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The Hybridization of Food Spaces: Changing Spatial Logics in Urban Food Systems and Prospects for Sustainable Diets

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KATA FODOR

Abstract.

On the consumption end of the food supply chain, cities have leverage to spatially facilitate sustainable food system transformations and accommodate sustainable diets. However, developing the appropriate architecture implied in such a feat, i.e., creating the adequate spatial conditions for sustainable urban food practices, is first predicated on understanding the existing spatial logics operating at the core of contemporary urban food practices and food spaces. This paper aims to contribute to this understanding, by identifying and conceptualising some of these changing spatial logics. Through a series of observations across four domains - cyberspace, retail spaces, the domestic realm and compound food spaces – the study finds that several 21st-century constructs, such as online food purchasing, the connected kitchen or the diversified supermarket, exhibit entirely novel spatial logics in organising urban food practices and the physical reality around them. As a key finding of the analyses, this paper introduces the term ‘hybridization of food spaces’, linking two overarching patterns identified: how 21st-century urban food space typologies increasingly show signs of functional diversification in their physical layouts, as well as ways of merging with virtual platforms. Finally, the paper considers the design and strategic potential that this hybridization presents. How blurring the boundaries between traditionally conceived spatial/functional domains, as well as shortening urban food supply chains may contribute to the physical facilitation of sustainable urban practices around food, and ultimately, sustainable diets.

Introduction

Changing urban food consumption practices in many parts of the world will be central to securing a sustainable future on this planet. Yet achieving ‘*sustainable diets*’ across different societies is a significant challenge, involving many complex issues such as nutrition and public health, the environment, sociocultural factors, food quality, economics and governance (Mason & Lang, 2017). Recent studies, such as the *EAT-Lancet Commission report*, not only demonstrate that human health and environmental sustainability can simultaneously be addressed, but also propose new dietary guidelines for ‘*planetary health*’ adaptable to a wide range of geographic and cultural contexts (Willett et al., 2019). However, to implement such knowledge by translating it into effective practical action - beyond individual voluntary measures - remains elusive, as food policy thinking is routinely ignored in legislative and governance circles preoccupied with the pursuit of economic prosperity (Nestle, 2007; Lang, 2009; Mozaffarian, 2016; Springmann et al., 2020).

Advancing one alternative way forward to practical application is to consider the implications of expert food policy thinking in spatial terms: to urban development, architecture, and housing. Through design, as Aravena (2013) suggests, the city itself can become a ‘shortcut’ in achieving goals which are often impossible to attain through bare politics. Nevertheless, the spatial design fields generally concerned with accommodating a rapidly

Kata Fodor, Doctoral Candidate

Aalto University, Department of Design, NODUS Sustainable Design Research Group
R209, Otaniementie 14, 02150, Espoo, Finland, E-mail: kata.fodor@aalto.fi

urbanising world do not yet seem to have taken notice. The question of how any of the desired shifts in urban food practices could be spatially facilitated remains insufficiently discussed (Parham, 2015), perhaps with the exception of urban agriculture. The spatial implications of sustainable urban food logistics, retail, storage, food preparation and waste management hardly feature in the dialogue and receive even less consideration in (the practice of) current mainstream urban developments (Pagh, 2014). Yet, a change of approach in both dialogue and practice will be all the more necessary, given how significantly spatial logics - on all scales from the layout of one's kitchen up to larger urban configurations - dictate the behaviours of individuals and implicitly define an urban convenience at a society level (Sobal & Wansink, 2006; Steel, 2008; Mikkelsen, 2011; Lim, 2014).

Cities are in a position to spatially facilitate sustainable food system transformations, as well as accommodate sustainable diets. They hold leverage from the consumption end over the whole food supply chain, both as a function of the sum total of the individual consumer choices and food provisioning practices taking place in them, and potentially through exerting power by collective food citizenship (Hatanaka 2020; Lang, 2020). From a spatial design perspective/approach this presents a (perhaps simplified) utilitarian challenge: How can our urban environments and spaces be designed to make sustainable food practices as convenient and universally adoptable as possible? What are the spatial barriers that currently exist to many and how do we eliminate them to allow for collectively practised urban sustainability?

Conceptually, this would imply an architecture catering for sustainable practices across and within urban and peri-urban territory in food production, processing, transport, storage, retail, consumption, and waste management. At the same time, any detailed speculation and definition of how the built urban environment can perform this strategic function must rely on a thorough understanding of the actually existing spatial logics underlying contemporary urban food practices and thereby the urban food system. In other words, the awareness of the principles guiding how food practices get organized in physical space is a crucial starting-point to any realistic vision of desirable food futures. This is all the more important, as those core spatial logics get rapidly affected and re-arranged by several concurring forces, such as technological developments, economic pressures, demographic changes and growing environmental concerns. Thus, considering this question from the context of affluent Western cities, the present paper aims to conceptualize the new spatial logics embedded in 21st-century urban food practices. It seeks to identify these logics through the analysis of a series of urban food space typologies across four domains: cyberspace, retail spaces, the domestic realm and compound food spaces. The study highlights two specific overarching phenomena: the '*hybridization of food spaces*' on the one hand, and the sprawling ubiquity of food in urban non-food spaces on the other, considering the potential of the former and the dangers held by the latter with regards to achieving sustainable diets.

