Healthy eating without wasting food: is it simply a question of organisation?

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Combatting obesity is now acknowledged to be one of our foremost public health priorities, at both the national and international levels. Global obesity rates almost tripled between 1975 and 2016.[1] More recently, growing awareness of the overuse of the planet's resources has prompted efforts to quantify food waste. Faced with the scale of the problem, actions to reduce food waste have risen rapidly to the top of the political agenda.[2] Both of these phenomena concern consumers, regarded both as responsible for the majority of food waste and capable of improving the nutritional quality of their own diets. This raises the possibility of new forms of synergy between the campaigns launched to tackle the two problems. And yet, in France, the public information campaigns aimed at reducing food waste (such as the *AntiGaspi* (Anti-Waste) campaign, see Inset 1) and those promoting "healthy eating" (such as the *MangerBouger* (Eat & Move) campaign, see Inset 2) remain separate and independent of one another. Nevertheless, these two themes are linked on various levels. Existing research has shown that the task of reducing food waste can be facilitated by devoting more attention to questions of nutrition (Graham-Rowe et al., 2014). However, purchases made with a view to improving the nutritional quality of our diets may result in more food being thrown away if it is not consumed (Evans, 2012). In this article we consider the *Anti Gaspi* (Anti-Waste) and *Manger Bouger* (Eat & Move) campaigns, focusing particularly on what both initiatives have in common.

The impact of healthy eating campaigns on the food consumption behaviours of consumers has generated an abundant scientific literature, including a number of overviews (see in particular Carins & Rundle-Thiele, 2013; Inserm, 2017). The broad conclusion reached by these studies is that, while certainly necessary, communication and education need to be backed up with other measures if they are to have an impact on the external factors which influence behaviour (HCSP, 2017, Carins & Rundle-Thiele, 2013). They also highlight the fact that behavioural change only becomes possible if the consumer's external environment (social environment, physical environment such as shopping environment and living conditions, macro-environmental factors such as food marketing and regulations) makes it possible (HCSP, 2017) and opportune (Nabec, 2017). This article follows the lead set by this existing literature, considering the feasibility of the behavioural advice dispensed by these campaigns by looking at the crucial issue of how the recommendations are actually performed (see Strengers &

[1] https://www.who.int/fr/news-room/fact-sheets/detail/obesity-and-overweight - Retrieved 18/12/2018

[2] At the global level, a third of all food produced ends up as waste http://www.fao.org/save-food/ressources/keyfindings/fr/ - Retrieved 27/06/2019

Maller,2014). In this study we thus propose to study the routine dimension of everyday practices, drawing upon practice theories.

Inset 1: the *Anti Gaspi* campaign

Building on a previous anti-waste campaign based on the message "love eating, hate waste," conducted in 2012, the French Department for Agriculture, Food and Forests launched a second public information campaign in 2014 as part of the National Pact for the Fight Against Food Waste, denouncing the "combined cost of all food products thrown away every year, which is so high that our bins are getting rich." It was this campaign which introduced the practical recommendations known as the "10 *Anti Gaspi* measures," (*French for Anti-Waste*) which are analysed in depth in the present article. The messages conveyed by this campaign focused on preventive measures designed to tackle the challenge of food waste, rather than seeking to raise awareness of the implications of this waste.

- Insérer image 1-

Inset 2: the *Manger Bouger* campaign

-Insérer image 2-

The National Nutrition and Health Strategy (French: Plan National Nutrition Santé, or PNNS) and the *MangerBouger* campaign (*French for Eat & Move*) are founded, much like the *Anti Gaspi* campaign, on an appeal to individual rationality. Their objectives can be summarised in four main points: reducing obesity and the number of people who are overweight, boosting levels of exercise and reducing sedentary habits among all age groups, improving eating habits and nutrition, and reducing the prevalence of nutritional pathologies. The campaign's messages take the form of behavioural recommendations: "To look after your health, eat 5 fruit and vegetables every day", "To look after your health, avoid eating too much fat, sugar and salt." The materials used to convey these messages include nutritional guides and communication campaigns (posters, press advertisements, television). The recommendations can be summed up in 6 advised practices:

1. Take the time to eat
2. Don't eat alone
3. Prioritise and vary the consumption of certain products (starchy foods, fruits and vegetables, proteins)
4. Limit consumption of fatty, salty and sugary products
5. Structured meals: starter, main, cheese, dessert
6. Structured food intake: three or four meals per day

In the present study we adopt a societal perspective on the two major challenges facing our food system (nutrition and food waste). In seeking to ascertain how recommendations are performed, and characterise the interactions between individuals and their environment (HCSP, 2017; Nabec, 2017), our goal is to develop operational tools to facilitate the promotion of these recommendations.

In the first section of this article, we present the results of social marketing research conducted in the two related fields of health-nutrition and food waste. The following section examines how practice theories – including the conceptual framework of *performance* employed in this study – can help us to move beyond the mere analysis of public health and anti-waste campaigns and get to grips with the actual *implementation* of the practices they recommend. In the third section, we detail the qualitative methodology developed to examine these everyday practices and offer a critique of a proposed analytical tool, before presenting and discussing our results. We conclude by offering a number of recommendations for municipal authorities and businesses.

1 Practice theories and social marketing

Social marketing is the adaptation of commercial marketing techniques to programmes aimed at influencing the behaviour of a specific target audience, with a view to improving their well-being and that of society as a whole. The key to this discipline is to know the target audience well, working with them to co-create and test actions which will bring about the desired changes in behaviour. Contrary to received wisdom, such actions are not limited to communication (Gallopel-Morvan et al., 2019).

