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Dimensionality of ethnic food fine dining experience: An application of semantic network analysis

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ABSTRACT

This study attempts to find the underlying dimensionality in online reviews of fine-dining ethnic food restaurant experiences in Hong Kong. This research adopted semantic network analysis with Clauset–Newman–Moore clustering. Consequently, diverse and specific dimensionality was explored in this research, including ambiance, service, food, drinks, desserts, view, location, occasions, reputation and price. The content of the reviews on five types of ethnic restaurants was different in some dimensions. Marketers of fine-dining ethnic restaurants can select a particular focus when they promote their restaurants, develop menu plan and train staff members. This study implies that the quality dimensions of traditional restaurants may not accurately represent the factual dimensions, thereby resulting in implications for developing a new index of restaurant quality.

1. Introduction

The increasing popularity of social media and proliferation of customer-generated content substantially amplified their effects on the hospitality industry. They have become significant information sources for customers and marketers to gather feedback on products and services. Accordingly, determining the fundamental motive of sharing and what customers want to deliver through electronic word-of-mouth (eWOM) is crucial; despite the anonymity of eWOM information, it has higher credibility and relevance to customers than marketer-generated information (Clare, Wright, Sandiford, & Caceres, 2018; Erkan & Evans, 2018; Viglia, Minazzi, & Buhalis, 2016). The raw data are available to describe the customer experience through big data analytics, which is conducive to identifying the underlying stories within the huge amount of data (Önder, 2017; Zhang, Zhang, & Yang, 2016). Restaurant review data also explain diners' food consumption experience. Food consumption experience is a pivotal behavior that can fulfil sensory, cultural, social and epistemic motivations (Correia, Kim, & Kozak, 2020). Previous studies have determined that this food consumption experience has a three-dimensional structure containing food, physical environment and service (Han & Hyun, 2017; Ryu, Lee, & Kim, 2012; Susskind & Chan, 2000).

Physical environment refers to ambiance, atmosphere, spatial layout and view (Heung & Gu, 2012). Various aspects of restaurant service have also been examined, including service quality (Li, Canziani, & Barbieri, 2016; Sweeney, Armstrong, & Johnson, 2016), service recovery and loyalty (Yao, Wang, Yu, & Guchait, 2019; Yi & La, 2004) and diners' emotions (Bowden & Dagger, 2011). These three dimensions of food consumption experience has been widely investigated and their importance has been proven (Canny, 2014; Susskind & Chan, 2000).

Even though active studies have identified food consumption experience, some research gaps remain in these investigations. First, most of the previous studies on restaurant experiences employed survey methods using questionnaires and employing less than 600 samples (Jang, Ha, & Park, 2012; Kim, Choe, & Lee, 2016). Moreover, because data were collected as a cross-sectional study, they represent an event at one point in time when we failed in assessing the overall picture of customers' preferences or experiences. Hence, research using online review data has received attention from the academic and industrial realms (Li, Ye, & Law, 2013; Zhang et al., 2016; Zhang, Ye, Law, & Li, 2010). Nevertheless, online review data have been rarely applied in studies on customers' experiences in ethnic restaurants.

Second, the dimensionality of ethnic restaurant experiences can be examined through text analytics using textual format data by detecting keywords that can represent restaurant experiences across different ethnic restaurants because ethnic food consumption experiences in different ethnic food restaurants vary (Choe & Kim, 2018; Kivela & Crotts, 2006; Lai, Wang, & Khoo-Lattimore, 2020; Mak, Lumbers, & Eves, 2012). However, limited efforts have been exerted to explore food consumption experiences in ethnic restaurants using text analytics. Therefore, this study initially attempts to analyze variations of

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consumers' experiences across five ethnic restaurants using sematic network analysis (SNA).

Thirdly, the SNA can be useful to recognize humans' communication channels by identifying the internal structure of data because this method is one of the few options that can extract meanings from text (Doerfel, 1998; Doerfel & Barnett, 1999). However, SNA has not been actively used in the ethnic restaurant management studies. Fourthly, the majority of studies on ethnic restaurants have examined customers' responses on one type of ethnic restaurant (Battour & Ismail, 2016: Jang et al., 2012). However, restaurant experiences can be different among varying ethnic restaurants (Jang, Liu, & Namkung, 2011). Thus, the current study attempts to identify such a distinctiveness using text analytics with online review data.

This study focuses on Hong Kong fine-dining ethnic restaurants. The main reason for selecting Hong Kong is that this territory is well-known as a culinary tourism destination because of its combination of Asian and Western cuisines (Okumus, Xiang, & Hutchinson, 2018; Promsivapallop & Kannaovakun, 2019). The current study is also keenly interested in fine-dining restaurants because these types of restaurants provide different quality and value of experience compared with other types of restaurants, such as quick service or casual dining restaurant (Ha & Jang, 2012; Noone, Kimes, Mattila, & Wirtz, 2007). The selection of five types of ethnic restaurants, namely, Japanese, Cantonese, French, Italian and Australian restaurants, is attributed to three reasons: competition status quo, substantial number of online reviews to analyze in this current study (over 1000 English reviews in the target period) and level of specializations in a certain ethnic food, which represents the cultural features and customs of a particular ethnic group (Kim et al., 2016; Lai, Khoo-Lattimore, & Wang, 2018). Consequently, experiential dimensions in ethic restaurants can vary with different cultural interpretations because they are determined by global experiential branding, novel product development, and brand extension issues (Lai et al., 2018; Schmitt, 1999).

The objectives of the current study are fourfold. Firstly, this study aims to examine and compare the influential keywords in online reviews for each type of fine-dining ethnic restaurants. Secondly, the current research aims to identify the underlying patterns of customers' food consumption experiences in fine-dining ethnic restaurants described in online reviews. Thirdly, this research intends to identify the differences in the outcomes of analytical results on the basis of five types of ethnic restaurants. Lastly, this study aims to investigate the common features and differences in the dimensionality of the food consumption experiences between the findings of the present and previous studies.

2. Literature review

Given that three dimensions, including ethnic food, physical environment, and service, characterize customers' experiences with ethnic restaurants, they determine customers' emotions. However, according to Schmitt (1999), experiences, such as sensory, emotional, cognitive, behavioral, and relational, can be explained in diverse values. Now that these experiences will be examined through holistic consumption and the interface of experience values, eclectic methods are required to analyze the experiential components. In addition, ethnic food consumption experience is complicated because it is integrated with diverse issues, such as branding, co-branding, globalization, organizational culture, and adoption of new products or technologies (Schmitt, 1999).

However, the experiential dimension must also be categorized systematically to more clearly reflect the experiential multidimensional structure of ethnic restaurant customers. Previous studies have treated food, physical environment and service as a three-dimensional framework beyond the important aspects of restaurant experiences (Canny, 2014; Han & Hyun, 2017; Susskind & Chan, 2000). These dimensions are related to Schmitt's (1999) strategic experiential modules, including sense, feel, think, relate, and act. For example, ethnic food, physical environment, and service can stimulate sensory, affective, and creative experiences and replay physical experiences, further affecting the assessment of experience and lifestyle. To ensure the dimensionality of previous studies, the current research accommodates the three-dimensional structure (i.e., ethnic food, physical environment and service) as a fine-dining ethnic traditional restaurant experience dimension. A detailed literature review is as follows.

2.1. Ethnic food

Ethnic food attributes indicate the features or characteristics of food experience (Kim et al., 2016). Past studies have proposed several specific attributes of ethnic food, such as taste, flavor, service, reputation, price, recipes, hygiene, surroundings, nutrition, variety, freshness, color and presentation (Guan, 2012; Kim, Badu-Baiden, Oh, & Kim, 2020; Verbeke & López, 2005). Studies on ethnic food attributes have also considered food quality, food presentation, number of dishes, value for money, variety of dishes, standard of food services, speed of service and attractiveness of surroundings as food attributes (Mors, Polet, Vingerhoeds, Perez-Cueto, & de Wijk, 2018; Nield, Kozak, & LeGrys, 2000; Steptoe, Pollard, & Wardle, 1995).

