



How chefs develop the practice to manage food waste in professional kitchens

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ABSTRACT

Throughout their career, chefs develop practices for food waste mitigation, but little is known about how these practices occur and evolve. This study draws upon the social practice theory, social learning theory and ecological systems theory to explore the lifelong experiences of food waste and its management among 44 chefs in England, Indonesia, Poland, and Russia. The study highlights the multiple environments in which chefs develop the practice of food waste management. The main points for intervention within a lifelong experience of chefs where they start recognising the significance of food waste and develop skills for its mitigation are identified. The study showcases family and senior chefs/supervisors as the key actors of learning who shape the meanings of food waste among chefs and provide them with competencies towards its management. The role of education providers in preparing chefs for dealing with food waste in professional kitchens is established as limited.

1. Introduction

The sector of hospitality and foodservice (HaFS) makes the third largest contribution to the global societal challenge of food waste (FW) (UNEP-United Nations Environment Programme, 2021). This calls for urgent mitigation if the United Nations Sustainable Development Target 12.3: to halve per capita global FW at the retail and consumer level is to be achieved by 2030 (FAO-Food and Agriculture Organisation, 2023). Mitigation is needed across all areas of HaFS operations, but the focus should be on the kitchen as this is where up to 2/3 of FW occurs (Filimonau et al., 2020b).

The kitchen is managed by chefs, and it is therefore important to study how they can be effectively engaged in FW mitigation (Sezerel et al., 2023). Surprisingly, research on chefs as the key actor of FW management in HaFS is scarce. Although numerous studies have examined the determinants of FW mitigation among HaFS consumers (Filimonau et al., 2020a; Sharma et al., 2021; Stöckli et al., 2018), employees (Chawla et al., 2022; Goh and Jie, 2019; Luu, 2020) and managers (Ng and Sia, 2023; Secondi et al., 2020; Vizzoto et al., 2020),

there is a paucity of empirical investigations dealing with chefs. Notable exceptions are Batat (2020), Chawla et al. (2020) and Filimonau et al. (2023a) who have explored the practices adopted by chefs towards FW mitigation. These studies have reconfirmed the importance of chefs if professional kitchens are to transit towards sustainability goals showcasing how chefs' practices can advance or, contrarily, hamper this transition.

Although the above-referenced studies provide a valuable perspective on the chefs' FW management practices, they do not explain how these practices are formed and how and if they evolve to become habitual. This is an important knowledge gap because an understanding of how the practices to mitigate FW occur and develop can identify the areas for intervention within a chef's lifelong experience and professional career. As Sezerel and Filimonau (2023) argue, such interventions can accelerate the development of these practices and aid in understanding how they should change to become more effective. This can also help establish appropriate actors within a lifelong experience and career of chefs who can shape their perception of FW and its management. The engagement of such actors will be paramount to form chefs'

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habitual behaviour towards FW mitigation in professional kitchens.

This study plugs this knowledge gap by exploring how the FW management practices are formed among chefs and what (f)actors can influence this formation and consequent evolvement of these practices into FW mitigation habits. To this end, the study builds upon three theories i.e., social practice, social learning and ecological systems to establish the different levels and actors of learning throughout a chef's lifelong learning and professional career. The goal of the study is thus twofold: 1) to reinforce the theoretical foundation of academic research on FW and its management in professional kitchens by showcasing how three different theories can be operationalised; and 2) to bridge the practical knowledge gap by examining how chefs develop the practice to manage FW and what (f)actors can influence this development. To provide a wider perspective on the issue of FW, which represents a global sustainability challenge, and to account for the potential cultural effect, the study is undertaken in four HaFS markets i.e., England, Indonesia, Poland, and Russia. The next section explains the theoretical background of the study.

2. Theoretical background

Research on FW and its management in the HaFS sector is rapidly emerging (see Munir, 2022 for a review). Studies have set to examine the magnitude of FW (Demetriou, 2022), explore its drivers (Coskun and Filimonau, 2021), investigate approaches to effective prevention and mitigation (Ng and Sia, 2023) and discuss the opportunities for multi-stakeholder engagement (de Visser-Amundson, 2022). Research has been underpinned by various theoretical perspectives, including theory of planned behaviour (Goh and Jie, 2019), norm activation theory (Kim et al., 2022), and value attitude behaviour theory (Kim et al., 2020). Despite growing empirical research on FW in the HaFS sector, a systematic literature review by Dhir et al. (2020) has established that 'most of the [empirical] studies [they reviewed] did not utilize any theory or theoretical framework' (p.9). This is aligned with Dolnicar (2020) who calls for more theory-driven empirical investigations on FW and its management in HaFS organisations. Such investigations should specifically target chefs as this HaFS stakeholder remains understudied from the perspective of its current and prospective involvement in FW management (Sezerel and Filimonau, 2023).

This study responds to the call for more theory-driven research on FW management in professional kitchens by exploring the potential role of three major theories in building an understanding of FW management practices among chefs. These theories are chosen because they have rarely (social practice theory) or never (social learning theory and ecological systems theory) been applied in the context of professional kitchens. Yet, there is evidence from other contexts and academic domains, such as green marketing (Beatson et al., 2020), lifestyle marketing (Chwialkowska, 2019) and information technology (Lennerfors et al., 2015) that the application of these theories can enrich scholarly and practical knowledge on how to foster pro-sustainable transitions among chefs.

2.1. Social practice theory

Social practice theory aims to understand how various social phenomena and structures are shaped by interconnected practices that individuals engage in (Giddens, 1984). These practices represent the main structural blocks of social life and include routine activities, behaviours, and interactions (Bourdieu, 1977), such as preparing or consuming food. These routine activities can become habitual with individuals showcasing the same set of actions in certain contexts, for instance when cooking or eating lunch (Pfeiffer et al., 2017). For a practice to become a habit, an individual should experience a trigger, then engage in a routine act in response to this trigger, and then receive a reward (Linder et al., 2022). For example, in the case of the practice of cooking lunch, a feeling of hunger represents the trigger, a meal preparation is the routine

action, and a feeling of satisfaction after a meal has been cooked represents the reward.

Social practice theory advocates that social life should not be considered a separate set of individual actions or societal structures but viewed as a complex, permanent interchange between the two (Schatzki, 1996). Practices which individuals pursue are embedded in broader social contexts shaped by manifold factors, including social and cultural norms, and organisational and institutional arrangements (Reckwitz, 2002). While individuals are influenced by these factors, they also actively interpret, reproduce, reinforce or even challenge them through their everyday actions. For instance, individuals may opt to change their habitual behaviour, such as following a meat-based diet, as a reaction to such factor as environmental crises (Hargreaves, 2011). Practices are therefore not static, but they evolve with time under the influence of various (f)actors (Warde, 2005). For example, Wertheim-Heck and Raneri (2020) showcase how the practice of food consumption in modern Vietnam is changing in response to the emerging challenge of food insecurity and the growing effect of western lifestyles. Likewise, Özbük et al. (2022) demonstrate how the practice of food preparation and consumption in households has evolved under the influence of COVID-19 restrictions imposed by national policymakers.

Social practice theory advocates a shift in the focus of analysis from an individual to their actions i.e., practices (Shove et al., 2012). This differentiates social practice theory from the theories of planned behaviour and reasoned action (Ajzen, 1991). Although these two theories provide a valuable perspective on the antecedents of human behaviour, they are limited by assuming that this behaviour is linear and rational (Hargreaves, 2011). The rationality of human behaviour has been questioned in numerous consumption contexts (Armitage and Conner, 2001). This holds true for HaFS where various factors, such as the occasion of food consumption (for example, celebratory versus routine) or the structure of a dining group (for instance, close family members versus business partners), can affect individual actions (Mottaleb and Mishra, 2017). By focusing on these actions rather than the individuals performing them, social practice theory can offer novel insights into an understanding of how and why these actions occur.

Social practice theory emphasizes symbolism and materiality of practices (Reckwitz, 2002). Individuals engage in practices not only for their physical benefits, but also because they carry certain meanings. For example, people practice eating out not purely for nutrition, but also because it has important cultural and social connotations. These are represented by the need for social interaction in the case of a family dining experience or play a role of a trust building exercise during a business meeting (Neuman, 2019).

The symbolic dimension of practice is constituted by meanings and competencies (Xu et al., 2021). Meanings explain why individuals perform practices, what value they assign to their acts, and what these practices represent in a specific context (Schatzki, 1996). The meanings associated with practices are not fixed but socially constructed and subject to individual interpretation and negotiation (Warde, 2005). For example, FW has different meanings for various HaFS stakeholders; some chefs view it as discarded leftovers while managers consider it lost profits (Filimonau and Delysia, 2019). Similar to practices, the meanings associated with them evolve with time being influenced by different (f)actors (Shove et al., 2012). For instance, a chef who has initially considered FW as junk can change this meaning under the effect of the media emphasizing the environmental and social detriments of FW.

Another symbolic element of practices is competencies defined as knowledge, skills, and abilities that individuals possess and routinely utilise to engage in practices effectively (Reckwitz, 2002). Similar to meanings, competencies are not fixed, but learnt through socialization being shaped by various (f)actors (Warde, 2005). Competencies are influenced by social expectations and interpretations of what constitutes skilful performance within a particular practice (Batat, 2020). For example, in one restaurant, cooking as a practice of chefs can be considered skilful as long as it delivers such values as taste, aesthetics

and, ultimately, customer satisfaction (Heikkilä et al. 2016). However, in another restaurant, skilful cooking may also involve an element of resourcefulness whereby chefs are expected to reuse surplus ingredients to avoid wastage (Filimonau et al., 2023a).

