



Geographia Polonica
2023, Volume 96, Issue 3, pp. 381-399
<https://doi.org/10.7163/GPol.0261>



INSTITUTE OF GEOGRAPHY AND SPATIAL ORGANIZATION
POLISH ACADEMY OF SCIENCES
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EXPLORING MEMORABLE GASTRONOMIC EXPERIENCES: AUTOMATIC TOPIC MODELLING OF TRIPADVISOR REVIEWS

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Abstract

The article aims to identify memorable gastronomic experiences reported online and verify their relationships with the type of cuisine served and restaurant location. This study used text mining, LDA, Pearson's chi-squared test and sentiment analysis. All 48,378 English reviews posted by TripAdvisor users concerning 155 restaurants in Krakow were scraped. Eight features that characterise MGEs were identified (service/staff, atmosphere, cuisine/food (taste), drinks, local specialities, location/setting, price & value and table booking). There are statistically significant differences in the frequency of the topic experiences depending on the location of restaurants in the city.

Key words

food tourism • culinary experiences • Krakow • restaurant management • Latent Dirichlet Allocation • sentiment analysis.

Introduction

Gastronomy experiences have become an important component of hospitality and tourism experiences (Hall & Sharples, 2003;

Richards, 2021), and also an important driver of contemporary tourism (Björk & Kauppinen-Räsänen, 2016). A reflection of the growing importance of this phenomenon is the development of a research field focused

on “gastronomic tourism” and “culinary tourism” over the last three decades of tourism studies (Ellis et al., 2018).

Contact with dining venues and culture while on holiday is expected to impact the ways travellers experience travel destinations in the future and the pleasant memories they take away with them (Stone et al., 2018). These experiences are referred to very differently in the scientific literature: memorable food-based experiences (Di-Clemente et al., 2019), memorable food and drink experiences, food consumption experiences (Soltani et al., 2020), and tourists’ memorable food experiences (Sthapit, 2017); and where they are associated with a visit to a restaurant: food and gastronomic experiences (Richards, 2021), tourists’ gastronomic experience (Goolaup et al., 2019), culinary travel experiences (Hernández-Mogollón et al., 2020), gastronomy tourism experiences (Kokkranikal & Carabelli, 2021), dining experience (Huang, 2017), restaurant experiences (Jeong & Jang, 2011), and gastronomic tourism experiences (Kattiyapornpong et al., 2021).

Much of the work of various authors has so far focused on identifying the positive dimensions of memorable experiences (Stone et al., 2018; Williams et al., 2019; Hosseini et al., 2021; Hosany et al., 2022; Saydam et al., 2022). Positive experiences lead to satisfaction with a visit to a restaurant, build loyalty toward the company and encourage a return visit (Ashton et al., 2010; Ryu & Han, 2010), whereas negative experiences most often result in dissatisfaction, disappointment and reluctance to visit again (Jeong & Jang, 2011; Kim & Hwang, 2022). In the eyes of customers, an MGE is a specific measurement of restaurant quality (Jeong & Jang, 2011), while for restaurateurs, an MGE is an essential source of competitive advantage in the gastronomic market (Mathayomchan & Taecharungroj, 2020).

Hosany et al. (2021) identified several research gaps in memorable experiences in tourism. They indicated, among others, that there is a lack of intercultural studies, identification of negative dimensions in the conceptualisation of MTEs, mixed methods

research (quantitative and qualitative), and methods other than those using self-reporting measurements.

In this article, the authors intend to answer a few of these issues based on memorable experiences in gastronomy. The first gap relates to not all experiences being memorable, as tourists selectively construct their most relevant and critical experiences. The second gap is the division into positive and negative dimensions in conceptualising memorable tourism experiences. So far, researchers have focused primarily on positive MGEs, ignoring restaurant guests’ negative emotions and memories. This study also highlights the poorly assessed aspects of catering services.

Another gap in the research on gastronomic experiences is the failure to conduct mixed methods research. Goolaup et al. (2019) show that most studies on gastronomic tourism experiences use only quantitative methods. Qualitative approaches, however, help to better understand a given phenomenon from the perspective of its experience (Vaismoradi et al., 2013; Kokkranikal & Carabelli, 2021). This study uses integrated qualitative and qualitative methods.

The article aims to identify memorable gastronomic experiences reported online and identify their relationships with restaurant location and the type of cuisine served. The authors formulated the following research questions:

- RQ1. What memorable gastronomic experiences are had by guests of restaurants in Krakow?
- RQ2. What are positive and what are negative gastronomic memorable experiences in relation to restaurants in Krakow?
- RQ3. Does an MGE depend on the restaurant’s location in the city and the cuisine served?

This article uses quantitative and qualitative methods. The topics of MGE were identified using the quantitative method (text mining – Latent Dirichlet Allocation, sentiment analysis), and the topics were then characterised using the qualitative method – content analysis. This was done in the context

of a specific tourist destination: Krakow – the leading destination of urban tourism in Poland, a city inscribed on the UNESCO WHL. Although there is extensive literature on culinary tourism in Poland, only a few studies on gastronomy research in the context of the experience economy have been published so far, and only in Polish (Gajewska & Szewczyk, 2012; Dziewanowska, 2012; Dziewanowska & Kacprzak, 2014; Gębarowski, 2014; Oleniuch, 2016; Stasiak, 2016, 2019). However, none of them applies to memorable gastronomic experiences. To the best of the authors' knowledge, this article is the first study identifying the components of memorable gastronomic experiences of customers not only in Krakow restaurants and Polish restaurants.

