

# Reinventing the gastronomic experience: using interactive digital environments to raise awareness of food-related cultural heritage

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## Abstract

Food is a resource that provides a multi-sensory experience. It is experiential and becomes emotional, ritualistic, and symbolic. A two-way cultural exchange exists between food and people. On one hand, each culture's cuisine is part of society, and gastronomy can influence the way we perceive food and society. On the other hand, people have enhanced their pursuit of food experiences, emotions, service, and culture. This paper focuses on which elements of an environment can be designed to deepen people's perceptions of food culture and whether it positively impacts their experience of learning about food stories. Recent developments in digital technologies have caused them to frequently intervene in the creation of food environments, such as digital twins used to enhance the offline and online food experience. However, these studies tend to rely on research techniques or a single physical environment to search for data. At the same time, they have largely been unable to deepen people's understanding of traditional food culture based on the perspective of environmental experiences. Therefore, by considering multi-sensory and immersive experience design, this study extensively considers the combination of food types and regional culture. It also seeks to determine whether the display of food processing and the creation of scene-based narrative space can stimulate consumers' multi-sensory experience. Moreover, it explores whether the creation of visual color, atmosphere, and taste integrated with culturally-focused food stories can add new value to food experiences. Specifically, the research questions are layered and start by seeking to identify the environmental factors that influence visitors' or consumers' perceived food experience while in an interactive food space. Secondly, it aims to figure out how food heritage and culture are reflected in food environments. Finally, it intends to explore whether the food experience's value is enhanced when people enter a food culture-centered environment and learn about its underlying stories. This research plan starts by highlighting existing theory and describes the research background. Furthermore, it intends to select qualitative research methods while collecting sources related to stories about food culture. On this basis, data was collected by conducting focus groups, and cases were critically com-

pared to discuss current research possibilities and expected outcomes. The purpose of this study is to promote traditional diets, enhance their popular appeal, strengthen people's identification with food culture, and improve their experience of food by considering food stories.

## Keywords

Food culture; Interactive spaces; Dining environments; Multi-sensory experiences; Cultural Heritage

## Introduction

"Gastronomy is a territorial symbol, a sample of both culture and nature that defines us as human beings with roots in a certain destination. The typical gastronomy that is associated with the particular context consists part of the heritage of societies"(Fusté-Forné, 2016). In contemporary society, there is a two-way cultural exchange between food and people. "New" consumers are highly complex and demanding. Accordingly, what they seek in food consumption goes beyond the means to get food to include the related experience, emotion, feeling, service, and culture (Wu, Liu, Huang, & Yu, 2021). Meanwhile, gastronomy can shape the way we think about food and society. In much the same way that art confronts us with objects that are contrary to well-established aesthetic expectations, the dishes served in restaurants might challenge and moderate the way in which food is perceived (Bröcker, 2021).

Although many interdisciplinary researchers have shed light on a series of emerging design spaces for food interaction amongst human beings through their work, they have largely overlooked how, from the perspective of environmental experience, people's understanding of traditional food culture can be deepened. For example, in many contemporary and emerging food consumption and display spaces, the combination of cuisines and the regional cultures underpinning the food is considered. In light of the above, this paper explores whether displaying the food processing process and the creation of scene narrative spaces can provide a multi-sensory experience for consumers. Moreover, it will discuss whether the creation of visual color, atmosphere, and the taste of en-

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environmental atmosphere integrated with the cultural story behind food imbue the food experience with new value. The purpose of this study is to promote the traditional diet and revitalize it with new charisma, reinforce people's recognition of food culture, and render the experience of tasting food more enjoyable through the provision of food stories.

This research report starts with the literature review, which probes the new theories and the interdisciplinary research methods used to investigate the study subject. It is proposed to carry out select qualitative research to thoroughly investigate the issues at hand through interviews, narrative analysis, and other methods, addressing the unsolved problems and putting forward the expected research results.

### Literature review

There is a growing body of evidence that the environment affects our perception of taste and even mediates how we understand food culture (Wu et al., 2021). Based on the multi-sensory, immersive experience design principles, a multi-sensory dining experience is designed to simulate all five of the primary senses of guests, both during the meal and beyond (Velasco & Obrist, 2020). Food is inherently experiential and is steadily becoming more sensual, ritualistic, and symbolic (Hall, 2003).

