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Cultural Influences on Food Consumption and Waste Among International Students in Portugal

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Master in Psychology of Intercultural Relations

Supervisor: Dr. Carla Sofia Mouro Invited Assistant Professor, ISCTE – Instituto Universitário de Lisboa

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Department of Social and Organizational of Psychology

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Abstract

This study explores how cultural influences affect food consumption and waste behaviors among international students in Portugal, addressing a gap in the literature on the impact of diverse cultural backgrounds on these practices. For this purpose, Hofstede's dimensions and Berry's acculturation model are considered, as well as the Theory of Planned Behavior, to examine cultural, contextual and individual factors intervening in food-related practices. The study utilized five focus groups (n=18) and thematic analysis to explore how participants' cultural backgrounds relate to their food consumption habits, adaptation to new culinary cultures, and attitudes toward food consumption, and waste. Participants reported food consumption behaviors as related to their cultural values and traditions, with notable distinctions between collectivistic and individualistic cultural backgrounds. Acculturation strategies were diverse, ranging from attempts to maintain cultural food identity to experimentation and integration of elements of Portuguese cuisine like seafood and spices. Positive attitudes towards healthy food consumption and no food waste were consensual. Family upbringing and health concerns were consistently emphasized as paramount values guiding food choices and waste management practices. Social norms regarding food waste were particularly emphasized in collectivist cultures, where it is considered unacceptable and shameful. Still, participants' beliefs in their ability to manage leftovers and reduce food waste also significantly impacted their behaviors. This study contributes to better understanding how cultural backgrounds shape sustainable eating practices and community values abroad, thereby influencing both food consumption habits and waste management practices. Practical implications and interventions are discussed.

Keywords: cultural influences; food consumption; international students; food waste behaviour; acculturation strategies

3020 – Group and interpersonal processes

4070 – Environmental Issues & Attitudes

Resumo

Este estudo explora como as influências culturais afetam os comportamentos de consumo e desperdício de alimentos entre estudantes internacionais em Portugal, abordando uma lacuna na literatura sobre o impacto dos diversos contextos culturais nessas práticas. São consideradas as dimensões de Hofstede e o modelo de aculturação de Berry, assim como a Teoria do Comportamento Planeado, para examinar os fatores culturais, contextuais e individuais envolvidos. Utilizando cinco grupos focais (n=18) e análise temática, o estudo investiga como os antecedentes culturais dos participantes influenciam seus hábitos alimentares, a adaptação a novas culturas culinárias e suas atitudes em relação ao consumo e desperdício de alimentos. Os participantes relataram que seus comportamentos alimentares estão ligados aos seus valores e tradições culturais, com diferenças notáveis entre culturas coletivistas e individualistas. As estratégias de aculturação variaram, desde tentativas de manter a identidade alimentar cultural até a integração de elementos da culinária portuguesa, como frutos do mar e especiarias. A aceitação de alimentos saudáveis e a redução do desperdício foram consensuais. A educação familiar e preocupações com a saúde foram destacadas como valores chave. Normas sociais sobre desperdício de alimentos foram particularmente enfatizadas nas culturas coletivistas, onde é visto como inaceitável e vergonhoso. A crença na capacidade de gerenciar sobras e reduzir o desperdício também impactou significativamente os comportamentos dos participantes. O estudo contribui para a compreensão de como contextos culturais moldam práticas alimentares sustentáveis e valores comunitários no estrangeiro, influenciando hábitos de consumo e gestão de desperdício.

Palavras-chave: influências culturais; consumo alimentar; estudantes internacionais; comportamento de desperdício de alimentos; estratégias de aculturação

3020 – Group and interpersonal processes

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Cultural Influences on Food Consumption and Waste Behavior

Food systems comprise a complex web of activities, from production and processing to distribution, consumption, and waste management (Food and Agriculture Organization [FAO], 2018). Transforming food systems is crucial for a sustainable future, as the current systems are inefficient and unsustainable, contributing to over one-third of greenhouse gas emissions (Crippa et al., 2021). Moreover, one-third of the food produced worldwide is lost or wasted (United Nations Environment Programme (UNEP), 2021; Gustavsson et al., 2011), exacerbating environmental degradation and issues of food insecurity and malnutrition. Despite advances in agricultural productivity, 9% of the world's population still suffers from hunger (FAO et al., 2023), while 30% experience malnutrition (World Health Organization [WHO], 2024). Furthermore, food value chains drive deforestation and biodiversity loss, compounding the environmental impact of food production and consumption. According to the FAO (2018), nearly 1.3 billion tons of food produced for human consumption is lost worldwide every year, underscoring the magnitude of the problem. This wasteful behaviour not only poses economic challenges but also undermines efforts to ensure access to adequate and nutritious food for all.

According to the latest estimates, more than 25 million people (or 3.1 percent of the total population) in Europe face food insecurity, highlighting the urgent need for structural measures to combat food waste and loss (FAO, 2023). Food waste squanders valuable resources and undermines global food security efforts. A comprehensive understanding of food consumption and waste behaviour is essential for developing effective strategies to promote sustainability and resilience in food systems.

Cultural factors significantly influence food behaviour, as highlighted by a recent literature review (Morkunas et al., 2024). This impact can become more complex to understand and deal with migration fluxes. For example, a study by Kansal et al. (2022), which explores the impact of food waste reduction campaigns on South Asian communities in Australia, highlights how cultural traits such as frugality, food insecurity, and religious practices shape food behaviour within these communities. It examines their perceptions and engagement with food waste reduction campaigns, revealing challenges like feelings of

exclusion due to unfamiliar campaign faces, western menus, and inappropriate messages and moral appeals.