Diners' ethnic experience encompasses a variety of benefits, including epistemic, hedonic, social and emotional benefits (Choe & Kim, 2018; Finch, 2006; Kim, Badu-Baiden, et al., 2020; Rozin & Vollmecke, 1986). The dimensional structure of ethnic food consumption experience is also pertinent to culture, meaningfulness, obtainment of knowledge, hedonism and adverse experiences. Studies have indicated that epistemic benefit positively affects customers' consumption value towards a provided facility or service (Ellis, Park, Kim, & Yeoman, 2018; Kim et al., 2016). From a cultural perspective, the consumption of local foods assists tourists to acknowledge the cultural diversity of the destinations they visit (Lee et al., 2011). For tourists, ethnic food consumption experience also enables exploration through learning during overseas travels (Choe & Kim, 2019).

Ethnic food consumption experience is regarded as a fundamental factor that results in topmost values, such as happiness and hedonism (Choe & Kim, 2018; Kivela & Crotts, 2006; Sulek & Hensley, 2004). Particularly, novel food consumption produces certain emotional responses, which include enjoyment, sensory stimulation and fulfilment (Mak et al., 2012). These novel foods represent the uniqueness that are related with consuming local foods in exotic destinations (Tsai, 2016). Similarly, some studies have found that ethnic food customers obtain meaningful dining experiences through the strengthening of affection, friendship and family well-being (Kim & Eves, 2012; Tsai, 2016). The emotional benefits of food consumption also lead to critical value, such as happiness and satisfaction (Barrena, García, & Sánchez, 2015; Barrena & Sánchez, 2013).

Food consumption experiences are different from one another based on the type of ethnic restaurants because each ethnic restaurant provides diners with a variety of benefits and types of food and culture (Liu, Li, DiPietro, & Levitt, 2018). Exotic food consumption experience in ethnic restaurants is based on cultural differences. Different ingredients and recipes from customers' own culture can lead to their satisfaction and positive emotions in ethnic food consumption experience. Some studies (e.g. Horng, Chou, Liu, & Tsai, 2013; Hwang, Kim, Choe, & Chung, 2018; Lai et al., 2018; Mak et al., 2012) have indicated that the positive image of a certain ethnic culture also has a positive influence on diners' satisfaction. However, the localization of food can be one of the key success factors even if the cultural difference makes ethnic restaurant unique.

2.2. Physical environment

Physical environment is considered to be another important dimension comprising the ethnic restaurant experience. This environment

is expressed and classified differently on the basis of the following study contexts: ambiance, atmosphere, spatial layout or interior design. Heung and Gu (2012) divided restaurant atmospherics into spatial layout and employees, ambiance, facility aesthetics and view from a window. Some studies have determined the following physical environment components of ethnic restaurants on the basis of the literature: facility aesthetics, ambiance, lighting, layout, table settings and service staff (Horng et al., 2013; Kim et al., 2016).

Physical environment has been highlighted because it influences customer perceptions and behaviors in relation to the ethnic restaurant experience (Kim, Oh, Choe, & Choi, in press) and even affects themed restaurant diners (Cheng, Shih, & Wu, 2016). The physical environment in the hospitality industry is emphasized because its outcomes have intangible characteristics; thus, a pleasant physical environment is perceived as a sign of the acceptable quality of services (Horng et al., 2013; Kim et al., 2016). Although foods and beverages constitute the core products of restaurants, improving their physical environment is also important, including such aspects as odor, interior design, staff uniforms, music, lighting and temperature (Lin & Mattila, 2010).

Numerous studies on the physical environment have been conducted owing to their latent significance. Heung and Gu (2012) verified that the restaurant atmosphere exerts a positive influence on dining satisfaction and behavioral intentions, such as return intention, WOM intention, and willingness to pay. The related literature was extended to investigate the influence of the restaurants' physical environment on loyalty, perceived value and satisfaction (Heung & Gu, 2012; Kim & Choe, 2019). In the full-service restaurant context, decoration and artefacts are significant elements of customer satisfaction. In particular, decoration and artefacts exert a significant direct influence on price perception, with spatial layout and ambient conditions indirectly influencing customer loyalty (Chen, Peng, & Hung, 2015). The treatment of the physical environment is imperative in theme restaurants (Cheng et al., 2016; Clemes, Gan, & Sriwongrat, 2013; Heung, 2002) or luxury restaurants (Chen et al., 2015). Although these studies ascertain the role of the physical environment, their analysis on the dynamics of customer experiential quality is limited, as they examine cross-sectional data using a questionnaire survey method and fail to review big data using a holistic perspective.

2.3. Service

Since the advent of a study on SERVQUAL, interest on service has been a major topic in the restaurant experience literature (Bojanic & Drew, 1994; Li et al., 2016). The results of developing a scale of service quality indicated that five dimensions represent service quality: tangibility, reliability, responsiveness, assurance and empathy (Parasuraman Zeithaml & Berry, 1988). Previous studies have found that service attitude has a significant impact on diners' satisfaction (Alhelalat, Ma'moun, & Twaissi, 2017; Kuo, 2007). Service attitude can be divided into functional and personal aspects. Employees' functional and individual service features have an influence on customers' satisfaction, but personal characteristics substantially explains customer satisfaction (Alhelalat et al., 2017). Service attentiveness also has an influence on satisfaction and positive responses (Lee, 2015; Liu, Zhang, & Keh, 2019). For example, the amount of tips given by American customers in a full-service restaurant was high when service attentiveness was good (Lee, 2015).

Perceived value is a subjective appraisal when people compare between benefits provided and costs paid. Diners are likely to become patrons if a certain restaurant provides high perceived value compared with its competitors. Past studies have indicated that quality service played significant roles as predictors of perceived value, whilst the outcomes of perceived value included satisfaction and behavioral intentions (Kim, Badu-Baiden, et al., 2020; Lai, 2015; Rashid, Rani, Yusuf, & Shaari, 2015).

3. Methodology

3.1. Analytic process

Although several studies have suggested new paradigms to explain the features in big data processing (Jin, Wah, Cheng, & Wang, 2015), the post-positivism paradigm would be associated with the present study in the current stage. Post-positivism criticizes the worldview of positivism because research results identified through positivism lack an enhanced understanding of social problems, are disconnected from the context and fail to apply subjectivity to the questions posed. From the post-positivist perspective, reality can be interpreted through the subjective evaluation of researchers, in which the research aim is for generalization. Post-positivism presents a reality by applying linguistic, mathematical or graphic forms, as well as generalize and compare individual differences (Schulze, 2003). The data characteristics in the current study are related to textual and unstructured data, thereby making this research qualitative. Janasik, Honkela, and Bruun (2009) explained that the feature of a study cannot be decided by the data collection method but by the data type and method of analysis. The research design of this study is close to an exploratory study because of attempts to address the salient factors of restaurant experience in online reviews. This study must leverage this type of data because its research objective is to determine the actual dimensionality of restaurant experience implicitly expressed by customers. Online reviews are more reliable than other analytical data, because online reviewers are not aware that their reviews are analyzed by other people; hence, they do not engage in “priming the artifact” (Scherer, 2005, p. 713).

Text analytics is a technique used to extract information and uses textual format data in an automated procedure (Halper, Kaufman, & Kirsh, 2013; Michalski, 2014). The use of text analytics, unlike a superficial evaluation of consumer ratings, can help ascertain the internal story of how people feel (Halper et al., 2013; Khan & Vorley, 2017; Laxmi & Pranathi, 2015). To analyze text form data, data must be altered from an unstructured to a structured form (Han, Mankad, Gavirneni, & Verma, 2016). Text analytics provides organizations with a good opportunity to properly analyze their market. Organizations use text analytics for marketing (customer relationship marketing, social media, churn detection and market analysis), business (document classification, human resources and risk management) or industry (fraud detection and warranty analysis) analytics (Halper et al., 2013).

Online reviews of fine-dining restaurants in Hong Kong were gathered from TripAdvisor.com. The automated parsing software Webharvy was used to gather data. Given that not all reviewers reveal their demographic information, reviewer/diners at fine-dining ethnic restaurants in Hong Kong were considered the target population. The major variables of this study are the date the review was written, the review's text and the overall recommendation ratings.

