent construct, and the direction of causality is from the indicators to the construct (Jarvis et al., 2003). In this way, the five types of innovation "make up" the latent construct of innovation as they are distinct and represent specific domains of innovations. To test this we propose the following hypothesis:

H_3: Innovation (operationalized as a formative construct comprised of product, service, process, management, and marketing innovations) has a positive effect on restaurant performance

2.2 The moderating role of education

Human Capital Theory (Becker, 1994) posits that humans are a form of capital which can be developed, and that investing in developing humans (e.g. through schooling and training) increases the productivity of the workforce (Nafukho, Hairston & Brooks, 2004). Schooling and training provides individuals with more knowledge and skills, enabling them to be more productive. In turn, this raises the earnings for their company and for themselves (Becker, 1994). Education can be domain-specific (i.e. industry or task-related) or general (i.e. total years of schooling). Previous studies have highlighted the lack of attention given to domain-specific education on entrepreneurship entry and performance (Van der Sluis et al., 2008). Human capital factors related to the tasks of entrepreneurship (e.g. specific vocational training, business education) demonstrated stronger effects on business performance compared to non-task related human capital factors (e.g. general education as measured by

level achieved, years in education) (Unger et al., 2011). However, evidence supporting a direct relationship between education and firm performance remains inconclusive (see Hallak et al., 2011; Lee et al., 2016a).

Drawing on Endogenous Growth Theory (Nelson & Phelps, 1966), in a knowledge-based economy owners with more advanced levels of educational qualifications will be better at sourcing, evaluating, and absorbing new information, enabling them to implement new ideas at a faster rate. In this research, we hypothesize that restaurant owners with education specific to hospitality and entrepreneurship (i.e. domain-specific education) will exhibit stronger relationships among ESE, innovation, and restaurant performance compared to owners without such education (i.e. general education). Higher domain-specific education equips a restaurant owner with business management skills and the ability to identify suitable technological and market opportunities (i.e. ESE), allowing him/her to exploit them with appropriate strategies (through innovation), which ultimately increase firm performance (Ganotakis, 2012). Domain-specific education also provides restaurant owners with entrepreneurial skills such as business management, how to select suitable and profitable markets, and how to apply for external funding, which are crucial for business growth (Goedhuys & Sleuwaegen, 2000). This forms the basis for the following hypothesis.

H_4: The structural relationships among ESE, innovation, and restaurant performance will be stronger for restaurant owners with industry related and entrepreneurship specific education, compared to owners with no industry related and entrepreneurship specific education.

3. Research method

3.1 Data collection

Data was collected through an e-survey of restaurant SME owners in Australia. Using publicly available information, a database of 4,219 restaurants was developed from a comprehensive search of online business directories. The e-survey was developed using Qualtrics, an online e-survey platform, and was subject to an initial pilot test using a convenience sample of 10 restaurant owners. After final improvements, the e-survey was distributed via e-mail. This resulted in 198 completed surveys returned, representing a 4.7% response rate, which is consistent with prior studies utilizing e-surveys (Stockton & Baker, 2013). Also, 100-200 cases are deemed sufficient for PLS-SEM analysis (Chin, 2010).

A priori and post-hoc power analyses using the G*Power tool was used to determine the adequacy of the sample size (Faul et al., 2009). Using suggested minimum values by Cohen (1988) (a minimum R^2 value of 0.10, a statistical power of 80%, and with 5 predictors [the innovation construct has the largest number of predictors]), the a priori G* Power calculation indicated that a sample size of 122 would be required. Additionally, the post-hoc G* Power calculation for a minimum R^2 of 0.10, a sample size of 198, and 5 predictors indicated that the statistical power achieved using the study's sample size of 198 was 0.96, which is well above Cohen's (1988) recommendations, thus justifying the adequacy of our sample size.

The e-survey also collected information on restaurant size (based on number of employees), age, location, legal structure, cuisine offered, seating capacity, whether the restaurant was family owned, the innovations implemented in the restaurant, and information concerning perceived restaurant performance. Personal information of the owner was also collected which included their age, gender, education levels, business ownership experience, and their ESE.

3.2 Construct measures

Restaurant performance – Owners rated their business on profitability, level of performance, sales volume, growth, success, and meeting expectations based on Hallak, Brown, and Lindsay's (2012) business performance scale. All items were measured on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree).