The material dimension of practices is represented by materiality which describes the physical attributes of behaviour and explains how practices are performed (Shove et al., 2012). It incorporates material resources (for instance, kitchen equipment), technology (for example, sous vide) and infrastructure (for instance, rigid supply chain). Materiality does not exist independently but is interconnected with other elements of practices and they influence each other in various ways (Warde, 2005). For example, although a restaurant can provide quality equipment for food preparation, the lack of chefs' competencies in using this equipment will affect their cooking practices negatively. Contrarily, if a chef is competent in cooking but lacks access to technology, such as sous vide, their practice will have to change by relying upon the available technological solutions.

Social practice theory has been applied to various study contexts, including food consumption and environmental sustainability (see, for example, Beatson et al., 2020; Fonte, 2013; Sahakian and Wilhite, 2014). However, its application to FW in the HaFS sector has been limited (Munir, 2022). Hennchen (2019) first highlighted how chefs' practices were related to FW mitigation in professional kitchens with particular reference to the importance of the 'meanings' element. Filimonau et al. (2023a) emphasised the role of chefs' competencies in FW management by elaborating on their importance for resourceful and therefore wasteless cooking in professional kitchens. Lastly, Chawla et al. (2020) evaluated materiality in FW mitigation interventions in professional kitchens. No research has yet attempted to consider all elements of social practice theory together in the context of FW management in professional kitchens (Sezerel and Filimonau, 2023). Most importantly, no studies have examined how the practices of chefs to mitigate FW occur and how/if they evolve throughout chefs' lifelong experience and professional career. Such understanding is, however, important given that social practice theory underlines the importance of studying the formation and evolution of meanings, competencies and materiality. This is especially true for such complex social phenomena as FW in the HaFS sector where numerous (f)actors play a role in how FW is generated and managed (Munir, 2022).

2.2. Social learning theory

Social learning theory emphasizes the role of observational learning and modeling in human behaviour (Bandura and Walters, 1977). It suggests that individuals learn by examining and imitating the behaviour of others, especially in social contexts. This imitation can be sustained for a long time and carried over from one stage of human development to another i.e., from childhood to adulthood (Bandura, 1978).

Learning occurs through a four-step process. In step one people pay attention to the behaviour and its consequences of an individual they have chosen to model. For example, children can mimic the behaviour of their parents and employees can imitate the acts of their supervisors (Brown et al., 2005). In step two, people memorise the observed behaviour, and, in step three, they reproduce it by imitating the attitudes and actions of their 'role model'. For example, Ikhida et al. (2023) indicate how hospitality employees mimic the sustainability behaviour of their peers, thus integrating sustainability values in their own behaviour. In step four, people are motivated to repeatedly imitate the behaviour they have once reproduced based on the consequences they have observed. If this behaviour is reinforced, people will be inclined to imitate it again. If the behaviour is punished, people are less likely to mimic it. For example, Bohdanowicz et al. (2011) indicate that public recognition of pro-environmental behaviour of employees can lead to its repetitive occurrence in the workplace, thus making sustainable acts common among hospitality staff.

Social learning theory is related to social practice theory. Individuals often develop practices by observing and learning about them from other people (Yardley et al. 2012). For example, Filimonau et al. (2022b) show how children can learn to save food from going to waste by observing wasteless practices of their parents when preparing and cooking meals at home. Likewise, Makhal et al. (2021) demonstrate how family practices of at-home growing and repurposing food facilitate the acceptance of suboptimal foodstuffs among family members. This is aligned with the vision of Reckwitz (2002) who has long argued that practices are informed by different (f)actors and that the accurate identification of these (f)actors can aid in understanding how practices develop and evolve, but also how they can be influenced.

Social learning theory is underpinned by the concept of self-efficacy which describes an individual's belief in their own ability to perform a successful act in specific situations (Bandura, 1978). Self-efficacy is critical for the individual's ability to imitate the observed behaviour as it signifies their confidence in that this behaviour can be reproduced effectively. Reinforcement can encourage people to engage in social learning by increasing their self-efficacy (Bandura and Walters, 1977).

The above suggests that social learning can contribute to the formation of habitual behaviour, such as FW management practices. Reinforcement is critical for occurrence of habitual behaviour (Linder et al., 2022). Likewise, in the context of social learning, if people consistently observe and imitate a behaviour that is reinforced, the likelihood of that behaviour to become a habit can increase. For example, a child can learn not to waste food from their parents (Sorokowska et al., 2020). If a child is encouraged to leave no food on their plate, then such behaviour can become habitual and retained throughout a lifetime (Filimonau et al., 2023b).

Social learning theory has been used to understand how chefs develop entrepreneurial spirit by observing the behaviour of their peers and replicating it in the kitchen (Abecassis-Moedas et al., 2016). No study has, however, attempted to apply this theory to examine how chefs develop the practice to manage FW. Chefs can recognize FW by observing how other people deal with it, such as their parents or other chefs. They can memorise this behaviour and reproduce it in the workplace. Positive reinforcement, such as a business owner's credit for their efforts or cost savings, can motivate chefs to retain their FW management practices.

2.3. Ecological systems theory

Ecological systems theory explains the dynamics of human development by showcasing the complexity of interactions between individuals and their surrounding environments, which can establish patterns of human behaviour (Bronfenbrenner, 2000). The cornerstone of this theory is the concept of ecological environment, which consists of various nested systems influencing human development (Spencer, 2006). These systems are organised into five levels, or 'spheres', with the individual placed in their center i.e., micro-, meso-, exo-, macro- and chrono- (Darling, 2007).

The microsystem refers to the immediate and direct settings in which an individual lives, such as their close family, friends, school, and neighbours. Due to its proximity, the microsystem offers the most influential level of interaction, thus building the strong foundation for developing various practices (Dobson and Douglas, 2020). For example, Hemar-Nicolas et al. (2013) demonstrate the considerable effect of family socialisation on how children learn about eating practices and indicate the sustained influence of this learning on future behaviour throughout children's lives.

The mesosystem describes the connections and interactions between different microsystems, such as the relationship between what individuals learn in school and their family. The mesosystem can reinforce or, contrarily, weaken the effect of different microsystems on human development (Duerden and Witt, 2010). For instance, if sustainability is practiced in a family, and if its values are also emphasized in a nursery,

this may create a multiplying effect, thus reinforcing the practice of more sustainable food consumption among children (Filimonau et al., 2022a). Contrarily, as shown by Vos et al. (2022), children can influence the healthy and sustainable eating practices of their parents as they get exposure to this topic in schools.

The exosystem incorporates the social structures and settings that can influence human development indirectly but in which the individual does not actively engage, such as family's friends, local community, and/or media. Changes in the exosystem can influence human development through the micro- and mesosystems. For example, media represent a powerful tool to prevent FW in households as it prompts individuals to change their shopping and cooking habits to make them more sustainable due to normative pressure (Teoh et al., 2022).

The macrosystem combines the broader socio-economic context in which the other systems are embedded, such as cultural values, social norms and macroeconomic conditions of the country where the individual resides. The macrosystem affects the other systems and can shape human development indirectly. For instance, the pay-as-you-throw systems, if adequately designed and implemented by local authorities, could mitigate FW effectively by encouraging households to change their habits of solid waste disposal (Elia et al., 2015).

Lastly, the chronosystem consists of various experiences that the individual has had during their lifetime, including major life transitions, historical and environmental events (Lau and Ng, 2014). The chronosystem acknowledges that the individuals and their environments are constantly changing and emphasizes the need to understand the drivers of this change. For example, Lavelle et al. (2016) argue that cooking skills are learnt differently at different ages with modern young consumers paying more attention to diet quality, potentially because of the influence of their parents and media.

Ecological systems theory suggests that the development of an individual is influenced by interactions and transactions across the different levels or systems of their ecological environment (Bronfenbrenner, 2000). It highlights that individuals take active part in their development and that their experiences and relationships within each system can impact their personal and professional growth (Darling, 2007). Ecological systems theory emphasizes that individuals can form specific practices or behavioural habits in response to the influences exerted by the various systems or the actors within these systems, such as parents or friends (Neal and Neal, 2013). These practices can be sustained throughout a lifetime, or they can evolve in the result of new influences. These influences can occur in the macrosystem, such as, for example, in the case of the COVID-19 effect on household FW behaviour, or in the exo- or microsystems, such as, for instance, in the case of increased FW awareness due to its media exposure (Özbük et al., 2022).

Ecological systems theory was originally applied in the field of developmental psychology to examine how children's development is influenced by the various systems in which they are embedded, including their family, school, local community, and wider society (Bronfenbrenner, 2000). To date, its application has been extended to understand the development of entrepreneurial climate (Kline et al., 2013), adoption of corporate social responsibility practices (Musgrave and Woodward, 2016), and the dynamics of social procurement policies (Woolcott et al., 2023). Woodside et al. (2006) have recognised that ecological systems theory can aid in explaining the actions of individuals within specific contexts of their lives; however, they have concurrently acknowledged a paucity of empirical investigations applying this theory to the hospitality settings.