Literature and Conceptual Framework

The objective of this paper - to understand the changing spatial logics in contemporary urban food practices - calls for a combined analysis of space and practice. Considering practices as the main unit of analysis toward sustainability goals has been argued before (e.g., Shove & Spurling, 2013; Strengers & Maller, 2014), and even in food practices specifically (Spaargaren et al., 2012). However, combining such an approach with a spatial analysis is less common. In the existing literature, concentrated in the social sciences, food practices are typically discussed in terms of specific demographic groups, such as mothers in families with young children (Bowen et al., 2019), vulnerable social groups (Redman, 2019), the elderly (Maguire et al., 2014; Ikejima, 2019), or niches, such as AFNs (e.g., Veen & D'Amico, 2018; Kallio, 2018). In contrast with this tradition, the present study employs a more design-oriented approach,

whereby food practices are analysed through a spatial lens. That is, this paper examines food spaces and food practices in combination.

The literature on the role of built environments in shaping food practices exhibits a wide range of terms that are based on different scales. Examples include food landscapes, food environments, foodscapes, kitchenscapes, tablescares and platescapes. Typically, the choice of the terms used also implies a certain level of physical tangibility or abstraction. To avoid the confusion posed by the various existing terms, the present study uses ‘*food spaces*’ and ‘*the spatial aspects of food practices*’ in order to convey both a high degree of physical tangibility and a wide range of scales cast, encompassing both micro and macro environments. This approach is in line with the current understanding of the multiscale influence of built environments on behavior around food consumption (Sobal & Wansink, 2006). Moreover, this interpretation aligns with social practice theory in considering space not only as a representation of practice but also as a resource in itself. That is, ‘space as a resource’ stands for the physical location of material elements that are simultaneously present on multiple scales (Shove et al. 2012, p. 130); eg. a tap and the larger supporting plumbing infrastructure, or the composting bin and the urban waste management infrastructure. As both of these examples illustrate, such a perspective neatly applies to the specific study of the spatial aspects of urban food practices and emphasizes the constant dynamic relationship between food practices, food supply chains and the food system at large.

In fact, urban food spaces could be conceived as nodes along the food supply chain, all the way from production to waste management. As such, food spaces are intrinsically connected to several other – nearby or possibly distant urban, rural and often global – locations. Of course, through design this tangible feature may either be exposed and visibly displayed or carefully concealed and hidden away. Either way, this complex, networked and physically bound condition is innate to food and therefore seems to be reflected in our food practices as well. Through considering the specific example of *eating*, Warde (2013) has demonstrated how difficult it is to draw boundaries between separate food practices. Indeed, pinpointing where exactly grocery shopping ends and cooking begins, or where cooking ends and eating begins (and so forth), are astonishingly difficult questions. There are no clear-cut boundaries between them, but rather they form a chain of interconnected practices. To describe the nature of the relationships formed between linked practices, social practice theory offers several helpful concepts. *Bundles*, *complexes* (Shove et al. 2012, p. 81) and *compound practices* (Warde, 2013; 2014) are some of the terms listed here in order of increasing integration and strength within their bonds. The links formed between practices, that is their being consecutive or simultaneous, are often the consequence of co-location and spatial conditions (Shove et al. 2012, p. 84). Upon considering the various uses and activities accommodated within food spaces, this conceptual framework offers interesting parallels with architectural notions of mixed-use and hybridity, as will be further explored in this paper.

The term ‘*hybridization*’ in a spatial context is used in several disparate discourses, ranging from CAD and digital architecture to stakeholder configurations in development projects, thus holding multiple and very distinct meanings. However, two specific uses are particularly relevant to the present study. First, the notions of ‘*hybrid building*’ (Fenton, 1985; Holl, 2014; Fernández Per et al., 2014) or sometimes ‘*spatial hybridization*’ (Uyttebrouck & Teller, 2017) refer to a specific way of combining different building uses (i.e. programs) that is distinct from both mere ‘*flexibility*’ and ‘*mixed-use*’. In a hybrid building, the constituent parts have meaningful, interacting and synergistic relationships. Therefore, the resulting overall spatial entity - the scale of which might vary - is qualitatively greater than the sum of its parts. In fact, spatial hybridization in architecture could be understood as a form of what systems theory calls ‘*emergence*’. The second use of the term of ‘*hybrid space*’, though equally relevant conveys a rather different meaning, related to networked social movements. This concept refers

to how physical space interacts and gets interwoven with cyberspace (Castells, 2012; Reed & Keech, 2019), creating a new entity in-between communication networks and urban space that is both networked and place-based at the same time (Álvarez de Andrés et al., 2015). The present study considers both of these distinct meanings as it attempts to bridge them by incorporating both into its use of the term hybridization. In other words, this study considers cyberspace as yet another element/dimension to be meaningfully accounted for in the creation of the new heterogenous spatial systems, the hybrids.

Methods and data collection

The scope of the paper is limited to the observation and analysis of the phenomenon of the hybridization of food spaces as it occurs within the context of affluent Western cities. Justification for selecting this context is based on three factors. First, it draws upon this researcher's deep familiarity with its culture and traditions; second, it considers the relative power, influence, potential, wealth and responsibility concentrated here toward and within a global context; and, third, it recognizes the ways in which contemporary cities in similar positions share and replicate patterns, tendencies, challenges and solutions amongst themselves. Furthermore, such a qualitatively narrow, but geographically loose setting proved helpful in describing a new and emerging urban phenomenon, whose constituent aspects are still unfolding at slightly different paces in any one city, thus rendering each element more apparent in some cities while still quite subtle in others. Therefore, deliberately focusing our attention on the most extreme (and thereby illustrative) expressions of the phenomenon helped in amplifying the initial observations, drawing attention to otherwise quite subtle changes in urban form.