Another motive for dislocation and consequent cross-cultural encounters is studying abroad. Studying international students' attitudes towards sustainable food practices is imperative due to their diverse cultural backgrounds and experiences, making them an ideal population to understand the role of cultural factors in shaping food choices and behaviours (Alattar et al., 2020; Németh et al., 2019). Additionally, the varied food consumption practices among international students underscore the importance of exploring potential differences in food waste behaviours (Tsai et al., 2020). Understanding the unique challenges faced by international students may therefore be a significant contribution to fostering sustainable food practices and reducing food waste on a global scale (Németh et al., 2019).

The phenomenon of acculturation is particularly relevant in the context of higher education, especially with the rise of international student mobility worldwide. The dynamics of cultural adaptation and integration play a significant role in shaping educational experiences for both students and host institutions. The Open Doors report (1996/1997) highlights the substantial number of individuals studying abroad annually, estimating up to 1 million students in foreign countries, indicating the vast scope of international education (Open Doors, 1996/1997). This trend is driven by various factors, including the pursuit of academic excellence, exposure to diverse cultures, and the role of students as cultural carriers (Klineberg, 1970). Portugal, like many other countries, has witnessed a significant influx of international students into its higher education system. Data from the 2022/2023 academic year reveal that out of the total of 446,028 students enrolled in higher education in Portugal, approximately 17% (78,113 students) are from foreign countries (Statistics Portugal - Web Portal, 2023). These students have actively chosen Portugal as their destination for higher studies, reflecting the country's attractiveness as an international educational hub. The presence of international students in Portugal underscores the significance of acculturation in academic contexts. Developing research with these students can provide valuable insights into how they navigate cultural differences, adapt to new social norms, and negotiate identities within a multicultural setting.

The research scope and relevance of this study are underscored by the global challenge of food waste and its multifaceted implications. As evidenced by various sources, including the Food Waste Index Report 2021 by UNEP in 2021, food waste at the consumer level is a pervasive issue across countries, with substantial environmental, economic, and social

consequences. Eurostat (2023) estimates that approximately 10% of food made available to EU consumers is wasted, while millions of people face food insecurity.

According to Ozanne et al. (2022), food waste refers to discarded food that is still fit for human consumption and occurs throughout all stages of the food supply chain. However, in developed countries, losses primarily occur in the final stages due to surplus food generation and consumer behaviours (Ozanne et al., 2022; Gustavsson et al., 2011; Jeswani et al., 2021). Approximately 60% of this waste is believed to be avoidable, suggesting the importance of addressing consumer behaviour in mitigating food waste (Ozanne et al., 2022; Buzby et al., 2014; Qi & Roe, 2016).

By studying international students, researchers can gain a better understanding of how to design educational programs that address the specific needs and challenges of this diverse group. These insights can help develop more inclusive and effective strategies for promoting sustainable food practices and reducing food waste across various cultural contexts.

To delve deeper into this topic, this study aims to investigate the relationship between cultural influences and food consumption and waste behaviours among international students in Portugal. The following specific aims and research questions guided the project:

1. Cultural Perspectives on Food and Food Waste:
   Q1: What cultural norms and values prevalent among international students relate to their food consumption habits and influence their views on food waste?
2. Food Consumption and Waste Behaviours:
   Q2: What are the typical food consumption practices among international students, and how do these practices correlate with the amount of food they waste?
   Q3: Are there noticeable differences in food waste behaviours among international students from diverse cultural backgrounds, and if so, what are the key factors that distinguish them?
3. Cultural Influence on Attitudes Towards Food Waste Reduction:
   Q4: How do international students' attitudes towards reducing food waste evolve in response to their cultural experiences and interactions with diverse backgrounds?

Therefore, the research problem addressed in this study focuses on the relationship between cultural influences and food consumption and waste behaviours among international students in Portugal. By employing focus groups as a data collection technique, this study

aims aimed to provide insights into the complex intersection between culture, food consumption, and waste behaviours within the international students' group.

The first chapter of this dissertation begins by establishing a global perspective on the issue of food consumption and waste. It then outlines the overall objective and relevance of this study. Within the second chapter of the study, a comprehensive theoretical framework is provided, focusing on the central research problem of the relationship between cultural influences and food consumption and waste behaviours among international students. This section features a thorough literature analysis of the current understanding of food consumption and waste issues, both globally and within the context of international students' communities.

Literature Review

Food Waste and Loss Definition

The Food Supply Chain (FSC) operates as a dynamic system involving various stakeholders, ranging from farmers to manufacturers, retailers, and consumers. Despite its complex structure, the concept of the food supply chain is significantly impacted by the widespread issue of food loss and waste (FWL) (O'Connor et al., 2023). Globalization, diet shifts, and changes in consumption patterns contribute to the complexity of the FSC, increasing the challenges associated with FWL (Mokrane et al., 2023).

FWL manifests at various stages of the FSC, as suggested by FAO's Food Loss Index (FLI), estimating that approximately 14 percent of all food produced is lost from the primary production stage (FAO, 2019). This stage includes agriculture, fisheries, and livestock, extending to post-harvest phases such as storage and handling (Mokrane et al., 2023; Gustavsson et al., 2011; Jeswani et al., 2021). Substantial food loss occurs in the primary production stage due to factors such as infestations, weather conditions, and inefficiencies in production processes (Ozanne et al., 2022; Gustavsson et al., 2011; Jeswani et al., 2021). Developing countries bear a significant burden of post-harvest or processing stage food loss due to inefficient machinery and storage techniques (Ozanne et al., 2022; Gustavsson et al., 2011; Jeswani et al., 2021), while developed countries experience losses due to overproduction, aesthetic standards, and market fluctuations (Jeswani et al., 2021; Bond et al., 2013; Kiaya, 2014).