Theoretical background

Memorable tourism experiences in gastronomy

A tourist product can be interpreted by consumers in an individual, unique way because it is their own experiences that become the primary value benefitted from by the buyer-tourist. Experiences arise in the consumption process, and in the case of services, they are the source of customer satisfaction. In services with a high intensity of intangible features (such as catering services), experiences are valuable in themselves and increase consumer satisfaction (Quan & Wang, 2004; Williams et al., 2019; Ka Wai Lai et al., 2021). The effect of positive experiences is re-using a service or recommending a service to friends, thus generating a positive economic impact (Niezgoda, 2013; Nowacki & Niezgoda, 2019). Kim et al. (2012: 13) introduced the concept of a memorable tourism experience, defined as a "tourism experience positively remembered and recalled after the event has occurred". According to Kim et al. (2012), a memorable tourism experience consists of critical moments in what tourists do, how they feel and what they think at a destination. However, as Hosany et al. (2021) noted, not all experiences will be memorable as tourists

selectively construct their most relevant and critical experiences.

Gastronomy fits perfectly into the experience economy (Hall & Sharples, 2003; Williams et al., 2019; Stasiak, 2016, 2019; Oliveira et al., 2019; Richards, 2021). As Prayag et al. (2020) note, gastronomy experiences can be considered a form of serious leisure, as gastronomy tourists seek out activities and experiences that involve skills development, education, fulfilment, socialising and interaction, and recreation. Dixit (2019: 18) defines a gastronomic tourism experience as a form of tourism experience that is related to tourists savouring the gastronomy in local restaurants, sampling street foods, attending cooking classes, and visiting local food markets and food exhibitions or festivals in unfamiliar places. Memorable food and drink experiences are proposed to significantly contribute to travel motivation and behaviour and influence how tourists experience a tourism destination (Wolf, 2006; Dixit, 2019). Moreover, MGEs in destinations would help tourists develop an emotional connection with the destination and create a sense of place (Tsai, 2016), which can be used in a marketing strategy. Chandralal and Valenzuela (2013) showed that participants' memories are strongly linked with local food experiences in foreign destinations. Ka Wai Lai et al. (2021) reached similar conclusions. They recognised that emotional value is the main source of tourist satisfaction and enduring memories of the destination's culinary experiences. DMOs are looking for new, unconventional strategies to meet the excessive expectations of tourist customers, who constantly demand new, original and emotional products. Some DMOs consider cuisine and food tourism as their brand product (cf. e.g. Lee & King, 2006; Ottenbacher & Harrington, 2011; Bustomi & Avianto, 2021).

Stone et al. (2018) emphasise that although experiences are mentioned together, only one of them (e.g., an extraordinary view or entrée) is enough to create an MGE. Likewise, Antón et al. (2019) confirm the positive impact of authenticity and cultural

contrast on MGEs. At the same time, adapting a typical local dish reduces the perception of authenticity and cultural differences and thus weakens an MGE. Moreover, according to Sthapit et al. (2019), the formation of individual experiences by the consumer-tourist is influenced, among others, by an individual's demographic characteristics (e.g., gender and age), prior perceptions and expectations, and travel characteristics (e.g. first-time visitors vs. repeat visitors).

Extracting tourism experiences from online reviews

As it is difficult to estimate the quality of services provided before visiting a restaurant (especially in a strange, unfamiliar city), tourists are increasingly looking for opinions on popular internet platforms (Google Maps' Local Guide, Facebook, Zomato, Expedia, Yelp and TripAdvisor). Despite an inevitable decline in interest in TripAdvisor, it is still the world's most popular travel destination review platform (Gan et al., 2017; Filieri et al., 2020; Nowacki & Niezgodna, 2020). Online reviews are considered credible and trustworthy by tourists as they are based on the previous experiences of real customers (Drozdowska & Duda-Seifert, 2016; Filieri et al., 2020). Research by Drozdowska & Duda-Seifert (2016) proves that this type of data is also reliable, complete and valuable from the point of view of marketing research.

So far, research into tourist experiences has mainly used questionnaires, surveys and interviews. The few studies available include the tourist experiences of Capo Verde visitors based on TripAdvisor reviews (Oliveira et al., 2019), post-consumption evaluations of ecotourism experience (Ruhanen, 2019), and customer experiences with different restaurant types (Mathayomchan & Taecharungroj, 2020), including Michelin 3-star restaurants (Saydam et al., 2022). Other studies also explored clusters of words in online reviews, where restaurant guests (Chinese and English) described their culinary experiences (Huang, 2017) and in which the preferences

of international tourists were expressed regarding dishes and meals, as well as restaurant attributes (Vu et al., 2019) and the impact of sensory experiences on a restaurant's star rating (Mehraliyev et al., 2020). Currently, text mining (Kirilenko et al., 2021), natural language processing, machine learning and deep learning (Li et al., 2019) are starting to be used in the analysis of web reviews.

Material and methods

Research context

The research material consisted of reviews posted by TripAdvisor users about restaurants offering local dishes in Krakow. Krakow is a unique city with a thousand-year history. After the fall of communism, Krakow experienced highly dynamic development in tourism and gastronomy. In the 1990s, hundreds of eateries were opened in the Old Town, giving the centre a specific atmosphere for social gatherings and entertainment. In the first decade of the 21st century, many restaurants were opened in neighbouring Kazimierz – the former Jewish district, forgotten and deteriorating since World War II (Kurek & Mika, 2008; Kowalczyk & Derek, 2020). Currently, the Krakow gastronomic scene is one of the best in the country, not only in terms of the number of restaurants (nearly 1,500 on TripAdvisor) and their diversity (Polish cuisine and cuisine from about 50 other countries) but also in quality (18 restaurants recommended in MICHELIN Guide Poland 2023, including the first and only restaurant in Poland with two Michelin stars) (Krakow Michelin Restaurants, 2023).