A fine-dining restaurant refers to an establishment that provides table services with upscale menu, sophisticated ambiance, and well-trained staff members (Ha & Jang, 2012). The current study followed the categorization of the fine-dining section of TripAdvisor.com, but the authors excluded some irrelevant shops, such as catering services. The restaurants in this study were categorized into ethic restaurant groups on the basis of the information on their website and TripAdvisor.com. Restaurants serving fusion food were excluded from this study. Reviews written in English between January 2014 and June 2018 were analyzed to consider the recent four-and-a-half-year reviews to control the external variables caused by translation and time. A total of 60,440 online reviews from 461 fine dining restaurants were collected. Restaurant information were assessed individually to screen the sample and evaluate the appropriateness of the inclusion.

Table 1 indicates that restaurants with undetermined locations and overlapping operations, cooking studios, and catering services were excluded. Restaurants without English reviews were likewise removed, thereby resulting in 43,757 reviews from 408 restaurants. After

Table 1
Data description.

Type of restaurants	Number of restaurants	Number of English reviews	Average number of English review per restaurant	Average rating score	Standard deviation of rating score
Cantonese restaurants	75	7724	103	4.16	1.08
Japanese restaurants	100	3094	31	4.29	1.01
French restaurants	51	4260	84	4.42	0.95
Italian restaurants	32	2981	93	4.26	1.02
Australian restaurants	4	1135	284	4.13	1.02

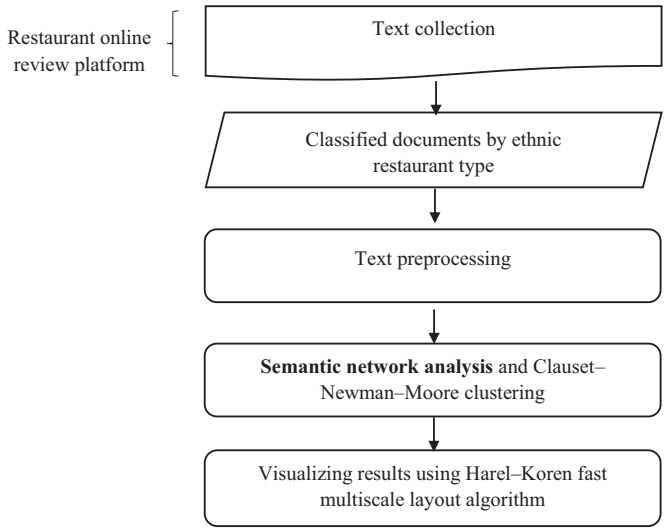


Fig. 1. Research flow.

collecting the reviews generated from January 2014 to June 2018, they were screened once again, and the sample size was reduced to 34,288 reviews from 396 fine dining restaurants in Hong Kong. The reviews of fine dining restaurants that serve Japanese, Cantonese, French, Italian, and Australian cuisine were separated for further analysis on the basis of their competitive relationship, number of online reviews (i.e., over 1000 reviews in English during the target period), and whether or not they offer different types of ethnic foods.

The data were analyzed using NodeXL Pro. A pair of vertices with numbers or one alphabet word was deleted. The use of NodeXL Pro enabled automatic tokenization; removal of numbers and terms with digits, hyphens and punctuation marks; change of letters into lower case (Casamayor, Godoy, & Campo, 2010; Ravi & Ravi, 2015); stop-word removal and removal of irrelevant words, such as function words (e.g., *and*, *the*, *a/an*) (Lucas et al., 2015). However, the current study did not perform stemming, which is the process of change in the basic form of words without a tense or number. To describe the data information, the number of reviews, average rating scores and average number of reviews were calculated (see Table 1). The sample consisted of 262 fine-dining restaurants in Hong Kong, with 19,194 online reviews written in English, the average rating score of which was 4.3 out of 5.0.

3.2. SNA

SNA refers to the method of obtaining meaning from texts by linking concepts that occur in close proximity to one another (Choi & Lecy, 2012). SNA concentrates on the paired association of shared meanings in a text rather than on the links between communication companions (Doerfel, 1998; Doerfel & Barnett, 1999). Spreading activation theory, which was suggested by Quillian (1962) and developed by Collins and Loftus (1975), is adopted in explaining SNA and addresses the semantic processing of humans. This theory asserts that memory search is the process of finding an intersection in a semantic network and is considered an activation that spreads from nodes, which represent concepts (Collins & Loftus, 1975). In spreading activation theory, concepts, words or phrases can form into nodes and links. Links indicate a direction between two different concept nodes. The memory searching process is anchored by tracing out nodes in parallel.

Three basic centralities have been discussed in the network analysis literature to recognize the power of nodes in a network: degree, betweenness and closeness centralities. Centrality in semantic network is a measure of how close a word is to the center in a network. Degree centrality (DC) refers to the number of direct ties a word has. The higher the degree a word has, the more influential it is in the network. Betweenness centrality (BC) means the extent to which a word lies between the various other words in a network, thereby enabling the word to play a gatekeeper role. Closeness centrality (CC) concentrates on the closeness of a word to all the other words in the network. Normalized DC (NDC) is calculated by dividing DC by the number of vertices in a network. The calculation of the normalized BC (NBC) is as follows. Normalized CC (NCC) can be measured by multiplying CC by the number of vertices in a network minus 1 (Freeman, 1977; Zhukov, 2016), where 'g' is the number of pairs of vertices in the network.

$$\text{Normalized DC} = \frac{1}{g-1}DC$$

$$\text{Normalized BC} = \frac{2}{(g-1)(g-2)}BC$$

$$\text{Normalized CC} = (g-1)CC$$

To summarize the method, the research flow is depicted in Fig. 1. Firstly, textual form data is gathered from TripAdvisor.com. Secondly, data are classified on the basis of the types of ethnic restaurants. Thirdly, text preprocessing is performed automatically. Fourthly, SNA and clustering is conducted And the Clauset–Newman–Moore clustering is used. Fifthly, visualization of network analysis and clustering results are carried out. Harel–Koren (HK) fast multiscale layout algorithm is used. The HK algorithm, which is another popular layout algorithm, uses a two-phase method: bringing a graph into a highly dimensional space and visualizing a low dimensional plane, using principal component analysis. The advantage of this method is that the network generated by this algorithm is fast, simple and has high levels of readability (Harel & Koren, 2002). Fig. 1 shows the overall research flow.

4. Results

4.1. Words with high centralities in networks

Table 2 displays the top 20 words with a high degree of centrality for comparison with the words in networks based on the types of ethnic restaurants with a high degree of centrality. The common words across the restaurant types, such as restaurant, include 'food', 'very', 'service', 'good', 'great' and 'dinner'. Moreover, several key differences were identified. First, online reviewers shared the menu items or ingredients in five fine-dining ethnic restaurants, such as 'sushi', 'duck', 'wine', 'pastas' and 'steaks' for Japanese, Cantonese, French and Italian, Italian

Table 2
Top 20 normalized degree centrality words.