The study utilized subjective performance measures because SME owners are often reluctant to disclose sensitive financial information, which leads to several potential issues such as item non-response and survey non-response. Furthermore, the financial records cannot be cross-checked for accuracy (Haber & Reichel, 2005; Runyan, Droge & Swinney, 2008). Subjective performance measures are found to be highly correlated to objective performance measures in small business research (Dess & Robinson, 1984; Wall et al., 2004).

Innovation – This measurement scale captured the innovations implemented in the business in five areas: products, services, processes, management, and marketing. Additionally, the innovation's "novelty" was measured by asking respondents to indicate whether the majority of innovations in each area were "new only for the business" (lowest novelty, given a value of 1), "new for the local market" (value = 2), "new for the Australian restaurant industry" (value = 3), or "new for the world" (highest novelty, value = 4). The items were adapted from the Australian Bureau of Statistics' Business Characteristics Survey 2008-09 (ABS, 2009) and the Oslo Manual: Guidelines for Collecting and Interpreting Innovative Data developed by the Organization for Economic Cooperation and Development (OECD) (OECD & Eurostat, 2005). During analysis, responses to the scale were combined to form a composite innovation score. For each innovation type, the mean for every yes/no item for a given innovation type was calculated (no: not implemented = 0, yes: implemented = 1). This was multiplied with its novelty score resulting in the composite score. As an example, to calculate the composite score for product innovation (PI):

$$\text{PI Composite Score} = \frac{(\text{PIa} + \text{PIb} + \text{PIc} + \text{PId})}{4} \times \text{PI Novelty}$$

Each innovation type was subjected to the above calculation.

Entrepreneurial Self-Efficacy – Owners rated their ability in undertaking the tasks of entrepreneurship in six areas: developing new product and market opportunities, building an innovative environment, initiating investor relationships, defining core purpose, coping with unexpected challenges, and developing critical human resources. De Noble et al.'s (1999) 23-item scale measured on a seven-point Likert scale was used.

Education – This was measured by asking respondents (yes/no) whether they had completed any qualifications/formal training in entrepreneurship and hospitality. Respondents were asked "Have you ever completed any formal qualifications/training in entrepreneurship?" and "Have you ever completed any formal qualifications/training in hospitality?". Based on their yes/no answers, the cases were subsequently sorted into the two groups as previously mentioned.

3.3 Data analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS (v. 3.2.6) (Ringle, Wende & Becker, 2017) was used to assess the measurement and structural models following a two-step approach: (1) validation of the outer (measurement) models; (2) examining the inner model (structural relations among the latent factors) (Chin, 2010). The structural model was also examined across the education groups through multi-group permutation tests (Henseler, Ringle & Sinkovics, 2009).

4. Results

4.1 Sample

The total number of usable responses was 198. Little's Missing Completely at Random test in IBM SPSS produced a non-significant result (χ^2 = 401.97, *df* = 404, p = 0.52), indicating data was missing completely at random. Based on this, missing values were imputed using the Expectation Maximization algorithm (Peters & Enders, 2002). The standard error of the mean (S.E.M) for each construct was calculated to support the representativeness of the sample. This functions to calculate the lower and upper bounds of the 95% confidence intervals (CI) in which the population's mean for each construct is likely to fall:

$$S.E.M = SD / \sqrt{n} \quad \ldots\ldots (1)$$

$$95\%\ CI = (S.E.M \times 1.96) \pm mean \quad \ldots\ldots (2)$$

The mean scores for innovation (Mean = 0.61; SD = 0.39; CI = 0.55 – 0.67), ESE (Mean = 5.31; SD = 0.89; CI = 5.19 – 5.43), and restaurant performance (Mean = 4.04; SD = 1.57; CI = 3.82 – 4.26) fell within the 95% confidence intervals (CI), indicating that the sample's construct means were similar to the population means. Additionally, non-response bias was assessed using a Chi-square test comparing respondents and non-respondents based on their location. The results indicated no significant differences between the two groups based on their business location (χ^2 (7, n = 198) = 11.691, p > 0.05), implying non-response bias was not an issue (Barclay et al., 2002).

Common Method Bias (CMB) was mitigated through procedural design and post-hoc analysis following Podsakoff et al.'s (2003) recommendations. For procedural design, the survey was developed in consultation with senior academics specializing in hospitality and tourism, and through pre-survey interviews and a pilot study involving a small sample of restaurant owners. This ensured the survey questions were clear, concise, and specific to the restaurant sector, reducing the complexity and potential ambiguity of the survey. In addition,

the three constructs of interest were measured in different response formats (Likert scale, yes/no questions, ordinal scales) to introduce methodological separation of the measures (Podsakoff et al., 2003). Finally, we implemented counterbalancing of question order by separating the survey sections about ESE, innovation, and restaurant performance (Podsakoff et al., 2003). For example, we asked owners about their innovative behaviors, then moved to a section containing demographic questions such as their business location and type of cuisine they specialize in, and followed that with the measures of the ESE construct. Next, we introduced a further section containing demographic questions such as their age and gender, and followed that with questions of restaurant performance interspersed with additional demographic questions.