1.1 A public health priority: improving the nutritional quality of our food intake

In matters of health and nutrition, since the early 2000s social marketing has been striving to better understand eating habits in order to steer them towards greater nutritional quality (Carins & Rundle-Thiele, 2013). Various communication and information tools have been developed: messages attached to products (encouraging, for example, to avoid excess “fat, salt and sugar”), nutritional information and claims (“low sugar content”) and scoring systems helping to guide consumers’ choices (such as the Nutriscore tool). In addition to developing tools designed to promote healthier eating, social marketing works to assess and measure the impact of such information. According to the existing literature, consumers have a good understanding of the nutritional information presented to them. Laporte et al. (2015) have shown that, although its

effect can be modulated by perceived "naturality", nutritional information does enhance perceptions of nutritional risk. Similarly, according to Ayadi & Ezan, (2008), children understand and take on board the health warnings used in the *Manger Bouger* campaign. Previous studies have generally agreed that the messages achieve widespread recognition, but that they do not succeed in stimulating new and healthier behaviours. Certain studies have even attempted to identify unexpected, or even harmful, effects caused by such information. In this vein, Werle & Cuny (2012) illustrate the counter-intuitive dimension of dietary health messages, with health warnings attached to advertisements for indulgent products actually tempering the negative image of those products on an implicit level. Chandon & Wansink (2010) have also shown that the presentation of food products at the point of sale, designed for easy access to the cheapest goods (which are also the most calorific), contributes to obesity rates. Several studies have highlighted a form of hypocrisy inherent to nutritional information efforts, since advertising is intended to be tempting whereas public health campaigns raise the possibility of offsetting any negative effects. For example, processes of cognitive restriction may arise in an attempt to compensate for the consumption of products presented as being "worse" for health, leading to disruptions in appetite management, or even eating disorders (anorexia, bulimia). On a more general level again, Nabec (2017) investigated the impact of nutritional claims on well-being, proposing three priorities for the development of a nutritional labelling system which is actually consistent with the objective of improving consumers' well-being: 1) motivating consumers to actually read the labels, 2) improving consumers' ability to understand the labels, and 3) making the social, cultural and societal context of consumption more conducive to attentive reading of food labels. In the present study we propose to broaden these perspectives with a greater focus on the social and cultural dimensions in which health messages are rooted.

Current research on social marketing – looking at the tools used to promote nutrition and food quality – has largely focused on how consumers understand/perceive recommendations and how other information/ preoccupations or factors linked to social and cultural context can interfere with health messages. Such studies have contributed to the evolution of public health messages, in an effort to tailor them more closely to consumers' preoccupations: Nabec (2017), for example, offers some suggestions for improving the appropriation of nutritional labels by consumers, while Werle & Cuny (2012) recommend developing messages and information campaigns which transcend the current dichotomy between 'good' and 'bad' products. However, apart from such adjustments to the form and formulation of messages, the existing

research has not explicitly addressed the question of how to implement these recommendations: What do consumers actually need in order to perform health recommendations? How do these recommendations fit in with consumers' eating habits? By looking at how the recommendations of *Manger Bouger* have been applied (consciously or not) on a day-to-day basis, this article offers a new perspective on efforts to promote healthy eating. Complementing the existing research which has helped to improve the content and form of health messages and the communication channels used, this article focuses on the concrete support available for implementing health recommendations. It thus attempts to move beyond the confines of campaigns targeting representations and knowledge, taking into account the capacity and competencies of individual consumers (Gallopel-Morvan et al., 2019).

1.2 Facing up to the depletion of natural resources: fighting food waste

The existing literature in the fields of social marketing and sociology can help us to better understand consumer awareness of the issue of food waste (e.g. Le Borgne, 2015). Previous studies have also identified opportunities and obstacles to the reduction of food waste by consumers. Visschers et al. (2016) show that, in addition to personal standards and intentions, key factors in the reduction of domestic food waste include perceived control (i.e. the ease of implementation of practices which reduce food waste) and the image of the "*good provider*," perceived as the ability to provide the whole family with food they like, in generous quantities. However, as far as we are aware, no previous academic or non-academic study has looked specifically at the acceptance, understanding and application of the recommendations included in anti-waste campaigns. Recent research attempting to achieve a clearer picture of food waste in the home has considered the role played by everyday logistical constraints, as well as certain normative aspects of consumption. In this respect, Metcalfe et al. (2012) show that food waste is often the result of a compromise involving more pressing issues, for example when wasting food actually corresponds to another objective, such as taking care of oneself and others. This should encourage us to look beyond the motivation provided by certain messages, and take better account of the other dimensions of consumption. Similarly, Watson & Meah (2012) show that the process leading from food purchase to waste involves a large number of preoccupations (e.g. health considerations: throwing away food to avoid the risk of food poisoning), habits (e.g. not wanting to eat the same dish for several consecutive meals, and thus preferring to throw away the leftovers) and constraints (e.g. eating out unexpectedly, resulting in products at home spoiling or going out of date). Our peers also have an influence on the quantity of food we throw away. The person responsible for preparing meals may be obliged to throw food away if the

children refuse to eat it, unless they "take it upon themselves" to finish the food rejected by other members of the household (Cappellini & Parsons, 2012). In such situations, the "sacrifice" involved becomes a matter of identity, playing into images of maternal self-sacrifice, the mother foregoing her own preferences in order to provide fresher food to her children. In light of such findings, which illustrate the complex and multi-faceted nature of food waste, it seems particularly optimistic and unlikely that an information campaign alone could hope to have a significant impact in terms of changing the types of behaviour that generate waste. As with the nutrition-oriented campaigns discussed above, our goal in this study is not to offer more recommendations on how to improve the formulation of anti-waste messages, but instead to consider what is needed for the recommendations of the *Anti Gaspi* campaign to be performed on a day-to-day basis.

1.3 Understanding the implementation of recommendations to improve their uptake: the contribution of practice theories

Practice theories actually encompass an array of theories and concepts aimed at understanding day-to-day and routine activities by studying the emergence of practices, rather than analysing the behavioural choices made by individuals. Schatzki, a pioneering author in this field inspired by the work of Bourdieu and Giddens, defines practices as all activities which involve and are connected by knowledge, competences, meanings and material elements (Schatzki, 1997). Reckwitz, another seminal author, builds on Schatzki's model by adding habits and routine actions. Reckwitz (2002) defines practice as "a repetitive type of behaviour, which includes several elements that are connected to one another: bodily activities, mental activities, 'things' and their use, understanding, know-how, states of emotion and motivational knowledge." Social practices are thus considered as units of analysis, with individuals the "carriers" of these practices.