Further losses occur during processing, manufacturing, and packaging, attributed to spilling, degradation, and inefficiencies in industrial processes while distribution-related

losses arise from multiple intermediaries, extended distances, and issues during transportation (Jeswani et al., 2021; Shafiee-Jood and Cai, 2016). Distinct from food loss, "food waste" emerges at retail and supermarket levels, denoting discarded or expired commodities (Mokrane et al., 2023). The causes of food waste at the retail level are associated with limited shelf life, aesthetic standards, and variability in demand (FAO, 2019). Consumer waste stems from poor purchase planning, excess buying, label confusion, and suboptimal in-home storage (FAO, 2019).

In contrast, according to the UNEP definition, food loss refers to human-edible commodities originating from crops and livestock that exit the production/supply chain without re-entering for other purposes until reaching the retail level. This encompasses losses incurred during storage, transportation, processing, and even imported quantities (UNEP, 2021). Expanding on these definitions, the FAO in 2019 introduces moral and ethical dimensions. It highlights that the term "waste" carries negative implications of deliberateness or avoidability, while "loss" suggests an unfortunate or unintentional event. Under the FAO's framework, food waste involves the disposal of food suitable for human consumption, regardless of reasons such as expiry dates, spoilage due to oversupply, market fluctuations, or individual consumption habits. On the other hand, food loss signifies a reduction in mass or nutritional value of food intended for human consumption (FAO, 2019).

Addressing FWL in the FSC involves recognizing the types of food most affected, with easily spoiled commodities accounting for more significant food waste than cereals (FAO, 2019). The FAO estimated that approximately one-third of food intended for human consumption was lost or wasted globally in 2011, with subsequent estimates suggesting a higher percentage (Mokrane et al., 2023; World Wildlife Fund-United Kingdom, 2021). Recognizing the environmental impact, the United Nations' Sustainable Development Goal 12.3 calls for halving per capita global food waste at the retail and consumer level by 2030 (UNEP, 2021).

The varied interpretations of terms like 'food loss' and 'food waste' create challenges in addressing the issue comprehensively (O’Connor et al., 2023; Spang et al., 2019). Distinguishing between these terms impacts policy interpretation and implementation, influencing funding priorities and technological versus social interventions (O’Connor et al., 2023; Gille, 2012). Additionally, definitions often exclude waste associated with food crops

grown for non-human consumption purposes, such as "inedible parts," hindering a complete understanding of FWL (UNEP, 2021).

Environmental Impacts of Food loss and Waste

Food loss and waste (FLW) pose a significant challenge to the sustainability of global food systems, impacting the economy, food security, nutrition, and the environment. The annual market value of globally lost or wasted food amounts to hundreds of billions of dollars (FAO, 2022; HLPE, 2014). At the national level, FLW can lead to a reduced gross domestic product (GDP) in the agriculture sector, affecting households and businesses throughout the food supply chain (FAO, 2022; HLPE, 2014).

Environmentally, FLW is a substantial contributor to greenhouse gas emissions and represents a wastage of critical resources in food production, such as land, water, and energy (FAO, 2022; FAO, 2015). It is estimated that FLW accounts for approximately 8 percent of annual greenhouse gas emissions and utilizes a quarter of the freshwater used in agriculture annually (FAO, 2022; Kummu et al., 2012). Additionally, the production of food that is eventually lost or wasted occupies significant land areas and contributes to the degradation of natural ecosystems and the loss of biodiversity (FAO, 2022).

FLW jeopardizes food security and nutrition by diminishing both global and local food availability and access for those within the food supply chain who endure economic losses due to FLW-related issues (FAO, 2022; HLPE, 2014). This phenomenon leads to quality and nutrient losses along food supply chains, potentially destabilizing food supplies and impacting food security and nutrition (FAO, 2022; HLPE, 2014). Recognized globally as a crucial strategy, reducing FLW aims to cut production costs, enhance food system efficiency, and improve food security, nutrition, and environmental sustainability (FAO, 2019a). Addressing FLW also responds to ethical concerns surrounding the squandering of food while millions grapple with hunger and malnutrition, ultimately safeguarding the environment and future generations.

The Food Waste Index Report 2021 by the United Nations Environment Programme (UNEP) reveals that approximately 17% of the total food available to consumers, equivalent to 931 million tons, is wasted annually (UNEP, 2021). Alarmingly, nearly 570 million tones occur at the household level (UNEP, 2021). Food waste significantly contributes to environmental degradation and economic inefficiency. Identified as a primary contributor to

greenhouse gas emissions, food waste aggravates climate change and biodiversity loss (UNEP, 2021; Mbow et al., 2019). The Food Waste Index Report 2021 by UNEP emphasizes that approximately 17% of available food is wasted across retail, food service, and consumer levels, leading to needless environmental impacts. The sustainability of the agri-food sector is a major concern in global policies due to its implications for climate change. Agriculture accounts for about 20% of global greenhouse gas emissions, with food losses and waste contributing an additional 6% (Pocol et al., 2020). Food waste carries significant environmental and ethical consequences, including emissions of greenhouse gases and impacts on ecosystems and biodiversity (Nunkoo et al., 2021). Addressing food waste is crucial for mitigating environmental damage and ensuring equitable access to food resources (Ozanne et al., 2022).

To effectively address these challenges, understanding consumer behaviour is paramount, particularly in the context of food waste and sustainability.

Consumer Behaviour

Consumer behaviour encompasses the study of how individuals, groups, or organizations select, buy, use, and dispose of goods, services, ideas, or experiences to fulfil their needs and desires (Ozanne et al., 2022). Understanding consumer behaviour is essential for various reasons, particularly in the context of food waste and sustainability.

Consumer behaviour related to food consumption and waste is a multifaceted phenomenon influenced by various factors such as cultural, economic, psychological, and social aspects. Food consumption holds a unique position within consumer behaviour due to its direct link to human survival and its intricate connection to biological, social, and cultural processes, which can lead to discomfort and disease despite being essential for well-being, presenting a paradoxical nature (Németh, 2019).