Design and approach

Quantitative methods (text mining – Latent Dirichlet Allocation, sentiment analysis, Pearson's chi-squared test) were used in the study. All 48,378 English reviews concerning all restaurants serving local cuisine (N = 155 restaurants) in Krakow were scraped using Web Scraper software [webscraper.io]. Reviews were downloaded for all restaurants

with at least ten English reviews. Each gastronomic establishment was assigned to one of the five distinguished zones (Fig. 1). Most of the restaurants studied are located in the Old Town within Planty (65-41.2%), in Kazimierz (37-23.9%) and the Old Town outside Planty (26-16.8%) (Tab. 1, Fig. 1). The vast majority of restaurants serve Polish cuisine - 95

(61.3%), with only 60 (36.7%) serving foreign cuisine (Tab. 1).

Analysis of results

Before starting the DLA analysis, text pre-processing was performed using the standard procedure (Vijayarani et al., 2015).

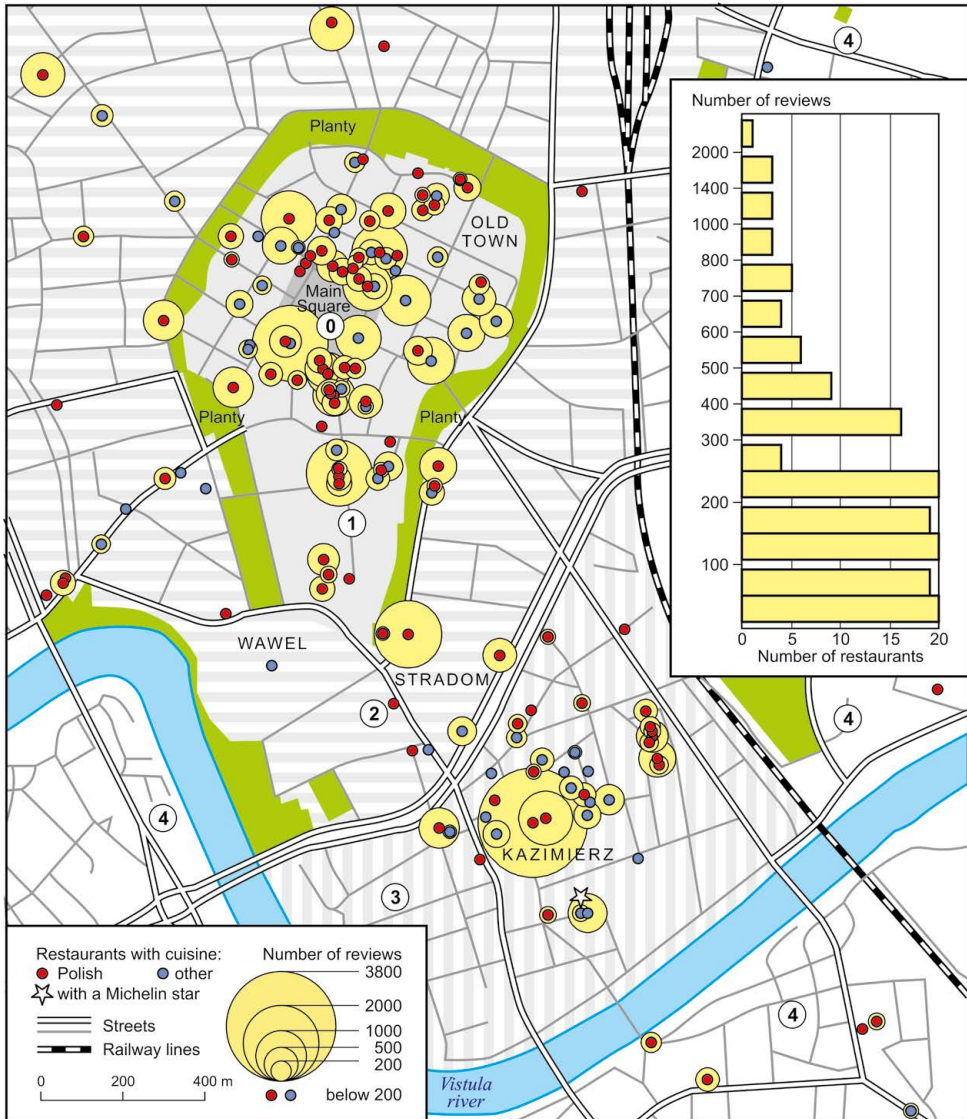


Figure 1. Distribution of the analysed restaurants on the city plan

Table 1. Characteristics of the research sample (N = 155 restaurants; n = 48,378 reviews)

Features of the restaurant	Number of restaurants	%	Number of reviews	%
Location				
Main Square	17	10.97	7,595	15.70
Old Town (within Planty)	65	41.94	20,448	42.27
Old Town (outside Planty)	26	16.77	7,580	15.67
Kazimierz	37	23.87	11,685	24.15
Others	10	6.45	1,070	2.21
Kind of cuisine				
Polish	95	61.29	32,276	66.72
Foreign	60	38.71	16,102	33.28

Punctuation marks, other characters and numbers were removed from the review texts, capital letters were changed to lowercase, words from the stop words list were removed, and words shorter than three letters were filtered out (Fig. 2). Finally, lemmatisation was performed to remove inflexions, e.g. plural forms, pronoun forms and verb endings – using the StanfordCore NLP library (Overview – Core NLP, 2020).

Topic modelling was performed using Latent Dirichlet Allocation (LDA). The LDA is used to discover topics in a collection of documents and then automatically classify any individual document within the group in terms of how “relevant” it is to each of the discovered topics. A topic is considered to be a set of terms (i.e., individual words or phrases) that, taken together, suggest a shared theme.