Invoking Schatzki (1997), we can make a distinction between practices as *performances* and practices as *entities*. The former correspond to what individuals *do* and *say,* on a daily basis and in more or less repetitive fashion. The latter correspond to the more general representations of practices, whose properties are cemented over time by means of *performances*. For example, preparing food is a practice-as-*entity,* comprising *performances* such as: consulting other members of the household about what they want to eat, choosing products from the refrigerator, shopping them up, cooking them in a specific way etc. This allows us to engage with the detail of what individuals *do* and *say,* examining in detail what the implementation of certain practices

actually entails. Southerton and Yates (2014) explain that "studying practices as *performances* involves defining practices in detail (e.g. washing, taking a bath, driving, riding a bicycle etc.)" Practices as *performances* and practices as *entities* are connected (Evans et al., 2012), as it is the *performance* of various practices which constitutes and anchors the network of *entities*: by habitually repeating the same *performances* when preparing food, each individual constructs their own definition of the *entity* "preparing food," in connection with the *entities* "doing the shopping," "looking out for the nutritional quality of one's food" etc.

In this article we approach the recommendations listed in Insets 1 and 2 as *entities,* with a view to identifying the *performances* of consumers. By achieving a better understanding of what consumers *do* and *say* when implementing recommendations, we can develop new means of supporting and complementing information campaigns.

With the aim of investigating mechanisms which have not previously been explored, the present study is focused on the analysis of qualitative data, set out in detail below.

2 Research methodology

Our research methodology comprises three main stages. The first two seek to describe and comprehend the way that consumers implement the practices recommended by the *Anti Gaspi* and *Manger Bouger* campaigns. The third stage is a discussion of a system developed based on the results of stages one and two (Inset 3).

Inset 3: the empirical study

Stages	**Stage 1: semi-directive interviews involving projective collages**	**Stage 2: participatory and non-participatory observations**		**Stage 3: focus group with consumers**
		Stage 2a: shopping	**Stage 2b: meals at home**	
	February to May 2016	*January to April 2017*		*June 2017*
Sample	23 respondents	11 respondents from the Stage 1 sample group		10 respondents
Method	Semi-directive interview with projective collage	Observation of food shopping	Participation in meals	Focus group with coordinator, debate
Duration	45 minutes to 2:30, 1:15 on average	15 minutes to 2 hours, 50 min ave.	2 to 5 hours 3:15 on average	90 minutes

2.1 Stage 1. Semi-directive interviews using projective collages

This qualitative approach requires us to engage with the diversity of practices encountered, in a bid to understand the mechanisms which inform their adoption. Sampling was conducted so as to ensure variety in terms of socio-demographic factors, which have been shown to impact food waste and the nutritional quality of people's diets. The sample seeks to encompass a variety of practices with regard to healthy eating and food waste, with diversity in terms of ages, number of people in the household and the presence or absence of children. 23 participants were recruited *via* a mailing list (see Appendix 1).

The projective method of collage consists of asking respondents to select and affix images to a poster, representing their thoughts or impressions regarding a situation or concept. Methods of this kind are primarily designed to facilitate dialogue. They are generally used to reduce bias, study individual perceptions and shine a light on consumers' subconscious processes and mental imagery. Collage is a method of getting around the perceptual barriers which afflict consumers' understanding of themselves.

Within the context of this study, the collage method was used to provide respondents with a discussion tool which they themselves created before the interview began, providing a starting point from which to address a subject (the organisation of everyday life) which can be difficult to express accurately in unstructured conversation. The posters were not analysed as objects of study in their own right.

In order to create their posters, participants were presented with copies of a "women's" magazine, an interior decoration magazine, farming magazine *La France agricole*, technology magazine *01net* and popular science magazine *Sciences et Vie*.[3] Participants were given the following instructions:

> *"Create a poster which represents your food habits, from shopping through to consumption, and indicate the factors which influence the organisation of your eating habits. Use the magazines, scissors, glue and drawing materials provided. Take as long as you need to complete this task. When you have finished we will discuss your poster; it will not be interpreted without your help."*

The participants had only been informed that the study was focused on food habits, so as not to specifically draw their attention to the themes of waste and healthy eating.

[3] Participants were not provided with the same issues of all the magazines, because the collages were not intended to be analysed in their own right, and as such the homogeneity of the images (potentially allowing for comparisons between respondents) was not important.

Participants took on average 40 minutes to complete this exercise (e.g. figure 1). This creative phase was followed by a round of individual interviews, in which the posters were used as conversation tools. Stage 1 has been done at respondents' home (except 2, for organisational reasons). All of the interviews were recorded and transcribed.

Figure 1: Example of a visual collage, produced by Paola

Thanks to the ensuing discussions, this technique enabled us to observe (through discourse) what happens in the *performance* of practice (Hargreaves, 2011). The collage method helped to bring to mind and describe in detail the everyday activities of the individuals questioned, and to examine the links between these activities. In order to better understand the context in which these practices operate, this collage/discussion process was followed by an observational data collection, described hereunder.

2.2 Stage 2. Observations in store and at home

Around a year after this collage/interview process (during which time we analysed the results from this first stage), we conducted observations/interviews 1) during shopping 2) while participants prepared and ate a meal at home, then tidied up afterwards. These observations, although isolated in nature, allowed us to objectivate some of the information provided in the first round of interviews (e.g. to see precisely what a participant meant when he said "my kitchen is very small"). They also provided a contextualised insight into the descriptions which emerged from the initial interviews. The preferred approach was for the researcher to meet the participants at their home before they set off to do the shopping, making the trip with them. If this was not possible, the researcher would join the participants at the shop.

The second phase of our observations took place in the home, focusing on gathering data about meal preparation and consumption, and the tidying up afterwards. During this process, in addition to gathering more data on the conditions and implementation of food-related practices,

our goal was to observe interactions between members of the household (i.e. what they *say*). All members of the household had to be present for these observations. The observation process lasted between 2 and 5 hours. While our observation of shopping activities was only partially participatory (the observer would accompany the respondent as they did their shopping, without participating in any meaningful way), our observation of the subsequent meals was fully participatory, in order to ensure that the observer was more integrated into the home environment, and that meal time felt as natural as possible.