One of the fundamental components shaping food consumer behaviour is the food itself, encompassing its physical, chemical, and biological properties, which trigger physiological needs. Simultaneously, the consumer, influenced by sensory perception and psychological factors, plays a pivotal role in interpreting food and its surrounding environment. Additionally, the economic and social environment acts as an external condition influencing consumer behaviour (Németh, 2019; Kárpáti & Lehota, 2007).

Cultural factors significantly impact consumer behaviour, as culture encompasses learned beliefs, values, and habits guiding behaviour within a society (Németh, 2019; Hofmeister-Tóth, 2003). Cultural models aid in understanding the dominant values across different societies, influencing food preferences and consumption patterns (Németh, 2019; Ildikó, 2010). For instance, the cultural distinction between every day and sacred foods dictates consumption practices, highlighting the role of culture in shaping dietary habits (Németh, 2019; Lehota, 2001).

Economic factors, such as income and prices, also play a crucial role in food-related consumer behaviour (Németh, 2019; Kárpáti & Lehota, 2007). Income levels influence food consumption patterns, with variations observed across different demographic groups. Sociological factors further shape consumer behaviour, as individuals are influenced by the groups they belong to or aspire to be a part of (Németh, 2019; Lehota, 2001).

The family unit emerges as a significant influencer of food choices, as familial traditions and eating habits acquired within the family setting heavily influence individual dietary preferences (Németh, 2019; Ildikó, 2010). Moreover, opinion leaders, such as doctors and nutritionists, impact consumer behaviour through informal communication channels, guiding food choices and consumption practices (Németh, 2019; Ildikó, 2010).

Consumer behaviour is crucial for addressing food waste because it directly influences consumption patterns, which, in turn, affect the generation of food waste. Factors contributing to food waste at the consumer level include plate waste, spoilage due to poor planning, and excess purchases resulting from impulse and bulk buying (Ozanne et al., 2022). Consumers' choices, habits, attitudes, and perceptions regarding food significantly impact the amount of food that is wasted. Additionally, cultural norms, such as expectations for aesthetically perfect produce, contribute to food waste, as consumers tend to reject imperfect items (O'Connor et al., 2023; Yue et al., 2007). Furthermore, consumer perceptions of expiration dates and food freshness influence purchasing decisions and contribute to food waste (Liu et al., 2021). Mismatches between food consumption patterns and household activities, as well as the surge in product differentiation due to allergies, also contribute to food waste (Aschemann-Witzel et al., 2015). Understanding these factors is crucial for developing effective strategies to reduce food waste and promote sustainable food consumption practices.

Food consumption and waste behaviour among international university students. Consumer behaviour among university students and young adults plays a pivotal role in shaping sustainable food systems and addressing food waste challenges. Studies have highlighted both the opportunities and complexities in promoting sustainable consumption practices within this demographic.

Lim et al. (2019) investigated attitudes towards sustainability influence behaviours among university students in Korea and Japan. Using the Theory of Reasoned Action, their research explored factors such as awareness, pro-environmental identity, and social norms to understand what drives sustainable consumption habits. Their findings revealed that while there is generally positive support for sustainability, this often does not translate into consistent actions. The study highlights the significant impact of descriptive norms—perceptions of what others do and expect—on shaping individuals' sustainable consumption behaviours.

Abraham et al. (2018) focused on examining college students' eating habits and their knowledge of nutritional requirements for health. Their quantitative, cross-sectional study aimed to understand how students' nutritional knowledge translates into food choices amidst the varied dining options available on college campuses. The research highlighted a disconnect where students, despite being knowledgeable about healthy eating, prioritize convenience and taste preferences in their food choices.

Studies categorizing consumer types among young adults further illustrate the variability in sustainable behaviour. For instance, Vecchio and Annunziata (2013 as cited in Pocol et al., 2020) classified Italian students into responsible, inattentive, and potentially sustainable food consumers, finding that only those demonstrating higher levels of interest and awareness in sustainability issues consistently engaged in sustainable practices. Similarly, Savelli et al. (2017 as cited in Pocol et al., 2020) identified segments like health-focused consumers and lazy consumers among young consumers, highlighting varying levels of interest and knowledge in food security and sustainability.

Cultural influences also significantly shape consumer behaviour among international university students (Németh, 2019). Variations in cultural norms and values contribute to differences in attitudes towards sustainable consumption practices. Understanding these cultural nuances is crucial for developing tailored intervention strategies to promote sustainable food consumption and reduce waste among diverse student populations.

Moreover, the issue of food waste remains pronounced among young adults, including university students, who contribute significantly to avoidable food waste (Ozanne et al.,

2022). Factors such as spontaneity, convenience-seeking behaviour, and limited food management experience exacerbate these challenges. Addressing these factors at the consumer level is essential for achieving sustainability goals and fostering resilient food systems (UNEP, 2021).

Understanding these cultural dimensions and their impact on consumer behaviour and attitudes towards sustainability is crucial for devising effective strategies to mitigate food waste and promote sustainable food consumption among international university students and young adults.

Hofstede's Cultural Dimensions Theory

Culture is a complex concept deeply embedded in societies worldwide. Scholars have proposed various definitions and frameworks to capture its complexity, with Geert Hofstede's cultural dimensions theory standing out as one of the most influential contributions in this field. Hofstede (2011) defines culture as "the collective programming of the mind that distinguishes the members of one group or category of people from others" (p.3), emphasizing its collective and distinguishing nature.