Based on the observations of empirical reality, the present qualitative study followed a grounded theory approach. This choice afforded the priority to be given to the liberal exploration of the field and the data over theory (Flick, 2018) and allowed the research to organically utilize the kind of analytical skills, creative methods and iterative processes that are at the root of the practice of architecture and spatial design. Data collection, memo writing and analysis took part concurrently, each feeding into the other (Charmaz, 2006). Emphasis was placed on the interpretation of the data and on developing theory through their analysis from the ground up. A corresponding theoretical sampling method was used to gradually select a series of individual spatial developments for in-depth analysis, constant comparison and to help identify linkages, similarities and differences (Chang, 2017). These were then termed in the study as 'constructs' or 'spatial developments', as they neither all strictly refer to spaces, nor only practices. These were ultimately reduced to nine items categorized into four main logical domains: cyberspace, retail, domestic realm and compound food spaces. Rather than opting for a focused study of one individual item or domain specifically, the broader study aimed at contributing to a state-of-the-art understanding of the changing spatial logics operating at the core of our urban food practices and urban food systems, cutting across all domains. Consequently, the domains and their items are presented in order to uncover overarching patterns, and with that identify the guiding principles embedded in their spatial organization. The iterative process of data collection for this sample was driven by two main criteria. First, to be considered relevant, a case had to be typological. In other words, the particular development displayed had to surface and be exhibited repeatedly in multiple spaces of the same type, across multiple cities, even if only at a niche level. Therefore, an art installation or one-off experimental project or single food space would not be relevant for this study. Second, the selected typological cases were deemed remarkable only if they displayed novel spatial logics in the way that they organize the corresponding food practices around themselves.

The direct spatial observations involved in this research were conducted between 2018 and pre-pandemic 2020 in food retail spaces, institutional and co-working office cafeterias, as

well as in private and shared home environments across several affluent Western cities: New York, London, Copenhagen and Helsinki. Just like these cities, the presented constructs themselves are mostly upmarket and highly exclusive, thereby unrepresentative of the diversity of contemporary urban food spaces. This limitation, however, was implied by the purpose of the paper, to begin theorizing an emerging phenomenon, which appears strongly driven by cutting-edge technological innovation and ‘scalable solutions’, highly engineered and purposely designed environments, and privileged lifestyle aspirations. The physical visits to the observed food spaces ranged between a few hours to entire days, and were complemented by 10-40-minute discussions and short interviews with the users, managers, operators and service staff members of these spaces. Memo writing and the drawing of operational diagrams helped to synthesize and make sense of the data gathered. Additionally, the data collection and analysis of some cases, where personal visits were either not possible or were too restrictive - such as the back end of online grocery shopping and in dark kitchens¹ - relied on further insight from secondary sources. This included video recordings and reporting from newspapers (i.e. The Economist, The Guardian, The New York Times and the Financial Times), screening of niche industry websites related to food retail and technology (e.g., thespoon.tech, foodtechconnect.com, supermarketguru.com), and in the case of eco-households and zero-waste shopping even practical life-style guide books (e.g., Zero Waste Home: Johnson, 2013) and similarly themed popular online blogs (e.g., trashisfortossers.com).

Table 1: A Sample of Spatial Developments in Urban Food Provisioning

#	Domain	Construct	Specific Examples
1	CYBERSPACE		
		Virtual food	muk bang, ‘sharing’ meals on video calls, instagrammed food, cooking tutorials
		Online food purchasing	Ocado, Amazon Fresh, Amazon Go, Wolt, Deliveroo, Olio, ResQ,
		New Automat(ed) fast food outlets	McDonalds (multiple cities), Eatsa (San Francisco), FEBO (Amsterdam)
2	RETAIL SPACES		
		Diversified supermarket	Whole Foods Markets (New York-London), Waitrose, M&S, K-Market. Herkku (Helsinki)
		Packaging-free grocery store	Unverpackt, Day by Day Whole Foods & Planet Organic sections
3	DOMESTIC REALM		
		Connected kitchens	diminished kitchen(ette) hyper/dream kitchen
		Eco-home	Growing food, fermentation, composting, zero-waste practices
4	COMPOUND FOOD		
		Spatial sharing & compartmentalization	Arabia campus lounge (Helsinki), KADK Canteen (Copenhagen)
		New office food space	LinkedIn HQ (London), Mindspace (London)

¹ Dark kitchens refer to those work spaces that prepare meals exclusively for delivery

Domains

1. Cyberspace

The Digital Age has brought about a number of ways for food items to be represented on IT platforms. Through photographs, videos, illustrations, codes and data, or a combination of the above, food items essentially obtain virtual ‘avatars’. These avatars then serve to accurately represent real food items for specific purposes. Such purposes and applications include product display functions for purchases (e.g., how an item appears on *Amazon Fresh*), advertisements for motivating purchases, entertainment (e.g. mukbang² streaming), education and knowledge sharing (e.g. video cooking tutorials and recipes), as well as ‘sharing’ per se (i.e. of experiences with others not present, of memories or for a display of social status, values and cultural aspirations). However, more often than not, we encounter combinations of these, rather than single-purpose applications. For example, an online cooking video might simultaneously be a form of entertainment, advertisement, social and knowledge sharing, all in one.