2.3 Stage 3: Focus group

In stage 3, the consultation phase, 10 new participants were recruited *via* an online form (Appendix 2) to participate in a *focus group*. The only advance information provided to these participants was that the study was focused on food habits. The participants did not know one another. In order to conduct this focus group, we developed a tool based on our initial results. The participants were presented with a refrigerator shelf (of adjustable size) full of leftovers (figure 2). We then gauged the opinions of participants using the walking debate technique. In a walking debate, participants stand up and are free to move around the designated space. This is a manner of structuring a debate in relation to a pre-determined proposition (in this case "This tool is useful"). With reference to the initial question or statement, the room is divided spatially into two sides: those who are in agreement go to the left, those who do not agree go to the right. Once all participants have established their spatial positioning, they take turns to explain their thinking. The statement used here was deliberately open-ended, in order to engage with participants' opinions in as broad a fashion as possible. If a participant is won over by any of the arguments aired, they can change sides. The advantage of this technique is that is promotes dialogue, as participants are required to adopt explicit positions. This technique is also a manner of smoothing out potential power dynamics within the group (arising from differences in temperament), as all participants are required to adopt a position and explain themselves.

Figure 2: Proposed tool – A dedicated, adjustable "leftover shelf"

3 Results

All of our discussions were transcribed. Non-targeted thematic coding was conducted on an exploratory basis. The purpose of this coding exercise was to identify and describe themes common to all participants. This coding used the technique of continuous thematization, identifying themes as they crop up during the analysis of the interviews, arranged based on the alphabetical order of the participants' names. Analysis then proceeded on the basis of this coding, identifying the *sayings* and *doings* involved in the application of the recommendations formulated in the campaigns *Anti Gaspi* and *Manger Bouger* (see Table 1). This included recording instances in which the recommendations were cited by participants without prompting, i.e. relating them as they were "told" or demonstrated by the participants.

Table 1: Identification of *performances* relating to the application of *Anti Gaspi* and *Manger Bouger* recommendations, mentioned without prompting by respondents.

***Performances* have been divided into categories based on whether they correspond to the coordination of activities [CoordActiv], the coordination of individuals [CoordIndiv] or product management (food purchases, storage, preparation etc.) [ProdManag].**

	Recommendation	*Examples of performances*	*Examples from the transcripts*
Manger Bouger	Take the time to eat	- Making time for food consumption amid other activities: organising oneself or coordinating with peers (e.g. delegating tasks) **[CoordActiv1]** - Buying and preparing products that are worth the effort - Take the time to eat **[ProdManag1]**	*"Cécile gets up at 6, then I get up at 6:30… that gives her time to do a session on the bike, or a little work-out, something like that. Then she gets in the shower and I go down for a spin on the bike, and while I get washed up she goes to the kitchen, usually to get something ready [for both lunch and breakfast], then usually I get out of the shower and help with the last little bits, and we eat." (Thibaut, 32)* *"Mathieu is somebody who is really, really sociable and who eats, who takes pleasure in eating, but who is also chilled-out […] he's very calm and he takes the time to decide what to eat, whereas with me it's more like 'wham, bam, thank you ma'am!' So I find that really relaxing, and it means I've rediscovered the pleasure of choosing vegetables and cooking them, smelling the aromas, smelling what I'm eating. So yes, I have really rediscovered eating, but eating… almost like eating to live." (Amélie, 42)*
	Don't eat alone	- Cooking more meals **[ProdManag2]** - Taking on a social role at mealtimes (e.g. hosting) **[CoordIndiv1]** - facilitating sociability (setting out the space, waiting for your partner, communicating about mealtimes etc.) **[CoordIndiv2]**	"*Yes a lot, when I have people over, I'm a lot more likely to cook than when I'm on my own […] if there's somebody else then it's more enjoyable to cook something proper, something which takes a little while; just taking the time." (Camille, 21)* *"Personally, when I'm at home I eat standing up in the corner of the kitchen, which is not good at all, but whenever I'm in Montpellier [at my partner's house] I always have to get a tray, get a plate and sit at the table. That's non-negotiable, she won't tolerate me eating standing up in front of the fridge." (Maurice, 69)* *"It' not like everyone does their own thing and then by magic we all end up eating together, it does require a certain amount of organisation to make sure we all sit down to a meal together."* (*Paola, 29*)
	Prioritise and balance starchy foods, fruits and vegetables	- taking the tastes and preferences of dinner companions into account **[CoordIndiv3]** - buying, storing, preparing and serving the recommended products **[ProdManag3]** - communicating with dinner companions about their preferences **[CoordIndiv4]**	*"Yes it's usually vegetables plus something starchy, or else meat or another protein, fish, but sometimes when I really want him [my son] to eat then I'll do chips or fish fingers, or a beef burger, but every day… it's not always vegetables every night." (Myriam, 42)* *"Oh yeah that's something that has changed, because when Yann turned up he brought his super smoothie maker with him, so I didn't really eat fruit before – I don't know why but I just don't like it that much, and after a meal I don't really want it – but now we have smoothies virtually every morning." (Marion, 33)*
	Limit fatty, salty and sugary products	- delaying decisions to avoid temptation **[CoordActiv2]** - limiting access to or availability of products to be avoided (hidden supplies, giving out treats etc.) **[ProdManag4]**	*"Sometimes, if I'm trying to watch my weight a bit [laughs!] because it's important, to watch your weight!... So if I'm trying to watch my weight, what I try to do is just bring less with me."* ***"So the rationing gets decided in the morning?"*** *"Exactly, in the morning. Or even the evening before. I know, or I try to predict more or less what I'm going to be doing during the day, so I already have an idea of what I'm going to take or not take." (Cédric, 37)*

