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van Boeijen, A.G.C.; Schifferstein, Hendrik N.J.

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ANNEMIEK G. C. VAN BOEIJEN
Delft University of Technology

HENDRIK N. J. SCHIFFERSTEIN
Delft University of Technology

How to include the sociocultural context in food design: Insights, tools and strategies

ABSTRACT

Designers hope that their innovations will be adopted by the people they are designed for. How well their designs align with consumers' cultural contexts is a key determinant of whether they are accepted or rejected. This is especially important for food solutions, as eating habits are deeply rooted in local cultures. However, academic disciplines from the humanities and social sciences that study food culture not always provide the knowledge, methods and tools that food designers need. Whereas these disciplines mainly investigate the past and present, designers look to the future to create new possibilities. In addition, designers often look for concrete, physical touchpoints they can use, whereas the other disciplines may look for sources of underlying meaning and, thereby, may generate conclusions that remain rather generic or abstract. In this article we discuss how culture and cultural context can be understood and utilized by designers. We describe models and tools designers can use to gain sociocultural insights, and we describe different strategies designers can employ to build on such knowledge in their design process. We conclude with suggestions to close the gaps between designers, design researchers and the other disciplines that study food culture.

KEYWORDS

culture-sensitive
design
cultural heritage
identity
values
food history
eating experience
innovation

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INTRODUCTION

For decades, product designers have devoted themselves to developing alternative cooking methods for the rural areas of the world, specifically for those with limited resources and incomes. They were motivated by the belief that cooking can and should be more efficient, using less fuel because it is scarce and expensive, and with fewer toxic emissions. Women should not need to walk long distances to find wood, thereby preserving sparse vegetation. Solar solutions are less expensive to use and more sustainable, which makes solar solutions worth promoting (Wentzel and Pouris 2007).

However, the acceptance of these well-intentioned solutions among local populations proved difficult. Ways of cooking are closely related to the food, its taste, texture, and local eating habits. A good match between a product design such as a cooking stove and local cooking habits is therefore essential (Diehl et al. 2018). For instance, solar cooking does not allow for a short and high-temperature stir-frying process as practised in Chinese cooking. In addition, the stove can only heat a single pot and its standard size may be too small to prepare a dish for the whole family. Furthermore, the solar heaters can be quite large, making it difficult to find a sunny spot to use them or a space to store them safely indoors (Wentzel and Pouris 2007). Because there is no longer an open fire, people cannot gather around the fire anymore and cooking takes place outside before sunset (Otte 2014). All these changes have a substantial impact on daily practices and routines and can hinder the adoption of this cooking tool (Figure 1).



Figure 1: Women test a solar cooker in India in 2009 (credit UN Photo).

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Cultural factors do not only serve as barriers to adoption, but they can also play a facilitating role. For instance, solar cookers have gained widespread acceptance among the Brahma Kumaris, a spiritual organization that uses them to generate steam for their institutional kitchens in retreat centres in India (Otte 2014). The Brahma Kumaris prefer to use solar cookers over fossil energy sources, due to their strong affinity for protecting and living in harmony with nature as part of their spiritual beliefs. In addition, the meaning of purity is a relevant spiritual principle within Hinduism. Solar energy is considered a clean energy source because it does not contribute to pollution and deforestation. Therefore, the use of solar cooking contributes to a clear conscience and a pure state of mind while cooking, which is considered to have a positive impact on the food properties. In addition, the Brahma Kumaris have resolved some of the usability difficulties by using the solar energy to generate steam rather than heating separate pots. This enables the cooks to use their habitual cooking methods in the institutional kitchens of the retreat centres.

As the example of the solar cookers shows, the match of new product introductions with local customs and habits is extremely important for the successful adoption of new products. Therefore, this article looks at designing food and eating activities from a cultural perspective. This means that we regard food as a manifestation of culture: not as a necessity or an individual source of pleasure, but as something with social significance. The symbolic meaning of food is often location-specific, evolves over time and can be deeply rooted in society.

Besides ensuring acceptance of new products, cultures can also provide *inspiration* for innovating food products and eating rituals, thereby enhancing values that may be evident in a foreign culture but neglected in the home culture. Bruns et al. (2012) asked multicultural groups of industrial design students to develop a cooking tool for their own culture that would respect the values of another culture. For example, Dutch students who observed a Japanese student noticed that hospitality is very important for Japanese culture. Food is eaten with attention, all ingredients are cut into bite-size pieces and portions are smaller, to facilitate eating with chopsticks. The chef was very calm during cooking, all ingredients were handled with care and measured precisely, and everything was well planned. Dishes were prepared and presented with elegance. For each dish a plate or bowl was chosen, based on colour and shape, making sure the plate contrasted with the food, to make it look fresh. These insights were then used to reshape a Dutch potato stew dish. During the design exploration, small scoops of kale stew were served on a piece of smoked sausage, decorated with bacon and pickle. To support the making of this kind of presentation, the students created a spoon that could make small scoops of stew, matching the diameter of the sausages. Furthermore, the students created a plate, consisting of a wooden board with six tapered cylinders on top, which matched the size of the scoops of stew. On the side of the plate there was room for a small cup with gravy. The plate had a light and a dark side to optimize the contrast between dish and plate (see Figure 2) (Bruns et al. 2012).

The two examples discussed above show two reasons why it can be important for designers to study food cultures. It is our aim to make industrial designers working in the food context aware of the importance of understanding a culture when designing for a specific group, to provide them with tools to gain such insights and to describe different ways how they can use such knowledge in their design process.



Figure 2: A redesigned Dutch potato stew dish, inspired by Japanese food culture (reprinted with permission from Bruns et al. 2012).

The focus in this article is on food, food preparation and the eating activity in its sociocultural context. We discuss the ways food pervades our societies, how the food we eat and the utensils we use become part of our cultural heritage and help build our identity and how eating habits change over time. But first we look at other academic disciplines in the humanities and social sciences that study (food) cultures. Although designers can learn a lot from the insights obtained in other disciplines, those insights seem insufficient to support the entire design process. Therefore, we first reflect on the distinctions between the discipline of design and other academic disciplines in the humanities and social sciences. We determine what the other disciplines can contribute and what type of knowledge designers typically must gather themselves to supplement the knowledge they already have.

HOW DESIGN RELATES TO OTHER DISCIPLINES THAT STUDY CULTURE

The term 'culture' includes everything that humans create to deal with each other and their world. One of the many definitions of culture useful in the current context is: 'Culture is the system of shared beliefs, values, customs, behaviors, and artifacts that the members of society use to cope with their world and with one another, and that are transmitted from generation to generation through learning' (Bates and Plog 1990). A different way to frame culture is given by Geert Hofstede, who emphasizes the differences between cultural groups in value orientation: 'Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others' (Hofstede and Hofstede 2005).

