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Up to the Roots: Tourism Sustainability, Health, Food and Culture

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Between consumer practices and values: the factors of change in food consumer habits during the lockdown in Italy

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Abstract: The outbreak of COVID-19 pandemic generated a global emergency that represented a health crisis of unprecedented proportions. Drastic measures to contain the contagion, such as the lockdown, demanded the review of the habits of daily life of both individuals and communities. The whole range of daily food-related practices especially underwent significant changes by both exacerbating, and normalising a polarization of extremes in people's ways of living, acting, thinking, and feeling.

Aware that consumer practices, especially eating, are 'the locus of the social', the research findings in this paper investigated changes that occurred in food habits during the two months of the first lockdown in Italy. The data emerging from a both explorative and confirmative factorial analysis show that five main latent dimensions determined the most significant changes in eating practices during the lockdown. Among them, a significant role is played by family structure as well as by more value-based, motivational factors conjured up into "mindful" patterns of aware and sustainable consumption. For sociological research in consumption this means to reconsider the weight of values guiding consumer choices when investigating the sphere of food-related practices.

Keywords: COVID-19 pandemic; lockdown; food habits; eating practices; values; sustainable consumption.

1. Introduction

The outbreak of COVID pandemic generated a global emergency that represented a health crisis of unprecedented proportions. The massive and drastic measures, such as the lockdown, that governments across the world have taken to contain the contagion demanded a review of the habits of daily life of both individuals, and communities (Eftimov *et al.* 2020). The whole range of daily food-related practices – from shopping, to cooking, to gathering information on purchases, all the way to the form and timing of meals – especially underwent significant changes (Di Renzo *et al.* 2020; Fontefrancesco 2020). New fears, especially those related to the transmissibility of viruses through food (Duda-Chodak *et al.* 2020), invested consumer practices,

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as well as the communicative polarization fostered by politics (Green et al. 2020) impacted on people's ways of living, acting, thinking, and feeling.

Starting from the awareness that consumer practices, especially eating, are 'the locus of the social' (Schatzki 2001), the research presented in this paper investigated in real time the changes that occurred in food habits during the two months of lockdown in Italy. The first research findings from a both explorative and confirmative factorial analysis show that five main latent dimensions determined the most significant changes in eating practices during the considered timespan (April-May 2020). The principal factor of change relates to what we have called "mindful" consumption, based on a sustainable and responsible approach to food. The second and the third main factors are respectively: 1) the size and composition of the household, and 2) food-related consumer practices based on social media, as a result of the "technological hypermediation of food consumption" (Onorati 2020) brought about by the pandemic.

In sociological terms this means that the way to more mindful and sustainable eating styles encouraged by the pandemic needs intervention on both the structural level (characteristics of the family structure), and on the cultural one (value-based individual motivation and strategies of communicative consumption). For sociological research in consumption this means to investigate both the sphere of practices (Warde 2016; Bourdieu 1984), and those of values and meaningfulness guiding consumer choices and shaping their food-related lifestyles (Grunert *et al.* 2014). Put in another way, to reintroduce a focus on agency and meaningfulness in the structuring of emerging food consumer practices.

2. The research design and the survey on food habits during the lockdown

Scarcity of basic goods and limited access to food were two of the most striking effects since the pandemic's outbreak. We remember the images of empty shelves ~~that went~~ around the world, showing us the extreme vulnerability of our supply-chains (Bakalis et al. 2020) and, as a result, limited access to safe, nutritious, abundant, and diverse food.

The survey was designed by a research team from the Pollenzo University of Gastronomic Sciences¹ and administered online to a conveniently self-formed sample, by availing of mailing lists, snowballing techniques, and the use of social media.

The questionnaire was circulated in the period April-May 2020, in the middle of lockdown, when a third of the global population and most economic activities were at a standstill. It reached 3155 valid respondents from the whole country, with a certain over-representation of women, but with a fairly balanced representation of the different generations active in the market.