	Meal structure: starter-main-dessert	- spreading nutritional recommendations across several dishes **[ProdManag5]** - taking into account the tastes of all fellow diners in the structure of the meal **[CoordIndiv5]**	*"If I eat pasta then afterwards…it depends what kind of pasta, if it's pre-cooked like that then I'll put grated cheese on it and so I won't eat cheese after, I'll just have a yoghurt for my dairy product, but I won't have another portion of cheese." (Myriam, 42)* *"Everyone helps themselves, unless it's something difficult or whatever, then we'll serve it up here, but otherwise everyone does what they want, because one person wants their salad a certain way, and the other doesn't want it like that… We put it all on the table and help ourselves […] So it's like that. It's true that he eats green salad, but he can't just eat green salad so he'll eat a dessert, like a yoghurt or something… a dessert, whatever."(Roxanne, 33)*
	Eat 3 or 4 meals per day	- eating at set times, coordinating consumption and non-consumption activities **[CoordActiv3]**	*If I don't eat breakfast in the morning, that puts everything out of balance. I mean, if I don't eat my usual thing in the morning, by 10 o'clock I will be hungry and I'll eat anything, I'll find an apple or something, I'll just eat." (Coline, 48)*
Anti Gaspi	Don't overestimate your appetite	- taking into consideration the appetite of all diners in the quantities prepared and served **[ProdManag6]** - taking the preferences and appetite of fellow diners into account **[CoordIndiv6]**	*"So the principle is… he explains that everyone takes a plate. You start by filling up a quarter of the plate with food, then you take a five-minute break once you've finished. If you're still hungry after the five minutes, then you take another quarter of a plate, then another five-minute break. If you're still hungry then you have a third quarter, and if you're still hungry after that then you finish the whole plate." (Noémie)* *"With pasta, for example, I'll serve him a third scoop because I'm sure he'll finish it." (Amélie, 42)*
	Buying and cooking the right quantities	- measuring appropriately **[ProdManag7]** - communicating with other members of the household about what they want **[CoordIndiv7]**	*The way it usually works is: I choose my recipes, I jot them down and I give them to my mum if she has time, like 'hey mum, do you fancy eating this?' etc. […]. If my mum needs something she'll put it on the supermarket shopping list, there are always memos lying around, so there are usually four unfinished lists and I round them up to make a proper shopping list." (Noémie, 26)*
	Using leftovers	- consultation within the household on attitudes to leftovers **[CoordIndiv8]** - making products attractive (accompanying them with other products, adding to the dish etc.) **[ProdManag8]**	*"'Operation leftovers tonight then?' 'Oh alright then.' And operation leftovers is like a dish full of… there may be a few carrots left, a few turnips, so I'll put together a nice little dish, if there isn't enough I'll cook some pasta, some rice […] so usually, with whatever is left over I can make another meal." Noémie, 26*) *"The other day we had nothing left to eat, but I'd kept some radish tops and there was a scoop of sour cream and a manky old bit of cheese […] that was it, but I made something really good, I did a radish leaf soup and I whipped up the cream with the cheese and some herbs from the garden, it was delicious." (Marion, 33)*
	Freezing products	- thinking about how to reuse products (defrosting, preparation of frozen products etc.) **[ProdManag9]**	*"Now I'm getting into making soup, and I make big quantities because my parents bought me a big pan. So whatever is leftover I freeze, and that means I have a meal ready for another time" (Marie, 32)*
	Sharing products with peers	- communicating to organise or facilitate the sharing of food **[CoordIndiv9]**	***"Does your mum bring you stuff every time she comes in the car?"*** *"Not always, but when she's been to the market on Sunday and she pops by on Monday then she brings me things, or if we haven't seen each other for a while she might drop in […] we see each other, we happen to live in the same region" (Sabrina, 23)*

The results reveal that what our respondents *do* and *say* can be divided into three broad categories: 1) sayings/doings designed to take into consideration the tastes and preferences of peers, ensuring satisfaction of all concerned, which generally implies communication; 2) sayings/doings relating to other practices (food-related ones or not), particularly the logistical dimensions and locations of these other practices; 3) sayings/doings relating to food purchase/storage to ensure that the products available at home meet the expectations of household members/peers. We have assigned the following titles to these categories, respectively: coordination between individuals, coordination of activities and product management.

3.1 Coordination between individuals: considering one's peers, organising and communicating

Respondents' relationship to dietary recommendations are influenced by their peers, particularly the injunction "Don't eat alone" (see CoordIndiv1 and 2 in Table 1). They also take on board the tastes and preferences of other members of the household, particularly with reference to the recommendation "Prioritise and balance starchy foods, fruits and vegetables" (CoordIndiv 3 and 4). Taking one's peers into consideration implies certain *performances* in terms of communication, and contributes to cohesion among members of the household on food-related matters, for example with reference to the recommendations "Structuring meals into 'starter-main-dessert'" (CoordIndiv 5), "Using leftovers" (CoordIndiv 8), and "Sharing products with peers" (CoordIndiv 9).

3.2 Coordination between different activities: managing daily routines in response to temporal and spatial constraints

The implementation of certain recommendations involves a greater degree of coordination with other practices, food-related or otherwise. Certain recommendations must be coordinated, on account of the spatial and temporal constraints involved (opening hours of shops, commuting etc.) and the framework imposed by other activities (working hours, other appointments etc.). These constraints, particularly the time constraints, place certain limits on the planning and organisation of activities (CoordActiv 2 and 3). This is particularly true of the recommendations "Take the time to eat" (CoordActiv1) and "Buy the right quantity" (CoordActiv7). The results require us to take into account the environment in which individuals go about their food-related activities, since the coordination of activities involved means that day-to-day food management is the fruit of a logistical process shaped by multiple constraints. The application of

recommendations requires an effort to take the needs and expectations of fellow diners into consideration, and to reconcile the various activities of everyday life.

3.3 Managing the food products present in the home: selecting, storing, cooking, consuming and recycling to satisfy everyday needs and expectations

Product management is a key element of the implementation of various recommendations in both campaigns. Management is a virtually omnipresent concern, as much for recommendations such as "Prioritise fruits and vegetables, vary starchy foods and protein sources" (ProdManag3) and "Limit consumption of fat, sugar and salt" (ProdManag4) as it is for recommendations such as "Take the time to eat" (ProdManag1) and "Don't eat alone." (ProdManag2) The *performances* associated with product management (purchase, storage, preparation, consumption, recycling) are also dependent on material dimensions, and in some cases this includes access to electrical appliances (e.g. Marion (33) who began eating more fruit thanks to the arrival of a smoothie maker).

3.4 Links between coordination with peers, coordination of activities and product management: discussion of the dedicated "leftover shelf"

The *performances* required to implement the recommendations formulated in the information campaigns are largely a matter of coordination and/or management, the two being linked: by way of an example, the recommendation "Don't overestimate your appetite" extends to the appetites of all fellow diners (CoordIndiv6), which need to be taken into consideration when gauging portion sizes (ProdManag5). The implementation of the recommendations also requires a degree of timetable coordination, agreeing on shared mealtimes in keeping with the recommendation "Don't eat alone." This dimension of coordination between peers is primarily a matter of reconciling divergent schedules, involving the coordination of activities both food-related and non-food-related.