The spatial consequences of this development are manifold. Most directly, they require physical spaces to serve - maintain, create, generate and display - the virtual content. Remarkably, in the case of the recording/studio settings and food preparation spaces that are designated for the creation of ‘virtual food’ (such as in *Bon Appétit* magazine’s New York ‘Test Kitchen’ or in any mukbang broadcaster’s home), the physical reality of space, food and practice all become mere tools in manufacturing what is primarily to become virtual food and content – that is, the avatars themselves. Along with this shift, home-chefs, food retailers and restaurateurs have also begun to consider the virtual appeal of their very real meals. The potential of their physical food realities (both food and the materialities around it) to effectively translate into enticing visual avatars - in other words the ‘*intstagrammability*’ of realities primarily meant for actual nutritional consumption - is becoming increasingly important. Secondly, the prevalence of such content – that is virtual food - in our physical environments has very significant effects on its presence and its consumption in real terms (Kroese et al., 2016; Spence et al., 2016). Persistent exposure to advertising and visual clues signaling food all lead to increased appetite - and thereby increased food sales too. To conclude, in the technologically advanced context of affluent Western cities, considering food only in the real physical layouts and arrangements of our urban environments (such as where the snack foods are positioned in the store, how close to schools fast-food-outlets are allowed to operate, or where formal advertisements are placed) by itself is becoming an increasingly insufficient approach, without also considering our growing physical exposure to ‘virtual foods’. Finally, a third key spatial consequence of these food avatars is that they allow virtual platforms to take on and perform many food-related functions previously accommodated in the traditional physical spaces of retail, advertisement, culture, entertainment and sociability.

The emergence of online food purchasing is one of the most obvious and significant such developments. Essentially, this has enabled transactions and purchasing choices – which were previously bound to centralized physical locations, such as marketplaces and retail outlets - to be made remotely via virtual platforms. Such a development enables, and actively calls for new spatial logics to take care of the corresponding logistical tasks (of storage and delivery). This has also implied a new separation between display and storage functions - in the form of virtual interfaces coupled with remote storage facilities. This new logic applied to grocery shopping has created online farmers markets and food hubs (e.g., *aarstiderne.com*, *birkemosegaard.dk*), as well as ‘online grocery stores’ (e.g., *Amazon Fresh*, *Ocado*). With

² Mukbang literally means ‘eating broadcast’, an online video livestream where a host eats food while interacting with viewers.

regards to ready dishes and restaurant meals, it has resulted in a number of online meal delivery services, such as *Deliveroo*, *Wolt* or *Uber Eats*. Many of these enterprises struggle to present viable business models, and merely hold the promise of profitability, once a critical mass - or market dominance - has been achieved (Eley, 2019), or ultimately market the very technologies they developed as their product to other businesses (Lang, 2020, p. 359). Moreover, the separation between display (where the purchasing decisions are made) and where the items are actually stored, prepared or get moved to their destinations, has consequently created a series of new hidden and precarious work opportunities and conditions. Examples of this include gig economy workers, as well as dark kitchen and warehouse staffs (Cheng, 2018), much of which is hoped by these businesses to be eliminated over time by more automated solutions. Another key feature of online food purchasing is that the financial transaction itself has become invisible, immaterial and entirely separated from the physical spaces at the location of both the purchasing decision and the material transaction. It no longer requires cashiers, check-out lines or any equipment to be monitored. While this, of course, has also created a need for data management facilities as well as financial technology solutions with their own materialities, however these are far removed from the spaces observed in this study. Ultimately, the consequences are and will be significant, as is already well illustrated by the full-size *Amazon Go* store in Seattle. The technological company's grocery store opened to the public in 2020 following a few smaller prototype stores. Here, a series of sensors and technologies installed in the retail space enable online shopping to take place simultaneously with (in fact following) choices made in front of stacked shelves in the physical store. In this setup the whole physical construct works precisely because it gets virtually modelled in real-time. That is, the store is primarily operated online with the avatars of both customers and of products.

Another way where we can observe automated technological solutions replacing functions previously accommodated in physical space is in typically casual/fast food chain outlets. Here, the waiting staff, who would traditionally take customers' orders and payments is now often cut out reducing further human interactions. While the food preparation processes and general oversight of such automated restaurants are still conducted by human staff members, their role is significantly smaller. The model itself follows a historic icon of a food outlet, the coin-operated US *Automat* restaurants by *Horn & Hardart* (Bromell, 2000), as well as its modern renditions still in operation to this day, such as the Dutch *FEBO* chain. These schemes, beyond the perceived convenience of reduced formal human interaction, have always offered an element of technological spectacle, similarly to the conveyor belts of running-sushi restaurants. Furthermore, as the technology applied here is still relatively expensive, it is mostly chains operating on a larger scale (e.g., *McDonald's*) that choose to implement them. In fact, a similar recent spectacle in San Francisco, the *Eatsa* restaurant, was revealed to be a mere showcase for the technology company behind it, ultimately exporting its technological product to other food businesses, such as *Starbucks's* coffee shops (Pershan, 2019). Furthermore, automated restaurant models are remarkable also in terms of the new barriers to entry that they create. While many young customers may find the lack of formal human interactions more attractive than the ordering and paying practices in traditional food outlets, it might also be the case, that this same solution proves to become a new barrier to elderly and technologically insecure customers.