¹ The present research has been carried out by a multidisciplinary research group from the Pollenzo University of Gastronomic Sciences. In addition to the Authors of this article, the research group also involved Prof. Paolo Corvo and Prof. Luisa Torrih, and Dr. Michele Filippo Fontefrancesco, Dr. Maria Piochi, Dr. Donatella Saccone.

The survey consists of 54 questions, sorted into 3 sections:

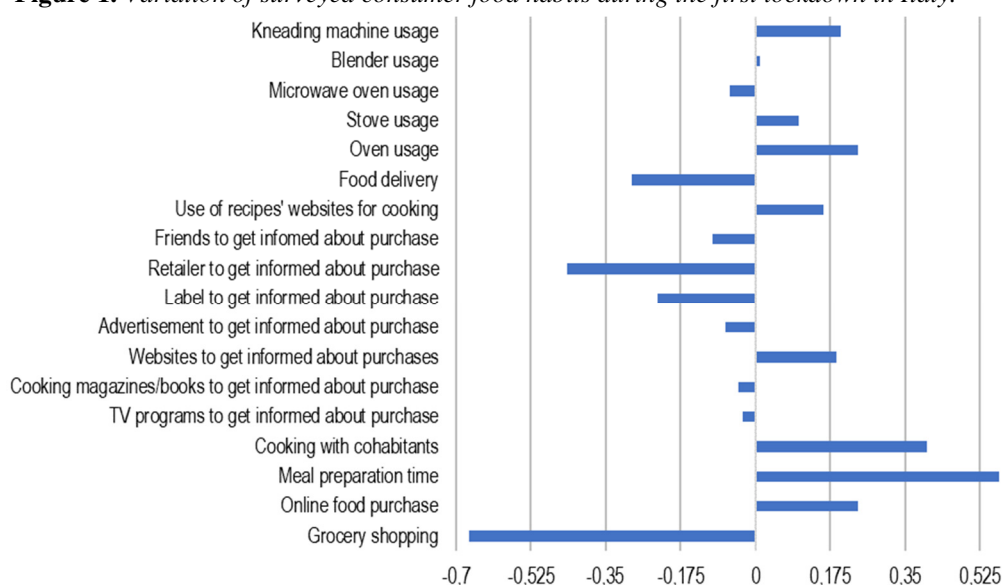
- a section on the socio-demographic status of respondents, to which a status was added with respect to COVID-19 (infected, sick, cured, never infected);
- a section on eating habits;
- a section on home food consumption practices before and during lockdown.

This allowed us to measure even minor changes that occurred in everyday family practices, especially those likely to become more stable and socially regulated patterns of consumption.

This research scrutinized the whole range of food-related daily practices, from shopping, to cooking, to gathering information for food purchase, to the ways and timing of preparing meals in an effort to detect the harbinger of new social dynamics in these “adjacent” practices of the “compound” practice of eating (Warde, 2016: 50).

In line with the main national research on food consumption during the pandemic (Food 2020), our data (**Fig. 1**) shows that the lockdown led to a significant reduction in going to the grocery store (-0.67) in favor of a real boom in e-commerce, especially e-grocery (online spending +0.24). Indeed, while online food buying had been practiced by Italians, up to that moment it only made up of 2.3% of the total purchases of Italian families (Nielsen 2019).

Figure 1. *Variation of surveyed consumer food habits during the first lockdown in Italy.*



Data shows that the lockdown caused a significant reduction of in-store visits for grocery shopping. This research confirms the national trend according to which, at the end of lockdown, the online food purchases in Italy more than doubled (Nomisma 2020) and the increase of e-grocery was one of the driving factors of the change in ways of purchasing.

Restaurant closures and smart-working also caused a shift in favour of cooking and eating at home, as shown in our data by the increase in time devoted to preparing meals (+0.57), especially with cohabitants (+0.4). International research shows how cooking at home has proven to be the prevalent mode in the main European countries, but especially in Italy (Nielsen 2020).