Early research in this domain focused on the impact of factors on people's food experience, such as lighting, color, hearing, tactile perception, and smell in the environment. Oberfeld et al. (2009) identified a strong relationship between ambient lighting and people's perception of a glass of wine, indicating that it tasted 50% sweeter when tried under the red ambient light compared to other lighting colours. Similarly, the ambient light of the environment has also been found to mediate the perceived flavor of food and beverages (Oberfeld, Hecht, Allendorf, & Wickelmaier, 2009). One study has shown that manipulating the pitch of background auditory stimuli could moderate the way in which people taste food (Crisinel et al., 2012). In addition, the tactile exploration of tableware in the environment revealed that plate texture also alters people's perception of food (Biggs, Juravle, & Spence, 2016). Finally, some researchers have emphasized the impact of scent on the virtual reality experience (Flavián, Ibáñez-Sánchez, & Orús, 2021).

In recent years, new technological tools are increasingly used in the creation of food environments. By definition, virtual reality (VR) is a sensory-enabling technology that facilitates the integration of sensory inputs to enhance multi-sensory digital experiences (Flavián et al., 2021). Grossenbacher and Lovelace (2001) define synaesthesia as 'the conscious experience of systematically induced sensory properties that most people may not be able to experience under comparable conditions'. This definition also allows for the incorporation of some authors' views who believe that synaesthesia constitutes a delicious form of edible 'edutainment' (Charles Spence & Youssef, 2019).

A number of practical projects that support the effectiveness of the contemporary food environment experience have been put forward in the literature. For example, Vi et al. discussed LeviSense, which was the first system to inte-

grate all five sensory modalities into a single platform based on the suspended food. Specifically, they used the system to demonstrate how different combinations of light and smell affect users' perceptions of taste qualities, namely, intensity, pleasure, and satisfaction (Vi et al., 2020). With regard to physical environments, in September 2014, the Náttúra dining concept developed by Kitchen Theory was applied in London, aiming to immerse diners in the Nordic experience while transporting them to a variety of different nature-inspired environments (Youssef & Spence, 2021).

However, an equally important, albeit low-profile, topic (at least so far) is the design of cultural environments for food. Throughout history, culinary heritage has been a fluid channel facilitating cultural exchange (Pascual & Orduna, 2020), with the typical cuisine associated with each environment constituting a part of its social heritage (Fusté-Forné, 2016). Shepherd (1999) was one of the first scholars to explore the relationship between psychological attitudes and dining behaviours. More recently, Cuevas et al. (2021) pointed out that there are multiple factors capable of moderating eating patterns, including culture, socioeconomic status, dining environment, and hedonism. These factors underscore the significance of culture, which is evolving and transforming consumption, ranging from owning objects to experiences (Scalise Sugiyama, 2001; Shepherd, 1999).

Broadly speaking, numerous authors have applied multi-disciplinary theories to produce the relevant evidence, contributing their different opinions from interdisciplinary perspectives.

With regard to museum environments, Kim et al. found that gastronomic tourists seek to build knowledge and access gastronomic experiences when visiting gastronomic museums and restaurant complexes. To be precise, they observed that each experience is made up of both tourist and environmental factors, with environmental factors specifically contributing to the gastronomic experience of museum restaurants (Kim, Park, & Xu, 2020). In folklore terms, food has been adopted as a totem of meaning to impart different information in Chinese culture on many occasions. For example, the traditional foods eaten in China to celebrate birthdays are noodles and peaches, both of which represent longevity (Ma, 2015). However, in relation to tourism, there is little discussion in the scientific literature about how to enhance the connection between food tourism and memory in the technical context (Biggs et al., 2016). In line with the above, research in multiple fields has highlighted the importance of cultural experiences, including the acquisition of knowledge and perception of local identities and cultures moderated by local food and 'foodways' (Kim et al., 2020).