The KNIME platform and MALLET library (A Machine Learning for Language Toolkit library) were used in the LDA analysis. In the LDA, the researcher must determine the number of topics and terms in a topic. For this purpose, the Elbow Method was used first (Khalid & Wade, 2020). Next, coherence and perplexity scores were calculated (Řehůřek, 2021, December 21). The topic coherence score measures a single topic by measuring the degree of semantic similarity between high-performing words in a given topic. Perplexity captures how surprising a model is due to new data not seen before and is measured as the normalised log-likelihood of a held-out test set (Chen et al., 2018). Hence, the lower the perplexity value, the better the model fit.

Sentiment analysis was performed using the dictionary method with the SentiStrength

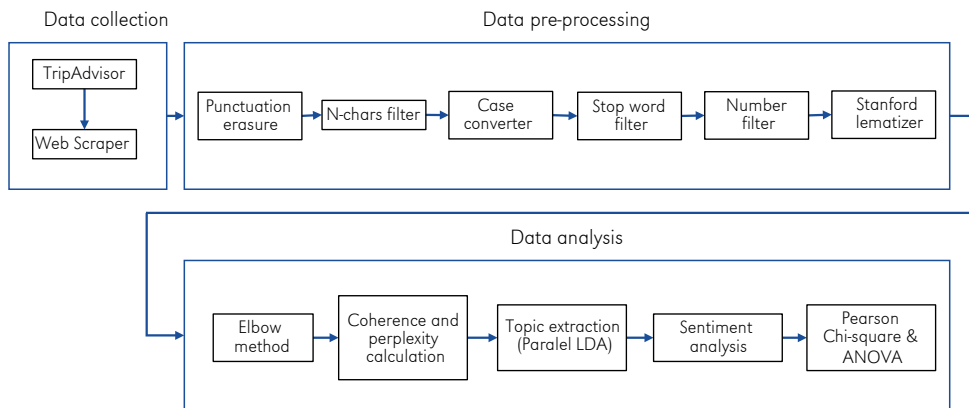


Figure 2. Research procedure

v.2.3 package. Positive and negative sentiments were calculated separately, then both effects were summed up. The significance of differences in the level of sentiment between the topics was verified using the analysis of variance (ANOVA). Differences in the frequency of topics depending on the restaurant's rating and location were calculated using Pearson's chi-square test.

Results

Krakow restaurant reviews: Topic extraction

The analysis began with estimating the number of topics in the LDA. In our case, the SSE values were calculated for k from 1 to

20 clusters. In the Elbow Method, the number of topics is selected for cases where the SSE drops sharply. Unfortunately, such a situation cannot be observed (Fig. 3).

Therefore, the semantic coherence (C_v) and perplexity scores were calculated in the next step. As Tang et al. (2014) recommended, to avoid selecting an overly large number of topics for the model, coherence and perplexity scores were calculated from 6 to 20 topics. The highest coherence score value was obtained for 14 topics $C_v = 0.508$. Similarly, the perplexity was calculated for these topics (the lower the perplexity value, the better the predictive performance of the model, Fig. 4).

Based on the above findings, it was decided that the optimal number of topics is 14. Then, using DLA analysis, 14 experience

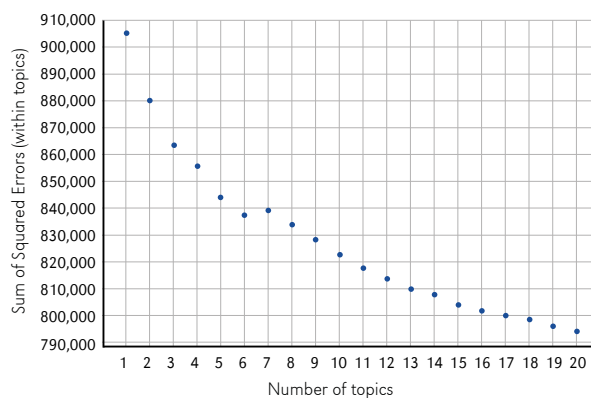


Figure 3. The number of topics was verified using the elbow method

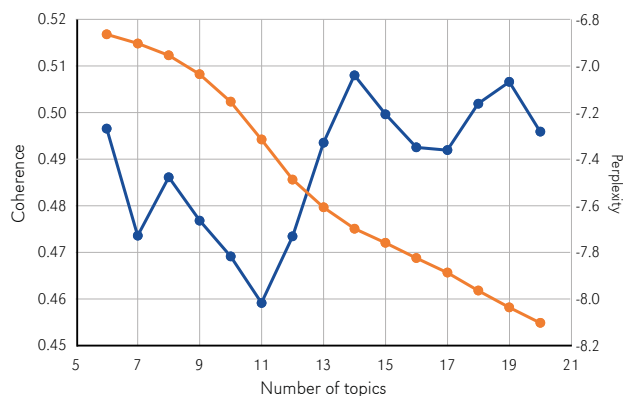


Figure 4. Coherence and perplexity values for 6 to 20 topics

Table 2. Topics obtained in the LDA analysis – the most common words in the title and content of the review (number of topics = 14, number of words in the topic = 20)