Scientific literature on culture is abundant and may originate from various fields. All disciplines that study culture in the humanities and social sciences use a holistic approach, strive to study the big picture (Hellemans 2014) and study the total collective representations associated with a particular society. They share this holistic approach with designers, who strive to see the bigger

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picture and try to predict the impact of their designs. In recent decades, the discipline of design has broadened its scope: while in the past design focused on creating artefacts, such as products, packages or advertisements, this focus has shifted towards shaping how people interact with and experience physical and virtual objects (Voûte et al. 2020). Even more recently, the realization that objects and interactions are imbedded in larger structures led to the insight that designers must not only develop singular interventions to make an impact, but often need tools to transform the entire system. This expansion of the design theme from product to interaction and system (Voûte et al. 2020) also makes clear why designers have become more and more interested in disciplines that consider the full complexity of the system, such as sociology, anthropology, history, and food studies.

However, the relevance of knowledge collected in different academic disciplines is not always evident to designers, as designers focus on creating innovations and transitions in which concrete interventions are the deliverables and also the starting points for behaviour change. Therefore, the knowledge must be applicable in concrete situations, whether the final design is a regulation, a protocol, a guideline, a service, an interface, or a physical artefact. For instance, Victor Margolin writes that

design historians, with occasional exceptions, do not give sufficient attention to the ways that the objects of their research belong to the study of larger issues. For some theorists, semantic issues are paramount. They talk endlessly about an object's meaning yet rarely insert the object into situations of use.

(2013: 380)

By focusing on underlying meanings and values, historians and other scholars focus on the abstract, while designers must deliver something concrete. Hence, knowing how to make connections from the abstract to the concrete and physical world is an essential design competence. For example, for designers the availability of materials, the development of skills and differences in local preferences are important aspects to consider.

Another important distinction is that most disciplines focus on understanding and explaining existing cultures based on the past and present, while designers are essentially focused on the present and future and want to improve existing situations. As the design historian Timo De Rijk states: 'The discourse of design – and product design in particular – is hardly based on history. This is mainly because design must be future-oriented, a concept that is at odds with the development of a history that can be actively used' (De Rijk 2014: 11). In contrast, sociologists and anthropologists tend to see food culture as the results of past developments. For instance, Otto and Smith state: 'Although anthropology is interested in social change and people's imaginations about the future, it as a discipline lacks the tools and practices to actively participate and collaborate in shaping their future by people' (2013: 3). Consequently, most of the literature on culture may not be delivering the right message to designers, and this could explain why designers do not easily gain a foothold in the existing cultural theories. Experiences in design education have shown that design students have difficulty applying insights from, for example, design history to a design project (Howell and Christensen 2013). However, in their desire to create something new, designers often tend to overlook valuable elements of cultural history. Therefore, designers may

benefit from theories or models that are more in line with their mindsets and tools that support them in examining cultural developments in a way that fits into the forward-looking perspective of the design discipline.

Designers' search for concrete possibilities and solutions requires them to consider the full complexity of the design and its interactions with other products, services and people. This limits their freedom to go into specific aspects, as designers will need to prioritize, which can lead to taking shortcuts and loss of nuance. Historians, for example, may dislike the use of models because they tend to dissect a complex whole into different elements, thus disentangling a reality that is strongly interconnected. It can lead to simplification where nuance and association are needed. Designers typically engage in an iterative process with changing cycles of zooming in or zooming out, alternating converging and diverging cycles, trying to take different levels of complexity into account, yet being able to propose ideas for concrete interventions. In these design cycles, models can support the process by providing structure.

Whereas designers strive to find solutions fast, other disciplines take more time to reflect and develop theories. Hence, these disciplines can help designers to take a step back, reflect on the changes they may evoke with any products and services they design and predict what the impact of these designs will be on individual behaviours, social interactions, the structure of the marketplace or society at large. Design historians may help understand how a product has acquired its meaning over time and how usage rituals have contributed to its identity. Cultural anthropological research can provide detailed analyses of daily eating practices, habits, and rituals. Psychologists try to unravel the universal mechanisms that underlie people's behaviour patterns. Design philosophers can raise relevant ethical dilemmas and provide means to support designers' decision-making (e.g. Verbeek 2011).

THE PHENOMENON OF FOOD CULTURE

Food pervades society

Food and beverages are a necessity for human life, as they provide the nutrition to fulfil the physiological requirements as building blocks and energy supply of the human body. Because of this continuous need for replenishment, food and drinks have become essential elements of many everyday routines, activities and rituals. The perishability of food and the limited availability of packaging and transport options used to prevent the transportation of many food products over long distances and, consequently, food cultures developed locally. However, under the influence of technological, economic and political developments local food cultures change over time and incidental major events (such as natural disasters and wars) may urge people to migrate, mingle with other cultures and adapt their habits.

Even nowadays – in a world where new ideas and trends may be shared easily over the internet and goods may be transported over large distances – the food habits that people developed during childhood still depend largely on local circumstances in their immediate surroundings. For instance, the local temperature, soil characteristics, the availability of water, wind and sun affect the local varieties of the crops and the seasonal differences in yield. How is food acquired? Is it produced at home, bought at a market or obtained at a store? Food can become part of local habits, rituals and traditions, which give products a different place in the local food system. Knowledge of symbolic

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meanings is essential to convey meaning through the stories and artefacts that accompany any new product or service. Ideas may differ on what is a good store, what is healthy and morally good food and what are good ways of preparing foods. Furthermore, kitchen practices may differ: ways of heating food, the functions and forms of tools and appliances, and the role the kitchen plays in the household (de Leur et al. 2006). Regarding the people involved, questions arise such as: who produces, buys, prepares and serves the food, and who cleans after the meal (Cieraad 2002)? How much time do we want to spend cooking? How do we eat: where do we eat, which utensils do we use and how many people participate in the meal? Is it socially acceptable to eat on the street, in a vehicle, in a public park? Which eating habits, practices and rituals have developed around specific food products (Shaker Ardekani and Rath 2017)? And at the societal level: how do people receive information about food? How is food safety and security managed? Food designers need to dive deep into local food cultures to make sure that new dishes and products connect to or fit with local traditions, rituals, routines, preferences and philosophies.

Cultural heritage

Heritage refers to the accumulation of tangible and intangible goods that a society inherits from the past, preserves in the present and passes on to the future. These are mediators, connecting members of society through space and time, serving as referential touchstones for self-identification and characterizing the group to outsiders (Di Giovine and Brulotte 2014).

One of the ways in which food has been used as cultural heritage is by creating a terroir designation for specific classes of food. In 1992, the European Union published a regulation on the protection of geographical indications and designations of origin for agricultural products and foodstuffs (No. 2081/92). Only a food product that originates from a specific region and possesses characteristics or a reputation that is tied to that geographical environment with its inherent natural and human factors, and for which production, processing, and preparation take place in the defined geographical area is eligible for this official protection. It legally protects these products from other companies trying to imitate or to benefit from the image of the product. The historical and cultural roots of these food products can be used to develop narratives for product marketing. The success of these protective measures, however, depends on the consumers' inclination to prefer such products and, possibly, pay extra.