The conceptualization of culture has evolved over time. Clyde Kluckhohn (1962), as cited in Hofstede (2011), explored culture through universal categories derived from human biology and general human situations. Edward T. Hall (1976) introduced the concepts of high-context and low-context cultures, focusing on communication styles. In high-context cultures, communication relies heavily on implicit understanding and shared experiences. These societies typically feature a high degree of similarity among their members in terms of education, ethnicity, religion, and history. As a result, individuals in high-context cultures often communicate in subtle, non-verbal ways, assuming a shared background and mutual understanding. Conversely, low-context cultures emphasize explicit and direct communication. These cultures are usually more diverse, with individuals coming from varied backgrounds. Therefore, communication in low-context cultures is more detailed and straightforward to ensure that messages are clear and understandable to all, regardless of their individual backgrounds. Cultures generally exist on a spectrum between high-context and low-context, often displaying characteristics of both to varying degrees. This nuanced understanding helps to grasp how communication styles and cultural contexts influence interactions within and between societies (Hall, 1976).

Talcott Parsons and Edward Shils (1951) identified pattern variables that influence human action at individual, social system, and cultural levels. Florence Kluckhohn and Fred

Strodtbeck (1961) conducted field studies to differentiate communities based on value orientations related to various aspects of life.

Hofstede's groundbreaking work in the 1980s advanced our understanding of cultural dimensions through extensive survey data from IBM employees in over 50 countries. His initial framework included four dimensions—Power Distance, Uncertainty Avoidance, Individualism vs. Collectivism, and Masculinity vs. Femininity—aligning closely with issues proposed by Alex Inkeles and Daniel Levinson (1969). In the 2000s, Michael Minkov (2007), using data from the World Values Survey, refined this framework, introducing a fifth dimension and, in collaboration with Hofstede, a sixth dimension, resulting in the updated model of cultural dimensions. These dimensions now include Long Term vs. Short Term Orientation and Indulgence vs. Restraint, each capturing different aspects of cultural variation.

Understanding these cultural dimensions and their impact on consumer behaviour and attitudes towards sustainability is crucial for developing effective strategies to mitigate food waste and promote sustainable food consumption among international university students and young adults.

The Hofstede Dimensions in a nutshell. Geert Hofstede's comprehensive exploration of cultural dimensions provides a rich understanding of the diverse fabric of global societies (Hofstede, 2011). These dimensions highlight essential aspects of cultural values and norms that significantly influence behaviours and interpersonal interactions within distinct societies. One of the primary dimensions investigated by Hofstede is Power Distance, which examines the degree to which less powerful members of a society accept and anticipate unequal power distribution. In cultures characterized by high Power Distance, there is a greater acceptance of hierarchical structures and authority, with followers endorsing the inequality of power as much as leaders (Hofstede et al., 2010). This dimension varies widely across different regions, with East European, Latin American, Asian, and African countries typically exhibiting higher scores compared to Germanic and English-speaking Western countries.

Another critical dimension is Uncertainty Avoidance, which explores a society's tolerance for ambiguity and unpredictability (Hofstede et al., 2010). Cultures with high Uncertainty Avoidance seek to minimize uncertainty through strict behavioural codes, laws, and a belief in absolute truth, while those with lower scores are more open to diverse opinions and adaptable to change. Countries in East and Central Europe, Latin America, and certain parts of Asia tend

to score higher on this dimension, whereas English-speaking and Nordic countries often demonstrate lower Uncertainty Avoidance.

The dimension of Individualism vs. Collectivism examines how integrated individuals are into groups within a society (Hofstede et al., 2010). Individualistic cultures emphasize personal independence, self-reliance, and individual achievements, while collectivist cultures prioritize group cohesion, loyalty, and interdependence among family members and social groups. Developed Western nations typically exhibit higher Individualism scores, while less developed and Eastern countries lean towards Collectivism. Japan occupies a middle ground on this spectrum.

Masculinity vs. Femininity reflects the distribution of values between genders within a society (Hofstede et al., 2010). Masculine cultures emphasize assertiveness, competitiveness, and material success, with distinct gender roles, whereas feminine cultures prioritize cooperation, modesty, care for others, and a more equal distribution of roles between genders. Japan, German-speaking countries, and certain Latin cultures often score high on masculinity, whereas Nordic countries and the Netherlands demonstrate lower levels of masculinity.

Another dimension, Long-Term vs. Short-Term Orientation, examines a society's focus on future rewards and long-term planning versus immediate gratification and adherence to traditions (Hofstede, 2011). Long-term oriented cultures value perseverance, thrift, and order, influenced by Confucian principles, while short-term oriented cultures prioritize fulfilling immediate social obligations, respect for traditions, and personal stability. East Asian countries typically exhibit a long-term orientation, while the USA, Australia, and Latin American countries lean towards short-term orientation.

Lastly, the Indulgence vs. Restraint dimension focuses on a society's approach to fulfilling natural human desires related to enjoying life (Hofstede, 2011). Indulgent cultures allow more freedom in fulfilling these desires, while restrained cultures regulate and control such gratification through strict social norms. Indulgent tendencies are more prevalent in South and North America, Western Europe, and parts of Sub-Saharan Africa, whereas Eastern Europe, Asia, and the Muslim world tend towards restraint.

The significance of these cultural dimensions extends beyond descriptive categorization; they have been empirically validated and linked to various external factors such as political systems, economic development, mental health, and personality traits (Hofstede et al., 2010).

Moreover, correlations between cultural dimensions and individual personality dimensions highlight the link of culture and individual behaviour, emphasizing the need for nuanced interpretation and avoiding stereotyping based on national culture scores.

In this study, Hofstede's framework provides a robust theoretical lens for understanding how cultural values, such as power distance, individualism versus collectivism, uncertainty avoidance, masculinity versus femininity, long-term versus short-term orientation, and indulgence versus restraint, can be related to individuals' attitudes and behaviours towards food consumption and waste behaviours. By applying Hofstede's dimensions, we aim to uncover how cultural differences among international students shape their food-related practices, including food purchasing habits, meal preparation, and disposal patterns.