#	Topic	Words	%
1	Good food & price	good, food, price, restaurant, service, nice, portion, menu, bit, expensive, quality, quite, choice, small, big, eat, dish, much, little, tasty	7.75
2	Book table for the night	book, table, restaurant, night, review, evening, reservation, go, Krakow, trip, visit, meal, busy, arrive, decide, day, disappointed, last, try, advance	8.10
3	Food order service	food, order, service, wait, waiter, ask, time, come, table, waitress, take, drink, look, restaurant, bad, give, go, serve, minute, menu	7.38
4	Breakfast lunch outside	breakfast, lunch, outside, sit, lovely, café, coffee, day, nice, great, drink, inside, hot, stop, watch, cold, warm, garden, little, went	5.13
5	Amazing food visit at night	food, visit, amazing, restaurant, Krakow, great, service, recommend, staff, meal, lovely, fantastic, excellent, night, eat, best, friendly, definitely, highly, went	16.63
6	Polish traditional food	Polish, traditional, food, cuisine, soup, restaurant, try, dish, local, good, dumpling, delicious, goulash, pierogi, authentic, serve, want, potato, tasty, pancake	5.17
7	Jewish live music	music, Jewish, live, restaurant, quarter, atmosphere, food, room, cellar, play, great, Kazimierz, downstairs, evening, area, piano, décor, wall, night, district	3.05
8	Food, service, price & value	food, good, great, service, nice, friendly, staff, excellent, atmosphere, price, recommend, restaurant, lovely, delicious, dinner, value, tasty, helpful, reasonable, wine	15.10
9	Best restaurant in Kraków	best, Krakow, restaurant, time, sushi, food, try, visit, always, taste, year, eat, amazing, poland, Italian, love, Indian, come, delicious, fresh	5.55
10	Vodka, pork, duck & dumpling (Poland's menu)	main, vodka, starter, pork, course, meal, duck, dessert, delicious, beef, soup, wine, sauce, try, dumpling, apple, start, bread, excellent, mushroom	5.24
11	Steak salad order	steak, salad, order, pasta, chicken, cook, soup, good, starter, sauce, cheese, dish, pizza, meat, delicious, burger, tasty, beef, fish, rib	5.09
12	Wine menu restaurant	wine, menu, restaurant, service, experience, food, excellent, course, dining, dish, dinner, waiter, fine, wonderful, meal, present, tasting, beautiful, perfect, quality	6.52
13	Main square restaurant	square, restaurant, main, walk, town, street, Krakow, little, gem, located, view, location, look, outside, hotel, market, away, find, right, across	5.43
14	Great beer bar	Beer, bar, great, cocktail, drink, free, staff, selection, good, visit, gluten, pub, nice, atmosphere, vodka, local, friendly, try, craft, night	3.86

topics were distinguished, each characterised by 20 words (Tab. 2). Topics were named after the most common words (the first in each row). The most opinions were found on the topic 'Amazing food visit' (16.63%) and 'Good food & price' (15.10%), while the least on 'Jewish live music' (3.05%) and 'Great beer bar' (3.86%).

Identification of memorable gastronomic experiences

First, the authors checked which topics were rated the highest (positive memories) and lowest (negative memories) among TripAdvisor users to identify MGE. For this purpose, the frequency of reviews with different rankings in individual topics was analysed.

Table 3. Frequency of the occurrence of particular topics in the ranking categories on TripAdvisor

#	Topic	Ranking in TripAdvisor					Row
		*****	****	***	**	*	
1	Good food & price	4.40%	13.44%	23.10%	11.05%	4.54%	7.75%
2	Book table for the night	8.46%	7.04%	7.81%	7.74%	8.94%	8.10%
3	Food order service	1.78%	4.59%	24.73%	53.76%	69.53%	7.38%
4	Breakfast lunch outside	4.37%	8.20%	5.27%	2.25%	2.10%	5.13%
5	Amazing food visit	22.76%	6.13%	2.57%	2.25%	1.47%	16.63%
6	Polish traditional food	4.64%	7.65%	4.85%	2.18%	2.31%	5.17%
7	Jewish live music	2.55%	4.66%	3.84%	2.60%	0.91%	3.05%
8	Good food & great service	16.20%	17.97%	6.25%	2.81%	0.56%	15.10%
9	Best restaurant in Kraków	7.04%	2.79%	2.31%	2.39%	2.59%	5.55%
10	Main vodka starter	5.84%	5.18%	2.93%	1.48%	1.19%	5.24%
11	Steak salad order	4.65%	5.94%	6.61%	7.32%	3.28%	5.09%
12	Wine menu restaurant	8.04%	4.46%	2.73%	1.55%	0.63%	6.52%
13	Main square restaurant	5.32%	7.11%	4.30%	2.32%	1.05%	5.43%
14	Great beer bar	3.94%	4.84%	2.70%	0.28%	0.91%	3.86%
	Total Percent	65.99%	21.76%	6.35%	2.94%	2.96%	100.00%

Note: Pearson Chi-square = 20,829.35; df = 52; $p < 0.001$; **bold** – above mean, *italics* – below mean

Table 4. Sentiment analysis

#	Experience topic	Positive		Negative		Sum		N
		Mean	St. dev	Mean	St. dev.	Mean	St. dev.	
1	Good food & price	2.88	0.78	-1.64	0.77	1.23	1.14	3,751
2	Book table for the night	2.97	0.86	-1.48	0.71	1.48	1.17	3,920
3	Food order service	2.44	0.93	-2.47	1.08	-0.03	1.51	3,569
4	Breakfast lunch outside	3.04	0.73	-1.39	0.65	1.62	1.02	2,483
5	Amazing food visit	3.40	0.64	-1.30	0.59	2.09	0.91	8,044
6	Polish traditional food	3.07	0.77	-1.42	0.68	1.64	1.06	2,500
7	Jewish live music	3.13	0.80	-1.41	0.70	1.71	1.10	1,474
8	Good food & great service	3.37	0.63	-1.21	0.51	2.14	0.85	7,303
9	Best restaurant in Kraków	3.09	0.75	-1.36	0.67	1.72	1.03	2,683
10	Main vodka starter	3.34	0.71	-1.49	0.72	1.81	1.06	2,537
11	Steak salad order	3.14	0.77	-1.46	0.75	1.66	1.15	2,464
12	Wine menu restaurant	3.40	0.69	-1.33	0.61	2.05	0.96	3,154
13	Main square restaurant	3.03	0.81	-1.39	0.63	1.63	1.07	2,628
14	Great beer bar	3.08	0.68	-1.48	0.72	1.57	1.04	1,868
	Mean/Sum	3.14	0.79	-1.46	0.75	1.66	1.20	48,378
Analysis of variance		F = 472.68; $p < 0.001$		F = 733.32; $p < 0.001$		F = 1006.98; $p < 0.001$		