2. Retail Space

Brick-and-mortar grocery stores have been significantly affected and rearranged in multiple ways with the emergence of the technologies described above. Food retail remains dominated by chain supermarkets concentrated into large retailing companies, which take full advantage of ICTs (Oosterveer, 2012). These often globally operating businesses may even consider themselves to be primarily logistics and distribution companies before identifying as food

retailers (LeCavalier, 2016). Consequently, the logistics systems themselves - managed by large singular entities working with huge datasets related to the precisely scheduled movement of goods – have become key actors in shaping the physical layouts and spatial qualities of retail spaces. Just-in-time deliveries allow for storage space to be almost entirely eliminated from the supermarkets, resulting in their extension of the display surface. This has been a particularly welcome development in dense urban areas where soaring land values often challenge businesses to turn any profit from their costly retail spaces. Of course, this in itself has been yet another development favouring chains over small individual grocery retailers. In summary, today's supermarkets are some of the most precisely designed and engineered environments. The level of meticulous attention paid to lighting, temperature, layout and circulation, as well as the relative positioning of shelves and products within the layout, to each other, as well as to customers' height and movements has been a source of fascination to even architects themselves (e.g. Penn, 2005; Bridger, 2012).

However, in this context, the present study also observed a functional diversification of supermarkets, which appears to be a direct spatial response to the emergence of online grocery shopping, as well as to changing patterns of home cooking. While many stores have opened their own online delivery services, they also implement a number of changes in their physical retail spaces. One way that (particularly upmarket) brick-and-mortar grocery stores can keep up with the competition of online retailers is by enhancing the physical experience of visiting their stores. As a result, these turn into spaces reminiscent of food theme parks. *Eataly Flatiron* in New York City, as well as *Whole Foods Market's* Kensington and *Waitrose's* King's Cross locations in London are some of the most extreme examples. In these spaces we encounter the addition of cookery schools, spectacle and a range of atmospheric tools deployed for the customers' entertainment. Furthermore, as the amount of time that households spend cooking, as well as its depth of elaboration keeps decreasing, grocery stores have also tried to tap into related other markets, such as ready-made meals. Their new offerings now include large amounts of packaged ready-meals, as well as a series of fresh meal offerings (e.g. salad bars and soup bars). Often, these come accompanied with seating areas for consuming these ready/fresh meals within the store. The ultimate expression of this development is where we see full combinations of offering both ready meals and a spectacular in-store experience, in the form of tapas bars, wine bars and entire cafés emerging inside the grocery stores.

Beyond supermarkets, in recent years, another remarkable development in grocery stores has been the re-emergence of traditional bulk shopping (that is packaging-free grocery shopping). In other words, produce and groceries on offer without any packaging or pre-portioning as we have been accustomed to around the usual consumer packaged goods. Historically, the innovation of transparent cellophane food packaging has played a crucial role in making self-service grocery shopping possible in the first place (Hisano, 2017). In fact, the various ways in which food gets packaged generally determine much of the larger systems of food retail and logistics around it. The function of packaging is not merely to contain food, but also to portion, protect, move, and preserve it, as well as typically to display practical and marketing information. In other words, packaging (or the lack of it) plays a crucial part in setting up the spatial logics around our food practices, from shopping thorough transportation and storage to consumption. To take canning as an example, it is as much a preservation method as it is a form of packaging. Therefore, the elimination of packaging in the grocery store has a series of consequences. First, it enables customers to purchase the exact amounts they want to buy, with precisely as little or as much of a product as they please. This consequently reduces food waste, and is primarily meant to cut out single-use and disposable packaging. It has to be noted however, that since plastic packaging often significantly extends the shelf-life of many food items, this is considered a somewhat contested issue (Heller, 2017). While its potential benefits are clear, this practice also introduces a series of new inconveniences into customers'

lives: having to weigh every item they intend to purchase, as well as also having to regularly transport their own reusable containers (such as glass jars and fabric bags). As a result, this activity also calls for some additional planning to take place in advance. Examples of this packaging-free shopping can be found both in whole independent stores, such as the German *Original Unverpackt* and the French *Day by Day* chain stores, as well as in the form of isles and compartments within large supermarkets, such as *Whole Foods Market* and health food store chain *Planet Organic* in the United Kingdom.

3. Domestic Realm

At the domestic end of the developments that we have been describing are the homes in which we live. In the context of affluent Western cities in the 21st century, most kitchens can be recognized as connected kitchens (to be distinguished from what is usually marketed as ‘smart kitchens’). In other words, most standard kitchens today are infrastructurally and physically well connected to the surrounding city - and all it has to offer in terms of other food spaces and services. In fact, today’s kitchens could be described as the spaces formed at the very intersection of four complex domains: our housing, our food supply chains, the mains services and our waste disposal systems. Moreover, if the user of such a domestic kitchen also happens to own a smartphone or a computer, as may be assumed for a great majority of urban dwellers, then via these technologies the space also becomes virtually connected to direct food retail opportunities, global knowledge bases and other online sources. In the suggested view of this present study, it is however worth distinguishing between two contrasting extremes found in these domestic urban kitchens. On one end of the spectrum, we find the ‘*diminished kitchen*’; on the other the ‘*hyper kitchen*’ or ‘*dream kitchen*’ model. In the first case, the diminished kitchen, both the size of the space and its functionality are reduced to the practical or legal minimum, since there is ‘no need’ to cater for sophisticated use, as that may be outsourced and solved elsewhere in the city. This kitchen is merely meant for some moderate storage, unwrapping and waste disposal tasks to take place within it. In the second case however - the hyper or dream kitchen - the possibilities of use are not only very comfortable but nearly limitless, if only a luxurious option for its prosperous users. This cooking environment offers both a pleasant work experience and an effective way to display sophistication and wealth. At the same time, the level of easy access to food products and services in the city, as well as the control of data on all aspects concerned in the kitchen, are all neatly catered for. However, in either extreme forms of connected kitchens, the traditionally assumed ‘cooking’ purpose of the space is but one possibility at best; increasingly fading into others, such as recipe browsing, online grocery shopping, combining ready-to-eat foods from the fridge, plating items, or merely disposing of the packaging from online meal orders.