In 2010, food made its first appearance on the UNESCO Intangible Cultural Heritage List by including the Mediterranean diet, the French gastronomic meal and the Mexican/Michoacán cuisine. In contrast to the products with designated origins, these cases concern constellations of products rather than single products (Di Giovine and Brulotte 2014). Hence, these are more representative of an eating pattern or ways of cooking and serving connected to a geographical region. However, recently some specific dishes have been considered, such as the *joumou* soup in Haiti, which has become the national symbol of liberation from slavery that is traditionally eaten on the country's Independence Day (Dehghan 2021).

To combat hunger in African countries that suffer from undernourishment, it could be useful to promote indigenous foods and crops, building on traditional knowledge and technologies and the customs of local farmers

and communities (e.g. Baldermann et al. 2016; Chivenge et al. 2015; Li and Siddique 2018; Muhanji et al. 2011; Kuhnlein et al. 2013; Honfo et al. 2012). However, a major obstacle is that local people are not valuing indigenous foods appropriately and that their potential benefits are underestimated. Indigenous foods tend to have a lower status than commercial crops (Rampa et al. 2020; Akinola et al. 2020). After new crops were introduced during the colonial era, people kept growing traditional vegetables to provide for household food supply and some additional income, but these foods became known as ‘poor people’s crops’ and often continued to carry the stigma of ‘food for the poor’ (Baldermann et al. 2016; Knaepen 2018). Consequently, people often consider globalized processed food products and brands more trustworthy and certainly more fashionable. Another challenge is a general lack of information on the nutritional value of indigenous foods and effective processing technologies that may build on proven local practices. Knowledge is being lost from one generation to the next, with potentially dire implications for long-term sustainable food security (Rampa et al. 2020; Akinola et al. 2020).

Recognizing and enabling indigenous foods as a key resource in ensuring healthy food systems could help to improve the nutritional status of the inhabitants of low-income countries. Indigenous foods could also offer a way to reconnect people with their roots. In many African cultures, these foods play a central role in rituals, ceremonies and traditional events. They could help in creating new policies to correct past imbalances in society, such as those occurring during Apartheid that left many feeling displaced (Akinola et al. 2020). Also, promoting the use of indigenous foods can empower women, who are usually the main producers of these foods, or other local value chain stakeholders (e.g. Dijkxhoorn et al. 2021). Fortunately, an opposing trend is emerging in some places, where traditional foods are rediscovered and revalued (Padulosi et al. 2013; Li and Siddique 2018).

Awareness of cultural heritage can provide an incentive for revaluing and revitalizing local food culture. For instance, the Garden of Holland project (<https://www.detuinvanholland.nl>), which was initiated by the province of South Holland, offers a historical framework that inspires innovative local companies, knowledge institutes, local governments and societal organizations to collaborate to bring nature and economy into a better balance and actively contribute to a better living environment, a circular economy and a healthy future. The historical analysis shows that the rich product diversity of the seventeenth century contrasts dramatically with common current practice, where only a few crops and animal breeds dominate world production. Several project partners now work together on an inclusive kitchen that is affordable, diverse, fair and accessible. In addition, health scientists cooperate with top chefs and food professionals to make sustainable, tasty and healthy food easier and more attractive and to revitalize Dutch food culture.

Food cultural heritage has also been used to develop culinary tourism, centred on exploring, experiencing and enjoying local cuisines. The gastro-nomic tour is all about a combination of gastronomy, local products and an authentic experience. For instance, Blichfeldt and Therkelsen (2010) give an example of a six-day cultural trip in Tuscany, staying in a Renaissance castle with various activities on the programme such as a trip to the local market, a wine tour with wine tasting, a visit to an authentic restaurant in the picturesque Tuscan countryside and a cooking class led by a star chef.

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Cultural identities and differences

'We are what we eat' is a popular saying, which refers to how food can shape people's identity. For instance, in his book *Über den Prozeß der Zivilisation* (1939), the sociologist Norbert Elias (1887–1990) describes the role eating utensils have played in the slowly changing processes of social rules. The introduction of the fork, he argues, led to new social norms and practices and different relationships, not only in terms of the distance to food but also between people and even to oneself. Utensils, the way they were used, together with the food that was adapted to these tools, became a manner to distinguish one social group from another. These cultural norms about 'what is appropriate and what not', together with the richly decorated utensils with expensive materials, were used to express one's social and economic status (Elias 1997).

Regional differences in food cultures contribute to the creation of narratives that contribute to a sense of identity at the city, region, or national level. For instance, in his essay 'Wine and milk', philosopher Roland Barthes analyses the symbolic meaning of wine in France, and he illustrates how myths about the meaning of wine as part of the French national identity may hinder people in changing their lifestyle into a healthier one:

[W]hat is characteristic of France is that the converting power of wine is never openly presented as an end. Other countries drink to get drunk, and this is accepted by everyone; in France, drunkenness is a consequence, never an intention. A drink is felt as the spinning out of a pleasure [...] knowing how to drink is a national technique which serves to qualify the Frenchman, to demonstrate at once his performance, his control and his sociability. Wine [...] is an ornament in the slightest ceremonials of French daily life, from the snack (plonk and Camembert) to the feast, from the conversation at the local café to the speech at a formal dinner. [...] [Milk] is now the true anti-wine: [...] because in the basic morphology of substances milk is the opposite of fire by all the denseness of its molecules, by the creamy, and therefore soothing, nature of its spreading. [...] Moreover, its purity, associated with the innocence of the child, is a token of strength, of a strength which is not revulsive, not congestive, but calm, white, lucid, the equal of reality. [...] But milk remains an exotic substance; it is wine which is part of the nation.

(1957: 59–61)

In contrast, in the Netherlands the drinking of milk has been an essential element of Dutch culture since the founding of the country. Van Bavel and Gelderblom (2009) suggest that the hygienic way of working that is necessary to obtain high-quality dairy products has been at the basis of Dutch cleanliness since the sixteenth century. More recently, drinking milk became increasingly popular in the 1960s and 1970s, as milk consumption was stimulated by large public campaigns supported by the dairy sector that produced more milk than could be sold on the market. With slogans like 'Three Glasses of Milk per Day', 'Milk, Good for Everyone', 'Milk, the White Motor' and 'I Drink Milk; You Too?' people were stimulated to drink more milk. In addition, milk was provided to children in primary school every day for an affordable price. Consequently, the Dutch identity is connected

not only to their preference for a cheese sandwich for lunch but also to the accompanying glass of milk.