Statistically significant differences were found in the frequency of topics depending on the rating given to the restaurant by TripAdvisor users (Pearson's chi-square = 20,829.3; $df = 52$; $p < 0.001$; Tab. 3): four very positive experiences (*Amazing food visit* - 22.8% 'excellent' reviews, *Good food & great service* - 16.2% 'excellent', *Best restaurant in Kraków* - 7.0% 'excellent', *Wine menu restaurant* - 8.0% 'excellent'), five moderate positive experiences (*Breakfast lunch outside*, *Polish traditional food*, *Jewish live music*, *Main square restaurant*, *Great beer bar*), one rather negative (*Steak salad order*) and one very negative (*Food order service* - 69.5% 'terrible' reviews).

Sentiment analysis of each topic was performed to verify the correctness of the identified MGE topics. The strongest positive sentiment are for the topics *Amazing food visit* and *Wine menu restaurant* (both at 3.40), *Good food & great service* (3.37) and *Main vodka starter* (3.34) ($F = 472.68$; $p < 0.001$; Tab. 4). Experiences in the topic *Food order service* (-2.47) have the most negative sentiment ($F = 733.32$; $p < 0.001$). After summing up the positive and negative sentiments, the highest sentiment values were for *Good food & great restaurant* (2.14) and *Wine menu restaurant* (2.05), and the lowest for *Food order service* (-0.03) ($F = 1006.98$; $p < 0.001$).

The comparison of both analyses shows that the most positively recalled experiences are in the topics: *Amazing food visit*, *Good food & great service*, *Main vodka starter* and *Wine menu restaurant*. The most negatively mentioned experiences are in the topic *Food order service*.

Identification of the relationship between memorable gastronomic experiences and restaurant location and type of cuisine

In the next step, it was verified whether the occurrence of MGEs depends on the restaurant's location and the menu type. It was found that there are statistically significant differences in the frequency of the topics

depending on the location (Pearson's chi-square = 3758.56, $p < 0.001$; Tab. 5): *Good food & price* experiences are characteristic of restaurants outside the Old Town and in Kazimierz, as prices are lower than in the very centre of the city. *Food order service* is mainly characterised by restaurants located on the Main Square (negative) due to the crowds. Still, at the same time, *Breakfast lunch outside* and *Amazing food visit* were also on the Main Square (but positive) due to the exceptional charming location of the restaurant in the historic surroundings of the Old Market Square. *Good food & service*, *Best restaurant in Kraków* and *Main vodka starter* (positive) - are characteristic of restaurants outside the Old Town due to lower prices, a more intimate atmosphere and less crowded.

The restaurant cuisine differentiates four experience topics: *Polish traditional food*, *Jewish live music* and *Main vodka starter* in restaurants with Polish cuisine and *Best restaurant in Krakow*, *Steak salad order* and *Great beer bar* with foreign cuisine (Pearson's chi-square = 4495.87, $df = 13$, $p < 0.001$).

Discussion

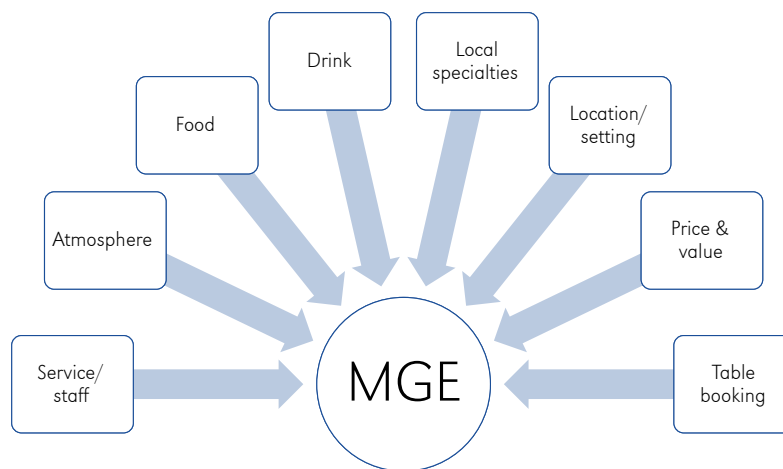
This article aimed to identify memorable gastronomic experiences and verify their relationships with the type of cuisine served and restaurant location. The authors identified eight features of memorable food experiences: service/staff, atmosphere, cuisine/food (taste), drinks, local specialities, location/setting, price & value and table booking (Fig. 5). The words 'Service' or 'staff' appear in 4 out of 14 identified topics considered 'memorable' (in one negative - #3 and three positive - #5, #8, #12), and in no others. It indicates the fundamental importance of service and staff in creating MGEs, which has also been confirmed by many other researchers (Jeong & Jang, 2011; Williams et al., 2019; Saydam et al., 2022).