Post-hoc analysis of CMB was conducted through Harman's (1967) one factor test and a marker-variable approach. First, Harman's (1967) one factor test was applied to the dataset. The eigenvalue unrotated EFA solution detected seven factors, with the highest portion of variance explained by a single factor being 33.7%. This indicated that CMB was unlikely to be an issue for this study as the majority of variance was not due to a single factor (Fraj, Matute & Melero, 2015). Second, we applied the marker-variable approach proposed by Malhotra, Kim, and Patil (2006) using steps designed for PLS-SEM (Rönkkö & Ylitalo, 2011). Specifically, we estimated the structural model with and without the inclusion of a marker construct as an exogenous variable predicting each construct. First, the correlation between the marker construct and all constructs in the model (restaurant performance [0.115], ESE [0.091] & innovation [0.075]) were very low, and its effect on the endogenous constructs (restaurant performance: $\beta = 0.040^{n.s.}$, innovation: $\beta = 0.077^{n.s.}$) were also very low and non-significant, indicating its suitability as a marker construct. Second, the comparison of results between the structural models with and without the marker construct present showed no notable differences, and all theorized paths maintained similar path

estimates and levels of statistical significance. Thus, taken together, the application of CMB remedies in procedural design and post-hoc analyses do not suggest the threat of CMB for this study (Podsakoff et al., 2003; Rönkkö & Ylitalo, 2011).

A summary of the sample demographics is presented in Table 1.

[INSERT TABLE 1 HERE]

4.2 Outer model analysis

Reflective constructs – Internal reliability for the ESE and restaurant performance constructs were established as both Dillon-Goldstein's rho (composite reliability) and Cronbach's α values were above the lower limit of 0.6 (Hair et al., 2017). Indicator reliability was established as all outer loadings were higher than 0.70 (Table 2). Convergent validity of both constructs were upheld with AVE values above 0.50. Finally, both constructs exhibited discriminant validity as the confidence intervals for the heterotrait-monotrait ratio (HTMT) of the correlations between the two reflective constructs were lower than 0.85, and the HTMT confidence interval (CI = 0.229-0.518) does not include 1 (Hair et al., 2017).

[INSERT TABLE 2 HERE]

Formative construct – The absence of collinearity of the innovation constructs' indicators was established as each indicator's VIF value was lower than 5 (Table 3). The construct indicators were considered valid as their outer weights were significant (management innovation), or, their outer loadings were above 0.5 and were significant (service, process, and marketing innovation) (Hair et al., 2017). Although the outer weight of the indicator "product innovation" was non-significant and the outer loading was relatively low (0.376), the item was retained as the outer loading was significant and the indicator has theoretical relevance to the innovation construct (Hair et al., 2017). Finally, the nomological

validity of the innovation construct was supported as the hypothesized relationships between innovation and the other constructs in the model were significant and in the intended direction (see Table 4), indicating that the construct behaves as it should within a nomological network (Henseler et al., 2009).

[INSERT TABLE 3 HERE]

4.3 Inner model analysis

There were no collinearity issues among the predictor constructs as all VIF values were below 5 (ESE to innovation = 1.000, ESE to restaurant performance = 1.165, innovation to restaurant performance = 1.165) (Hair et al., 2017). The results show (Table 4) that ESE and innovation were positively and significantly related to restaurant performance, supporting H_1 and H_3. ESE was also positively and significantly related to innovation, supporting H_2. Additionally, an analysis of the significance of the indirect effect of ESE on restaurant performance through innovation indicated that, in addition to a direct effect, ESE has an indirect effect on restaurant performance that is partially mediated by innovation. The Stone-Geisser Q^2 values obtained through the blindfolding procedures for restaurant performance (Q^2 = 0.103) and innovation (Q^2 = 0.056) were found to be larger than zero, supporting the predictive relevance of the model (Hair et al., 2017). Finally, the SRMR value for the structural model that was less than 0.08 (0.054 for our model), which indicated good model fit (Hair et al., 2017).