Research has demonstrated the utility of Hofstede's framework in examining food-related behaviours across different cultural contexts. For instance, Liu et al. (2021) employed Hofstede's cultural dimensions to investigate plate waste generation in both home and vacation contexts. Their study, involving samples from China (a masculine collectivist culture) and Slovenia (a feminine collectivist culture), explored how cultural values influence environmentally significant behaviours like plate waste. They found that while collectivist cultures typically exhibit more pro-environmental behaviour at home, this tendency diminishes during vacations due to heightened hedonic motivations. Specifically, Slovene tourists maintained their home social norms, whereas Chinese tourists prioritized hedonic and gain motives, leading to increased plate waste.

Similarly, Pelau et al. (2020) investigated cultural influences on food waste, focusing on fruit and vegetable waste within the European Union. Applying Hofstede's cultural dimensions, they conducted panel regression analysis across 28 European countries and identified that higher levels of uncertainty avoidance and indulgence correlate with increased fruit and vegetable waste. Their study revealed that cultures with high uncertainty avoidance tend to waste more food due to a cultural inclination to minimize uncertainty by purchasing surplus food. Moreover, higher indulgence levels contributed to greater food waste, suggesting that cultures emphasizing enjoyment and pleasure might be more prone to waste.

Berry's Model of Acculturation

In the realm of cross-cultural psychology, the process of acculturation—how individuals adapt to a new cultural environment—has received significant attention, particularly in our era

of unprecedented global migration and international education. One pioneering figure in this field is John W. Berry, whose influential model of acculturation provides a framework for understanding how immigrants engage with their host society's culture while retaining aspects of their heritage (Berry, 1980). Berry's model, proposed in 1980 and refined over subsequent decades, conceptualizes acculturation along two key dimensions: cultural preservation (or maintenance) and contact with the dominant cultural group. These dimensions intersect to form four distinct acculturation strategies.

Integration, the first strategy outlined by Berry, reflects a dual commitment to maintaining one's ethnic identity and engaging positively with the majority culture. Individuals who pursue integration actively seek to preserve aspects of their original culture while also forming meaningful connections within the new cultural environment. Integration embodies a balanced approach where cultural diversity is embraced, contributing to multiculturalism and societal cohesion (Berry, 1980).

Assimilation, in contrast, prioritizes interaction with the dominant culture at the expense of one's own ethnic identity. Those adopting an assimilation strategy may actively seek to adopt the behaviours, values, and norms of the host society while minimizing ties to their heritage culture. Assimilation can lead to cultural homogenization but may facilitate social integration, particularly in contexts where conformity is valued (Berry, 1980).

Separation, as the third strategy in Berry's model, emphasizes cultural preservation while minimizing interaction with the majority group. Individuals who adopt separation strive to maintain their ethnic identity and resist assimilation into the dominant culture. Separation can stem from a desire to protect one's cultural heritage or in response to perceived discrimination or social exclusion (Berry, 1980).

Finally, marginalization represents a disengagement from both the heritage culture and the dominant society. This strategy often arises involuntarily when individuals feel alienated from both their original community and the new environment due to systemic barriers or discrimination. Marginalization can lead to social isolation and psychological distress, highlighting the complexities of cultural adaptation in unwelcoming contexts (Berry, 1980).

Importantly, Berry's model acknowledges the dynamic nature of acculturation, recognizing that individuals may shift strategies over time depending on social circumstances, personal experiences, and evolving cultural identities (Berry, 1980). Moreover, Berry's framework challenges earlier uni-dimensional views that assumed a linear progression toward cultural assimilation, highlighting the diverse pathways through which individuals navigate cultural integration (Bourhis et al., 1997).

Research using Berry's framework has provided valuable insights into the acculturation experiences of international students, particularly regarding their dietary habits and food choices. For instance, Noyongoyo (2011) examined dietary acculturation issues among international students of African origins in the United States. This study involved 142 participants who completed a survey about their eating habits before and after moving to the U.S., supplemented by in-depth interviews. The findings revealed that students from sub-Saharan Africa faced more challenges in adapting their diets compared to students from other regions. Newcomers tended to seek out familiar foods, whereas those who had been in the U.S. for more than 25 months adapted by cooking or relying on friends. This adaptation often included an increase in American dietary items such as TV dinners and packaged cakes and a decrease in traditional foods from their home countries.

Beyond considering broad cultural values and examining acculturation strategies, it is essential to explore individual and contextual factors contributing to decision-making on food consumption and waste. This includes the availability of familiar foods, social networks, and the length of time spent in the host country. Understanding these interconnections among different levels of analysis—cultural values, acculturation strategies, and individual/contextual factors—can provide a more comprehensive understanding of food-related behaviours and inform targeted interventions to promote sustainable food practices.

In this sense, Berry's model of acculturation provides a valuable framework for understanding food consumption and waste behaviours among international students. It explores not only broad cultural values but also individual and contextual factors like the availability of familiar foods, social networks, and time spent in the host country.

The theory of planned behaviour (TPB)

The Theory of Planned Behaviour (TPB) has its roots in the theory of multi attribute attitude (TMA) and the Theory of Reasoned Action (TRA), which were developed by Ajzen and Fishbein in 1973. TPB aims to explain the decision-making processes underlying human behaviour, emphasizing the role of individual will in determining behavioural outcomes. According to TRA, behaviour intentions are shaped by two primary factors: attitude and subjective norm. Attitude reflects individuals' positive or negative evaluations of a behaviour, while subjective norm is influenced by societal normative beliefs.