Another 'atmosphere' feature is in topics #7, #8 and #14. Although only topic #8 contains 'memorable experiences', one should

Table 5. Frequency of topics according to the location of the restaurant in the city

#	Topics	Main Square	Old Town (within Planty)	Old Town (outside Planty)	Kazimierz – Jewish district	Outside the Old Town	Row
1	Good food & price	7.66%	7.19%	8.14%	8.11%	12.43%	7.75%
2	Book table for the night	5.39%	6.67%	8.39%	12.55%	4.21%	8.10%
3	Food order service	10.27%	7.07%	6.04%	7.06%	5.61%	7.38%
4	Breakfast lunch outside	8.16%	5.91%	3.27%	3.28%	2.15%	5.13%
5	Amazing food visit	19.12%	15.92%	15.95%	16.91%	14.11%	16.63%
6	Polish traditional food	2.49%	6.18%	6.35%	4.40%	4.95%	5.17%
7	Jewish live music	3.36%	2.54%	<i>0.86%</i>	5.31%	1.21%	3.05%
8	Good food & great service	15.75%	15.20%	15.29%	14.19%	17.01%	15.10%
9	Best restaurant in Kraków	2.79%	5.22%	7.43%	6.04%	12.52%	5.55%
10	Main vodka starter	2.51%	3.92%	5.25%	9.05%	8.32%	5.24%
11	Steak salad order	5.57%	5.19%	3.85%	5.45%	4.67%	5.09%
12	Wine menu restaurant	6.70%	6.94%	10.13%	3.28%	6.92%	6.52%
13	Main square restaurant	8.61%	5.52%	7.51%	<i>1.88%</i>	5.33%	5.43%
14	Great beer bar	1.62%	6.51%	<i>1.54%</i>	<i>2.48%</i>	<i>0.56%</i>	3.86%
	Total Percent	15.70%	42.27%	15.67%	24.15%	2.21%	100.00%

Note: Pearson Chi-square = 3758.56, df = 52, $p < 0.001$; **bold** – above mean, *italics* – below mean;

**Figure 5.** Features of memorable gastronomic experiences

point to the experiences described in topic #7 related to the ‘atmosphere’ prevailing in Jewish Kazimierz (synagogues, music, Jewish cuisine, etc.). Similar results were obtained by Jeong and Jang (2011), who stated that satisfactory gastronomic experiences are

determined by an excellent restaurant atmosphere. At the same time, they are partially contradictory to the results of research by Kim and Hwang (2022) because, in the case of Krakow, the atmosphere, service and location are not “indifferent” factors for eWOM.

They have been described in both positive and negative contexts.

The following three features of MGE relate to the dishes and drinks served. The first – ‘Food’ – is the most frequent word in all topics. It appeared in eight topics, including four ‘memorable’ ones. It is evident because ‘food’, as shown in other authors’ research, is the essential attribute of MGEs, characterised by ‘quality’, ‘taste’, ‘portion’ (big) and ‘tasty’. The situation is similar for ‘Drink’, although this word appears only three times, while other related terms such as wine, vodka, beer, and cocktail appear in 8 topics, including 4 ‘memorable’. Finally, there is “Local specialities”, which relates to two Polish speciality topics ‘Polish traditional food’ and ‘Vodka, pork, duck & dumplings’, but also Jewish specialities available mainly in Kazimierz (topic “Jewish live music” and cuisine that differentiates the location of the restaurant).

Almost all the topics are significantly differentiated by the restaurant cuisine. Similar results were obtained by Hernandez-Mogollon et al. (2020), who confirmed that local food, enjoyed through quality experiences, is a determining factor in designing memorable products, achieving tourist satisfaction, improving their quality of life and encouraging loyalty to experiential food-based practices. Also, Choe and Kimb (2019), researching the multidimensional value of tourists’ consumption of local food, assumed that emotional value is a significant benefit that tourists obtain through experiencing local foods.

Many of the opinions examined also emphasise the importance of the authenticity of local cuisine (Polish dishes, Polish vodka, Jewish cuisine). Antón et al. (2019) also point to the extent of authenticity. They showed that the perception of authenticity in food experience and cultural contrast determine the perception of a memorable, exciting and enjoyable experience. In our study, experiences of authenticity were identified only in topic #6 “Polish traditional food” (the word ‘authentic’). It was related to terms that characterised Polish cuisine: dumplings (pierogi), goulash, and pancake. However, this topic did not contain

very positive or negative opinions (or strong sentiments), which may indicate that experiences without a robust emotional sentiment but authentic can also be memorable. It is in line with research by Quan and Wang (2004), which points out that local food consumption can provide memorable and enjoyable tourist experiences. In addition, perceived authenticity and cultural contrast significantly influence future tourist behaviour by increasing the intention to recommend the experiences or repeat them. The features mentioned above are also indicated by many other researchers, who add various adjectives such as ‘unusual or bizarre’, ‘novel’ or ‘authentic’ (Stone et al., 2018), ‘food souvenirs’ (Sthapit, 2017), ‘surprise’ (Stone et al., 2018) or even ‘foodie risk taking’ (Williams et al., 2019).

Another feature is location/setting, differentiating 13 out of 14 topics. Although these words do not appear directly in the opinions, analysis of the differences between topics showed a strong differentiation of the topic depending on the restaurant’s location. Stone et al. (2018) pointed to similar features, although this concerned the restaurant’s décor rather than its location on the city map. Although in the following article, he noted that dining is more memorable if it occurs outside the usual environment (Stone et al., 2021). The reviewers also paid attention to the prices and value of gastronomic services (both high and affordable) – topics #1 and #8 (included in MGE).

Among the factors not mentioned in the literature but identified in this study is the ‘table booking’ experience (topic #2), without which a restaurant experience would be impossible, but which can also trigger MGE (no booking possible – very negative, easy and pleasant booking – very positive).