Ecological systems theory can provide useful insights into how the practices of chefs to manage FW are formed and how/if they evolve in time as a result of chefs' interactions with different systems and actors. To this end, chefs can be asked to reflect upon how they have gained an understanding of the detrimental effects of FW and developed knowledge and relevant skills to act upon its mitigation. This will link the ecological systems theory to the theories of social practice and social learning to provide a holistic outlook on how chefs have grown the habit

of FW management and what actors have contributed to this growth throughout their lifelong experience and professional career. For example, Sorokowska et al. (2020) demonstrate that consumer awareness of FW may have formed in their childhood being influenced by parents. Likewise, Filimonau et al. (2023b) show that, by observing that parents discourage FW, children learn to save food from going to waste and retain this habitual behaviour as they grow. This suggests that, as individuals progress from childhood to adulthood, they may carry the FW awareness along and even develop it, and this can positively influence their FW behaviour later in their lifetime. Chefs can be subject to this influence, but this needs to be proven empirically.

2.4. Summary and research gap

The theories of social practice, social learning and ecological systems can help explain the FW management practices of chefs. The different environments can influence how chefs develop the meanings and competencies to manage FW and how they access the necessary materials and technology. The different (f)actors can contribute to this development as time goes by. No research has, however, attempted to shed light on this topic, thus revealing the opportunity for this study whose research design is explained next.

3. Methodology

Data were collected by the method of semi-structured interviews given the exploratory nature of the study. Qualitative research design enables an in-depth understanding of true feelings and life experiences of individuals in the context of complex social phenomena (Gair, 2012), such as FW management, which is aligned with the study's aims. More specifically, semi-structured interviews, given their flexibility, allow participants to freely express their views in their own terms while enabling researchers to follow upon any points made by participants to seek clarity or ask for in-depth explanations (Brinkmann, 2014).

It is important to note that a phenomenological qualitative method was initially considered for data collection and analysis in the current study given that it enables to explore in detail the lived experiences of individuals (Pernecky and Jamal, 2010), including chefs (Robinson et al., 2014). However, as data for the current study were collected in four countries (see below), thereby implying time-consuming and laborious fieldwork, but also potential researcher bias, it was eventually decided to employ semi-structured interviews. However, these interviews were designed to gain an in-depth insight into the lived experienced of chefs from the viewpoint of their learning about how FW could be effectively managed in the kitchen. Therefore, although not being a classical phenomenological investigation, this current study adopted the elements of phenomenology when exploring the FW management experiences of chefs.

3.1. Interview schedule design and sampling

The interview schedule incorporated three sets of questions. The first set of questions were introductory aiming to understand how the study participants developed interest in becoming a chef and how their career had progressed. These questions were also designed to examine the problem of FW in the HaFS organisations which the study participants represented and highlight approaches to its management. The second, main, set of questions aimed at understanding how the study participants first encountered the problem of FW, how they built their perception of it, and how this perception had changed, if at all, throughout their life and career journey. These questions were also designed to identify the key (f)actors (that)who had contributed to the study participants' understanding of FW and developed their practices towards its management. The questions sought to understand how the elements of social practice theory i.e., meanings, competencies, and materiality, influenced the FW management practices of the study

participants at the different stages of their personal life and professional career. Further, drawing upon social learning theory, the questions set to explore how the study participants learnt about FW and the need for its management, including the role of various (f)actors in this learning. Likewise, building upon ecological systems theory, the questions aimed to examine how the different social structures and settings, but also wider socio-economic and temporal contexts, influenced how FW management practices of chefs emerged and evolved. These questions were inspired by [Batat \(2020\)](#), [Chawla et al. \(2020\)](#), [Filimonau et al. \(2023a\)](#), [Sezerel and Filimonau \(2023\)](#), and [Sezerel et al. \(2023\)](#). The third set of questions provided the study participants with the opportunity to comment on this study and highlight any aspects of it which the interview did not cover.

To achieve content and face validity, the interview schedule design was first consulted with four senior academics studying culinary arts, human resources management in the HaFS sector, environmental sustainability in HaFS operations, and developmental psychology. The interview schedule was subsequently presented to two head chefs and their feedback was sought on the appropriateness of the questions used. Lastly, the interview schedule was piloted with two chefs prior to fieldwork. The interview schedule was designed in English and back translated in Polish, Russian and Bahasa Indonesia. Supplementary material (Appendix 1) contains an English copy of the final version of the interview schedule.

3.2. Sampling

The study population was represented by the chefs occupying a senior position i.e., equivalent to executive, head or sous chef, who must have made a conscious effort to practice FW management in the kitchen which they managed. Examples of such practices included cooking on demand, portion control, reuse of surplus ingredients and leftovers, surplus food redistribution, and onsite FW recycling for composting. As a pre-condition for participation, a prospective study participant should have had at least 2 years of work experience as a chef (excluding the periods of apprenticeship and training) and a minimum of 1 year of experience working as a senior chef. They should have obtained either some type of vocational education/training in cookery, kitchen management, restaurant management, hospitality management and/or culinary arts, or attended a similar course at a university. They should have also occupied a junior position in the kitchen, such as the apprentice chef or the commis chef, before their promotion.

The study participants were recruited by purposive sampling. This was deemed appropriate because of the above selection criteria and given that the study aimed at so-called 'information rich' cases ([Lincoln and Guba, 1985](#)) who could provide detailed answers regarding their lifelong and career experience of FW and its management. Professional contacts of the research team were used for initial recruitment, and snowball sampling was subsequently applied to access other eligible study participants. The research team was composed of academics, including those with the experience of working as chefs, and practicing chefs. Given the mixture of academic knowledge and practical experience, the research team was well positioned to sample study participants who could provide a detailed account of their FW management practices and elaborate on how these occurred. The sampling procedure was therefore aligned with [O'Reilly and Parker \(2012\)](#) who emphasize the critical role of a research team in defining adequacy and suitability of the study sample from the perspective of deemed appropriateness and richness of data to be collected.

As for the study's scope, senior chefs representing the HaFS organisations specializing in casual dining were targeted given that this sub-sector was dominant. All these organisations operated for profit, providing full service to their guests and being represented by medium-sized enterprises (150–300 seats). Geographically, the study covered the HaFS organisations based in England (mostly London and Southeast), Indonesia (Bali), Poland (mostly the Malopolska region), and Russia

(mostly southwest Siberia). This focus was determined by the availability of professional contacts established by the research team with HaFS organisations in the above geographies.

44 datapoints constituted the study sample ([Table 1](#)). Data saturation is often used as an indicator of the sample's adequacy ([O'Reilly and Parker, 2012](#)) and 10–30 datapoints are usually considered sufficient for saturation (Thomson 2010 cited by [Marshall et al., 2013](#)). This study fits into this recommended range. However, [Sebele-Mpofu \(2020\)](#) argues that a measure of saturation should not be the size of the raw data, but how these data can be categorized into themes. The results of thematic analysis (see [3.4. Data analysis](#)) indicated the 'themes saturation' as advocated by [Constantinou et al. \(2017\)](#) because the data loaded upon several main themes. Hence, the sample size was deemed adequate to reach the study's aims.

3.3. Interview administration

The interviews in England were conducted online using Microsoft Teams virtual meetings or Zoom as this enabled the research team to be more 'resource efficient' when reaching the study participants ([O'Reilly and Parker, 2012](#)). The interviews in Indonesia, Poland and Russia were conducted face-to-face on premises of the HaFS organisations which the study participants represented. This provided the research team with the opportunity to observe the FW management practices adopted by the study participants in their kitchens.

Data were collected between September 2022 and May 2023. The interviews lasted, on average, 65 minutes. They were recorded for subsequent transcribing. The study participants were not incentivized.

3.4. Data analysis

Thematic analysis was applied using guidance by [Clarke et al. \(2015\)](#). For trustworthiness, the interview transcripts were first carefully read by the research team member who collected data in their respective country. An initial coding structure was produced by them. Another member of the research team, who was detached from field work, then read the transcripts and coded them independently ([Lincoln and Guba, 1985](#)). The coding results were then compared to build the final coding structure. In the case of disagreements on data interpretation, a third member of the research team was involved for consensus.

[Fig. 1](#) presents the final coding structure. The main themes emerged around the meanings, competencies and materiality of the FW management practices adopted by chefs alongside the main actors of learning represented by the different individuals who chefs interacted with throughout their personal lives and professional careers, such as teachers or senior chefs/supervisors. These actors affected how the different elements of FW management practices occurred and evolved into habitual behaviours at the main levels of learning represented by the different stages of chefs' personal lives and professional careers, such as school or first workplace. In other words, [Fig. 1](#) plots the three elements of FW management practice across the main actors and the main levels of learning, thus 'glueing' social practice theory, social learning theory and ecological systems theory, respectively, together. The next section explains the study's findings in detail.

4. Findings

4.1. Meanings

When discussing the meanings of FW, the study participants spoke about the negative implications of wastage for HaFS organisations ('wasting food means wasting money and wasting money means you go out of business', P3), people ('it's a crime to waste [food] when there're so many disadvantaged people around', 18), the environment ('food waste is just bad because it means pollution and consumption of [natural] resources', R3) and them personally ('I just don't feel this [food waste] is right, it's against my

Table 1
Study participants (n=44).