[INSERT TABLE 4 HERE]

4.4 Multi-group analysis

The structural model was cross-validated across the two education groups using multi-group permutation tests (Henseler et al., 2009). Despite Table 5 indicating several

differences in terms of significant path estimates between the groups, the multi-group permutation tests (final column on the right) showed no significant differences among the two groups on any of the paths. This signifies that education does not play a moderating role on the relationships among ESE, innovation, and restaurant performance (Hair et al., 2017). Thus, H_4 is not-supported as the structural model of ESE, innovation, and restaurant performance did not differ between the two groups.

[INSERT TABLE 5 HERE]

5. Discussion

This study examined a theoretically derived structural model of ESE, innovation, and restaurant performance in restaurant SMEs. The results showed that ESE (operationalized as the entrepreneur's ability to develop new product and market opportunities, build an innovative environment, initiate investor relationships, define core purpose, cope with unexpected challenges, and develop critical human resources) was positively and significantly related to restaurant performance (operationalized as the firms' profitability, level of performance, sales volume, growth, success, and ability to meet expectations). Furthermore, ESE had a significant positive effect on restaurant innovation (operationalized as the innovations implemented in the business in five areas: products, services, processes, management, and marketing).

The findings provide empirical support for Self-efficacy Theory (Bandura, 1997) in a new context, restaurant entrepreneurs. The results also demonstrate that those associated with higher ESE were also more innovative, in line with the Entrepreneurship Theory of Innovation which states that the primary function of an entrepreneur is to develop and introduce innovations to market (Schumpeter, 1952). Restaurant owners with high ESE have greater abilities in developing new product and market opportunities. This, coupled with

better capacity in sourcing financing from investors, provides innovative ideas with sufficient capital to be successfully developed and implemented within the business, ultimately leading to superior firm performance (Lee et al., 2016a).

Innovation was found to be positively and significantly related to restaurant performance. The introduction of innovations in products, services, processes, management, and marketing confers competitive advantages through increased sales and/or reduced costs, which enhances the profitability of the restaurant (Lee et al., 2016a). This also creates a barrier to imitation, keeping the restaurant's portfolio ahead of the competition, which establishes a long-term competitive advantage (Ottenbacher & Harrington, 2007). In addition, we contribute to new theoretical knowledge in the specification of the innovation construct for structural models. Our results support the formative latent structure of the innovation construct, where the direction of causality is from the indicators to the construct, meaning, the five types of innovation "make up" the restaurant's innovation portfolio as they are distinct and represent specific domains of innovation that are not interchangeable (Jarvis et al., 2003).

The study also makes a new theoretical contribution by examining the extent to which the entrepreneur's education (industry related and entrepreneurship specific education) influences the relationships among ESE, innovation, and restaurant performance. Examining the structural model across two groups, it was predicted that the structural relationships among the constructs would be stronger for restaurant owners with industry related and entrepreneurship specific education compared to owners without such education. However, the PLS-SEM multi-group analysis failed to show education as a moderator variable, indicating that the presence of industry related and entrepreneurship specific education did not strengthen the relationships among ESE, innovation, and restaurant performance.

Despite evidence suggesting education, as a dimension of human capital, has an important role in entrepreneurial performance (Ganotakis, 2012; Goedhuys & Sleuwaegen, 2000), our findings highlight the complexity of these relationships. Previous studies have also found inconclusive evidence of the effects of human capital. For example, Lee et al. (2016b) reported the entrepreneur's education to be non-significant in distinguishing between high, average, and low performing restaurants. An entrepreneur's type and level of education may be less relevant in industries with low barriers to entry, but instead, the acquisition of skills from extensive business ownership experience may contribute more to profitability (Lerner & Haber, 2001). The inconclusive findings on the effects of education could also be, as suggested by Reuber and Fischer (1993), not merely about the amount of education an entrepreneur has received, but rather, how much an entrepreneur has learned and absorbed knowledge from such education, that would determine firm performance. Furthermore, an individual's level of education is considered as a measure of "human capital investments", which evidence suggests has lower effects on entrepreneurial success (e.g. profit, income) compared to measures of "outcomes of human capital" (Unger et al., 2011).