Simultaneously, with regards to the earlier described method of packaging-free grocery shopping, corresponding developments can be observed within the domestic realm as well. Here, we can currently observe a number of traditional practices to re-emerge and get incorporated into the daily lives of typically affluent, eco-conscious urban households. These niche practices include ‘zero-waste’ lifestyles (aspiring to eliminate CPG plastic and disposable packaging, as well as food waste from the household), home-composting of food and other organic discards, as well as the direct growing of herbs, greens and mushrooms. Often, these practices are accompanied by a newfound enthusiasm for a range of traditional fermentation processes, such as yogurt, sourdough bread or kombucha making. The precise motivations driving these actions are far from being limited to environmental concerns within these households. They similarly often appear to stem from cultural aspirations, trends, as well as various health concerns. However, one shared objective and desire across all cases seems to be the sense of (relative personal) control and autonomy that the households perceive to exert by engaging in these practices. The deeper question of precisely which domain of life this control

is perceived to be asserted over is beyond the field and scope of this study. However, some obvious assumptions are related simply to the processes, substances and ethics involved in the complex operations of food supply chains serving urban dwellers, and lack of transparency experienced. At the time of this study, the above described niche practices are still quite far from becoming mainstream behaviours in most affluent Western cities. Nevertheless, in recent years there has been a remarkable surge in households attempting to sort their food waste along with recyclables – thus finally separated out from residual waste - as an increasing number of cities introduce municipal compost collection schemes.

4. Compound food spaces

Beyond domestic environments, however, some of the most remarkable spatial developments can be observed in new urban office food spaces. Specifically, in the new shared food spaces of sought-after workplaces, such as big technology companies or the slick co-working spaces accommodating startups, these food spaces began to combine a series of functions. First, they serve as traditional workplace kitchenettes for getting coffee and storing the office workers' home-cooked lunch boxes in a fridge. However, these spaces go above and beyond, often combining these standard uses with more café, kiosk, and restaurant-like features. They might incorporate all of the above into their version of a canteen, or offer a hotel-like buffet of snacks, fruits and drinks throughout the day, as part of the staple services and comfort that such a 'work environment' is supposed to provide. In some cases, these workplaces offer full-day access to a 'shared kitchen' that is far more spacious and better equipped than the ones most of their employees might have at home. This way, cooking itself becomes a more attractive and convenient proposition at the workplace, where so much of the employees' time is spent by default. One specifically interesting observation in this study was an office food space, where employees routinely cooked their scrambled eggs for breakfast, as a seemingly fun and social way to start their mornings. Of course, by offering several different options for employees to choose from (store your own lunch-box in the fridge, rely on the canteen service, the all-day buffet or just cook yourself if you prefer), very few of them opt for leaving the premises of the office for a meal. At the same time, the challenges here are similar to those of shared kitchens in co-living enterprises. That is, these self-service accessible spaces require a substantial amount of staff presence and attention to maintain their high cleanliness and sheen. This difficulty often makes such operations either unmanageable or prohibitively costly – as also witnessed by the recent fall of the honesty-based snack-kiosk system at the co-working office company *WeWork* (Tan & Sidders, 2019).

Closely related to the spatial divisions and diversity of functions created in supermarkets and new office food spaces described above, we can also observe a tendency of spatial compartmentalization and sharing. This can be understood as a consequence of multiple smaller food spaces and operations coming together under one roof – typically of a larger spatial and organizational unit or institutional entity. This has long been typical in the food courts of malls and markets, whereby certain functions and areas – such as seating or waste management - become shared between different customers/users/businesses, while others, such as the food stalls or kitchens themselves, get more exclusively used. This is a form of compartmentalization and sharing at the same time, and is typically a feature of new lobby areas in hotels, office buildings, campus canteens and cafeterias these days. That is, larger entities – such as a university building (e.g., KADK Holmen campus canteen in Copenhagen or Aalto University's former Arabia Campus in Helsinki) – facilitating both public seating all-day, but also smaller enterprises within to operate their small businesses, such as running a coffee booth or kiosk. In these arrangements, various user groups get to assert full control over a smaller compartment and partial control/access over an extended area at other times. This creates both new efficiencies and an intensity of use, which are often important factors in enabling the viability

of the highly valuable swaths of urban real-estate typically in question – by way of ‘sweating the asset’.

Discussion

As the paper has shown, food spaces in affluent Western cities display a wide range of discreet yet significant mutations and these heterogenous developments appear to have little in common at first glance. Many seem to occur independently from each other and are driven by often entirely different actors and forces: economic pressure, demographic changes, technological and business opportunities, or environmental concerns. Some of these developments are rather niche, others already mainstream, and many of them undoubtedly controversial. Yet, this paper demonstrates why they are worth considering conjointly. When observed in connection with each other, two dominant overarching patterns can be recognized: namely, contemporary urban food spaces diversify their functional offerings physically, while also merging their operations with virtual platforms. This is why the paper calls this dual phenomenon, the ‘*hybridization of food spaces*’. Instances observed of the functional diversification in this study included the salad bars, seating areas and cookery schools that have appeared among supermarket aisles, or the multi-purpose office food spaces. In domestic environments, it is the re-incorporation of practices like composting and food-growing into the kitchens of the environmentally conscious, along with the zero-waste and packaging-free grocery stores emerging to serve them. Examples of the merging with virtual platforms found in this study are the meal-delivery services assisted by *dark kitchens*, online grocery stores supported by automated warehouses, the connected home kitchens supplied by these technologies, including even neighbourhood food sharing apps, and the automated fast-food outlets.