TPB serves as a comprehensive framework tailored to predict and explain human behaviour within specific contexts, building upon the foundation laid by the theory of reasoned action. While traditional models emphasized the significance of intentions in forecasting behaviour, they often overlooked the impact of external constraints. In response to

this limitation, TPB was developed, incorporating perceived behavioural control as a pivotal determinant of behaviour (Ajzen, 1985).

Central to TPB are three primary determinants shaping behavioural intentions. Firstly, individuals evaluate specific behaviours through their attitudes towards them, indicating their favourable or unfavourable stance (Ajzen & Fishbein, 1980). Secondly, subjective norms come into play, representing perceived social pressures or expectations surrounding behaviour, thus highlighting the influence of social context (Ajzen & Fishbein, 1980). Lastly, perceived behavioural control emerges, encompassing an individual's perception of the ease or difficulty associated with behaviour performance, integrating elements of self-efficacy and perceived constraints (Ajzen, 1991).

While intentions play a pivotal role, TPB uniquely acknowledges the importance of perceived behavioural control, recognizing that behaviour may be influenced not only by intentions but also by individuals' perceptions of their ability to perform the behaviour under prevailing circumstances (Ajzen, 1991).

Empirical research within the TPB framework has underscored its predictive validity across diverse behaviours and populations. Studies consistently demonstrate that combining intentions with perceived behavioural control enhances the accuracy of behaviour prediction. However, the relative importance of intentions and perceived behavioural control varies depending on the degree of volitional control over the behaviour (Ajzen, 1991).

Furthermore, a systematic literature review by Morkunas et al. (2024) demonstrates the relevance of TPB in the context of food waste. Their research highlights how cultural factors influence TPB components. They found that negative attitudes towards leftovers and food waste, shaped by cultural beliefs and traditions, significantly impact individuals' intentions to reduce food waste. Social norms also play a crucial role; cultural expectations regarding food consumption can either promote or discourage waste-reducing behaviours. Moreover, perceived behavioural control is influenced by factors such as education and awareness campaigns, which help individuals feel more capable of managing their food waste (Morkunas et al., 2024).

Similarly, Nunkoo et al. (2021) examined household food waste in island communities using a grounded theory approach, revealing key themes related to attitudes and barriers. Participants expressed guilt over wasting food, lacked environmental awareness, faced financial concerns, and felt exempt from responsibility. Barriers to food waste recycling included a lack of awareness, space limitations, inadequate policy, and lack of time or prioritization. The study suggests that effective food waste management requires a holistic

approach, including educational campaigns, better waste sorting facilities, and supportive policies. This highlights the importance of tailoring interventions to local contexts, particularly in small groups (Nunkoo et al., 2021).

Together, these studies underscore the value of integrating cultural context with TPB to develop targeted strategies for promoting sustainable food consumption and reducing food waste. By understanding cultural attitudes, social norms, and perceived behavioural control, researchers can design more effective interventions to address food waste on a global scale.

Overview and Research Goals

This study aims to explore the complex interplay between cultural values, acculturation processes, and individual attitudes in shaping food consumption and waste behaviours among international students. By employing Hofstede's Cultural Dimension Model, Berry's Model of Acculturation, and the Theory of Planned Behaviour (TPB), this research provides a comprehensive analysis of how these factors influence food-related decision-making. The primary goal is to understand the impact of cultural norms and traditions on attitudes towards food waste, assess how international students adapt their food consumption behaviours in a new cultural environment, and determine the role of attitudes, subjective norms, and perceived behavioural control in shaping intentions to reduce food waste. Additionally, the study aims to identify individual and contextual factors contributing to food waste decisions, such as the availability of familiar foods, social networks, and duration of stay in the host country. The primary goal of this qualitative research, using focus groups, is thus to explore in more detail the diversity of perspectives regarding food consumption and waste behaviours and the role of cultural contact and exchanges in these practices among international students. The findings will provide actionable insights for developing targeted strategies to promote sustainable food consumption and reduce food waste in educational settings.

Method

Participants

The study involved 18 participants (see Table 1), 56% females (n = 10), with ages ranging from 21 to 51 years (M = 30.94, SD = 805). We employed a purposive sampling technique to select participants who either were current international students residing in Portugal or had recently resided there. All participants were required to be fluent in English.

The participants represented a diverse range of countries, including Brazil, Bosnia and Herzegovina, France, Germany, Ghana, Italy, Japan (n=3), Jordan, Kenya, Nigeria, Pakistan,

Syria, the United States (n=2), Venezuela, and Zimbabwe. Accordingly, five participants were from countries with higher scores on Individualism are Germany, France, Italy and U.S.A., with Japan presenting a middle-of-the-scale score (Hosftede, 2015). Their length of residence in Portugal varied significantly, from as little as three months to as long as four years, with a mean length of approximately 1.59 years (SD = 0.99 years).

Participants' educational backgrounds varied: fourteen were undergraduates who were also pursuing master's degrees, four had completed master's degrees and were currently pursuing a PhD. This diverse range of educational attainment provided a broad perspective on the experiences and backgrounds of individuals living in Portugal.

Regarding marital status, six participants were married, one was in a relationship, and eleven were single. Participants also provided insights into their living arrangements, sharing various aspects of their household contexts during discussions about food consumption and waste behaviours. Some participants lived with children or partners.