This increase of at-home-cooked meals, along with smart-working, is one of the factors of the food delivery decline (-0.29) during those first two months of isolation; nevertheless, just the ready-to-eat meal delivery formula proves to be one of the determinants of those emerging patterns of smart and mindful consumption (**Fig. 2**), which are expected to remain and become prevalent in the 'new normal' era.

Our research records a significant reduction in the number of people who speak to the shopkeeper (-0.44) to ask for advice on food purchases, as an obvious consequence of social distancing. Likewise, there is a reduction in the use of the label (-0.23) as a source of information on the product; the latter is a practice that has a significant impact on the perception of quality (Grunert et al. 1998) and that is particularly widespread among Italians (Aprile - Gallina 2008), but exclusive to purchases in stores. On the other hand, there is an increase in the use of websites both for information on food purchases (+0.19), and for inspiration from shared recipes when cooking (+0.16).

On the whole, the introduction of technologies in the daily practices of food consumption seems to be the crucial finding of this research. In fact, whether it is a question of recipe sites, online shopping, or food delivery, these forms of hypermediated consumption are variables strongly and directly correlated with a latent factor that, as clearly highlighted by the statistical analysis that follows, shows a new way of consuming based on the use of new technologies.

3. Statistical Analysis

The results provided in the previous paragraph represent only a small part of those obtained in the preliminary analysis. The survey envisaged too many variables, even after recoding many of them as behavioral variations between before- and after- the lockdown (see Fig. 1 again).

In order to identify only the essential dimensions of the food consumption by the surveyed subjects, first a Principal Component Analysis was carried out, with removal of the less relevant variables. However, since most of the observed variables are ordinal, and some socio-demographic ones are nominal, it was necessary to quantify these variables using an ALSOS method such as the CATegorical Principal Component Analysis (CatPCA)².

² This statistical technique (De Leeuw et al. 1976; Young et al. 1978) allows to apply the rules of Principal Component Analysis also to nominal variables, respecting the measurement constraints of ordinal variables too, better than PCA can do (De Leeuw and Meulman 1986; Meulman and Heiser 2011). CatPCA directly produces both correct Principal Component Analysis coefficients and optimal

CatPCA allowed us to build a theoretical model that can explain the surveyed behaviors with the smallest possible number of factors and variables, selecting the principal variables correlated with each other with very strict criteria: extraction of components with eigenvalue minimum 1.05 and progressive removal, with *backward stepwise* method³, of all the variables observed with communality <51.

At the end of the procedure, 14 variables survived out of the initial 50, and they are expressed in 6 main components that explain most of their variability (over 61%). Each component explains more than 8% of the overall variability, described as follows:

Principal Components	1	2	3	4	5	6
Eigenvalues	1.93	1.70	1.37	1.26	1.19	1.13
% of variance	13.8	12.2	9.8	9.0	8.5	8.1
Cumulated % of variance	13.8	26.0	35.8	44.8	53.3	61.4

These components were rotated with a Promax method⁴ that re-defined the six dimensions described in terms of the weights of the observed variables, as presented in Tab. 1.

The first factor is clearly connected to consumption behaviors, the second one to the family structure, the third one to the use of food websites (and, in part, to the gender of the respondent), the fourth one to certain individual socio-demographic characteristics, the fifth one to information about purchases based on traditional channels (retailers, labels), the sixth one to food delivery.

Starting from this result, by using a covariance-based SEM (Jöreskog 1973; Jöreskog and Sörbom 1984) with parameter estimation ADF-*Asymptotically Distribution Free* (Browne 1984), we carried out a Confirmative Factorial Analysis, that suggested to remove the factor “Food purchasing” in favour of others.

quantifications of the observed variables, which can be easily used in subsequent steps, such as explorative factorial analysis or causal analysis.