Japanese restaurants (g = 6393)				Cantonese restaurants (g = 19,294)			
Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality	Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality
food	0.040	0.007	1.982	restaurant	0.031	0.003	3.241
very	0.037	0.008	1.950	food	0.029	0.002	3.280
restaurant	0.031	0.006	1.918	very	0.025	0.002	3.261
good	0.031	0.005	1.924	service (attentiveness)	0.022	0.001	3.183
sushi	0.024	0.004	1.854	good	0.022	0.001	3.222
great	0.023	0.003	1.860	dishes	0.017	0.001	3.087
service (slow but attentive)	0.023	0.002	1.815	one	0.015	0.001	3.087
one	0.020	0.003	1.803	great	0.014	0.001	3.068
Japanese (decoration)	0.020	0.003	1.790	place (revisit intention)	0.013	0.000	2.913
place (ambiance)	0.019	0.002	1.758	menu	0.013	0.001	2.933
time (slow service)	0.015	0.002	1.700	Chinese (ambiance)	0.012	0.001	2.952
menu	0.015	0.002	1.707	duck	0.011	0.001	2.952
dinner	0.014	0.001	1.739	dinner	0.011	0.000	2.913
(memorable) experience	0.013	0.001	1.726	more	0.011	0.000	2.894
more	0.013	0.001	1.656	table (layout)	0.010	0.001	2.836
really	0.012	0.001	1.707	dish	0.010	0.000	2.913
best	0.012	0.001	1.732	ordered (volume of orders)	0.010	0.000	2.990
dishes	0.012	0.001	1.694	really	0.010	0.000	2.913
lunch	0.012	0.001	1.707	staff (attentiveness)	0.010	0.000	2.836
here (visit experience)	0.011	0.001	1.675	here (revisit intention)	0.010	0.000	2.855
French restaurants (g = 10,538)				Italian restaurants (g = 6410)			
Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality	Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality
food	0.037	0.005	2.255	food	0.040	0.007	1.878
restaurant	0.033	0.005	2.213	restaurant	0.037	0.007	1.865
very	0.033	0.006	2.223	very	0.037	0.009	1.884
good	0.024	0.003	2.171	good	0.031	0.006	1.839
service (efficiency)	0.023	0.002	2.118	service (speed of service)	0.026	0.003	1.743
menu (degustation menu)	0.022	0.003	2.128	great	0.025	0.003	1.795
one	0.018	0.002	2.086	one	0.020	0.003	1.724
great	0.017	0.001	2.086	Italian	0.018	0.003	1.711
place (suitable for various situation)	0.015	0.001	1.960	menu (limited choices, with wine)	0.015	0.002	1.673
experience	0.015	0.001	2.002	dinner	0.015	0.002	1.673
dinner	0.014	0.001	2.034	table (layout)	0.015	0.002	1.628
dishes	0.013	0.001	2.013	place	0.015	0.001	1.641
wine (wine pairing)	0.013	0.001	1.970	wine (pricey)	0.014	0.002	1.647
well (overall quality)	0.012	0.001	2.002	staff (friendliness)	0.013	0.001	1.641
time (visit experience)	0.012	0.001	1.928	time (service timing)	0.013	0.003	1.647
more	0.012	0.001	1.928	pasta	0.013	0.001	1.647
chef (well-known chef)	0.011	0.002	1.939	well (staff)	0.013	0.002	1.660
table (layout)	0.011	0.001	1.949	view	0.013	0.001	1.621
dish	0.011	0.002	1.960	lunch	0.012	0.002	1.634
really	0.011	0.001	2.013	really	0.012	0.001	1.647

(*continued on next page*)

Table 2 (*continued*)

Japanese restaurants (g = 6393)				Cantonese restaurants (g = 19,294)			
Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality	Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality
Australian restaurants (g = 4168)							
Vertex	Normalized Degree Centrality	Normalized Betweenness Centrality	Normalized Closeness Centrality				
good	0.035	0.009	1.717				
steak	0.033	0.009	1.658				
restaurant	0.032	0.007	1.650				
view	0.032	0.008	1.671				
very	0.031	0.007	1.621				
great	0.027	0.005	1.638				
food	0.026	0.004	1.629				
service (friendliness)	0.026	0.005	1.633				
table (window seat)	0.021	0.005	1.546				
one	0.020	0.005	1.563				
place (location)	0.018	0.002	1.554				
drinks	0.017	0.002	1.525				
nice	0.017	0.002	1.567				
dinner	0.015	0.002	1.538				
bar	0.015	0.002	1.496				
steaks	0.015	0.002	1.483				
here (visit experience)	0.015	0.002	1.538				
out	0.014	0.003	1.396				
up (error: mix up, mess up)	0.014	0.003	1.404				
go	0.014	0.002	1.538				

Note: g is the number of pairs of vertices in a network.

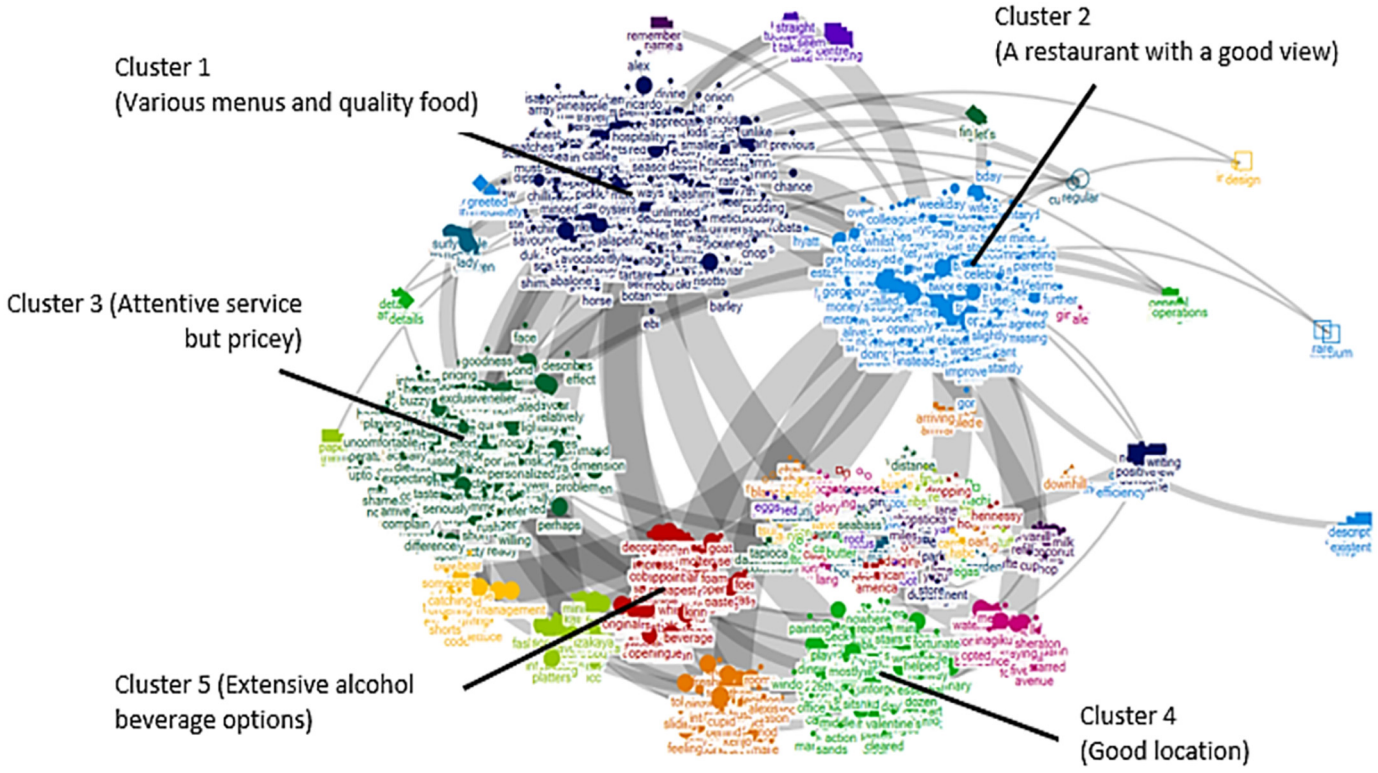


Fig. 2. Semantic network of Japanese fine-dining restaurant online reviews.

and Australian restaurants, respectively. That is, menu items or preferred/core ingredients had influence in sharing reviewers' experience. Second, other differences were observed. In the top 20 NDC words of Japanese restaurant, “Japanese (decoration),” “time (slow service),” “experience,” “best,” “here (visit experience),” and “lunch” were identified. Words were placed in brackets to elaborate the main words because some common words have obscure interpretations.

In the top 20 words of Cantonese restaurants, ‘Chinese (ambiance)’, ‘table (layout)’, ‘ordered (volume of orders)’, ‘here (revisit intention)’ and ‘staff (attentiveness)’ were observed. In French restaurants,

'experience', 'well (overall quality)', 'time (visit experience)', 'chef (well-known chef)' and 'table (layout)' were examined. In Italian restaurants, 'table (layout)', 'time (service timing)', 'well (staff)', 'staff (friendliness)' and 'view' were identified. In Australian restaurants, 'view', 'table (window seat)', 'drinks', 'bar', 'here (visit experience)' and 'up (service error: mix up, mess up)' were identified.