A review of the previous research shows that it was inclined to delve into the data by examining technology or a single physical environment, as can be seen with Batat's questioning of whether augmented reality (AR) technology has positive or other far-reaching impacts on consumers' dining experience (Batat, 2021). As such, our contemporary understanding of the design of cultural environments for food remains incomplete. However, the research gaps identified here present a solid base for this study to investigate which elements of

the environment can be designed to deepen people's perceptions of food culture. Additionally, it sets the stage to investigate whether there is a positive effect on the food experience when food stories are learned by consumers.

## Research Questions

This study takes the form of an exploratory, open-ended piece of research. The research process will be split into five stages: (i) Desktop research, including the construction of a knowledge network map and research framework through theoretical literature review and stakeholder analysis; (ii) Interviews, including, through engagement tools, the use of questionnaires and in-depth interviews to gather information; (iii) Case studies, such as the LeviSens system; (iv) Data analysis, which may include the creation of a design prototype to evaluate and test the applicability of the proposed process; (v) Conclusions and reflections, suggesting possibilities for future development. This study will take Chinese time-honored restaurants as an example.

This study is provisionally based on the following research questions:

- » RQ1: What are the various environmental factors that influence the visitor's or consumer's perceived gastronomic experience in a food interaction space?
- » RQ2: How are culinary heritage and food culture reflected in the food environment?
- » RQ3: Is the value of the food experience enhanced when people enter an environment with food culture and learn the stories behind the food?



Figure 1. Summary of the research question process.

## Methodology

Despite the usefulness of quantitative research, qualitative research methodologies are necessary to guide researchers to better understand the important social and environmental factors affecting food choices and eating habits (O'Kane & Pamphilon, 2016).

This study uses qualitative research to explore people's subjective feelings about their experience of a Chinese catering cultural environment. Semi-structured open-ended questions were used to draw out specific themes, whilst rich descriptive data was collected using examples of different environmental experiences (Jordan & Gibson, 2004). In the data collection process, the point describing similar answers repeatedly heard by the interviewer is referred to as 'data saturation' (Grady, 1998). Some studies have specifically focused on data saturation to determine the ideal number of participants in qualitative research (Lemke & Schifferstein, 2021).

Some research methods that may be used in this study include:

### 1. Literature analysis

The survey results are counted, classified, and summarized based on the quantitative analysis of the literature on the combination of food types, furnishing layout, decorative color, smell, and environmental background music on people's experience and perception in many current studies.

### 2. Narrative inquiry methodology

Narrative inquiry has evolved from its origins in sociology and anthropology in the early 20th century with 'realist' orientations. In the present day, it is used in a multiplicity of disciplines and professions. Its use involves the adoption of a range of orientations, including 'constructivism', 'post-modernism' and 'post-structuralism' (Wansink, 2004). The first step is to gather materials related to food culture stories, similar to creating a mind map. Then, the three key elements of the story are selected to understand how spatial awareness tells the story.

### 3. Focus group interviews

Focus groups are conducted to collect data as they are a valuable way to gain insights into people's attitudes, experiences, and views on a topic in a social context (Wilkinson, 1998).

A simple interview will be designed to record participants' feelings about the tasting experience and their daily eating status after learning the story of the food in front they consume in a food culture setting. A minimum of two control groups will be used for comparison.

## Conclusion

This study expects to adopt the principles of multi-sensory and immersive experience design as the foundation; however, intervention in the food environment remains a complex topic. For example, food design often involves consideration of the way in which food is presented (e.g., packaging or meal utensils) and the context in which it is consumed (e.g., on the street, in a specific setting, in a restaurant with a specific theme)(Schifferstein, 2010).

Focusing on the field of multi-sensory perception and experience, Hekkert and Schifferstein (2008) defined subjective product experience as the awareness of the psychological effects caused by interaction with products, including the degree to which all senses are stimulated and the meaning and value consumers vest in products (Hekkert & Schifferstein, 2008). The feelings and emotions triggered and the benefits conveyed by food packaging design in different fields must also be considered (Schifferstein, Lemke, & de Boer, 2022). It should be noted that these are the parts that I did not understand sufficiently during the research period. Also, we need comprehend the different ways in which food stories can be presented in the creation of space from a more environmental-spatial perspective.

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