Participant ID	Gender	Age	Current position	Experience of working as chef, years	Experience of working in a senior position as chef, years	A university degree in hospitality?	A vocational degree / training in hospitality?
ENGLAND							
E1	Male	In their 50 s	Head chef	25	8	-	+
E2	Male	In their 30 s	Head chef	8	5	-	+
E3	Male	In their 40 s	Head chef	12	7	-	+
E4	Female	In their 40 s	Sous chef	10	5	+	-
E5	Male	In their 40 s	Head chef	15	7	-	+
E6	Male	In their 40 s	Head chef	12	10	-	+
E7	Male	In their 40 s	Head chef	8	3	-	+
E8	Male	In their 40 s	Head chef	14	8	-	+
E9	Male	In their 50 s	Executive chef	25	21	-	+
E10	Female	In their 30 s	Sous chef	6	3	-	+
INDONESIA							
I1	Male	In their 30 s	Sous chef	5	3	-	+
I2	Male	In their 40 s	Head chef	8	4	-	+
I3	Female	In their 50 s	Executive chef	24	21	+	-
I4	Male	In their 40 s	Head chef	11	6	-	+
I5	Male	In their 40 s	Sous chef	22	12	-	+
I6	Male	In their 40 s	Head chef	12	7	-	+
I7	Male	In their 40 s	Head chef	17	12	-	+
I8	Male	In their 30 s	Sous chef	10	4	+	-
I9	Female	In their 30 s	Sous chef	12	6	-	+
I10	Female	In their 40 s	Head chef	20	14	-	+
I11	Male	In their 50	Head chef	25	18	-	+
I12	Male	In their 50	Head chef	28	22	-	+
POLAND							
P1	Male	In their 30 s	Head chef	10	4	+	+
P2	Female	In their 40 s	Head chef	12	8	-	+
P3	Male	In their 40 s	Head chef	16	8	+	+
P4	Male	In their 50 s	Executive chef	25	20	-	+
P5	Male	In their 40 s	Sous chef	20	6	-	+
P6	Male	In their 40 s	Sous chef	17	10	-	+
P7	Male	In their 40 s	Sous chef	22	16	-	+
P8	Female	In their 30 s	Head chef	12	5	+	-
P9	Male	In their 30 s	Head chef	10	4	+	-
P10	Male	In their 40 s	Head chef	18	6	+	-
RUSSIA							
R1	Male	In their 30 s	Sous chef	11	5	+	+
R2	Male	In their 30 s	Head chef	8	5	+	-

(continued on next page)

Table 1 (continued)

Participant ID	Gender	Age	Current position	Experience of working as chef, years	Experience of working in a senior position as chef, years	A university degree in hospitality?	A vocational degree / training in hospitality?
R3	Male	In their 50 s	Head chef	19	13	-	+
R4	Male	In their 40 s	Executive chef	20	14	-	+
R5	Female	In their 30 s	Head chef	8	3	-	+
R6	Female	In their 40 s	Head chef	12	5	+	-
R7	Male	In their 40 s	Head chef	10	4	+	+
R8	Male	In their 40 s	Head chef	18	6	-	+
R9	Male	In their 50 s	Executive chef	20	12	-	+
R10	Female	In their 40 s	Sous chef	18	14	-	+
R11	Male	In their 40 s	Head chef	12	6	-	+
R12	Male	In their 30 s	Head chef	8	3	-	+

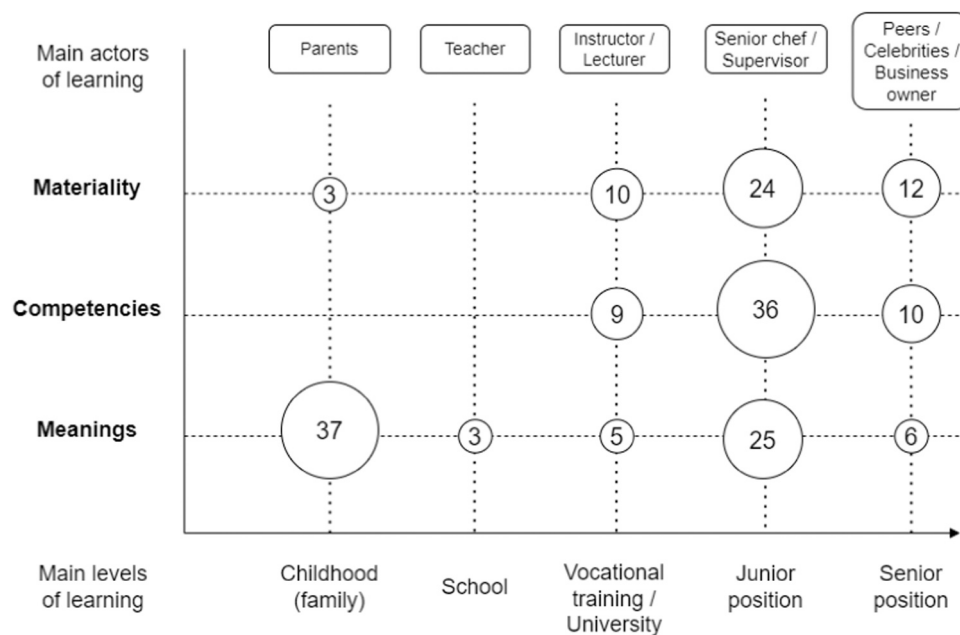


Fig. 1. The coding structure of the datapoints. See explanations in the text. Notes: (1) Horizontal axis represents the lifetime of a chef and their career; (2) Vertical axis represents the different elements of the social practice theory; (3) The size of the circle corresponds to the 'weight' of each code i.e., the number of times it was mentioned in the interview transcripts (equivalent to the figure inside the circle).

nature', E9), see Table 2 for further elaboration. When prompted on when these meanings were formed, the study participants primarily referred to their families (Fig. 1). The majority first recognised FW in childhood with mothers and grandmothers shaping this recognition. The study participants discussed how they learnt from parents about not wasting food when eating as a family:

'I remember when I was young, probably 6 or 7 years old, every time I had a dinner with my family, my mother would say 'XXX [name removed for anonymity] remember how difficult it was to make your meal, so finish it off and do not waste a piece. I learnt not to waste thanks to my mother' (R11)

The meanings were also repeatedly discussed when the study participants referred back to their experiences as junior chefs (Fig. 1). The role of senior chefs and supervisors as the key actors and role models

under whose influence junior chefs would either gain the first recognition or receive reinforcement to their understanding of FW was acknowledged. For many, this was the first 'real life' encounter with FW in commercial HaFS settings, and the study participants retained that memory throughout their careers. This showcased the social learning experience which became habitual as the chefs' career progressed:

'It was one of my first shifts, and I was nervous. The service was busy, my senior was tasked with something else, so I was ordered to cut a steak. Which I did but, apparently, wrong. XXX [head chef, name removed for anonymity] witnessed that, looked at me and said 'This is the last time you made this waste, understood? There is no waste in my kitchen!' That was a good lesson [laughter]' (I2)

The other levels of chefs' lifelong experience and career played a much less significant role in the formation and reinforcement of their FW meanings (Fig. 1). Few study participants discussed how, already

Table 2

Examples of meanings, competencies and materiality in FW management practices provided by the study participants.

Social practice element	Description/Interpretation	Exemplary quote
Meanings	Negative financial consequences of food waste generation	'Food waste means low profit margins' (R5)
	Negative environmental and socio-economic implications of food waste generation	'There are people who cannot afford food, so wasting it in the presence of poor people is barely acceptable' (I10)
	Personal norms and values on food waste reduction	'I live by the principle that any waste is bad, be it food or anything else' (E3)
Competencies	Menu planning and design	'Long menus are wasteful. You order too much stuff, it gets rotten before it gets used' (P1)
	Inventory management	'First In First Out is the basic principle of saving food from waste in the kitchen' (R7)
	Knife skills and food preparation techniques	'As a chef, the first thing you must learn is how to cut and trim. Without this skill, you won't succeed in the kitchen' (P6)
	Plating and presentation skills	'Say, you put too much sauce on a plate. The customer doesn't like it. You receive the dish back with a request to re-do it. This is waste' (R9)
	Creativity	'You need to be creative to avoid food waste. You need to know how to use whatever is left in the kitchen to ensure it doesn't go to the bin. Sometimes this means you have to challenge yourself and prepare something new' (I4)
Materiality	Kitchen equipment	'If the fridge is broken, all food goes to waste, this is obvious, isn't it?' (P3)
	Cutting implements (for example, knife)	'If a knife is not sharp enough, a good piece of meat will be wasted' (I5)
	Digital technology	'New things are coming up. Say, a smart fridge which reminds you by when the foodstuffs should be used...' (E5)

being senior, they recognised FW because of the business owner or manager ('our owner was super savvy and made it very clear to me that he wouldn't tolerate any unjustifiable wastage in the kitchen', P10), their peers ('I learnt it from my mates how to broth out of bones', I7), mass media ('it [food waste] is always on the news, it's difficult not to notice it and therefore not to become aware of it', R2) and even celebrities ('I saw the show with Jamie Oliver once where he was speaking about how to cut the amount of food people waste and save money. I was impressed, so I started doing it myself', E5). Only a handful of study participants spoke about getting the first meanings of FW in vocational education/training or at a university. Very few acknowledged the role of teachers in schools, thus indicating social learning:

'In my school, the teacher was brilliant. She spoke about it [food waste] when we wouldn't eat our meals, so this is how I've remembered that and taken it through my life' (R12)

In summary, the meanings of FW were formed among most chefs in their childhood with the family being the main actor of learning. These meanings were carried over throughout the chefs' lifelong experiences and reinforced early in their career by the interactions with senior chefs/supervisors. In some cases, the meanings were formed directly at the beginning of the chefs' professional careers. This was the case for those chefs whose families did not encourage FW mitigation. The contribution

of other life and career stages, such as school, vocational and university education, alongside senior work positions were noticeably less significant.