4.2. Clusters in networks

The Clauset–Newman–Moore clustering generated 110, 81, 126, 108 and 78 clusters for Cantonese, Japanese, French, Italian and Australian fine-dining restaurants, respectively. Given that the first five clusters covered approximately 93–99% of the word counts of semantic networks, this study introduces the first five largest clusters of each type of ethnic food restaurants with a direct quotation of the reviews. Semantic networks showed distinguishable clusters on reviewers' fine-dining restaurant experiences in Hong Kong. The clusters generated as results of sematic networking using the Clauset–Newman–Moore clustering method were named on the basis of the notable words and sentences with such words. The names of the clusters were used to create the theoretical dimensionality of the ethnic food consumption experience.

a. Japanese restaurants

The result of SNA in Japanese fine-dining restaurant online reviews indicates that cluster 1 (various menus and quality food) of these restaurants illustrates dishes and ingredients, such as sushi, sashimi, beef or teppanyaki, with high word frequency (32.62%) (see Fig. 2). For example,

'We had a large business dinner with a set menu and the food was diverse and delicious from sushi to foie gras to lobster ravioli to beef…'

'…We had a lunch set - and everything was perfect: the tuna, the nigiri, the rolls, the shrimps, the spring chicken and not to forget the specialty: black cod, which is one of D's signature dishes! And if you get a chance to taste it - you will know why'.

Cluster 2 (a restaurant with a good view) expounds the reputation of places with good views. Approximately 31.67% of the term frequency were contained in this cluster.

'Super-fancy restaurant in a busy neighborhood in Hong Kong. Located in a big building you have an astonishing view of the city lights…'

Cluster 3 (attentive service but pricey) covers 21.44% of online reviews on Japanese fine-dining restaurants in Hong Kong. Two examples are as follows.

'As a solo diner, the staff was extremely attentive and went out of their way to make it a memorable experience. Waiter proactively recommended that I order half portions of two signature entrees (Black Cod Miso being one) so that I could sample multiple…'

'Definitely the huge selling point of this place is the view, the food was good but a little bit pricey (fortunately you have a free-flow of champagne to compensate), the service was very good, special award for the guest relation manager and the staff that served us, they literally been fussing with us. Very nice experience'.

Cluster 4 (good location) indicates the location of restaurants (5.54%), whilst cluster 5 (extensive alcohol beverage options) presents the alcoholic beverages (2.96%).

'Would recommend this newly opened rooftop bar in central HK'. 'Good wine and sake list'.

b. Cantonese restaurants

The SNA results indicate that cluster 1 (special occasions/events and reputable) is about experiences in restaurants with a high reputation and explained special occasions or events (see Fig. 3). Approximately 41.15% of words in Cantonese fine-dining restaurant online reviews discussed this topic.

'Spent our wedding anniversary there and was an enjoyable night with great food but the service was a little all over the place. Seemed to have so many staff with different people servicing your table was hard to keep up and didn't really flow for a top class restaurant. Peking Duck pancakes were divine and we will definitely go again on our next visit to HK'.

'The private dining room and Michelin-starred restaurant on the top floor has amazing views and the best service we've experienced in quite some time. A has been a great experience and we have one more night to enjoy. The tremendous service - exceptional Cantonese food and a view overlooking the Hong Kong (and the nightly laser light show) is excellent'.

The semantic network of cluster 2 (various menus and quality food) in Cantonese fine-dining restaurant online reviews manifests dishes and ingredients. Approximately 28.26% of the words described this topic.

'M, an interesting Chinese restaurant with a western style setting locates at the basement of Charter Bank Headquarter in Central…… We had tried a few dim sum dishes a few weeks ago, and it was amazing. The signature crispy BBQ pork bun which is made with Spanish Refuel pork was flat out amazing. I have been to quite a few Michelin star restaurants that also offer similar bun, but none can match the supreme quality of tender and juiciness of C. It is everything a bun should be and more'.

Cluster 3 (attentive staff and friendly atmosphere) covered 22.23% of the Cantonese fine-dining restaurant online reviews and presents service and atmosphere.

'… The staff is outstanding and highly attentive and honestly, you must go when you are in HK. And the atmosphere is wonderful, especially lunch at the bar'.

Cluster 4 (generous service for tea/beverage) is related to elaborating tea service and free drinks. This cluster consists of 5.26% of words of Cantonese restaurant online reviews. A few examples are as follows.

'The service staff was keenly aware of our drinks and seemed to refill our jasmine tea after each sip we took. Great meal and great service, you can't go wrong when you choose this restaurant'.

'What a great nice surprise for us that we could all get a free glass of sparkling wine for the birthday celebration!'

Cluster 5 (decoration with Chinese classical art and upscale banquet) comprises 2.14% of the words counted in the semantic networks. Examples are as follows.

'Excellent Cantonese food served in a very well decorated classical/modern environment'.

c. French restaurants

The SNA result indicates that cluster 1 (special occasions/events and reputation) explains 36.57% of the French fine-dining restaurant online reviews in Hong Kong. An example is as follows.

'We're a Chinese/French couple living in HK for many years, F is definitely one of our favorite places for birthday or anniversary dinners. We tried the special French May menu, copious and everything was absolutely delicious……Total bill was around 5k with a glass of champagne and wine each, worth it for a nice occasion. Will come back!'

Cluster 2 (quality food and wine) describes wonderful dishes, ingredients and drinks, explaining 35.05% of online reviews on French fine-dining restaurants in Hong Kong.

'…The menu features cutting edge and wonderfully reimagined French dishes such as the radish salad made into a Chrysanthemum bouquet and the duck soup reduced to a dollop and served on a spoon. We ordered the three-course meal including dessert and were served close to 7 courses with wonderful amuse bouche courses thrown in between. The setting is

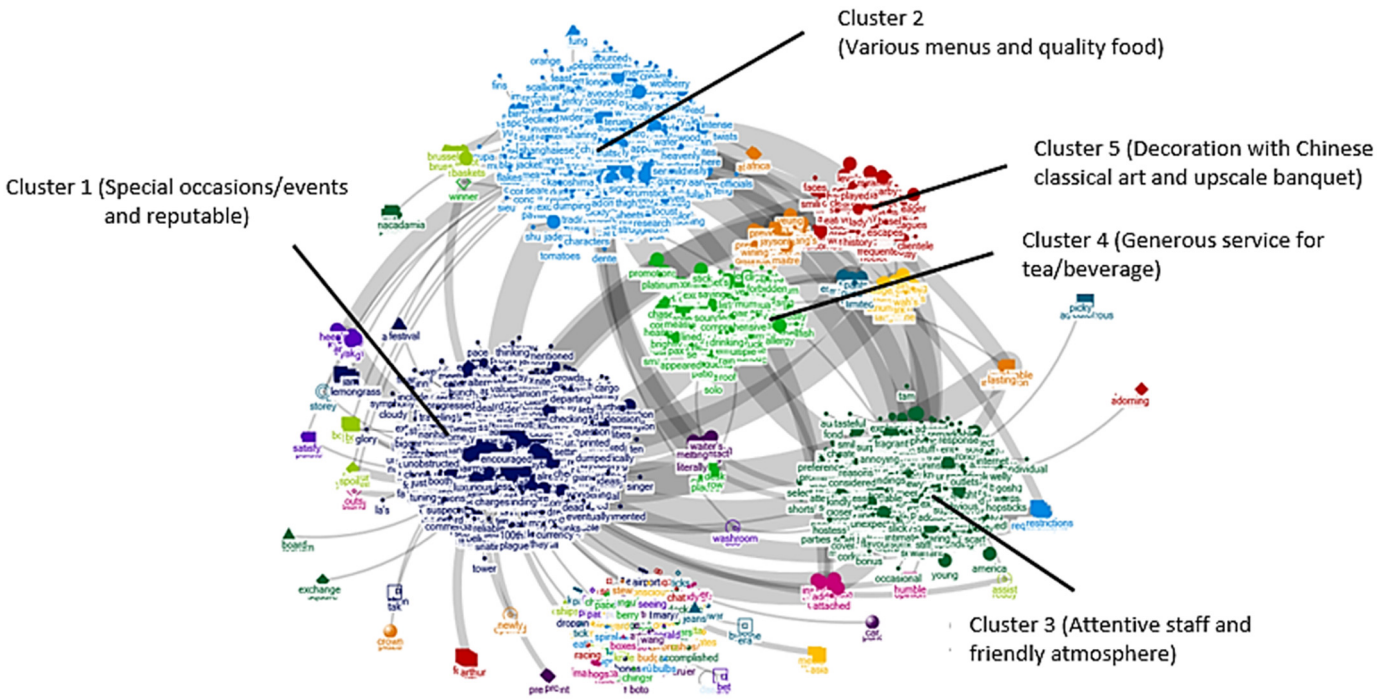


Fig. 3. Semantic network of Cantonese fine-dining restaurant online reviews.

elegant, the food is imaginative and the service is attentive. Highly recommended'.