Product marketing can make use of this process of identification and cultural stereotypes, by conceiving and propagating narratives, often not based on real facts, but drawing on shared myths about the identity of a particular group of people. Examples include the marketing of a major brand that sells tomato sauce suggesting that all tomatoes were grown under the Sicilian sun and were processed by a traditional Italian family, whereas the sauce is more likely to be made from greenhouse tomatoes processed in a large industrial facility. Ethnic cuisines that you may enjoy in your home country may also make use of national stereotypes. Think of the Chinese, Italian, Ethiopian or Turkish restaurants you may find in your hometown. In this case, the national identity will largely define the types of dishes and part of the beverages, together with the decoration used for the restaurant, the music and perhaps also the ethnic backgrounds of some of the staff members (de Rijk 2022).

However, the dishes served in ethnic restaurants have often been adapted to local preferences. In fact, multinational food companies such as McDonalds and Pizza Hut base their success largely on decreasing any cultural differences. Their highly standardized products and processes keep their products as similar as possible around the globe. Therefore, customers can be quite sure what to expect, no matter where in the world they enter a restaurant. Nonetheless, the need to adapt to local food preferences is unavoidable, leading to diversity in local offerings. For example, McDonald's will provide curly fries for Chinese New Year in Singapore, the McKroket (with a deep fried, breaded patty of beef ragout) in the Netherlands and Nasi Lemak, a rice dish cooked in coconut milk, in Indonesia. The company also adjusts its food products and names to the local situation, such as McLaks (grilled salmon sandwich) in Norway and McHuevo (poached egg hamburger) in Uruguay (Vignali 2001).

Historical development of food cultures

Although cultures are deeply rooted in society, they are also dynamic and will change over time. For the development of possible futures, designers need to understand past and present cultures, so they can avoid the dead-end roads already taken, and avoid losing valuable ideas. By studying the changes in products, habits and traditions over time, designers can obtain insights not only in the impact of historical developments but also in the interrelationships between the different elements of the food system.

Willemine Biemond analysed the contents of *Allerhande* from 1985 until 2005, a free monthly food magazine for the Dutch supermarket chain Albert Heijn with approximately 4 million readers. Some of the developments she observed were the decrease in household size, the introduction of the microwave oven and the increase in the employment rate among women. These developments created a growing need for smaller packaging and quick and easy-to-prepare meals. In addition, due to the increasing slimness ideal, from the mid-1980s the caloric content of main dishes decreased, even though caloric consumption overall did not decline, due to increased snacking behaviour. Despite the emerging convenience trend, in the early 1990s the magazine also published recipes for beautiful, time-consuming dishes following the nouvelle cuisine trend in the restaurant world. Because these dishes often consisted of chopped ingredients, it contributed to the spread of the food processor. Partly thanks to the favourable economic climate during the

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mid-1990s, luxury semi-finished products became popular. The average cooking time and the number of ingredients per main meal decreased significantly and the price increased. In the late 1990s, cooking an extensive meal was no longer regarded as a duty, but people started to cook as a leisure activity with (semi)professional kitchen equipment during the weekend. A market also arose for kitchen appliances such as the bread maker, with which the hobby chef could prepare food products that were readily available in stores, but perhaps lacked a personal touch. The kitchen came to be regarded as a living space, but the kitchen and its associated equipment also became a status symbol. Thanks to foreign travel and ethnic restaurants, recipes of ethnic dishes and advertisements for ethnic products started to occur in the magazine. Where the dishes were first adapted to the local familiar food, the dishes became increasingly authentic over time in terms of ingredients, presentation and way of eating. Both the food range and the daily meals, therefore, became more varied over time. After the turn of the century, the Netherlands fell into an economic depression and the magazine encouraged readers to go back to basics with familiar Dutch dishes and simple dishes with fresh ingredients (Biemond 2007).

Because cultures evolve over time, they cannot be separated from their historical context. Culture encompasses what worked in the past (de Mooij 2004) and therefore designers should make use of their understanding of the past. Otherwise, they will continue to make the mistakes other designers made before that had unintended consequences. In addition, historical insights can be a source of inspiration. Displaying previous designs and associated insights on a timeline can help designers to structure these insights and construct a story about the past and the present, providing a highly effective way to communicate the story to potential stakeholders (Figure 3).

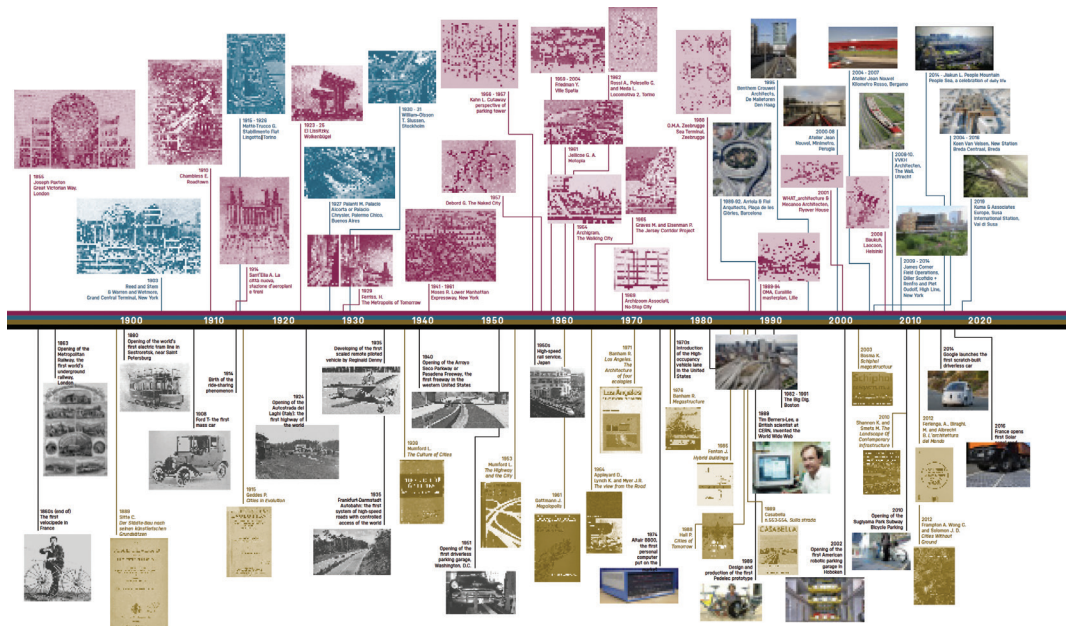


Figure 3: An impression of a visualized timeline: major developments in western road and mobility infrastructures, projected along a linear timeline (van Boeijen and Zijlstra 2020: 112).

MODELS THAT STUDY CULTURE AND SUPPORT DESIGN

To design for specific cultural contexts, designers need to get acquainted with these contexts. Several models from the academic literature support the characterization of cultures by distinguishing between different layers, dimensions or elements, even though all such variables are closely connected and sometimes intertwined. Models help designers structure the information they acquire while reading about or exploring a culture. They support designers in documenting materials, structuring their thoughts and their design processes, and communicating their insights, ideas and plans to other stakeholders. Because many design projects are complex and involve many variables, designers may need to simplify matters and the models can help choose a perspective on the design challenge at hand and the possible solutions.