4.2. Competencies

The study participants described competencies to manage FW as a set of skills required to save food from going to waste, emphasizing the importance of personal confidence in cooking resourcefully i.e., 'it's when you know how to, say, make a gazpacho out of any leftover tomatoes at the end of the shift. It's also about making sure the customer likes this gazpacho without guessing it was made impromptu' (E4), see Table 2 for further elaboration. This highlighted the role of self-efficacy in the FW management practices. When prompted to speak about how competencies were formed, the majority referred to their work experience as junior chefs (Fig. 1). Senior chefs/supervisors were instrumental for building these competencies with many study participants explaining how they learnt from observing how their senior colleagues were acting to mitigate FW in the kitchen. The success of these actions reinforced the perceptions of the value of FW management among junior chefs, thus encouraging them to adopt the practice to mitigate FW in their career:

'My senior [chef] was a magician. No, really [laughter], he wouldn't waste a thing. Once we had a pile of bananas by mistake. He ordered to make banoffee pies out of these bananas. It was such a hit; the customers were so happy that our manager ordered a banoffee pie as a regular menu item' (R1)

Some study participants discussed how they built competencies in FW management once they had been promoted to their current, senior positions (Fig. 1). At this stage of their careers, fellow colleagues, celebrities and business owners were the main actors of learning. By observing what their peers were doing with food leftovers, some chefs learnt to apply the same practices in their own kitchens. Likewise, by following celebrity chefs, some study participants claimed to have learnt how to cook more skilfully to mitigate FW. Further, some chefs started deliberately learning how to save food from going to waste by seeing how FW was discussed in mass media. They admitted that this learning was further facilitated by the growing national pro-environmental agenda as reported by journalists and promoted by the non-governmental organisations specializing in FW prevention, such as the UK's Waste and Resources Action programme (WRAP) and Indonesia's Scholars of Sustenance (SOS). Lastly, attitudes of business owners towards FW and its mitigation played a role in the chefs' upskilling. For example, one chef spoke about the training courses on FW management which they attended upon recommendation of their business owner:

'Of course, I knew the basics [of FW management]. However, my boss was really a perfectionist; he wanted us to excel. So, once he came and said, you know, there is a guy from France in town who will run a workshop on green kitchens. Do you wanna go? I said 'okey' and, you know what, it was quite good. I learnt some interesting stuff on wasteless cooking and storage' (I4)

Lastly, unlike in the case of the FW meanings, the role of education providers was highlighted as more significant for building initial competencies in FW mitigation (Fig. 1). Some chefs became competent in managing FW when attending their vocational training or university degree courses. This was the case for those who received their vocational or university education from the providers with on-site training restaurants. This training was instrumental in making chefs resourceful:

'My vocational training was good. The training restaurant was the place where I learnt how to cut food waste. Although it was not the focus of the training, my instructor insisted that wasteless cooking went hand to hand with skilful cooking' (P8)

In summary, competencies towards FW mitigation are initially formed early in a chef's career with senior colleagues/supervisors being

the key to this formation. Later in the career, chefs can refine their competencies by observing how peers and business owners handle FW. Early in the career, initial competencies can also be formed at the level of vocational training and university education. The influence of this career stage is, however, less critical compared to the other two.

4.3. Materiality

The study participants acknowledged the importance of tools and technology for FW management in professional kitchens, see Table 2 for further elaboration. It was recognised that the first exposure to these materials occurred at the early stage of the chefs' careers (Fig. 1). Similar to competencies, this is where senior colleagues/supervisors were instrumental for explaining how to access kitchen tools and technology and how to use it. Training was considered critical to ensure that the materials were not only used for FW management, but also to guarantee a chef's own safety:

'Thinking back, the core knowledge of how to cut, chop, boil, bake and fry efficiently came to me when I was junior [chef]. This is when I was exposed to all the kitchen equipment. I mean I more or less knew how to use it, but the equipment can be different, so it takes time before you get used to it. For example, in my first job the frier was tricky to handle as it tended to burn things on one side. It took me a while to find a 'common language' with this device [laughter]' (R2)

As the study participants progressed in their career, the role of materiality in their FW management practices decreased (Fig. 1). Business owners were paramount at this career stage as they determined which tools and technology could be used in the kitchen. If these were deemed

insufficient, a business owner would be approached with a request to buy new ones. Some study participants claimed that they would also oversee the tools and technology used by their peers and then try to convince their business owners to purchase these for their own kitchen.

'The owner is the one who decides on what [equipment] to buy. Therefore, they are key for food waste management. I remember our freezer did not work properly. When this was reported, the owner replaced it straight away. Faulty freezer means faulty food and waste' (I9)

The study participants were exposed to materiality when they obtained their education or training (Fig. 1). For some, this was when they first encountered the tools and technology which enabled them to use these more effectively in the first job and as their career progressed. Lastly, few study participants spoke about materiality in the context of their families. Some claimed to have started cooking when they were young, and this was the first time when they developed an understanding of materiality for FW management.

In summary, similar to competencies and meanings, an understanding of materiality occurs early in a chef's career being influenced by senior colleagues/supervisors. Materiality can also form at the stage of vocational training and university education. Lastly, even if a chef is senior, materiality can be reinforced by learning from peers and communicating with business owners.

5. Discussion

Through the prism of three theories, this study enhances an understanding of how the FW management practices are formed and reinforced throughout a chef's lifelong experience and professional career.

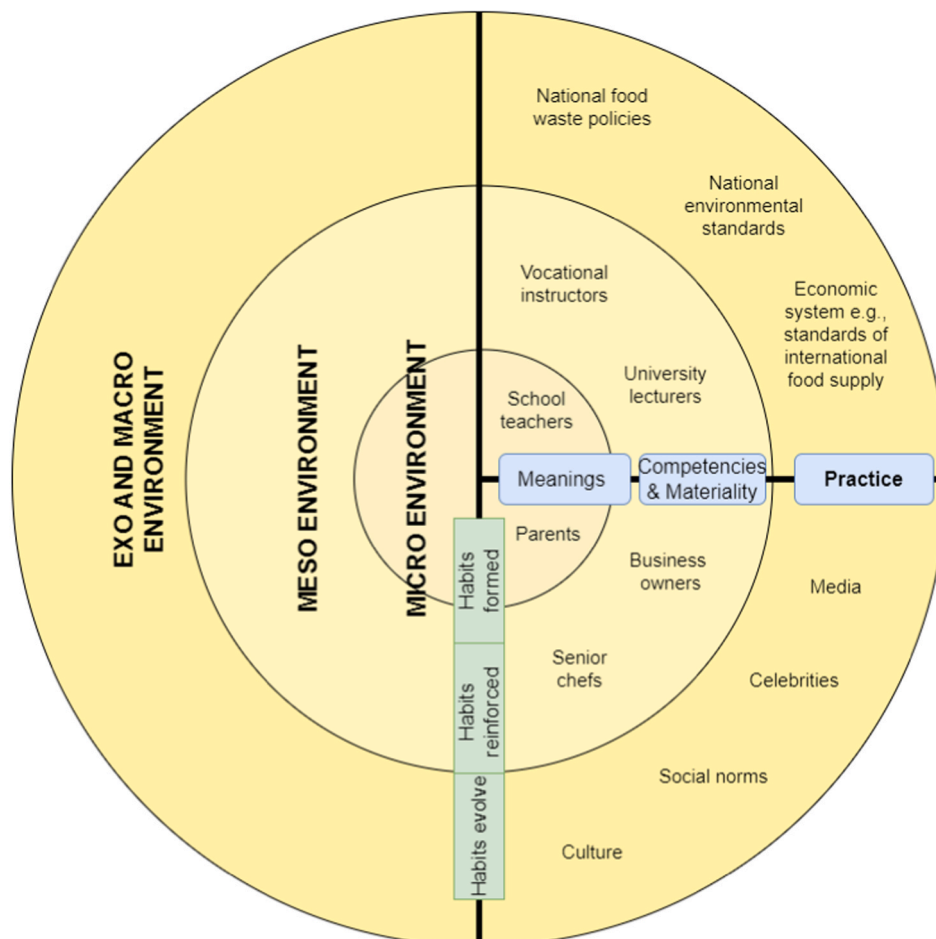


Fig. 2. The (f)actors shaping the food waste management practices of chefs across the different environments of their lifelong experience and professional career.

The study establishes the (f)actors contributing to this formation and reinforcement across the different, physical and chronological, environments in which a chef lives, works and learns (Fig. 2). More specifically, Fig. 2 shows how the main actors of learning are positioned in relation to the elements of social practice theory and ecological systems theory. Lastly, the study pinpoints how habitual behaviour of chefs towards FW mitigation occurs across their lifetime and what actors of learning should be engaged to accelerate this occurrence.

The study reveals that the meanings of practices, one of the cornerstones of the social practice theory, first occur in childhood i.e., in the micro-environment of human interactions as per the ecological systems theory. Parents represent the main actor of learning in this environment. Depending on children's age, they may not impose direct change to behaviour, but facilitate formation of early practices or even habits. In terms of FW management, these practices can be bad, such as leaving food on a plate uneaten. However, the practices can also be good, such as when parents encourage consumption of all food. Chefs learn from their family and then reproduce their attitudes and behaviour towards FW later in their life, as per the social learning theory. Importantly, the meanings are retained by chefs as they progress in their personal lives and professional careers. The meanings are influenced, or even refined, later in a chef's career by other actors of learning, especially senior chefs/supervisors.