Let us now consider the particular relevance of this phenomenon with regards to sustainable food systems, or rather the urban and spatial facilitation of sustainable diets. What is worth noting, is that along the process of the hybridization of food spaces, some of the underlying spatial logics, that also direct and organize corresponding food practices, fundamentally change in two distinct ways. First, the divisions between different stages in the food supply chain get radically blurred, as do traditionally conceived spatial domains. For example, retail and domestic food spaces are impossible to separate from each other, when supermarkets act as urban dwellers’ pantries, when grocery shopping itself can be conducted from the home, or when the use of a kitchen is reduced to a place to unwrap ready dishes from online meal delivery services. In fact, the findings of the present study negate the very domains that it relied upon to group the theoretical sample it observed. In particular, cyberspace, retail space and the domestic realm as separate food domains from one another are, in truth, a nostalgic misrepresentation of our 21st-century reality. Arguably, those categories have mostly collapsed and have given way to urban food spaces which are all mostly compound and intertwined territories. Secondly, hybridization changes the spatial logics of our urban food systems, by enabling new ways to sequence functions and practices along the urban food supply chain. For example, the way functions of display, storage and financial transactions are not necessarily bound together in space anymore, holds much more potential than merely enabling Amazon to supply our groceries. It also presents opportunities to create new configurations, possibly in service of shortening food supply chains. This, of course, is not independent of the previously discussed blurring of divisions and the collapsing separations between disparate stages along the food supply chain.

The more consecutive stages (and practices) get to be accommodated and catered for under ‘one roof’ (production, processing, preservation, storage, retail, preparation, consumption, cleaning and composting), the less the transport and logistics challenges are, and ultimately the shorter the food supply chain will be. Such more congested configurations would also have the advantages of reducing food waste and the need for disposable packaging (since

the challenges of transport get reduced). Furthermore, the new proximities could allow for opportunities to increase transparencies - both literally and figuratively (Pollan, 2002) - within such systems, and thereby offer channels for information/knowledge sharing and education. Mere access to such facilities could allow for more participation and the more active involvement of urban dwellers into their own food systems, simply by spatially extending linkages from the two key food practices they are currently in most direct connection with: consumption and disposal.

In achieving sustainable diets, urban consumer choices, our food practices and food citizenship all play a part. Nestle and Trueman (2020) emphasize food advocacy, Lang (2020) speaks of rebuilding “*connection and engagement between people and their food*”, Pollan (2013) and Mills et al. (2017a, 2017b) allude to the potential benefits of rediscovering home cooking, to list just a few important voices. But the overarching theme, perhaps consensus, is that more active participation in the food system, in all its possible forms, is what we need to realize - and as architects, to spatially accommodate. Solving and designing this spatial accommodation piece also seems key to addressing the type of relevant criticism (e.g. Szabo, 2011; Bowen et al., 2019) which points out the various social (gender, racial and socioeconomic) inequalities that both create unequal access to and reinforce barriers by ‘re-engaging with food’. The hybridization of food spaces in itself, as an organically occurring urban phenomenon will likely not solve this problem, when left to the devices of businesses and property developers. However, the new spatial logics this phenomenon helps uncover may help spatial design practitioners to engage in directing urban spatial developments toward the creation of new publicly accessible hybrid food spaces, that could allow for universal access to the above mentioned ‘re-engagement’.

As previously noted, practice theory understands space as a representation of practice but also a resource in itself. Furthermore, it appears, that the hybridization of food spaces accurately reflects what social theory describes as ‘practice complexes’. In contrast with bundles, where there is little or only loose connection between the simultaneous practices involved (much like between different programs in mixed-use buildings), ‘complexes represent stickier and more integrated combinations, some so dense that they constitute new entities in their own right.’ (Shove et al., 2012, p.81) Thus, the connections between the constituent elements themselves are meaningful, just as they are when consecutive stages and spaces (or practices) along the urban food supply chain are brought together. In fact, this is a key property to note, especially to distinguish the hybridization of food spaces from a concurrent phenomenon: what could be called the sprawling ubiquity of food in the city. The exploding physical presence and availability of food in our non-food spaces is best witnessed through the various high-calorie snack foods on offer in our cinemas, bookshops and libraries. In an astonishing contrast to a few decades ago, these spaces now increasingly incorporate large areas dedicated to the sale of food within their premises. Moreover, in the checkout lines of even hardware stores, fashion stores, and pharmacies, snack food items are now a new norm (Nestle, 2006). These typically offer packaged sweets and snacks, foods that require very little care/attendance and infrastructure locally. More crucially however, they help to maximize revenue on the real-estate, and in many cases are the very means by which their primary business operations become viable. For better or worse therefore, a range of actors, whose primary function is unrelated to food, may become relevant stakeholders in the nutrition of our urban populations. An interesting - if somewhat extreme - example of this is the furniture store giant *IKEA*, which today also ranks as the sixth largest restaurant chain globally (Wilson, 2019).