For our overview we have classified the models in three categories that serve different purposes during the design process, and we give examples of the most useful culture models for designers. For each model we indicate what its main components are, why the model is particularly relevant for designers and how designers can best make use of the model.

Systemic models

Systemic models try to capture the full complexity of a culture and highlight the different types of meaning that a design may acquire in a cultural context. These comprehensive models can give insight in the dynamic changes that may occur when a designer modifies an existing product or introduces a new artefact in an existing system.

An example of a systemic model is the Circuit of Culture (Du Gay et al. 1997), which has been applied in design education for over twenty years (van Boeijen 2014). It covers five processes that all contribute to the production of culture (Figure 4). The process of *Representation* stands for the development of the cultural meaning of things that are influenced by public communication (e.g., advertisements, blogs and vlogs) with different media (e.g., TV, internet and books). *Identity* refers to how products and services gain meaning through the way social groups use them as part of their group identity. For example, in some places barbecuing is associated with a subculture of carnivorous men. *Production* refers to the creation of the product as a meaningful artefact by the designer or a company. *Consumption* stands for the process of meaning creation through how people use things in everyday practice. And the fifth process *Regulation* refers to the response to products and services in relation to socially acceptable and non-acceptable norms and rules. For example, the introduction of fast food with its disposable packaging may have changed habits and the underlying cultural values regarding eating without utensils, in public and while travelling. The arrows in the model indicate the interrelationships of the processes, without specific order and hierarchy.

Using the Circuit of Culture encourages designers to make a complete, comprehensive overview of all relevant points of view regarding the cultural significance of a product. It makes clear that designers have only a limited influence on the meaning that their creations acquire. Hence, the model helps designers to develop a comprehensive vision on the meaning their creation could acquire to guide the design process and support decision-making, while at the same time being aware of the many factors beyond their control.

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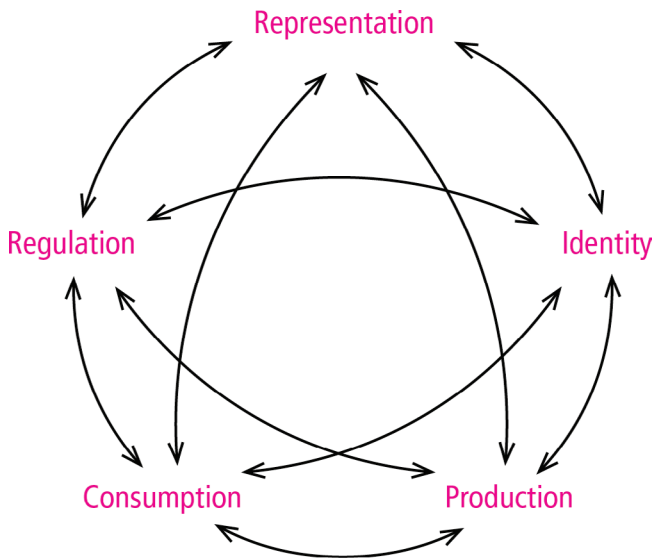


Figure 4: *The Circuit of Culture with five processes influencing the meaning of things (Du Gay et al. 1997).*

Dimensional models

Several authors have developed sets of dimensions that try to capture the value orientations in different cultures (e.g., Trompenaars and Hampden-Turner 1998; House et al. 2004; Hofstede 2001). As values lie at the basis of what motivates and drives people, insights in the positions on these dimensions can be a starting point for understanding the differences between cultures. However, as the dimensions represent people's values, they are quite abstract, and it may be difficult to determine their impact on the design of products and services. Therefore, van Boeijen (2013) developed a set of nine sociocultural dimensions that are more specifically tailored to the designers' needs. Each dimension includes descriptors for the two extremes of the dimension and Table 1 also gives an example for one of the extremes that illustrates how a specific value orientation may relate to a product idea.

Because the cultural systems of nations are complex, the information from value orientations can only be used as a guideline or for creating awareness. If the dimensions are used to calculate mean scores for the value orientations of the inhabitants of specific countries, this can easily lead to stereotyping and limit the designers' view. For instance, the positions on the dimensions that apply to the population may not apply to subgroups, particular organizations or individuals within that population (Hofstede 2021). In addition, deviant values may apply in specific situations. For example, although the general value orientation on the hierarchy dimension may be considered high in a country like China, the round tables used in Chinese restaurants facilitate informal social interactions that suggest low hierarchy.

The dimensions can provide a perspective or lens through which the relationships between the various elements of a culture can be understood. This helps designers to empathize with people in a specific cultural context.

Table 1: The nine sociocultural dimensions for design (van Boeijen 2015).

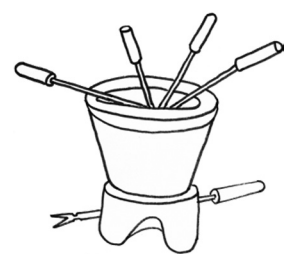
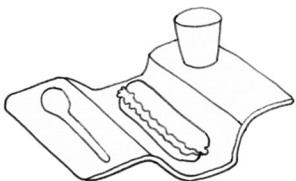
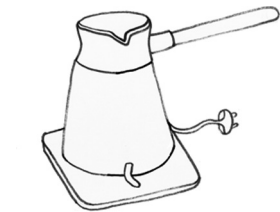
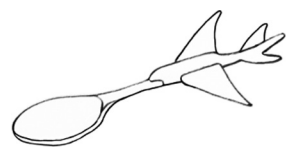

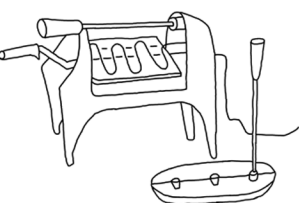

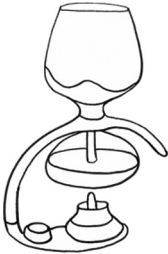

| Sociocultural dimension | Example |
|---|--|
| <p><i>Hierarchy:</i> high vs. low</p> <p>Hierarchy is about how power is divided within a group and to what extent power is accepted by the group members.</p> |  <p>This fondue set can be viewed as designed for a low hierarchy situation, because everyone eats from the same pot with the same forks.</p> |
| <p><i>Identification:</i> individual vs. together</p> <p>Identification stands for the preferred extent of individual freedom and the closeness of the connection within a group.</p> |  <p>This tray is designed for individual use. It gives the individual user the option to eat wherever and whenever they want.</p> |
| <p><i>Time:</i> past, present or future</p> <p>Some cultures value the past as something to be proud of and make references to their history and traditions. Others are more focused on the future.</p> |  <p>The shape of this electric coffee maker refers to a traditional Turkish coffeemaker. The long handle was needed to keep away from the fire. Although this feature is no longer needed, the shape refers to the traditional model.</p> |
| <p><i>Aim:</i> care vs. achievement</p> <p>The aim of an activity can be more focused on caring for each other or on individual or group achievements.</p> |  <p>A children's spoon in the shape of an aeroplane is designed to seduce children to eat. This design can be viewed as a mediator to achieve something rather than to care.</p> |
| <p><i>Truth:</i> absolute vs. contextual</p> <p>Are the processes and rules of use clearly defined, or do they depend on the context, and are people expected to know these unwritten rules?</p> |  <p>In a dinnerware arrangement, etiquette rules dictate when and how to use each fork, spoon, knife and other table accessories. This is difficult for people who are not familiar with the rules.</p> |
| <p><i>Gender:</i> divided vs. equal</p> <p>In some groups the social roles of men and women are strictly divided, whereas in other groups there are no separate gender roles.</p> |  <p>A domestic grill designed by Gregory Jamin (2009) is inspired by Churrasco, a Brazilian-style meat preparation, typically performed by a man who takes the lead in cutting and serving the meat.</p> |