Cluster 3 (attentive staff and elegant ambiance with good views) contains 21.41% of words that explain service, ambiance and views of French fine-dining restaurants in Hong Kong.

'The restaurant has a tranquil and elegant ambiance. The service very attentive. The food was delicious and splendidly presented. It is a good restaurant for business lunch and an elegant and romantic dinner'.

Cluster 4 (favorite menus and desserts) mentions dessert (2.19%), whilst cluster 5 (pricey menus) addresses an expensive meal (2.00%).

'The dessert of black truffle ice cream was a big but pleasant surprise. Maybe due to the summer heat but this was just truffle heaven. Was expecting a subtle finish but the chef managed to sign off with sensual fireworks'.

'Definitely a must visit space, but be warned, it is pricey'.

The results are demonstrated in Fig. 4.

d. Italian restaurants

The SNA result indicates that cluster 1 (various menus and quality food) manifests dishes and ingredients (see Fig. 5). This cluster covers 30.16% of the word counts of Italian restaurant online reviews.

'Came here for a business dinner and we shared a fresh salad, and had for a starter this wonderful pasta with lobster and sea urchin. Pasta was very al dente and the broth was extremely flavourful. We shared a steak and it was great. Desserts were also quite creative if you have the stomach for it'.

Cluster 2 (friendly service and atmosphere with a night harbor view) consists of 45.65% of the word counts of the restaurant online reviews.

'The restaurant is quaint and has a great view of the Hong Kong harbor. After reviewing the menu and wine list, we enlisted the help of the manager to choose a wine that matched our taste. He was very helpful and recommended a wine at once, one that was reasonably priced and very smooth. He even went into great detail on the wine and its origin - it was more than evident that he knew a great deal about wine and was very knowledgeable…'

Cluster 3 (pricey menus) indicates the price issue for 8.58% of the word counts.

'Loved the food here. Great menu that had everything from gourmet dishes to pizza. Everything we ordered was yummy. An extensive wine list, but pricey (hey, it's Hong Kong!)'.

Cluster 4 (well-known restaurants for special occasions/events) refers to high-reputation restaurants for special occasions (6.77%), whilst cluster 5 (good place for celebration and business) showcases occasions (3.07%).

'Long lunch for friend leaving Hong Kong. Smallish restaurant located right in the center of Hong Kong's shopping district and CBD, so convenient. We opted not to take the set menu offered despite being a group of 7 (which for some reason they really wanted us to do). Overall good food, good value (given 3 Star Michellin) but for me not quiet to Caprice levels including service'.

'Always great food inside the S hotel. Have been many times for business and each time there's is always something great. Portions aren't big but they are good and I always get the buffalo mozzarella appetizers'.

e. Australian restaurants

The SNA results indicate that cluster 1 (good steaks and menus but pricey) illustrates the food they serve, which consists of 25.37% of the word counts of Australian restaurant online reviews.

'This restaurant is in the clouds with fantastic views over the Hong Kong skyline. The Australian steaks are excellent as is the rooftop open-air bar immediately above the restaurant itself. Cannot think of a better place to relax and enjoy a special occasion, and enjoying a beer in a wonderful & unique setting. Pricey, but most eateries in Hong Kong are. After all, Hong Kong is THE most expensive city in the world'.

Cluster 2 (good quality of service and views) contains 43.19% of the word counts in online reviews of Australian fine-dining restaurants in Hong Kong.

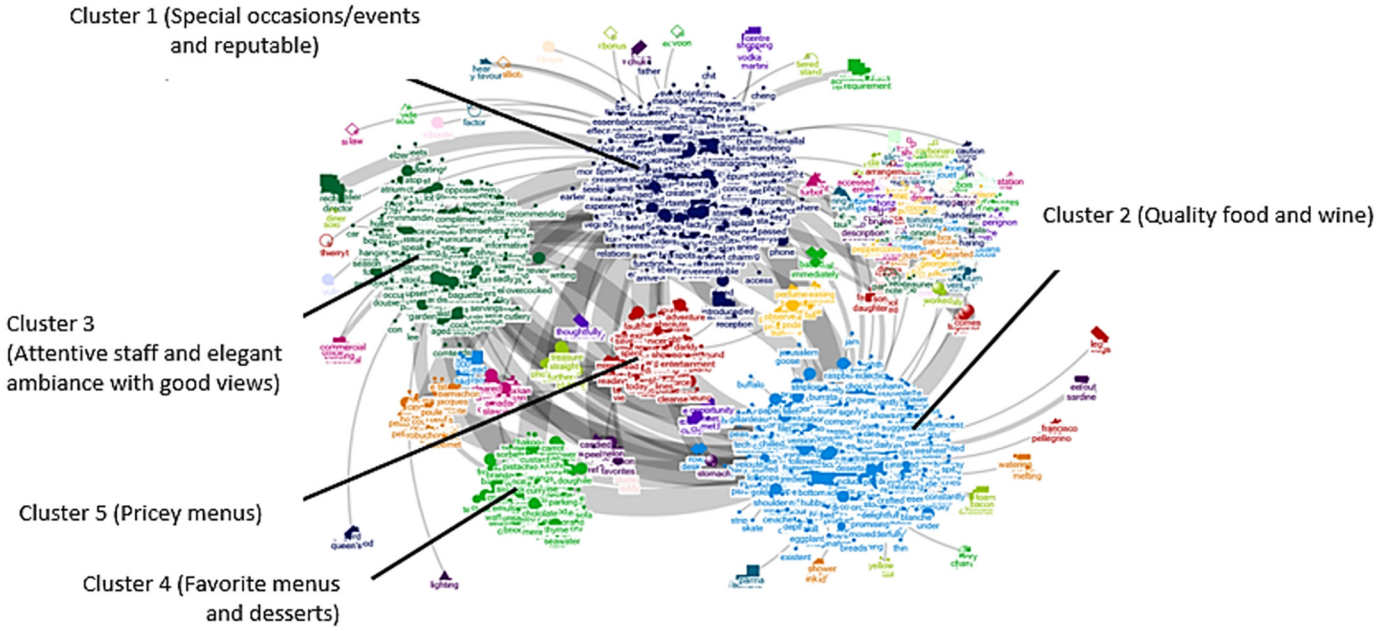


Fig. 4. Semantic network of French fine-dining restaurant online reviews.

'*Great, friendly and attentive staff. …… A bit too dark maybe but you have a great view over the city…'*

Cluster 3 (worthy place to visit) illustrates the value of restaurants with 22.55% of the word counts.

'What a great restaurant…… Food is so delicious and couple that with the best view in Hong Kong, this is one restaurant you have to try. A little expensive but so worth it!'

Cluster 4 (mediocre experience) exhibits the region where a restaurant is located (2.60%), whilst cluster 5 (good place for celebration) explains the circumstances people visit (2.20%).

'This place is really confusing to get to via the lifts in the shopping center. No clear instructions'.

'I would suggest just coming up for a drink to look at the view'.

'We came in to celebrate our anniversary! We ordered the tastings menu with wine. The food was amazing and have really kept up to their standards'.