Nonetheless, what sets the hybridization of food spaces apart from the phenomenon of this sprawling ubiquity of food, is that in the latter case the physical presence of food is added on top of a primary function that is altogether different and independent of it – much like a practice bundle. In contrast, the hybridization of a food space implies an enrichment and

diversification of what has been a designated food function to begin with. This distinction is significant, for it typically implies the presence (or absence) of core spatial and infrastructural assets, which facilitate food beyond its sale in the narrowest sense. Such features include the provision of appropriate space for consumption, organizing the circulation of non-disposable food containers directly, and the sufficient internal management of waste streams. However, when food appears as a new – supplementary - layer on top of something else, such as a movie theatre, such costly and complex operations - beyond mere sale - are likely disregarded. In fact, it is highly unusual in cinemas to receive reusable containers for the snacks and beverages on offer. Instead, we are typically provided with single-use disposable items that simply link into the standard linear waste streams of the city. In conclusion, the unfettered overlaying of food across all our urban spaces - that is the ubiquity of food - creates a whole set of new challenges for the city, particularly with regards to dietary health and environmental concerns.

The hybridization of food spaces, on the other hand can be considered a promising urban development in terms of its potential to help facilitate a shift towards more sustainable diets. As the examples of this study have demonstrated, some of the most fundamental spatial logics around our urban food practices have radically changed over the past decade. While the mental models in our collective imagination may lag behind, these radical changes actually imply a range of new opportunities, which could be strategically exploited in the conscious reconstruction of our urban food supply chains.

Conclusions

The paper has provided a succinct analysis of a number of discrete spatial developments, but has shown how they can be understood in conjunction with each other. The term ‘hybridization of food spaces’ was introduced to describe the overarching phenomenon which links the two key patterns that emerged in this study: functional diversification and physical-digital merging of food spaces. The study then considered the significance of these shifts, finding that in this process of hybridization, the spatial logics of the urban food supply chain may radically change. More specifically, they lead to a ‘blurring’ between traditionally conceived spatial/functional domains, as well as may shorten (parts of) their respective food supply chains. Finally, the strategic and design potential of the findings was considered - how it can contribute to facilitating positive changes in our urban food practices.

The developments described in this paper are not meant to provide a complete and exhaustive register of all changes occurring in our urban food spaces, or present every observable expression of food space hybridization. The theoretical sample considered here has been used merely to pinpoint this phenomenon, as well as to contribute to a better understanding of the changing spatial logics around 21st-century urban food practices. Further research could investigate if and to what extent these findings apply in contexts different from the ones specified here, such as in non-Western, as well as less affluent urban and rural contexts. However, as the analysis of this sample demonstrates, two patterns are simultaneously unfolding in the food spaces of affluent Western cities. First, they physically diversify the functions they provide. Second, they increasingly merge their operations with virtual platforms. This present study has termed this combined phenomenon as the hybridization of food spaces. A third contrasting phenomenon observed was the sprawling ubiquity of food in urban non-food spaces (e.g., food in cinemas, bookshops, libraries). The Discussion section touched upon the problems presented by a non-selective overlaying of food on our urban spaces and suggested, that the absence of food from some urban spaces might be just as important as its presence in others. In contrast, through the hybridization of existing food spaces, the city can densify, centralize and compress different food functions. By doing so, it can also maximally utilize its existing infrastructures. Most importantly, it could help in creating an urban environment, where the presence and absence of food is more pronounced and decidedly

polarized. As the cases of the study have illustrated, the hybridization of food spaces has two effects on urban spatial logics. First, and primarily as an effect of their merging with virtual platforms, it blurs the boundaries between traditionally assumed domains and food space functions. On one hand, there are new possibilities in the logics of separation and merging between food display, storage and purchase functions. On the other hand, the traditional separations between domestic and commercial food environments, between private and social food domains are quickly fading away. Secondly, the food supply chain itself can be shortened by bringing multiple food functions together, primarily by way of diversifying food spaces. In conclusion, these two shifts - the blurring of traditional domains and the shortening of food supply chains – hold great potential for reshaping our urban food systems. In other words, the hybridization of food spaces could be recognized not only as a set of organically occurring urban phenomena to observe, but also as one to be deployed as a strategic tool in re-imagining and re-configuring how the city might facilitate food provisioning practices in an accessible, equitable and sustainable manner.

Postscript: Reflections on Covid-19

While this study preceded the pandemic, many of the trends addressed here have come into sharper relief as a consequence of it - all the way from digitization to domestic sourdough bread baking. Clearly, the implications of Covid for the food system are multiple and likely to be the subject of further in-depth research. Yet It Is worth underlining how some of the themes raised in this paper have been accentuated: the explosive and wide adoption of online/virtual solutions to all aspects of food provisioning; the deep inequalities along economic, racial and gender lines embedded in most of our urban food systems operations; and the (perhaps false) dilemma between robotized/automated versus human-handled procedures – implying either higher risk of exposure for less privileged workers, or that of their unemployment; as well as the true difficulties of moving on from single-use food packaging and disposable items. On the other hand, however, the pandemic has brought about new more bottom-up and scalable forms of food space hybridization, which point exactly toward the phenomenon's sustainability potential alluded to in this paper. Such constructs from citizen groups, charities and restaurants began to take on novel roles in feeding their communities and neighborhoods, attempting to ensure the livelihoods of their local suppliers by utilizing their produce as mini neighborhood processing plants. Undoubtedly, this will form the basis of a very rich field for future research.

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