Table 1: Continued.

| Sociocultural dimension | Example |
|--|--|
| <p><i>Space:</i> private vs. public</p> <p>What is considered a private space by one group may be considered public by another group.</p> |  <p>Whereas in one culture one feels free to serve oneself in a friend's house without asking, in another culture the refrigerator is considered a private space that one does not open without the owner's permission.</p> |
| <p><i>Attitude:</i> fun vs. duty</p> <p>Some cultures attach importance to a life with clear duties and rules, whereas other cultures are more indulgent, prefer some ambiguity and like to improvise.</p> |  <p>The Cona coffee maker – designed by Abram Games (1962) from a patented design by Albert Cohn (1910) – presents making coffee as an activity to be enjoyed, not a duty to be performed as efficiently and effectively as possible.</p> |
| <p><i>Expression:</i> neutral vs. emotional</p> <p>In some groups, controlling emotions is regarded appropriate and efficient, but in other groups it may be perceived as unnatural and cold.</p> |  <p>To motivate children to eat, designers devise game elements that stimulate play and self-expression.</p> |

Therefore, van Boeijen (2015) proposes that designers use the nine sociocultural dimensions to qualitatively assess the implications of differences in value orientations in various cultural contexts for the designs they create. The dimensions are particularly useful in the exploratory stages of the design process to generate culture-specific questions (e.g., how does hierarchy play a role in the current or envisioned situation?) and to make comparisons between cultural contexts.

Compositional models

This third category of models tries to describe the components that together form a culture. By focusing on components, these models make explicit what variables designers need to consider in their design and development process. As these models typically contain products, people and their interactions, they provide the most concrete input for design processes.

The first example of a compositional model comes from Activity Theory (Vygotsky 1978; Leont'ev 1978), which describes human activity in a sociocultural context (Engeström 1987). Fundamental to Activity Theory are the ideas that (1) the human mind can only be understood in the context of people's interactions with the world and that (2) human activity is situated in and shaped by the social and cultural context (Kaptelinin and Nardi 2006). The

model includes six components, of which three are central: subject(s) – one or more persons; object(ive)s – what one or more persons want to achieve; and community – a group of people with shared values, meanings and practices. In addition, the model contains artefacts – the designed things or interventions that mediate the relationships between subject(s) and object(ive)s; rules – the hidden or explicit social rules that regulate the relationships between subject(s) and the community; and the division of labour – describing the roles within the group relating the object(ive)s of different people to their contribution to the community (Figure 5).

Geert Hofstede (1991) developed an onion model with four layers: values, rituals, heroes and symbols (Figure 6). The outer layer of the model is most easily observed in daily life. It consists of symbols, including objects, pictures, gestures and words. Products initially developed for their utilitarian purpose may acquire a symbolic meaning over time. In addition, symbols from a specific cultural group may be adopted by others. The second layer concerns the people who serve as sources of inspiration and role models in a culture, here called heroes. They can be alive or dead, real or imaginary. The third layer of rituals consists of the collective activities that may not be technically necessary to achieve a goal, but are nonetheless considered socially essential. The core of the onion model is formed by values, which are preferences for certain states of being that are shared within a culture and the importance that is attached to them. Where symbols, heroes and rituals are connected, together they form practices. Practices may be observed through the people that use particular objects in their activities and the procedures that have been installed, but their full meaning can only be comprehended if their ritual value can be assessed (Hofstede and Hofstede 2005).

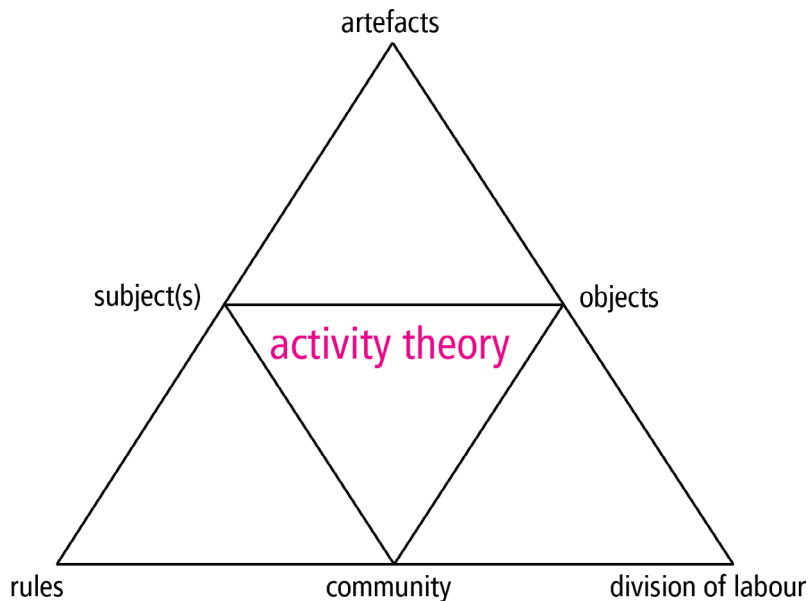


Figure 5: Model of Activity Theory (Engeström 2001).

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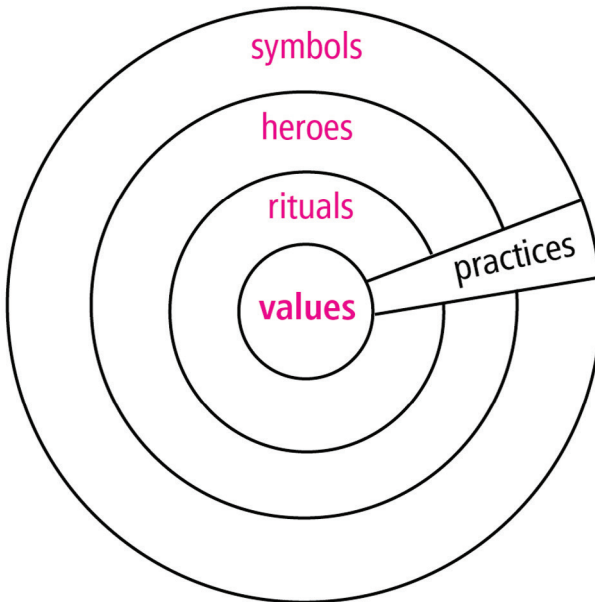


Figure 6: The onion model that describes culture with four layers, representing people's shared values and the related practices: rituals, heroes and symbols (Hofstede and Hofstede 2005; Hofstede 1991).