Although no research has considered formation and reinforcement of FW management practices among chefs from the perspective of their lifelong experience, some parallels can be drawn between the findings of this study and the literature. For example, Hemar-Nicolas et al. (2013) and Sorokowska et al. (2020) have demonstrated how children are influenced by the food consumption practices of their parents. Filimonau et al. (2023b) have specifically shown how children learn about FW from their parents in the context of Poland, where part of the data was collected for the present study. The above-referenced investigations are, however, concerned with children as future consumers. The unique contribution of the current study is in highlighting that parents can also shape the professional outlook of children if their future jobs are to deal with food preparation, such as chefs.

Competencies and materiality, as the other two cornerstone elements of the social practice theory, are mostly formed in the meso-environment (Fig. 2) being a product of complex interactions of chefs-to-be and junior chefs with multiple actors, primarily senior chefs/supervisors, but also, to a lesser extent, educational instructors, peers and business owners. Social learning occurs extensively in this environment with knowledge transfer on how to cook skilfully and wastelessly from these actors of learning towards chefs. Competencies and materiality reinforce the meanings of FW management in this environment because, even if a chef is well aware of the detriment of FW in the result of previous exposure to FW in their family, without the necessary skills and access to the correct equipment, they cannot be fully resourceful. For example, Ko and Lu (2021) demonstrate how such skills as menu design and meal planning can support chefs' recognition of why surplus food should be reused, thus complementing this study's findings (Table 2). Likewise, Martin-Rios et al. (2020) show how specialized kitchen tools, in their case an automated FW data collection and analysis solution, can motivate chefs to manage FW more effectively. This is aligned with the findings of the current study, see Table 2. In other words, as Hennchen (2019) argues, all elements of practice theory are interlinked, and these interlinkages can evolve with time under the influence of various (f)actors.

Batat (2020) and Chawla et al. (2020) were the first to highlight the importance of chefs' competencies and materiality for FW management in professional kitchens. These investigations did not, however, consider how these elements of practices emerged. The unique contribution of the present study is thus in highlighting the stages of a chef's lifelong experience and career development where interventions are warranted to form and reinforce competencies and materiality for FW mitigation. This indicates that the first jobs are critical for building an understanding of FW management practices among chefs and apprentices

across the global HaFS market.

The study shows that the exo- and macro-environment is also important for shaping FW management practices (Fig. 2). The initial meanings, competencies and materiality will be formed in the micro- and meso-environments, being influenced by the actors of learning located in the direct proximity to chefs, such as parents and senior chefs/supervisors. For example, Filimonau et al. (2022b) and Makhal et al. (2021) show how FW perceptions of children are influenced by their parents and how these influences can persist as children grow, leave their parents, and start living an independent life. However, the FW management practices can evolve under the influence of different (f)actors within the exo- and macro-environment. These (f)actors are represented by media, social norms and cultural values of the society where chefs work, to mention a few. For instance, Pizzetti et al. (2023) pinpoint the importance of media and, more specifically, celebrity chefs being present on media, in shaping the outlook of other chefs on how to perceive FW and practise its management. Further, in the context of the current study, a participant from Indonesia claimed that as much as they wanted to mitigate FW in their kitchen by avoiding surplus meals during weddings and funerals, they had to fulfil the customer orders demanding them to produce more meals than required. This highlights the influence of the cultural trait of 'face saving' which often occurs during social events (Filimonau and Delysia, 2019). The chef claimed that, to at least partially mitigate FW during social events, thus changing their practice, he provided all surplus meals to the customer after the end of the event. Likewise, Vizzoto et al. (2020) argue how the national legislative system can prompt chefs to change their FW management practices by, for example, engaging in food rescue.

Lastly, the study reveals that chefs develop the habit to mitigate FW in professional kitchens throughout their lifelong experience and career (Fig. 2). Habitual behaviour can be initially formed in childhood when chefs-to-be observe and internalise the FW management practices of their parents. For instance, when eating a meal, when told by a parent to finish it (=a trigger), a child cleans a plate (=a routine behaviour) and receives a praise or a dessert (=a reward). Interestingly, if parents do not practice FW mitigation, then this sequence is not followed and a habit to manage FW does not form at this stage, but it can occur later in a chef's life or career under the influence of other (f)actors. Further, as a child grows and becomes a chef, the habit of FW management formed in the childhood can be reinforced at various stages of their lifelong experience and career. For instance, instructors and lecturers can strengthen the habit at the stage of vocational training and university education, respectively. Likewise, by engaging in FW mitigation and encouraging others to do so, senior chefs/supervisors can reinforce the FW management habits of junior chefs. The habit can further evolve when chefs become senior under the influence of various macroeconomic, social, legal and political factors. For instance, if new legislation comes into force requiring HaFS providers to redistribute surplus food, such as in the case of Italy (Secondi et al., 2020), then chefs will have to change their current FW management practice accordingly. This suggests that the FW management practice of chefs can represent an object of a macro analysis and the habits of chefs to mitigate FW occurring at various stages of their lifelong experience and career can thus become the determinants of this practice's formation at the individual level.

6. Conclusions

This study responds to the call by Munir (2022) and Sezerel and Filimonau (2023) for more empirical research on the role of social practice theory in FW management in the HaFS sector. By exploring the lifelong experiences of senior chefs from four HaFS markets, this study builds an initial understanding of how the FW management practices of chefs are formed and how they evolve throughout the chefs' personal lives and professional career. The study identifies the main actors of learning who have the largest potential to influence formation and reinforcement of FW management practices within the different

environments of the chefs' lifelong experience.

6.1. Theoretical implications

The study complements an emerging line of research on the application of social practice theory in the context of FW management in professional kitchens (Batat, 2020; Chawla et al., 2020; Filimonau et al., 2023a). The literature has acknowledged that the practice of chefs is critical for effective FW mitigation and that all elements of this practice i.e., meanings, competencies and materiality, can aid in explaining how FW is managed by chefs. The unique contribution of the current study is in revealing how the FW management practices of chefs are formed and become reinforced as a chef's personal life and career progress and what (f)actors should be engaged in this formation and reinforcement.

Another theoretical contribution of this study is in extending the theories of social learning and ecological systems towards the realm of FW mitigation in professional kitchens. The study demonstrates that chefs learn about FW and its management from different actors and reproduce the attitudes and behaviours of these actors as their life and career develop. The learning occurs in different environments as a result of complex interactions of chefs with various (f)actors. This learning shapes habitual behaviour of chefs towards FW mitigation which they practice in the workplace and can transfer to other actors within the kitchen, such as junior chefs and apprentices, and, potentially, outside it, such as children at home.

6.2. Managerial implications

The study indicates two key actors of learning who hold the foremost potential to shape and reinforce the FW management practices of chefs i.e., their family and senior chefs/supervisors. These actors should be engaged to nurture FW mitigation in professional kitchens.

Education campaigns can potentially aid in building awareness and behaviour towards FW management among parents. This becomes especially important because, by educating parents, FW mitigation can be achieved both at the level of households (i.e., immediate, direct effect) and HaFS (i.e., future spillover, indirect effect when/if children become chefs). However, the design of education campaigns on FW management for parents can be challenging; further, it may be difficult to engage parents in such campaigns even if these have been effectively designed. Therefore, future research is warranted to better understand who or what may represent the center of influence for parents. Once identified, these centers of influence can then be engaged in the development of awareness building campaigns and initiatives that will extend beyond education.

Education campaigns are also important for building FW awareness and behaviour among senior chefs/supervisors so that it can be transferred to junior chefs and apprentices. These campaigns should take the form of pro-environmental training which can be provided by governmental organisations or industry associations, potentially in collaboration with celebrity chefs as they are considered the role models from who chefs can learn. By engaging both parents and senior chefs/supervisors at once, the potential effect on the FW management practice will be doubled. This is because the practice will be formed in the family and then reinforced in the workplace. However, even if the FW management practice is not formed in the family, it can still occur in the workplace as a result of junior chefs' learning from senior chefs/supervisors.

The study shows that education providers do not yet play a role in shaping the FW outlook of chefs-to-be. Alarmingly, this is the case for all four countries studied, thus indicating that the issue may persist across many HaFS markets. Future research is warranted to better understand why education in its current form is ineffective to encourage FW management among chefs. More specifically, it is important to examine if such ineffectiveness is due to the lack of specialised study programmes/modules or because these programmes/modules are not delivered effectively. In either case, the findings of the current study indicate that

education providers should more actively integrate dedicated programmes on FW management and/or resourceful cooking in their curricula. This is to ensure that the FW mitigation practices of chefs are formed and reinforced while attending vocational training and university. For example, an extended period of a hands-on training in either a university-hosted restaurant or a commercial kitchen should become mandatory for the students who pursue programmes in culinary arts and hospitality management at university level.