³ The *backward stepwise* selection method is well known and used in statistics, for example in multiple regression analysis; it consists, first of all, in the removal of the least significant or least relevant variable (depending on the type of analysis, and in any case defining a threshold criterion) of a set of different variables. The analysis of significance or relevance is repeated after said removal, and if a second variable is below the threshold, it is removed in turn. At this point, however, to evaluate any confounding interactions between the removed variables, the first removed variable is reconsidered in the analysis, evaluating whether it is still to be removed or not. In the first case, the algorithm performs a new significance/relevance analysis, possible removing a third variable (and then a fourth, with the same precautions described above, and so on). In the second case, it immediately evaluates whether a third variable is to be removed, and then the analysis is repeated after the re-insertion of the second variable, with subsequent possible removal, and so on. This cycle ends, logically, when no further variable is found to violate the predetermined criteria (see, e.g., Burnham and Anderson, 2002).

⁴ The factorial rotation is a mathematical procedure which, without loss of information, manages to differentiate in an optimal measure the relationships between the extracted components and the observed variables, obtaining a characterization of the factors. The Promax technique, in particular, is a non-orthogonal rotation method, also able to identifying any relationships between the factors themselves.

Table 1. Factorial weights of observed variables in the matrix of Promax rotation models, and relative communality

Variables	Rotated Factors						Communalities
	1	2	3	4	5	6	
Number of minors (<16 y.o.) in the household	0.001	0.890	-0.053	0.103	-0.006	0.036	77.70%
Number of people in the household	0.023	0.858	0.032	-0.095	0.013	-0.018	76.70%
Works. worked. or is a scholar in the agribusiness sector	0.065	0.056	0.84	-0.008	-0.058	-0.058	72.10%
Frequency of consumption of local products	0.812	0.053	-0.015	0.01	0.039	0.052	66.60%
Age group (generation) of respondents	0.101	-0.098	-0.264	0.585	0.144	0.262	62.10%
Change (before/during) in using recipes' websites for purchase information	-0.016	0.010	0.776	0.015	0.131	0.094	59.40%
Frequency of consumption of fresh foods	0.761	-0.004	0.000	0.034	0.000	0.026	58.60%
Change (before/during) in food delivery orders	0.042	0.015	0.022	0.099	0.054	0.744	57.90%
Change (before/during) of applying to the retailer for purchase information	-0.033	-0.010	0.013	0.078	0.748	-0.062	57.10%
Change (before/during) in using recipe websites for cooking	-0.053	-0.031	0.756	-0.057	0.087	0.096	56.90%
Frequency of consumption of organic foods	0.734	-0.022	-0.027	-0.159	-0.002	-0.055	55.60%
Change (before/during) in online food purchases	-0.023	0.007	0.167	-0.086	-0.244	0.718	55.40%
Gender of respondents	0.207	-0.034	0.389	0.401	-0.320	-0.210	52.10%
Change (before/during) in label usage for purchase information	0.089	0.013	0.221	-0.033	0.705	-0.083	51.30%

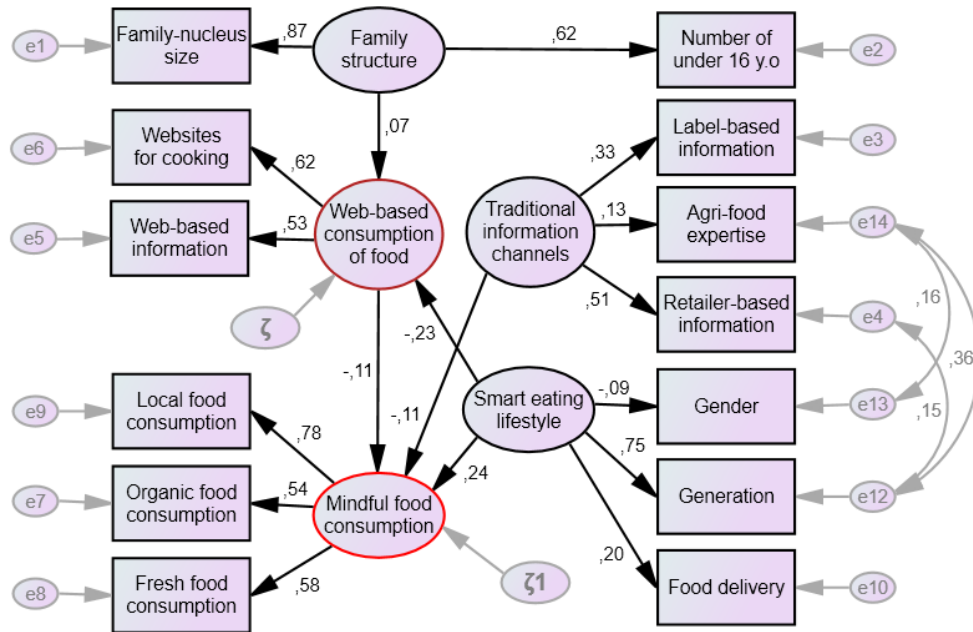
Finally, a “data driven” causal model (by using in-built modification indices) identified 5 latent variables, described by the path diagram in Fig. 2.