As practices connect products, people and the way they interact, it is no surprise that Social Practice Theory has also gained interest among designers. According to Reckwitz, a practice is 'a routinized type of behavior which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, "things" and their use, background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge' (2002: 249). While performed by individuals in distinct moments and distinct ways, practices are inherently social in nature; people learn practices from each other and thereby also standards or norms of practice develop. Theories of social practice are interesting for designers, because they allow for a 'focused investigation of how design, production and consumption are embedded in and constitutive of contemporary routines and habits' (Watson and Shove 2008: 71).

Shove et al. (2012) describe social practices as sets of interrelated variables, consisting of materials, competences and meanings (Figure 7). 'Materials' here include technologies, artefacts, spaces, bodies, structures, formats, compositions and ingredients. 'Meaning' refers to the social and personal meaning of practices, including emotions, aspirations, beliefs, identity and aesthetics. An interesting addition to the models described above is the variable 'Competences', which includes people's understanding, taste, skills, know-how or procedures. Social Practice Theory makes explicit that design (materials) can only be successful if people can make sense of the new designs and have the competences to use them. For applications of Social Practice Theory in the food domain see Domaneschi (2012), de Borja et al. (2010) and Olstad and Kirkpatrick (2021).

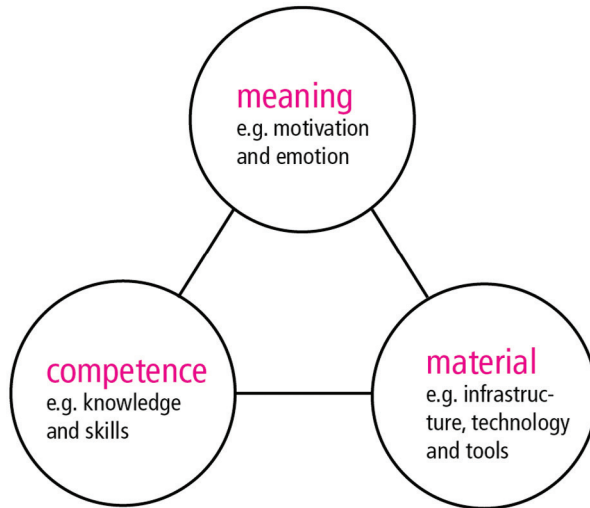


Figure 7: The different elements that together form a practice (Shove et al. 2012).

Although the compositional models differ to some extent in the variables they include, they all link a design to how it is used, the context in which it is used and the meaning it has for the people who use and benefit from it. In this way, they offer designers concrete tools for analysing products, empathizing with users, connecting to the context of use and deriving symbolic meanings. The choice of a particular model in a project may then depend on the requirements of a specific design challenge.

Integrating multiple models

Since each model provides a simplification of reality and has its limitations, none of the individual models discussed above can provide a complete overview of a culture or support the full complexity of the design process. Chen Hao (2019) developed a toolkit for designers that integrates components of multiple models of culture, and she called it the Cultura. The toolkit provides guidance for conducting contextual user research in cross-cultural settings. Besides gaining rich insights into people's cultural contexts, the aim is to build cross-cultural empathic understanding in the early stages of new product development (Hao et al. 2017).

The Cultura Wheel consists of a canvas printed on a world map, together with two or three question cards for each of the nine categories (Figure 8). The central category is formed by the sociocultural values. This field is encompassed by a circle of seven categories that are derived from Activity Theory and the onion model: material world (artefacts and everything that is designed); community and groups (the people involved); division of roles (among community members); rituals in everyday lives; knowing the rules (social regulation); role models (people who are highly esteemed in the community), and goals (of the targeted people). These categories are surrounded by the final category, which is called macro-developments and describes contextual factors, such as developments in demography, economy and politics, including geographical characteristics, development of infrastructure and so on. This layer has been



Figure 8: Cultura Wheel with question cards (Hao 2019).

added to better understand how the current culture is influenced by external developments and to anticipate such changes in the (near) future.

DESIGN STRATEGIES USING CULTURE IN THE FOOD CONTEXT

In the previous sections, we have mainly described what culture is, the reasons for studying culture and how we can obtain the insights designers need. In the next step, designers must decide how they will take culture into account in their food design project. Besides considering the cultural context for which they are designing, designers must also consider universal behaviour principles, along with technical limitations, business requirements and legal and political constraints, to name a few, making their task highly complex. Therefore, designers should formulate the *intention* they have when developing an intervention within a specific cultural setting, and they can employ different strategies when trying to realize their intention (van Boeijen 2015):

1. Follow the dominant cultural values.

These interventions conform to existing cultural values and may try to enhance these values. Thereby, they try to avoid mismatches between the cultural group and the product. Designers remain alert to possible misinterpretations and check how design characteristics are perceived in the target population. Because cultures are layered, designers must ensure that cultural values are addressed in multiple ways and touch the various layers.

For example, the designers who made an electric coffee maker with a large handle (see Table 1) followed the shape of a Turkish coffeemaker and thereby connected their modern apparatus to traditional Turkish practices of making coffee. Even though the long handle did not serve any

practical purpose anymore, the handle made the apparatus recognizable for its Turkish consumers, and also had a symbolic value by connecting with Turkish habits and traditions.

2. Changing an existing cultural value.

These interventions try to bring new values in a specific domain where designers or the stakeholders deem it desirable. In some cases, the new values can be derived from another culture, such as the redesign of the Dutch potato stew dish inspired by Japanese food culture described in the Introduction (Figure 2).

Design researchers in the *Healthy Storytelling* project (2021) tried to improve the food habits and prevent obesity in deprived neighbourhoods in the Netherlands. In a five-week project, primary school children were presented with a story about the Torries from the island of Tortor, who came to stay with the children and learn about a healthy lifestyle. Together with their family members, children performed weekly assignments wrapped in stories and tailored in audios, games and props (e.g. cuddly toys). The aim was to reach and involve vulnerable groups and to inform and transfer health knowledge. In this way, children and their caregivers learned about aspects that constituted healthy lifestyles, including nutrition, exercise, sleep and social health (Vegt et al. 2021).

Another example is given in a graduation project for the development of alternative protein foods. Master student Karla Rosales deliberately chose to break with the mainstream meat culture and strengthen a flexitarian food culture by offering a totally new shape for a vegetarian meat alternative, instead of proposing shapes that followed familiar meat products like sauces, meatballs and minced meat. In cooperation with food development specialists, she developed lasagne-like protein-rich sheets that allowed for wrapping other ingredients (Figure 9), such as vegetables and spices (Rosales Palomec 2012).