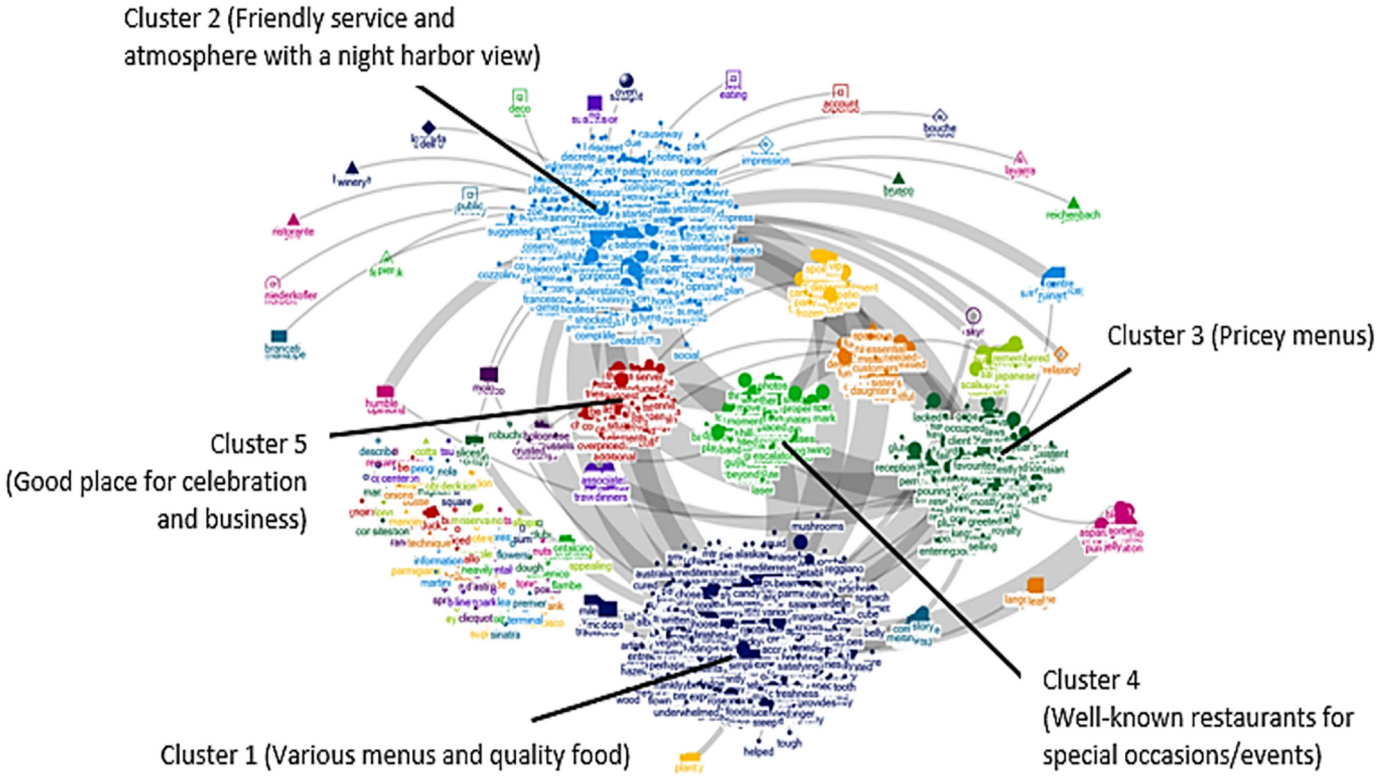


Fig. 5. Semantic network of Italian fine-dining restaurant online reviews.

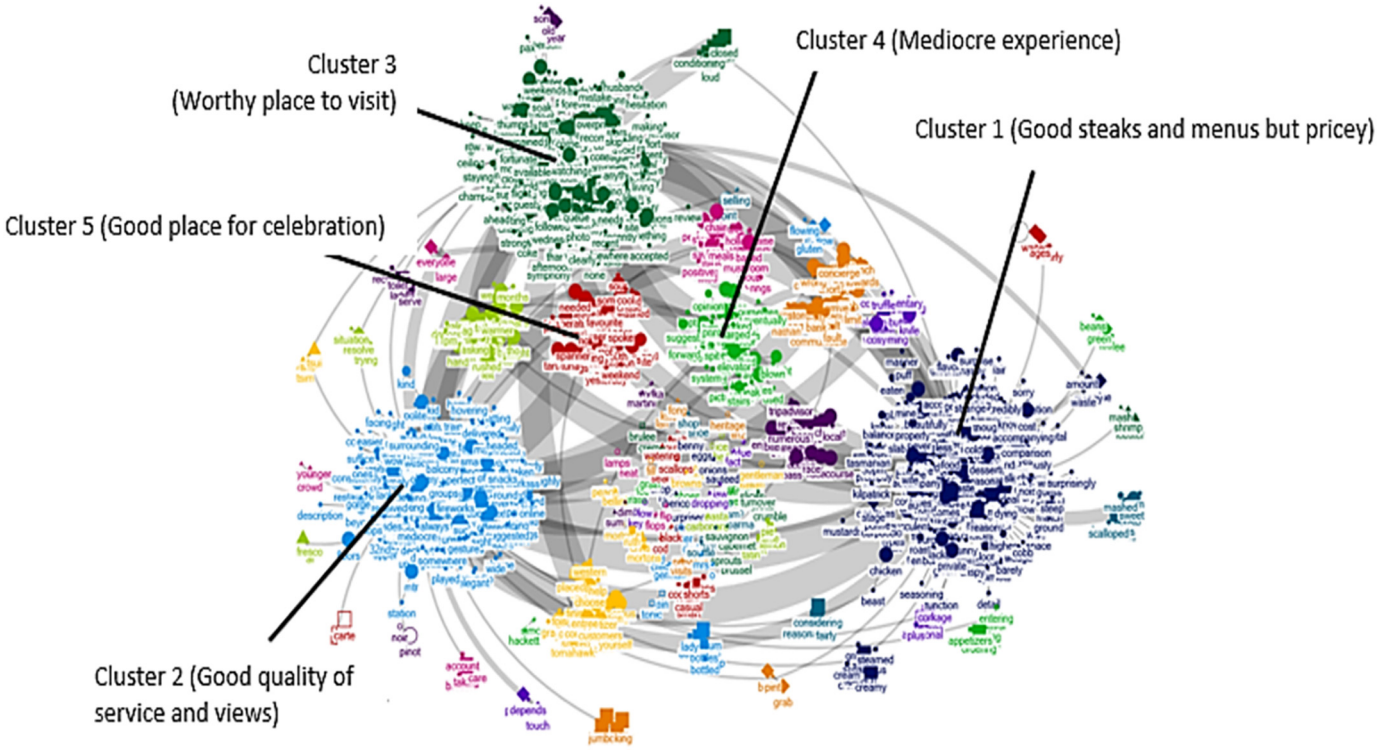


Fig. 6. Semantic network of Australian fine-dining restaurant online reviews.

All results are illustrated in Fig. 6.

5. Discussions and implications

Discussions and implications are as follows based on the SNA results. Firstly, the high centrality words among the five fine-dining ethnic restaurants have some similarities and differences. Ambiance and decoration were the notable aspects in the semantic networks of Japanese and Cantonese restaurants; chef and overall quality were impressive features in the semantic network of French restaurants and the view from a window was an inspiring feature in the semantic networks of Italian and Australian restaurants.

Secondly, another differences found in high centrality words were that reviewers addressed evaluation of service quality regarding each type of ethnic restaurants. For example, staff attentiveness and friendliness in Cantonese and Italian restaurants were found to be important. The importance of service attentiveness is consistent with the results of previous studies (Lee, 2015; Liu et al., 2019). Moreover, narrow spatial layout in Cantonese, Italian and French restaurants and service timing in Japanese and Italian restaurants were detectable words with high centralities.

Thirdly, online reviewers classified drinks and desserts different compared with one dimension of food during their fine-dining ethnic restaurant experience. Previous studies have treated drinks and desserts as an underpinning part of food experience (Nield et al., 2000; Verbeke & López, 2005). For example, Japanese restaurant reviewers focus on extensive alcohol beverage options. Cantonese restaurant reviewers care about generous service for tea/beverage. These results reflect the trend of restaurant specialization, such as dessert bars or wine/spirit bars. Food becomes substantially specialized and customers showcase a change of this trend. Restaurant managers can apply this finding to menu design by developing additional beverage and dessert menus and by training staff members to improve their knowledge on drink and dessert menus.

Fourthly, ambiance and view were treated as sub-categories of the physical environment in previous studies on the ethnic restaurant experience dimensions (Heung & Gu, 2012; Horng et al., 2013; Kim & Choe, 2019; Kim et al., in press). However, the findings of the current study indicated that these sub-categories are equally as important as service and food. Thus, ambiance as a tangible cue of a restaurant is an important aspect, particularly in upscale restaurants, because patrons spend substantially on buying a high-end experience. Additionally, many fine-dining restaurants in Hong Kong are located near harbor with high-rise floor, thereby appearing to have an influence on the result of importance of view.

Fifthly, occasions/events were spotlighted as their ethnic food consumption value. Situational factor, such as celebration, business purpose or family/friend gatherings, appeared to be important to make decisions when people visit fine-dining ethnic restaurants. They were newly created as one dimension even though they were discussed in previous studies in the context of customers' experience in ethnic restaurants (Choe & Kim, 2018; Kim & Eves, 2012).