6. Conclusion and implications

This research makes a number of important contributions. We demonstrate a rigorous approach to examining a structural model with multiple predictors of performance under moderating conditions, providing a holistic integrated model of restaurant SME performance. Through this, we support the importance of innovation and ESE as antecedents to restaurant success, as well as the role ESE plays in promoting innovation development. We also validate the innovation construct as a formative latent variable, and encourage future studies of innovation to apply this specification when conducting structural equation modelling. More importantly, the moderating effects of education are inconclusive. This further elucidates the importance of measuring outcomes of human capital investments (e.g.

entrepreneurial skills, knowledge, competence) as the results suggest that it is not a matter of the presence or absence of qualifications achieved, but, it could be more pertinent to measure how entrepreneurs have gained new knowledge from their education (Hallak et al., 2011; Reuber & Fischer, 1993; Unger et al., 2011). The study also provides practical contributions to industry practitioners. Industry bodies such as restaurant associations should develop training programs that focus on enhancing entrepreneurial skills, such as developing innovations, sourcing funding, and developing human resources. These programs should focus on hands-on activities for attendees to engage in business scenarios, which have been demonstrated to enhance entrepreneurial capabilities (Maritz & Brown, 2013).

In terms of limitations, the sample for this study came from restaurant SMEs in Australia. It may be possible that the economic and environmental factors that are unique to this restaurant sector could influence these businesses in a way that may differ from businesses in other sectors of tourism, other industries, and/or other countries, requiring the structural model to be cross-validated across different contexts. In addition, the use of subjective performance measures may introduce bias into the results such as social desirability. Future research should also focus on operationalizing the outcomes of human capital investments by measuring the skills and knowledge gained from an entrepreneur's education and experience.

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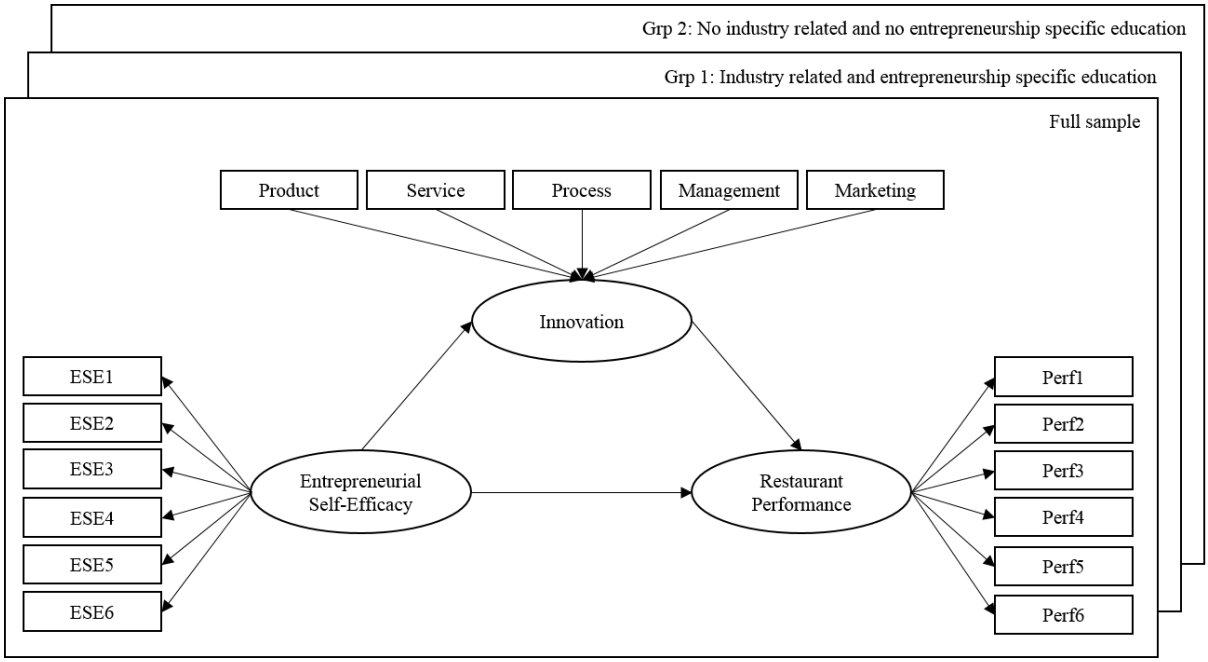