The discussions of our "leftover shelf" in the *focus group* sessions (stage 3 of our methodology) confirm this connection between coordination among peers, coordination of activities and product management. It became clear that this initiative – primarily designed for product management purposes – also has consequences for coordination among individuals. The shelf serves as a tool for elucidating certain forms of non-verbal communication between members of households. Sonia (44) explains*:*

> *"What I like about this idea is that it's not me saying: 'We need to eat this.' And that it's localized, because my husband is pretty involved in our meal planning. Fortunately we do communicate well, but yes this would be a way of communicating without the sense that it's your boss saying: 'do this.'"*

Similarly, some participants saw this initiative as a first step towards children getting involved in food preparation. Aude (33), reflects:

> *"My kids are still young, but perhaps when they start to get involved with the cooking this could help."*

This system could also have consequences for the coordination of activities, not least food preparation. Several participants noted that having a dedicated space like this could "make cooking easier," directly promoting the use of leftover products. However, some participants questioned the usefulness of this idea. Félicie (28) explains:

> "*I really look to food for pleasure, so I find leftovers depressing… It's a good idea, really, but I would really have to get into cooking, to learn how to cook with leftovers […] If there were a variety of recipes using leftovers it would be OK, but otherwise it wouldn't work for me."*

This response serves to illustrate the fact that the consumption of leftover products in the refrigerator is not simply a question of the products themselves; knowledge and preferences also come into play. As such, one potential improvement to the system would be to accompany it with a recipe book helping some users to overcome an aversion to eating leftovers (not simply a matter of food management).

One other limitation raised by participants is the fact that they sometimes plan out menus for the week, and thus the accumulation of leftovers may come into competition with the scheduled dishes and meals. This highlights the need to test the system, in order to determine to what extent it can be integrated with different routines and organisational set-ups: after several weeks of using a leftover shelf, would users adjust by planning fewer meals in advance and leaving themselves some room for manœuvre in the form of a "leftovers meal?" Would it help them to better gauge quantities, since leftovers would be clearly visible in the refrigerator? It would also be pertinent to observe whether or not this system leads to a noticeable decline in the variety (and thus balance) of dietary intake across the week as a whole.

Finally, an additional improvement to the system was suggested by a participant, who would like to see a corresponding section in the refrigerator door, where certain products – such as open bottles of milk – can sometimes be forgotten.

4 Recommendations to accompany consumers: informing, creating a conducive context and providing tools

Municipal authorities, as both creators of private spaces in which meals are taken, and as direct interlocutors of citizens, have a role to play in shaping the way individuals appropriate space and time, with a view to institutionalising certain practices. Businesses also play a role in determining the products we consume and the context in which we consume them, and could thus contribute to shaping day-to-day organisation. Recommendations relevant to local authorities and businesses are included in the ensuing sections.

4.1 Familiarising consumers with their *foodscape*: information

The application of *Anti Gaspi* and *Manger Bouger* on a day-to-day basis requires the integration of multiple logistical constraints: food shopping is generally combined with other journeys (taking the children to school, returning from work etc.), the consumption of leftovers requires suitable facilities, the consumption of fruits and vegetables can be boosted by the presence of a market in the vicinity etc. However, in order for an appropriate organisational structure to be put in place, consumers need to be aware of the possibilities available to them. Local/municipal authorities could play an important role in providing information on available food options: details of shopping, exchange and meeting places present in the local area, communicated via brochures, local newspapers, websites, mobile applications etc. A communication policy of this nature would serve two main purposes: firstly, to increase where possible the proximity and frequency of household shopping, factors which can help to cut food waste (Lee, 2018), thanks to a better awareness of shopping options; secondly, to establish unsold stock distribution and leftover sharing as key elements in the food supply chain, raising awareness of the presence of such initiatives. We might easily imagine an interactive map tool, providing details of the types of produce on offer and the opening hours of local shops, complete with access information (bicycle parking, car parking etc.) as well as information about leftover sharing initiatives,[4] and links to mobile apps or outlets selling off unsold stock at reduced prices (e.g. Too Good To Go, Phenix, Karma etc.). This would be conducive to more effective coordination of activities and better product management, thus facilitating the implementation of dietary and food waste

[4] Examples include the 'yellow fridge' programme, with refrigerators installed in public places allowing people to share unwanted leftovers, and the Hop Hop Food application, designed to help people exchange and share leftovers.
https://www.google.fr/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjY8Ou_karZAhUMuBQKHcyCBuIQFgiUATAA&url=https%3A%2F%2Fwww.lefrigojaune.com%2F&usg=AOvVaw04szODZHfk5VIlY__tov5s

recommendations. An interactive map would also serve to assess the current state of affairs in terms of the food supply at local level, highlighting any inequalities in terms of access to certain services and products (particularly fruits and vegetables, or the prevalence of *fast food* outlets).

4.2 Creating moments and spaces conducive to shared consumption: providing a favourable context

Coordination between peers also involves spatial considerations. In response to the question "where can we eat together?" cities and local authorities could help by facilitating opportunities for shared consumption. They could encourage the appropriation of free shared consumption spaces, such as parks and public facilities. Such a strategy could be backed up with a communication campaign focused on events and popular initiatives such as the "Neighbourhood Festival," (Inset 4) or the creation of a "leftover day," informing consumers about participating locations. The goal would then be to create new opportunities for sociability in these places. While more and more informal neighbourhood festivals are springing up, there are still too few French local authorities getting involved with this operation (1390 of 34,968 in 2019)[5].