However, the topics identified in the study lacked many of the words indicated by Sthapit et al. (2017), as well as the characteristics of emotions related to food (e.g. comfort, annoyance, stimulation and sentimentality) which, as the authors say, may also influence visitors’ memories of culinary experiences. What is more, ‘involvement’ is not included among

them, although Di-Clemente et al. (2019) suggest that this is a predictor of memorable experiences in culinary activities. Nor are there the 'senses and sharing' attributes connected to the memory of food experiences by Stone et al. (2021). It is probably due, as mentioned above, to the content analysed in the article, which concerns the evaluation of the supply side rather than one's own emotions and experiences.

Conclusions

The study identifies valuable insights into memorable gastronomic experiences in Krakow, Poland, a prominent destination for urban tourism with a rich culinary scene. Understanding the spatial context of Krakow's history, cultural diversity, and UNESCO World Heritage status provides crucial context for interpreting the formation and perception of memorable gastronomic experiences.

Furthermore, exploring how tourists' behaviours and preferences in dining vary depending on the spatial context can shed light on how different areas of Krakow attract visitors seeking specific types of cuisine or experiences.

The study also highlights the differences in memorable experiences between restaurants serving Polish cuisine and those offering foreign cuisine. Investigating the reasons behind these differences, such as cultural contrasts, authenticity, or emotional connections to local dishes, adds depth to understanding gastronomic tourism development and marketing strategies.

Mapping the spatial distribution of positive and negative gastronomic experiences within Krakow can reveal patterns and clusters of popular dining spots or identify areas that need improvement. This spatial analysis can assist policymakers, destination marketing organisations, and restaurant owners in enhancing visitors' experiences and gain a competitive advantage in the gastronomic market.

Generally, the results of this study can be used by destination managers (of DMOs) to create a strategy for developing culinary

tourism in the city. The results of Jennings and Nickerson (2006) provide evidence that tourists articulate three dimensions of meaning: the social aspects of the experience, the environmental aspects of the experience, and the aspect of activities within those environments, as the experience can be taken as a starting point for creating a specific strategy. As Ginting (2020: 170) points out, the market becomes an integral part of the value creation process. Therefore in the strategy, you can use the role of consumers as co-creators, meaning consumers and business players interact to create a shared experience (social aspect). By accepting our results, you can mainly use the "Atmosphere" feature for marketing messages (advertising, social media). Poor service brings out negative comments and taints the quality of an experience. It emphasises providing training in good customer service (Jennings & Nickerson, 2006). The results of this study may translate into the marketing strategies of individual restaurants but also create a comprehensive action through their cooperation. The strategy includes expectations, social construction, media exposure, and interactions with environments (providers). A joint effort can create a product which will allow the distribution of tourist traffic from the most crowded places in Krakow, using the features of experiences from our study.

Another issue that can be used in the new strategy is using MGE to include the local population and contribute to the experience. In the case of Krakow, this comprises authentic traditional Polish cuisine (from the Lesser Poland region), the reimagined former cuisine of Krakow Jews (from the Kazimierz district), as well as a contemporary, dynamic and diverse international culinary scene (ethnic cuisine, fusion cuisine). However, when destination managers and stakeholders realise that gastronomy is a key space resource, it can transform into a deliberate strategy (Seyitoğlu & Ivanov, 2020).

Furthermore, the study emphasises the role of gastronomic experiences in fostering cross-cultural understanding, promoting

local traditions, and contributing to sustainable tourism development. Exploring the interactions between gastronomy and local culture can provide insights into how food experiences enrich tourists' connections to the destination.

Moreover, the impact of restaurant locations on gastronomic experiences raises the potential for creating culinary tourism routes or trails that guide visitors through diverse dining experiences across different neighbourhoods in Krakow.

Limitations and future research

The results of this study have significant limitations. The study relies on English reviews from TripAdvisor only, which may exclude valuable insights from non-English-speaking tourists. Language barriers could prevent the inclusion of diverse perspectives on gastronomic experiences in Krakow.

Online reviews, while valuable, may not fully capture the richness and complexity of in-person dining experiences. The digital nature of these reviews might limit the depth of emotional and sensory aspects of the actual gastronomic experiences. Moreover, online sources do not include the opinions of people who are inactive on the Internet and social media. It can be assumed that these are mainly older adults, so we are probably dealing with an overrepresentation of young and middle-aged reviewers (the e-WOM generation) in the study.

Although the study considers restaurant locations, it does not account for spatial characteristics beyond geographical coordinates. Factors such as proximity to tourist attractions or accessibility might influence gastronomic experiences but are not fully explored.

The analysed opinions relate strictly to the restaurant – and therefore the product – and not to experiences. Thus, the authors do not describe the social aspects that accompany a visit to a restaurant (e.g. relations between family or friends), which also impact MGE, as Williams et al. (2019) confirmed.

Despite these limitations, the study contributes valuable insights into memorable gastronomic experiences in Krakow and lays the groundwork for further research in gastronomic tourism. Addressing these limitations in future studies could enhance understanding of gastronomic experiences in various spatial contexts and contribute to more informed destination management and marketing strategies.

The study's examination of the use of technology, such as online reviews, in evaluating gastronomic experiences can inspire further research into the role of technology in enhancing visitors' gastronomic journeys. Integrating innovative technologies can contribute to more engaging and immersive culinary tourism experiences. The study of memorable tourism experiences makes it possible to consider the importance of the humanistic aspect, which is noticed by the authors studying robotic tourism experiences (Fuentes-Moraleda et al., 2020; Manthiou & Klaus, 2022).

Finally, comparing Krakow's gastronomic experiences with other cities or regions renowned for their culinary offerings can provide benchmarks and best practices in gastronomic tourism.

Editors' note:

Unless otherwise stated, the sources of tables and figures are the author's, on the basis of their own research.

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