The exogenous Latent Variable “Family Structure” has a direct causal effect (minimal but still significant) on the endogenous factor “Web-based Food consumption”, which is in turn inversely caused by the exogenous “Smart eating style”. The latter LV, instead, affects directly the endogenous “Mindful consumption”, while the exogeneous “Traditional channels for consumer information” and the endogenous “Web-based food consumption” present an inverse effect on “Mindful consumption”, that is our output factor, an entirely endogenous and generated Latent Variable.

The measure model has some noise correlations, but they do not affect either the causal model’s statistical significance (almost all with a $p < 0.001$, no one with $p > 0.02$) or its goodness of fit. The most interesting fit indexes are, in fact: GFI (Goodness of Fit Index)=0.98; AGFI (Adjusted Goodness of Fit Index)=0.97; RMSEA (Root Mean Square error of Approximation)=0.046; RMR (Root Mean Square Residual)=0.05 compared with RMR=0.175 for the independence model; Standardized RMR=0.043; ECVI (Expected Cross-Validation Index)=0.16, compared with ECVI=0.72 for the independence model and ECVI=0.06 for the saturated model.

This model was validated by using a bootstrap procedure with 5000 resamples.

Figure 2. Causal model of food consumption in COVID-19 times, identified through Structural Equation Model and ADF estimation of parameters



4. The sociological storytelling of statistical data

What does the model tell us in sociological terms? /

As the size of the household composition increases (number of members and, among them, minors under 16 years old), the use of the web for food consumption increases, and the use of traditional channels (such as labels and retailers) decreases.

This aspect requires particular attention; in fact, one wonders how it is possible that both the use of the web, namely social media, and the use of traditional channels to obtain information about food negatively influence the attitude to mindful consumption, where 'mindful' means sustainable, healthy, and responsible. In the factorial model, "mindful food consumption" (factor F5) alludes to three qualities that were given priority in food purchasing during the lockdown: fresh, local, and organic, three main though not exclusive qualities that feature sustainable food.

The answer is that both the web, and traditional channels, when considered alone and separately, are no longer catalysts for 'mindful' food consumption. On the contrary, factor F4 shows the harbinger of a 'smart' eating style, which seems to be the future driver of sustainable eating, as proved by the direct positive link between factors F4 and F5.

A "smart" eating style means an approach to food consumption that is both convenient, and intelligent, but nonetheless accessible.

In fact, the components (variables) that contribute to the definition of this factor are: firstly, age (the factor becomes stronger as age increases and includes several

generations); to a lesser degree, appreciation of food delivery; in a minimal way, but still present, gender, in fact this factor seems to decrease when the value becomes the one attributed to female gender, thus identifying a type of consumption that is more relevant to men.

This makes sense if we think that the data tells us of the variations that occurred during the first lockdown and, in those circumstances, it is plausible that, among those few who continued to use food delivery, there were mainly adult men engaged in smart-working, or adults with children.

We guess that, if working remains at a distance, food delivery is one of those eating patterns that might relieve women of the burden of care work, including cooking, a load that instead seems to have dramatically increased during the lockdown, exacerbating the gender gaps within the family tasks (Alon et al. 2020; Del Boca et al. 2020). However, this factor “smart eating style” seems to have negatively affected obtaining information from the web for food purchases, while having positively influenced more “mindful” consumption.