A second communication campaign could subsequently be launched to encourage the appropriation of these spaces by consumers, making them part of their everyday consumption habits. In efforts to promote existing infrastructure, emphasis could be placed on shared meals and events. These spaces could also be used to encourage other practices such as waste sorting, composting etc. Of course, the results of such an initiative would depend on the nature of the food consumed (ready-meals, for example), but it seems safe to assume that the structural effects of communal eating would have a positive impact on nutritional quality. The next challenge would be to make such consumption spaces a permanent fixture of consumers' dietary habits. Again, this would require particular attention to the geographical positioning of these facilities, ensuring that they correspond to the needs of the whole population, providing social spaces where they are needed. Complementing the work of local authorities, the Neighbourhood Solidarity Network could help to make shared consumption a widely-accepted practice, organising themed events throughout the year, with a special focus on sharing products, dishes or whole meals. Building upon the results of our research, we proposed such a

[5] https://www.lafetedesvoisins.fr/mairies retrieved 04/11/2019.

programme to the network; local pilot schemes will launch in 2021, ahead of a national roll-out in 2022.

Inset 4: The Neighbourhood Festival and Neighbourhood Solidarity: potential catalysts for shared consumption?

Created in 1999 by Atanase Périfan, a local elected official in Paris, the Fête des Voisins (Neighbourhood Festival) rapidly spread to the rest of France, where it is now an annual fixture in May. It has also begun to spread internationally. In 2019 ten million neighbours got together throughout France, with a total of around 30 million taking part in dozens of countries around the world (www.world-neighbours-day.org).
Individual and associations wishing to organise events can access free communication materials (posters, flyers). Municipal authorities and social housing agencies are required to sign up officially (www.lafetedesvoisins.fr/mairies). In return, they receive communication materials and benefit from the national advertising campaign (television, radio, press), as well as national partnerships such as the Accueil des Villes Françaises (AVF) network, devoted to welcoming new arrivals in French towns.

Furthermore, the Voisins Solidaires association (Neighbourhood Solidarity www.voisinssolidaires.fr), launched by the founders of the Neighbourhood Festival, runs a national campaign aimed at strengthening local solidarity throughout the year. The agenda includes regular events at certain moments of the year (back to school, Christmas etc.), and a variety of thematic events (cold weather, recycling initiatives etc.).

4.3 Providing technical solutions: tools

The coordination of activities and individuals, as well as day-to-day product management, are influenced by material elements which provide points of reference (labelled refrigerator compartments, shopping apps, phone calls between members of the household to pass on information and shopping lists etc.). The development of technologies which can be used to manage day-to-day necessities, and particularly the predominance of *smartphones*, offer clear opportunities to improve the coordination of activities. There are now smart refrigerators on the market which suggest recipes based on what is left inside, or help users to keep track of use-by dates,[6] as well as the various mobile applications offering similar services (Checkfood; A Consommer etc.). As of yet, no scientific study with a sizeable sample has analysed the impact of such technologies on the quantity of food wasted (Reynolds et al., 2019), and we have no data regarding their effects on the nutritional quality of food. It would be pertinent to make use of this opportunity, but such developments also need to be approached with a degree of caution. Southerton (2003) notes the increasing flexibility of modern society, observing the

[6] Smart refrigerators of the kind developed by Samsung, Haier, LG SmartChat, Whirlpool, Siemens etc. (http://lesbonstuyaux-domeo.fr/domotique/objets-connectes/les-5-frigos-connectes-de-demain)

disappearance of spatial and temporal limitations on food shopping (thanks *click-and-collect* services, for example), and the rise of mobile applications offering recipe ideas. He argues that the availability of everything, all of the time, can lead to a feeling of overload which may be quite the opposite of the desired effect, namely helping consumers better manage their day-to-day tasks. Southerton (2003) defines this phenomenon as the "24-hour society." It is therefore essential that we appreciate the potential of digital tools to make everyday life easier, while remaining vigilant with regard to their invasive tendencies. It may be possible to envisage simpler, more accessible solutions.

In this respect, the "leftover shelf" proposed in this study presents several advantages: it is simple, inexpensive, can be rapidly operational and does not require the purchase of new electronic devices and/or equipment containing pollutants. This makes our solution compatible with a certain sense of environmentally-conscious material austerity. Our study suggests that the 'leftover shelf' could act as a means of non-verbal communication within the household, enabling all members to easily identify leftovers while also highlighting the importance of identifying and consuming them. This initiative is, in this respect, similar to experiments with colour codes for different categories of food (dairy, meat, fruits and vegetables) in the refrigerator, a solution tested by Farr-Wharton et al. (2014) with seven households. By facilitating the coordination of household members with regard to the location of specific foodstuffs, colour coding makes it easier to find and consume food in time. In order to facilitate the uptake of this new tool, rather than restricting it to new refrigerators it would be preferable for manufacturers to develop adjustable dividers which could be used in existing fridges. Building on the results of our study, it would also be interesting to develop a similar device for the door of the refrigerator, where products may also languish too long (e.g. milk). Meanwhile, it would also be pertinent to take sanitary considerations into account, since the different shelves of the refrigerator are generally designed to optimise the conservation of products. It might thus be possible to envisage the sale of multipacks of dividers, allowing users to create leftover sections on each shelf in the refrigerators. Combining these tools with recipes and advice on how to use surplus ingredients could help to promote the consumption of leftovers.

5 Discussion

This study contributes to the existing corpus of research applying practice theories to matters of health (e.g. Blue et al., 2016) and environmental sustainability (e.g. Gram-Hanssen, 2010). By considering anti-waste and healthy eating recommendations as social practices, with a view

to supporting and encouraging their implementation, our work illustrates that the coordination of individuals, activities and products are of central importance to the implementation of public recommendations. Facilitating the implementation of the recommendations contained in both campaigns requires more support for these different forms of coordination.

Our results demonstrate the importance of temporal and spatial constraints with regard to the coordination of activities. The goal of coordinating activities is to optimise the use of time, viewed as a resource, with reference to the constraints imposed by the geographical and spatial circumstances. Food intake can thus be construed as a function of the prevalent spatial and temporal order, influenced by factors such as flexibility and the presence of institutionalised timeframes (working hours, schools, mealtimes). The temporal pressures illustrated by our results chime with the sense of time pressure described by Southerton (2003). Individuals deal with time pressures on a daily basis, and their practices are structured on the basis of this resource. The use of some electrical devices (freezers, for example) may thus serve to postpone certain practices and avoid waste (Le Borgne, 2015). We have also observed the importance of spatial constraints. In this respect, the concept of the *foodscape* (the food landscape, comprising all locally-available sources and consumption spaces; Mikkelsen, 2011) can help us to understand how the appropriation of the food landscape informs the organisation of eating practices, and can help to facilitate the logistical coordination of different members of the household and their daily activities.