Figure 1 Theoretical model of the study

Variable	Category	N	Valid %
Age	18 – 25	1	0.5
	26 – 35	27	13.6
	36 – 45	74	37.4
	46 – 55	63	31.8
	56 and above	33	16.7
Gender	Male	135	68.9
	Female	61	31.1
	Missing	2	
Length of current business ownership	Less than 3 years	40	21.9
	3 – 5 years	51	27.9
	6 – 10 years	51	27.9
	11 – 15 years	22	12.0
	More than 15 years	19	10.4
	Missing	15	
Method of business acquisition	Started from scratch	108	54.8
	Inherited from family	3	1.5
	Purchased an existing business	81	41.1
	Other	5	2.5
	Missing	1	
Owned businesses in the past	Yes	113	57.1
	No	85	42.9
Currently own other businesses	Yes	59	29.8
	No	139	70.2
Type of cuisine	Modern Australian	97	49.0
	Indian	11	5.6
	Asian	23	11.6
	Greek	1	0.5
	Italian	25	12.6
	Other	41	20.7
Average price of main dish on menu	$1 - $15	17	8.6
	$16 - $25	71	35.9
	$26 - $35	90	45.5
	More than $35	20	10.1
Business location	Sydney	32	16.2
	Melbourne	36	18.2
	Brisbane	15	7.6
	Adelaide	14	7.1
	Perth	10	5.1
	Darwin	1	0.5
	Hobart	3	1.5
	Canberra	2	1.0
	Other New South Wales	26	13.1
	Other Victoria	20	10.1
	Other Queensland	18	9.1
	Other South Australia	7	3.5
	Other Western Australia	5	2.5
	Other Tasmania	9	4.5
	Other Northern Territory	0	0
Number of employees	0 – 2	4	2.2
	3 – 5	17	9.1
	6 – 10	63	33.9

	11 – 20	66	35.5
	21 – 50	32	17.2
	More than 50	4	2.2
	Missing	12	
Seating capacity of the business	Less than 20 seats	4	2.0
	21 – 50 seats	46	23.2
	51 – 100 seats	79	39.9
	101 – 150 seats	46	23.2
	More than 150 seats	23	11.6

Table 1 Sample demographics

Latent construct	Indicator	Outer loadings	Lower bound (95%)	Upper bound (95%)	Average Variance Extracted (AVE)	Cronbach's α	D.G. rho (CR)
ESE	DevNewProd	0.775	0.681	0.842	0.613	0.874	0.904
	InnovEnv	0.803	0.734	0.856			
	Invest	0.705	0.594	0.787			
	CorePurp	0.839	0.781	0.887			
	UnexChall	0.744	0.661	0.811			
	CritHR	0.821	0.755	0.874			
Restaurant Performance	Perf 1	0.785	0.706	0.846	0.741	0.929	0.945
	Perf 2	0.787	0.692	0.857			
	Perf 3	0.843	0.792	0.883			
	Perf 4	0.891	0.824	0.935			
	Perf 5	0.926	0.898	0.947			
	Perf 6	0.923	0.898	0.941			

Table 2 Results of the reflective construct assessments

Latent construct	Indicator	VIF	Outer weight	Lower bound (95%)	Upper bound (95%)	Outer loading	Lower bound (95%)	Upper bound (95%)
Innovation	Product	1.336	-0.096	-0.483	0.278	0.376	0.017	0.633
	Service	1.443	0.398	-0.002	0.700	0.682	0.368	0.855
	Process	1.760	0.148	-0.324	0.555	0.685	0.352	0.864
	Management	1.816	0.678	0.281	0.972	0.914	0.686	0.975
	Marketing	2.002	0.062	-0.370	0.532	0.706	0.416	0.869

Table 3 Results of the formative construct assessments

Path estimates of baseline model	**Path coefficient**	**Effect size (f^2)**	**Significance**
ESE → Restaurant Performance	0.285	0.083	CI (0.129 – 0.427)
Innovation →Restaurant Performance	0.180	0.033	CI (0.020 – 0.350)
ESE → Innovation	0.376	0.165	CI (0.270 – 0.510)
ESE → Innovation → Restaurant Performance	0.068	-	CI (0.007 – 0.152)

Note: CI = Confidence Intervals (Lower bound – Upper bound)

Table 4 Path estimates of the inner model

	Pooled N = 198		Grp 1 (With education) N = 133		Grp 2 (No education) N = 65		Grp 1 vs Grp 2
Path	**β**	**CI**	**β**	**CI**	**β**	**CI**	**p-value**
ESE → Restaurant Performance	0.285	0.129 – 0.427	0.313	0.133 – 0.476	0.230	-0.109 – 0.516	0.330
Innovation → Restaurant Performance	0.150	0.020 – 0.350	0.217	-0.098 – 0.371	0.181	-0.505 – 0.416	0.482
ESE → Innovation	0.365	0.270 – 0.510	0.361	0.144 – 0.468	0.420	-0.391 – 0.584	0.707

Note: β = path coefficient; CI = 95% Confidence Intervals

Table 5 Multi-group analysis results