F4 factor (“smart eating style”), given its close correlation with food delivery and with the generational characteristics of respondents, can rise to an element of crucial importance in our research, allowing us to glimpse in the triad convenient, intelligent and accessible, featuring the adjective “smart”, the future of food consumption and catering. This factor impacts positively and directly on mindful consumption (F5).

Already before the pandemic outbreak, ISTAT (Italian National Institute of Statistics) had estimated that in 2020 this form of meal consumption would have entered the basket of Italians' consumption (<https://www.istat.it/it/files/2020/02/paniere.pdf>).

The increase in food delivery before the pandemic mainly concerned the younger generations: indeed, out of the 35% of Italian consumers of home delivered meals, 43% were Centennials, 50% Millennials, and 30% Baby Boomers (TadeLab 2020).

The data on Baby Boomers are in line with what international research data consistently highlights: Baby Boomers are generally carriers of change in the marketplace, much like the Millennials they are parents to (Acosta 2018). Although we find an overall decline in food delivery during the first lockdown, some resilience of the service was found precisely among older generations (as also shown by the directly proportional relationship between “smart” consumption style and age in the factorial model), while it declined primarily among younger generations, as we would have more easily expected.

Generation X and Baby Boomers are those who have maintained, albeit occasionally, the habit of ordering ready-made meals at home. This finding is in line with recent analysis by GfK for Best Brands Italia, which presents us with an emerging consumer in the Covid era, who is mature, thoughtful, and inclined to embrace innovation, as well as to carefully ponder his or her choices, and to prioritize sustainable behavior that is attentive to the territory and society (GfK for Brand Italia 2020).

Despite the decline of food delivery found by our data during the abrupt and emergency situation created by the first lockdown, this new form of catering seems to be destined to survive the crisis and to permanently impact on eatery. Other national research data (TradeLab 2020) show, in fact, that only 1% of those who

used it before and during the pandemic say they will not use it again after the emergency. This data on smart consumption, significantly explained by delivery, can be read as one of the potential resilience factors of the food system in the post-pandemic era.

The reasons for food delivery's success derive from its use of innovative technology, which makes this practice a unique opportunity to renovate the catering sector and meet the contradictory (or simply complex) demands of the post-traumatic consumer, who demands safety but also convenience, comfort but also care, quality but also convenience, services but also sustainability. In short, a set of priorities which, once satisfied, will make food delivery a smart service in all respects, likely to become inclusive and sustainable, but also able to face the risks of an uncertain future.

5. Conclusions

In summary, the data described above present significant harbingers of change in food consumption, in some cases by accelerating already existing trends, in others by encouraging a change of direction and confronting us with the following future scenario:

- Social structure (i.e. family characteristics) is still the main factor driving food consumption, especially new forms of consumption leaning on technology. Family composition is the prevailing factor from which any form of consumption descends. In sociological terms, this means to glimpse the re-establishment of some form of social determinism in the current scenario of cultural omnivorousness, probably as a result of the worsening of social inequalities brought about by the pandemics.
- Traditional channels of information, such as the retailer and the label, which are the second determinants directly impacting decisions, seem no longer to be the drivers of mindful consumption, since their influence on this kind of consumption is negative.
- Similarly, a consumption based only or predominantly on web use also demonstrates a negative, albeit direct impact, on forms of responsible consumption.
- A "smart" eating style is on the horizon which shows a *new domesticity*, connecting the practices of cooking and eating with an expanded edible space, including the knowledgeable choices that human groups make in their environments to select, obtain, and preserve food. This "smart" eating style is a complex factor, dependent both on "structural" determinants (generation and, albeit to a lesser extent, gender), and on behavioural ones, namely the emergent habit of ordering meals at home. The latter factor positively impacts on the rise of a mindful food consumption and seems destined to become the driving force of a "re-think" in a world reshaped by the pandemic where increasing room is left to an intelligent technology that meets the demand for harmonization between the new and the old.

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