With regard to the coordination of individuals, Southerton (2006) points out that the daily schedule of individuals is largely determined by the need for coordination with peers exterior to the household. In our study, the most significant form of coordination appears to be that between members of the same household: taking account of the tastes and timetables of household members, planning meals, agreeing upon the organisation of the refrigerator, agreeing upon mealtimes etc. Our study also reveals the need for coordination to include all members of the household, their constraints and their practices. Considering the application of the recommendations promoted by the *Anti Gaspi* and *Manger Bouger* campaigns in terms of *performances* allows us to more effectively account for the constraints and conditions which shape consumers' daily lives.

We identify two potential scenarios for promoting coordination, depending on the extent to which daily routines are systematic (Dyen et al., 2018): coordination can be facilitated either by offering greater fluidity and flexibility, or by expanding and entrenching certain practices

which can reduce the uncertainties which make coordination necessary. In the former case, we might envisage ways of making food supplies more flexible (Hebrok & Heidenstrøm, 2019), for example by promoting the sale of loose items to satisfy occasional demand. The second scenario, on the other hand, involves encouraging more systematic practices, for example a 'leftover day' or the use of mobile applications designed to help with shopping lists.

Building on the work of Hargreaves (2011), who has studied the transformation of practices following efforts to reduce electricity consumption in a workplace environment, the present study is focused on recommendations which were not formulated with the theory of social practices in mind. Indeed these campaigns, although they do increasingly attempt to take into account the environment in which consumers operate, continue to regard choice and motivation as the key factors in the adoption of new practices. As such, our aim here is not to totally rethink the foundations of the fight against food waste and campaigns to promote healthy eating. Our goal is rather to build upon and clarify existing knowledge with input from practice theories. This is consistent with the fact that, while communication is not the preferred input of practice theories, it is nonetheless acknowledged that it can play a role in the evolutionary process of social practices (Vihalemm et al., 2016). In order to build upon existing knowledge and practices, this study brings new actors into the fold: municipal authorities and businesses are invoked as potential sources of support for the practices promoted by government agencies, since they play a genuine (albeit non-explicit) role in the coordination of peers, activities and food products by consumers. The recommendations presented are to be considered in the light of the prevailing technical, political and budgetary realities. Such considerations are inherent to any initiatives focused on praxis (Vihalemm et al., 2016). In order to move beyond primarily discursive actions (awareness of impact, recommendations for more positive practices), more tangible and structural measures are required to spur on the evolution of social practices. The aim is to facilitate certain practices by acting upon the social and material environment in which they exist.

6 Conclusion: Better understanding the implementation of recommendations

In this article we study healthy eating practices with a view to understanding and promoting the application of the recommendations made by the *Anti Gaspi* and *Manger Bouger* campaigns. Through a holistic approach (studying all practices relating to food, while also looking at issues relating to food waste and healthy eating), this study adopts an approach which has not

previously been attempted. The majority of previous research has focused on forms of behaviour to be encouraged or changed, but has rarely devoted much time to pre-existing recommendations. In this article we deploy practice theories on an expanded scale, since such theories are often used to describe behaviour in a detailed manner, but rarely applied in a social marketing context. In terms of methodology, this study deploys various techniques to create a coherent discourse, allowing us to describe the everyday food-related activities of consumers precisely and exhaustively. In this respect, our study may be of use to future research into everyday practices. It would, however, by useful to extend the observation period in order to obtain a better understanding of how practices are performed in a greater variety of everyday circumstances.

Our research demonstrates that the implementation of recommendations is dependent upon three categories of *sayings* and *doings*: coordination between individuals, coordination of activities and the management of food products. Guaranteeing these three forms of organisation would facilitate the implementation of the recommendations promoted by campaigns such as *Manger Bouger* and *Anti Gaspi*, and we offer a number of recommendations for local authorities and businesses, with a view to informing, organising, creating a favourable context and providing tools.

Although it does allow us to better understand how such campaigns are performed by consumers, the approach adopted in this study cannot be unequivocally claimed as a complete social marketing approach. Indeed, if our reason for attempting to better understand behaviour is to modify it, and in doing so attenuate negative consequences for society, then the present approach is lacking a test phase in which action targets are determined with reference to the results obtained. The research presented in this article is intended for continuation via the testing of simple tools such as the "leftover shelf," and has already given rise to collaborations which offer opportunities for action (the Neighbourhood Festival and the Neighbourhood Solidarity network). The limitations of this work, and the improvements needed to make the approach more complete, offer perspectives for further research and development.

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Annex 1: Description of the qualitative sample used in Stages 1 and 2 (semi-directive interviews with visual collages and observations). In the interests of privacy, names have been changed.

Respondent code name	Gender	Household structure	Age
Marion	F	Lives with partner	33
Esther	F	Lives alone	67
Paola	F	Lives with partner	29
Valérie	F	Husband and two children	48
Noémie	F	Mother	26
Bérengère	F	Lives alone	29
Arnold	H	Wife and daughter	46
Maurice	H	Lives alone	69
Roxane	F	Husband and son	33
Camille	F	House share with friend	21
Amélie	F	Shared custody of daughter	42
Coline	F	Mother	48
Myriam	F	Husband and son	42
Sylvie	F	Lives alone	30
Justin	H	House share with two friends	24
Sabrina	F	Lives alone	23
Vincent	H	Lives alone, son visits	52
Léa	F	Husband and two daughters	30
Thibaut	H	Lives with partner	32
Marie	F	Husband and baby	32
Edouard	H	Lives with partner	29
Cédric	H	Wife and 2 children	37
Max	H	Wife and 2 children	40

Annex 2: Description of the qualitative sample used in Stage 3 (focus group). In the interests of privacy, names have been changed.

Respondent code name	Gender	Household structure	Age
Sonia	F	Husband and 3 children	44
Caroline	F	1 child	48
Isabelle	F	House share with one man and one woman	40
Antoine	H	Lives alone	21
Aude	F	Husband and 2 children	33
Pascale	F	Husband and 2 children	50
Félicie	F	Lives alone	28
Marina	F	Daughter	48
Nadia	F	Lives alone	52
Adrien	H	Lives with partner	31