Figure 9: Design of an innovative meat substitute (Rosales Palomec 2012).

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3. Circumventing cultural values.

Designers may use this strategy when stakeholders' priorities differ widely. In this case, completely different values may be addressed in the design, which can change the meaning of practices. The role of culture-specific values is ignored in this case, and the design is more likely to address universal human principles, such as 'people want to be comfortable' or 'children like to play'.

For example, consider a parent trying to improve a child's eating habits. The parent wants the child to eat the meal to grow healthy and strong, but the child tries to avoid the unpleasant taste of some of the ingredients. Perhaps the parent would turn the eating practice into a game to distract the child or emphasize that eating the food will make the child part of a select, desirable social group. Analogous to the creative parent, by linking a design to the value of enjoyment (the game) or the value of belonging (a new social identity), a designer can introduce new elements that are not specifically rooted in the original culture.

In immigration integration programmes, food can play an important role in bridging gaps between groups (e.g., Fuster et al. 2020). Cooking together or tasting each other's food emphasizes commonalities between people in their need for nutrition and interpersonal connection, rather than the cultural differences that separate them. Cooking traditional foods allows people to reconnect with their country of origin (Porreca et al. 2020), while encountering new tastes or combinations can spark interest in other cultures and other people.

4. Considering the values of multiple cultures simultaneously.

When people from different geographical regions come together, when people from different subcultures in society meet or when a conflict occurs between a subgroup and the dominant culture this asks for a consideration of multiple cultural values that may not agree. To bring cultures together and build bridges, the strategy is likely to focus on resolving dilemmas to fulfil multiple, conflicting concerns simultaneously.

For example, Ozkaramanli et al. (2013) investigated afternoon tea rituals in Turkey with the aim of developing new concepts for teatime snacks. One of the dilemmas they encountered was that the host wanted to show appreciation for her guests by baking herself (a traditional value), while also saving time to have a paid job and be economically independent (a modern value). The project team tackled the discrepancy by offering prefabricated products that saved the host time when she wanted to bake snacks.

In Italy people eat spaghetti with only a fork. However, outsiders believe that the correct Italian way to eat spaghetti is with a fork and a spoon. As part of a course assignment, Master student Stefano Oliva decided to integrate these practices and proposed a plate with the impression of a spoon (Figure 10). With the fork you can twirl the spaghetti in the hollow impression, so that a real spoon is no longer necessary. Hence, the need for a spoon has been eliminated, and the design now suits both eating practices.

CONCLUSION

The work presented here demonstrates how multifaceted the designer's landscape is when designing food within the cultural context. We have discussed



Figure 10: Prototype of a spaghetti toolkit designed by Stefano Oliva in 2012.

that food pervades societies and that culture is a multi-layered phenomenon. Therefore, the interactions with food products seem ubiquitous and have consequences at multiple levels in society. In addition, these interactions may change over time and differ between different regions and countries, and even between subgroups in the same area. Hence, it is an important design competence to be sensitive to the meanings that underlie cultural intricacies. In addition, although we have defined culture in terms of mindset, it is important to realize that the people who identify with different cultures can vary on many other aspects, including race, ethnicity, class, gender, stages of ageing and health status, that must be taken into account while designing for specific cultural contexts.

Although we have discussed some of the differences between the disciplines that study culture, the boundaries between disciplines become more and more porous, given that many complex societal problems ask for solutions that combine inputs from multiple disciplines. In this sense, this article is an attempt to dissolve some of these borders between traditional disciplines, to improve the understanding of cultural phenomena and the applicability of such knowledge in creating solutions for the existing societal challenges around food. To achieve this, we need to understand the aims and approaches of the different disciplines and – without losing the strengths of the separate disciplines – find a common language for understanding each other's viewpoints.

The work of designers enriches the world and, thereby, contributes to the study field for several disciplines. Designers create the artefacts that become part of the observable, material culture. In addition, they contribute to the design of interactions, rituals and processes in which such artefacts are used. Typically, sociologists, anthropologists and historians study the artefacts and the way they are used in society. Perhaps the designers' intentions and the thought processes that shape these artefacts and interactions could receive more attention in the other disciplines? For instance, designers are likely to develop visions of the

future as their designs will only take shape in the near or distant future. How do they develop these visions? What are the different cultural views on visioning? What input do they need from other disciplines and in what form should they be offered? By recording design processes, including the intentions and cognitive considerations of designers, the understanding of creative processes can be increased, which can lead to an enrichment of the various adjacent disciplines and may facilitate transdisciplinary cooperation.

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CONTRIBUTOR DETAILS

Annemiek (A.G.C.) van Boeijen is an assistant professor at the Faculty of Industrial Design Engineering, Delft University of Technology. She has many years of international experience in design, education and research. Her aim is to develop methods and tools that support designers with a culture-sensitive approach. In 2015 she defended her doctoral thesis 'Crossing cultural chasms: Towards a culture-conscious approach to design'. She is initiator and co-editor of the *Delft Design Guide* (BIS Publishers, 2013, 2020), established the awarded online course *Culture Sensitive Design Thinking* (2016–22) and author of the book *Culture Sensitive Design: A Guide to Culture in Practice* (BIS Publishers, 2020), co-authored by Yvo Zijlstra. Recent work is for *Healthy Storytelling* (2019–21), a Research-through-Design project concerning obesity risk prevention.

Contact: Department of Human Centered Design, Delft University of Technology, Landbergstraat 15, 2628 CE Delft, The Netherlands.
E-mail: A.G.C.vanBoeijen@tudelft.nl

 <https://orcid.org/0000-0003-1889-2310>

Rick (H. N. J.) Schifferstein is an associate professor at the Faculty of Industrial Design Engineering of Delft University of Technology. His topics of interest include (multi)sensory perception, food design and experience-driven innovation. He has contributed to 100+ articles in international scientific journals, including *Acta Psychologica*, *Food Quality and Preference*, *Chemical Senses*, *Materials & Design* and the *International Journal of Design*. He is principal editor of the *International Journal of Food Design* and co-editor of the books *Food, People and Society* (Springer, 2001), *Product Experience* (Elsevier, 2008), *From Floating Wheelchairs to Mobile Car Parks* (Eleven International, 2011) and *Advanced Design Methods for Successful Innovation* (Design United, 2013). He is founder and director of the Food & Eating Design Lab (<https://delftdesignlabs.org/food-design/>) in which staff members and design students work together to improve people's interactions with their daily foods.

Contact: Department of Human Centered Design, Delft University of Technology, Landbergstraat 15, 2628 CE Delft, The Netherlands.
E-mail: h.n.j.schifferstein@tudelft.nl

 <https://orcid.org/0000-0002-3424-7138>

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