6.3. Limitations and future research directions

The study involved the multi-geographical data collection with limited participants from each country. Future research should be more focused, engaging more participants from a single HaFS market, to gain a (more) detailed account of their FW management practices. Alternatively, future research can be concerned with multiple geographies, focusing on the potential influences of national cultures of chefs on their FW management practices. Such a comparative investigation can aid in detecting the effect of socio-cultural contexts on how the practice to manage FW in professional kitchens is formed and how it evolves with time. Next, the study was limited to a sample of senior chefs from four HaFS markets. By extending the scope of investigation towards junior chefs and chefs-to-be, including students, and other HaFS markets, can provide interesting new perspectives on the issue in focus. Likewise, the integration of other stakeholders in analysis, especially those identified as the key actors of learning, such as education providers and parents of children aspiring to be chefs, can offer novel insights into how the FW management practices are formed and reinforced at different stages of the chefs' lifelong experience and professional career. Next, the study's sample was represented by medium-sized, full service HaFS enterprises operating for profit in the casual dining segment of the market. Future research should expand its inquiry to cover other types of HaFS organisations given that FW management practices differ depending on business category, size and specialism. Further, given its focus on the lived experiences of individuals, the qualitative method of phenomenology may offer useful insights into how FW is managed by senior chefs. Therefore, future studies should take advantage of phenomenology in pursuit of detailed accounts of the 'lived' FW management experiences of senior chefs. Lastly, a longitudinal investigation is warranted: students admitted to a programme in culinary arts or hospitality management can first be examined about their FW awareness and behaviour. A subsequent investigation can take place at the end of their studies to understand how/if these attitudes and behaviours have changed. Another round of data collection can then be undertaken after the graduates have embarked on their first job and/or following a few years of work experience as a chef. Such a long-scale longitudinal investigation can offer a valuable, realistic perspective on how FW awareness and behaviour are formed and evolve with time, but also what (f)actors contribute to these formation and evolution.

CRedit authorship contribution statement

Bhaskara Gde Indra: Conceptualization, Investigation, Writing – review & editing. **Ermolaev Vladimir A.:** Conceptualization, Investigation, Writing – review & editing. **Ashton Mark:** Conceptualization, Investigation, Writing – review & editing. **Kubal-Czerwińska Magdalena:** Conceptualization, Investigation, Writing – review & editing. **Filimonau Viachaslau:** Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft. **Sezerel Hakan:** Conceptualization, Formal analysis, Writing – review & editing.

Declaration of Competing Interest

The authors hereby declare no conflict of interest.

Data Availability

Data will be made available on request.

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References

- Abecassis-Moedas, C., Sguera, F., Ettlie, J.E., 2016. Observe, innovate, succeed: a learning perspective on innovation and the performance of entrepreneurial chefs. *J. Bus. Res.* 69 (8), 2840–2848.
- Ajzen, I., 1991. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* 50, 179–211.
- Armitage, C.J., Conner, M., 2001. Efficacy of the theory of planned behaviour: a meta-analytic review. *Br. J. Soc. Psychol.* 40 (4), 471–499.
- Bandura, A., 1978. Social learning theory of aggression. *J. Commun.* 28 (3), 12–29.
- Bandura, A., Walters, R.H., 1977. *Social Learning Theory*. Prentice Hall, Englewood cliffs.
- Batat, W., 2020. Pillars of sustainable food experiences in the luxury gastronomy sector: a qualitative exploration of Michelin-starred chefs' motivations. *J. Retail. Consum. Serv.* 57, 102255.
- Beatson, A., Gottlieb, U., Fleming, K., 2020. Green consumption practices for sustainability: an exploration through social practice theory. *J. Soc. Mark.* 10 (2), 197–213.
- Bohdanowicz, P., Zientara, P., Novotna, E., 2011. International hotel chains and environmental protection: an analysis of Hilton's we care! programme (Europe, 2006–2008). *J. Sustain. Tour.* 19 (7), 797–816.
- Bourdieu, P., 1977. *Cambridge. Outline of a Theory of Practice*. Cambridge University Press.
- Brinkmann, S., 2014. Unstructured and semi-structured interviewing. *Oxf. Handb. Qual. Res.* 2, 277–299.
- Bronfenbrenner, U., 2000. *Ecological systems theory*. Oxford University Press.
- Brown, M.E., Treviño, L.K., Harrison, D.A., 2005. Ethical leadership: A social learning perspective for construct development and testing. *Organ. Behav. Hum. Decis. Process.* 97 (2), 117–134.
- Chawla, G., Lugosi, P., Hawkins, R., 2020. Evaluating materiality in food waste reduction interventions. *Ann. Tour. Res. Empir. Insights* 1 (1), 100002.
- Chawla, G., Lugosi, P., Hawkins, R., 2022. Factors influencing hospitality employees' pro-environmental behaviours toward food waste. *Sustainability* 14 (15), 9015.
- Chwialkowska, A., 2019. How sustainability influencers drive green lifestyle adoption on social media: the process of green lifestyle adoption explained through the lenses of the minority influence model and social learning theory. *Manag. Sustain. Dev.* 11 (1), 33–42.
- Clarke, V., Braun, V., Hayfield, N., 2015. *Themat. Anal. Qual. Psychol.: A Pract. Guide Res. Methods* 3, 222–248.
- Constantinou, C.S., Georgiou, M., Perdikiogianni, M., 2017. A comparative method for themes saturation (CoMeTS) in qualitative interviews. *Qual. Res.* 17 (5), 571–588.
- Coskun, A., Filimonau, V., 2021. I waste food but this is not my fault!: exploring the drivers of plate waste in foodservices of Turkey through the prism of neutralisation theory. *J. Clean. Prod.* 329, 129695.
- Darling, N., 2007. Ecological systems theory: the person in the center of the circles. *Res. Hum. Dev.* 4 (3–4), 203–217.
- Demetriou, P., 2022. Hotel food waste in Cyprus: an exploratory case study of hotels in Limassol. *Cogent Soc. Sci.* 8 (1), 2026556.
- Dhir, A., Talwar, S., Kaur, P., Malibari, A., 2020. Food waste in hospitality and food services: a systematic literature review and framework development approach. *J. Clean. Prod.* 270, 122861.
- Dobson, G.J., Douglas, G., 2020. Who would do that role? Understanding why teachers become SENCOs through an ecological systems theory. *Educ. Rev.* 72 (3), 298–318.
- Dolnicar, S., 2020. Designing for more environmentally friendly tourism. *Ann. Tour. Res.* 84, 102933.
- Duerden, M.D., Witt, P.A., 2010. An ecological systems theory perspective on youth programming. *J. Park Recreat. Adm.* 28 (2), 108–120.
- Elia, V., Gnoni, M.G., Tornese, F., 2015. Designing Pay-As-You-Throw schemes in municipal waste management services: a holistic approach. *Waste Manag.* 44, 188–195.
- FAO-Food and Agriculture Organisation, 2023. *Sustainable Development Goals*. Rome.
- Filimonau, V., Delysia, A., 2019. Food waste management in hospitality operations: a critical review. *Tour. Manag.* 71, 234–245.
- Filimonau, V., Matute, J., Kubal-Czerwińska, M., Krzesiwo, K., Mika, M., 2020a. The determinants of consumer engagement in restaurant food waste mitigation in Poland: An exploratory study. *J. Clean. Prod.* 247, 119105.
- Filimonau, V., Zhang, H., Wang, L.E., 2020b. Food waste management in Shanghai full-service restaurants: a senior managers' perspective. *J. Clean. Prod.* 258, 120975.
- Filimonau, V., Mika, M., Kubal-Czerwińska, M., Zajadacz, A., Durydiwka, M., 2022b. Religious values and family upbringing as antecedents of food waste avoidance. *Glob. Environ. Change* 75, 102547.
- Filimonau, V., Ermolaev, V.A., Vasyukova, A., 2022a. Food waste in foodservice provided in educational settings: an exploratory study of institutions of early childhood education. *Int. J. Gastron. Food Sci.* 28, 100531.
- Filimonau, V., Chiang, C.C., Wang, L.E., Muhaldin, B.J., Ermolaev, V.A., 2023a. Resourcefulness of chefs and food waste prevention in fine dining restaurants. *Int. J. Hosp. Manag.* 108, 103368.
- Filimonau, V., Matute, J., Kubal-Czerwińska, M., Mika, M., 2023b. Religious values and social distance as activators of norms to reduce food waste when dining out. *Sci. Total Environ.*, 161645.
- Fonte, M., 2013. Food consumption as social practice: solidarity purchasing groups in Rome, Italy. *J. Rural Stud.* 32, 230–239.
- Gair, S., 2012. Feeling their stories: Contemplating empathy, insider/outsider positionings, and enriching qualitative research. *Qual. Health Res.* 22 (1), 134–143.
- Giddens, A., 1984. *Elements of the theory of structuration*. Routledge.
- Goh, E., Jie, F., 2019. To waste or not to waste: Exploring motivational factors of Generation Z hospitality employees towards food wastage in the hospitality industry. *Int. J. Hosp. Manag.* 80, 126–135.
- Hargreaves, T., 2011. Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *J. Consum. Cult.* 11 (1), 79–99.
- Heikkilä, L., Reinikainen, A., Katajajuuri, J.M., Silvennoinen, K., Hartikainen, H., 2016. Elements affecting food waste in the food service sector. *Waste Manag.* 56, 446–453.
- Hemar-Nicolas, V., Ezan, P., Gollety, M., Guichard, N., Leroy, J., 2013. How do children learn eating practices? Beyond the nutritional information, the importance of social eating. *Young.-. Consum.* 14 (1), 5–18.
- Hennchen, B., 2019. Knowing the kitchen: Applying practice theory to issues of food waste in the food service sector. *J. Clean. Prod.* 225, 675–683.
- Ikhida, J.E., Ogunmokun, O.A., Chen, T., 2023. Restraints and enablers of green initiative-taking among hospitality employees: a mixed-methods approach. *J. Sustain. Tour.* 1–22.
- Kim, M.J., Hall, C.M., Kim, D.K., 2020. Predicting environmentally friendly eating out behavior by value-attitude-behavior theory: does being vegetarian reduce food waste? *J. Sustain. Tour.* 28 (6), 797–815.
- Kim, W., Che, C., Jeong, C., 2022. Food waste reduction from customers' plates: applying the norm activation model in south Korean context. *Land* 11 (1), 109.
- Kline, C., Gard McGehee, N., Paterson, S., Tsao, J., 2013. Using ecological systems theory and density of acquaintance to explore resident perception of entrepreneurial climate. *J. Travel Res.* 52 (3), 294–309.
- Ko, W.H., Lu, M.Y., 2021. Developing a professional competence scale for kitchen staff: food value and availability for surplus food. *Int. J. Hosp. Manag.* 95, 102926.
- Lau, J., Ng, K.M., 2014. Conceptualizing the counseling training environment using Bronfenbrenner's ecological theory. *Int. J. Adv. Couns.* 36, 423–439.
- Lavelle, F., Spence, M., Hollywood, L., McGowan, L., Surgenor, D., McCloat, A., et al., 2016. Learning cooking skills at different ages: a cross-sectional study. *Int. J. Behav. Nutr. Phys. Act.* 13 (1), 1–11.
- Lennerfors, T.T., Fors, P., van Rooijen, J., 2015. ICT and environmental sustainability in a changing society: the view of ecological World Systems Theory. *PLoS Technol.* People 28 (4), 758–774.
- Lincoln, Y.S., Guba, E.G., 1985. *Naturalistic inquiry*. Beverly Hills, CA: SAGE.
- Linder, N., Giusti, M., Samuelsson, K., Barthel, S., 2022. Pro-environmental habits: an underexplored research agenda in sustainability science. *Ambio* 51, 546–556.
- Luu, T.T., 2020. Reducing food waste behavior among hospitality employees through communication: dual mediation paths. *Int. J. Contemp. Hosp. Manag.* 32 (5), 1881–1904.
- Makhal, A., Robertson, K., Thyne, M., Mirosa, M., 2021. Normalising the “ugly” to reduce food waste: exploring the socialisations that form appearance preferences for fresh fruits and vegetables. *J. Consum. Behav.* 20 (5), 1025–1039.
- Marshall, B., Cardon, P., Poddar, A., Fontenot, R., 2013. Does sample size matter in qualitative research?: A review of qualitative interviews in IS research. *J. Comput. Inf. Syst.* 54 (1), 11–22.
- Martin-Rios, C., Hofmann, A., Mackenzie, N., 2020. Sustainability-oriented innovations in food waste management technology. *Sustainability* 13 (1), 210.
- Mottaleb, K.A., Mishra, A.K., 2017. Consumption of food away from home in Bangladesh: do rich households spend more? *Appetite* 119, 54–63.
- Munir, K., 2022. Sustainable food waste management strategies by applying practice theory in hospitality and food services—a systematic literature review. *J. Clean. Prod.* 331, 129991.
- Musgrave, J., Woodward, S., 2016. Ecological systems theory approach to corporate social responsibility: contextual perspectives from meeting planners. *Event Manag.* 20 (3), 365–381.
- Neal, J.W., Neal, Z.P., 2013. Nested or networked? Future directions for ecological systems theory. *Soc. Dev.* 22 (4), 722–737.
- Neuman, N., 2019. On the engagement with social theory in food studies: cultural symbols and social practices. *Food, Cult. Soc.* 22 (1), 78–94.
- Ng, P.Y., Sia, J.K.M., 2023. Managers' perspectives on restaurant food waste separation intention: the roles of institutional pressures and internal forces. *Int. J. Hosp. Manag.* 108, 103362.
- O'Reilly, M., Parker, N., 2012. Unsatisfactory saturation: a critical exploration of the notion of saturated sample sizes in qualitative research. *Qual. Res.* 13 (2), 190–197.
- Özbük, R.M.Y., Coşkun, A., Filimonau, V., 2022. The impact of COVID-19 on food management in households of an emerging economy. *Socio-Econ. Plan. Sci.* 82, 101094.
- Pernecky, T., Jamal, T., 2010. Hermeneutic phenomenology in tourism studies. *Ann. Tour. Res.* 37 (4), 1055–1075.