Sixthly, the results indicated that price is a component of fine-dining ethnic restaurant experience dimension because it was shared as much as service and food. Even though the importance of price level was an imperative antecedent to trigger satisfaction with the hospitality experience (Ali, Amin, & Cobanoglu, 2016; Kelley, Van Rensburg, & Jeserich, 2016; Sukhu, Bilgihan, & Seo, 2017), price was discovered as one dimension of ethnic restaurant diners' experience.

Seventhly, service and food remained central dimensions in sharing fine-dining ethnic restaurant experience as well. Given that fine-dining restaurant experience is based on high employee-customer interaction with a requirement of high attentiveness from employees, service is continuously considered to be an imperative dimension. The importance of service and food in ethnic restaurants is consistent with the majority of previous studies (e.g. Choe & Kim, 2018; Clemes et al., 2013; Kivela & Crotts, 2006; Li et al., 2016).

Eighthly, attentiveness and friendliness within the service dimension were found to be important aspects when people share their fine-dining ethnic restaurant experience. They mentioned this aspect more than speed of service, knowledge or employee appearance. This result is similar to those of the majority of previous studies that staff's personal

aspects and service attentiveness influence positive responses (e.g., Alhelalat et al., 2017; Liu et al., 2019). Thus, practitioners can maximize this finding when they train their staff. For the food dimension, menu variety and various recipes were important aspects because fine-dining ethnic restaurant customers want to care more on the range of savor, texture, presentation and temperature of food (Barrena & Sánchez, 2013; Clemes et al., 2013; Guan, 2012).

Ninthly, the majority of the dominant clusters were different in ethnic restaurant experience. For example, reviews on Cantonese and French restaurants most frequently addressed the high reputation of a restaurant and special occasions/events; reviews on Japanese restaurants most highly described various menus and quality food and reviews on Italian and Australian restaurants placed considerable importance on good quality of service and a good view.

Tenth, as addressed by Holbrook and Hirschman (1982), consumption experience is achieved by pursuing pleasure, feelings, fantasies, and fun. Now that experiences can be interpreted as "sensory experiences, affective experiences, creative cognitive experiences, physical experience, behaviors, and lifestyles" (Schmitt, 1999, p. 60), experience dimensions can coexist. Therefore, future studies must analyze the interface between the dimensions rather than the systematic categorization of consumption experience patterns.

6. Theoretical and practical implications

As the primary contribution to academic knowledge, this study helps extend the understanding on customers' ethnic restaurant experiences. The results of analyzing online reviews provide evidence of the new dimensionality proposed in Fig. 7. Staff attentiveness and friendliness are the major domains used to evaluate service quality rather than reliability, assurance, tangibility, responsiveness, and empathy, which are the five major domains used in the literature. In terms of food quality, online reviewers focus on ingredients and recipes as the key domains when elaborating on fine dining restaurant experiences. By contrast, previous studies considered food quality from various perspectives, such as taste, portion, presentation, variety, freshness, temperature, and options (Ha & Jang, 2013; Namkung & Jang, 2007). In terms of the physical environment, window views are highlighted in online reviews rather than facility aesthetics, ambiance, lighting, layout, or table settings (Ryu & Han, 2011).

Moreover, this study envisions a comprehensive picture of fine dining restaurant experience by identifying other differences from the literature. Reputation, occasions, and prices are important dimensions in explaining fine dining restaurant experience. Given that reputation is considered an antecedent of diners' loyalty (Chen et al., 2015), premier reputation, such as that of Michelin-starred restaurants, is an important aspect in fine dining restaurant experience. Occasions are also imperative aspects in understanding customers' fine dining experience as they influence restaurant choices (Kivela, 1997). Prices are identified as an important domain in explaining restaurant experience based on the results of the SNA. Specifically, high or low value for money is discussed using the word "pricey."

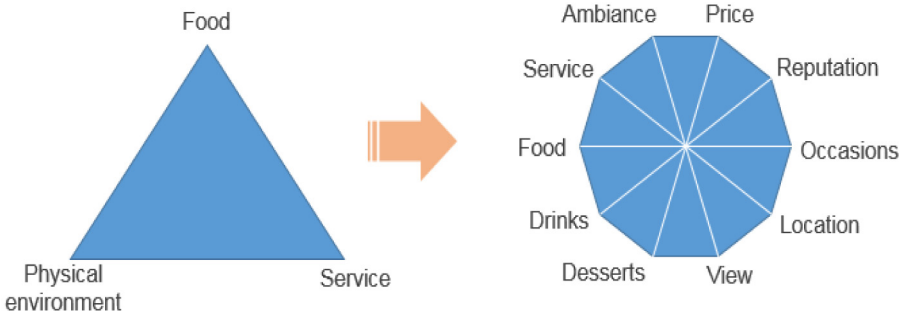
Several practical implications are presented. First, though different fine dining restaurant experiences share similar aspects that customers focus on, frequently shared information differs depending on the restaurant type. This finding implies that restaurant practitioners may need to develop different strategies to survive in the market and encourage revisits. For example, French restaurants can feature a celebrity chef as a promotional marketing tool, and Italian and Australian restaurants can take advantage of scenic views to attract customers.

Second, staff attentiveness and friendliness, which are addressed in semantic networks, are considered important domains in determining service quality. By contrast, reliability and assurance fail to appear frequently in networks, which is inconsistent with the findings of previous research. Thus, restaurant practitioners can use this information to educate and train their staff.

Finally, the importance of stressing food quality and physical environment is justified. Reviewers are more concerned about ingredients and recipes than food taste, portion, presentation, or temperature when describing or evaluating fine dining restaurant experiences. At the start of menu planning, various ingredients and recipes should be considered to attract customers' attention and deliver satisfaction. In terms of physical environment, window views are more decisive than aesthetics, ambiance, lighting, layout, or table settings in determining fine dining restaurant experience. However, classical interiors have an effect on online sharing for Cantonese restaurant reviewers.

7. Conclusions and suggestions for future study

This study performed an exploratory study on the underlying dimensionality of fine-dining ethnic food restaurant experiences in Hong Kong using SNA. Online reviews of fine dining restaurant experiences were comprehensively analyzed using SNA to address four objectives. Despite the numerous aspects that customers can experience in fine dining restaurants, previous studies highlighted three major dimensions, namely, food, physical environment, and service. However, these dimensions are insufficient to explain various and emotional customer experiences. To overcome this limitation, this study analyzed the pattern of keywords and frequently used words in online reviews written by customers about their restaurant experiences. Moreover, this study identified 10 dimensions compared with the 3 dimensions addressed in previous studies. The findings of this study reflect the comprehensive



Previous dimensionality of food consumption experience in a restaurant

Dimensionality of food consumption experience in fine-dining ethnic restaurants (evidence found through SNA)

Fig. 7. Dimensionality of the ethnic food consumption experience.

and diverse kaleidoscopic experience of ethnic restaurant diners. Thus, this study creates the foundation for subsequent studies on restaurant experiences that venture beyond cross-sectional data analysis via a questionnaire survey method.

This study is vulnerable to some limitations. First, this research focused only on unigram (single word) and did not consider the bi-grams, trigrams, or polygrams of text. In addition, this study did not categorize keywords with main categories and sub-categories because of the limitation of the textual analytical method. Thus, future studies may consider different algorithms to gain profound insights into the textual data. Secondly, given that the quality of Hong Kong fine-dining restaurants is high, the majority of the online reviews showed positive and satisfactory level. Accordingly, the nature of dissatisfiers should be identified. Thirdly, the current study only focus on fine-dining ethnic restaurants even though different types of restaurants can show the different dimensionalities of a restaurant experience. Thus, a future study can explore the dimensionality of restaurant experiences in other types of ethnic/religious restaurants, such as halal, Indian food, or African food. Further, tourists' perceptions of exotic food in a tourism destination can be distinctive according to cross-cultural differences (Lai et al., 2018, 2020). For example, Asian tourists may perceive uniqueness or exoticness after tasting Western local food, whereas some of them may perceive food neophobia. Fourthly, this study includes only English-written reviews. A future study can gather and analyze reviews written in other languages to investigate the differences in diners' ethnic food consumption experience. Fifthly, the current research did not examine the distinctiveness of the results of textual analyses based on online writers' socio-demographic profiles. Thus, a future study should compare the results of the textual analyses on the basis of their socio-demographic features.

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