- Pfeiffer, C., Speck, M., Strassner, C., 2017. What leads to lunch—How social practices impact (non-) sustainable food consumption/eating habits. *Sustainability* 9 (8), 1437.
- Pizzetti, M., Longo, C., Türe, M., 2023. EXPRESS: Embracing Food Well-being: Lessons from Chefs' Caring Actions in the Fight against Food Waste. *J. Public Policy Mark.* 07439156231206791.
- Reckwitz, A., 2002. Toward a theory of social practices: A development in culturalist theorizing. *Eur. J. Soc. Theory* 5, 243–263.
- Robinson, R.N., Solnet, D.J., Breakey, N., 2014. A phenomenological approach to hospitality management research: Chefs' occupational commitment. *Int. J. Hosp. Manag.* 43, 65–75.
- Sahakian, M., Wilhite, H., 2014. Making practice theory practicable: Towards more sustainable forms of consumption. *J. Consum. Cult.* 14 (1), 25–44.
- Schatzki, T.R., 1996. *Social Practices: A Wittgensteinian Approach to Human Activity and the Social*. Cambridge. Cambridge University Press.
- Sebele-Mpofu, F.Y., 2020. Saturation controversy in qualitative research: Complexities and underlying assumptions. A literature review. *Cogent Soc. Sci.* 6 (1), 1838706.
- Secondi, L., Principato, L., Mattia, G., 2020. Can digital solutions help in the minimization of out-of-home waste? An analysis from the client and business perspective. *Br. Food J.* 122 (5), 1341–1359.
- Sezerel, H., Filimonau, V., 2023. Practice to change: Reflecting upon practice theory for food waste management in professional kitchens. *Int. J. Gastron. Food Sci.*, 100751
- Sezerel, H., Filimonau, V., Ashton, M., Xu, S.T., 2023. Reducing" food waste in multiple cultural realms. *Int. J. Gastron. Food Sci.*, 100745
- Sharma, R., Dhir, A., Talwar, S., Kaur, P., 2021. Over-ordering and food waste: The use of food delivery apps during a pandemic. *Int. J. Hosp. Manag.* 96, 102977.
- Shove, E., Pantzar, M., Watson, M., 2012. *Sage. Dyn. Soc. Pract.: Everyday life how it Chang.*
- Sorokowska, A., Marczak, M., Misiak, M., Stęfańczyk, M.M., Sorokowski, P., 2020. Children older than five years do not approve of wasting food: An experimental study on attitudes towards food wasting behavior in children and adults. *J. Environ. Psychol.* 71, 101467.
- Spencer, M.B., 2006. Phenomenology and Ecological Systems Theory: Development of Diverse Groups. In: Lerner, R.M., Damon, W. (Eds.), *Handbook of child psychology: Theoretical models of human development*. John Wiley & Sons., pp. 829–893.
- Stöckli, S., Dorn, M., Liechti, S., 2018. Normative prompts reduce consumer food waste in restaurants. *Waste Manag.* 77, 532–536.
- Teoh, C.W., Koay, K.Y., Chai, P.S., 2022. The role of social media in food waste prevention behaviour. *Br. Food J.* 124 (5), 1680–1696.
- UNEP-United Nations Environment Programme, 2021. *Food Waste Index Rep.* 2021.
- de Visser-Amundson, A., 2022. A multi-stakeholder partnership to fight food waste in the hospitality industry: A contribution to the United Nations Sustainable Development Goals 12 and 17. *J. Sustain. Tour.* 30 (10), 2448–2475.
- Vizzoto, F., Tessitore, S., Iraldo, F., Testa, F., 2020. Passively concerned: Horeca managers' recognition of the importance of food waste hardly leads to the adoption of more strategies to reduce it. *Waste Manag.* 107, 266–275.
- Vos, M., Deforche, B., Van Kerckhove, A., Michels, N., Poelman, M., Geuens, M., Van Lippevelde, W., 2022. Determinants of healthy and sustainable food choices in parents with a higher and lower socioeconomic status: A qualitative study. *Appetite* 178, 106180.
- Warde, A., 2005. Consumption and theories of practice. *J. Consum. Cult.* 5, 131–153.
- Wertheim-Heck, S.C., Raneri, J.E., 2020. Food policy and the unruliness of consumption: An intergenerational social practice approach to uncover transforming food consumption in modernizing Hanoi, Vietnam. *Glob. Food Secur.* 26, 100418.
- Woodside, A.G., Caldwell, M., Spurr, R., 2006. Advancing ecological systems theory in lifestyle, leisure, and travel research. *J. Travel Res.* 44 (3), 259–272.
- Woolcott, G., Loosemore, M., Keast, R., Chamberlain, D., 2023. Addressing youth un-/underemployment through construction social procurement: an ecological systems theory perspective. *Constr. Manag. Econ.* 1–19.
- Xu, D., Pearce, P.L., Chen, T., 2021. Deconstructing tourist scams: A social-practice-theory perspective. *Tour. Manag.* 82, 104186.
- Yardley, S., Teunissen, P.W., Dornan, T., 2012. Experiential learning: transforming theory into practice. *Med. Teach.* 34 (2), 161–164.