Table 1

Participant Characterization

Focus Group	ID	Age	Gender	Marital Status	Country of Origin/ Nationality	Length of Residence in Portugal	Educational Status
Focus Group 1	P1	24	Female	Single	Italy	3 months	Postgraduate/ Master's Degree
	P2	29	Male	Married	Jordan	2.5 years	Postgraduate/ Master's Degree
	P3	24	Female	Single	Japan	1.5 years	Undergraduate/ Bachelor's Degree
Focus Group 2	P1	33	Female	Divorced	Venezuelan	3 years	Postgraduate/ Master's Degree

	P2	41	Female	Married	Ghanaian	2 years	Postgraduate/ Master's Degree
	P3	23	Male	Single	Germany	1 year	Undergraduate/ Bachelor's Degree
Focus Group 3	P1	29	Male	Married	American	1 year	Undergraduate/ Bachelor's Degree
	P2	51	Female	Married	Brazilian	4 years	Postgraduate/ Master's Degree
	P3	43	Male	Married	Zimbabwean	1 year	Undergraduate/ Bachelor's Degree
	P4	21	Male	Single	Nigerian	1 year	Postgraduate/ Master's Degree
	P5	24	Female	Single	Bosnian	9 months	Undergraduate/ Bachelor's Degree
Focus Group 4	P1	42	Male	Married	Pakistani	5 months	Undergraduate/ Bachelor's Degree
	P2	25	Female	Single	French	2 years	Undergraduate/ Bachelor's Degree
	P3	33	Female	Single	Japan	8 months	Undergraduate/ Bachelor's Degree
	P4	29	Female	Single	Kenyan	1.5 years	Postgraduate/ Master's Degree
Focus Group 5	P1	32	Male	Single	Japanese	1 year	Postgraduate/ Master's Degree
	P2	28	Female	Single	American	2 years	Postgraduate/ Master's Degree
	P3	26	Male	Single	Syrian	3 years	Undergraduate/ Bachelor's Degree

Design

This study employed a qualitative research design using focus group discussions to delve deeply into the diversity of perspectives regarding food consumption and waste behaviours among international students, and the role of cultural contact and exchanges in

shaping these practices. The use of focus groups was justified by the need to facilitate dynamic interactions and discussions among participants, allowing for the emergence of rich, detailed data related to social interaction that might not surface in one-on-one interviews (Jensen & Laurie, 2016). Focus groups are particularly suited for exploring complex behaviours and social practices as they enable participants to build on each other's ideas and experiences, offering a broader range of insights.

Five online focus group discussions were conducted with the participants between April and June 2024. Each group comprised between three and five participants. The primary goal of these sessions was to explore in detail the diversity of perspectives regarding food consumption and waste behaviours, as well as the role of cultural contact and exchanges in these practices among international students. This method was chosen to create an interactive environment where participants could engage with each other's experiences and viewpoints, facilitating a deeper understanding of the issues under study.

The discussions were guided by an interview guideline, which can be found in Appendix A. This guideline provided a structured framework for moderating the discussions while allowing flexibility for participants to naturally express their views and experiences. The main topics addressed included cultural significance of meal sharing, the impact of Portuguese culinary traditions, and attitudes towards food waste. Key questions centred around these themes included: "In your culture, how significant is the act of sharing meals with others?"; "Can you describe how Portuguese culinary traditions have impacted the foods you regularly eat?"; and "How do you feel about food waste? What do you do with leftovers?"

The focus group discussions were conducted and responded to in English, to guarantee a shared understanding of the interventions. The interviewer used a script based on the interview guide but oriented the questions towards participants' responses to allow for a more dynamic and responsive dialogue.

Procedure

Ethical approval for this study has been obtained from Iscte's Ethical Committee (Parecer 141/2023) to ensure adherence to ethical guidelines and protection of participants' rights throughout the research.

The recruitment of participants was conducted by the researcher to maintain confidentiality and uphold the voluntary nature of participation. Potential participants who expressed interest were screened to ensure they met the selection criteria, including nationality, to align with the study's focus. Purposive sampling was then employed to select a final group of 18

participants, aiming for diversity in cultural backgrounds and academic experiences among international students in Portugal.

All focus group sessions were recorded with the explicit consent of the participants. Video and audio recordings were made to capture both verbal and non-verbal interactions, providing a richer context for analysis. Participants were informed about the recording process and assured that their privacy would be maintained, with the recordings used solely for research purposes.

To ensure data confidentiality, all personal data were pseudonymized, with participants' names replaced by unique identifiers. Data were securely stored in an ISCTE SharePoint folder, accessible only to the thesis supervisor. Following the study's completion, data will be anonymized or destroyed in accordance with institutional guidelines. Measures were taken to minimize the risk of re-identification, such as removing identifying information from transcripts.

Informed consent (see Appendix B) was obtained from all participants before any data collection activities. Consent forms, provided in English, were distributed electronically via email during the recruitment phase. These forms detailed the types of personal data collected, including voice recordings, names, and contact details, and outlined the study’s purpose, procedures, data handling, and the voluntary nature of participation. Participants reviewed, electronically signed, and returned the forms, ensuring their understanding of the research objectives and their consent to participate. Treating email consent records as personal data was essential to comply with privacy regulations.

Participants also completed a participation information form (see Appendix C) to provide demographic details, facilitating data analysis and ensuring diversity among study participants. At the end of each focus group discussion, a debriefing (see Appendix D) was conducted to address any participant concerns, clarify the study's aims, and reaffirm adherence to ethical guidelines.

Each focus group session lasted 1 hour and 15 minutes, allowing for comprehensive discussions while remaining manageable for participants to encourage full engagement. All five focus group discussions were fully transcribed to capture detailed interactions and non-verbal cues, ensuring thorough data preparation for analysis. The recordings were stored securely, and transcriptions were anonymized to maintain confidentiality and protect participants' privacy.

Data Analysis

The data collected from the focus group discussions were analysed using thematic analysis, selected for its flexibility and ability to provide a detailed, nuanced understanding of complex qualitative data (Braun & Clarke, 2012). An inductive approach was adopted, allowing themes to emerge naturally from the data rather than imposing pre-existing theories. This method facilitated an in-depth exploration of participants' perspectives on food consumption, waste behaviours, and cultural exchanges. The analysis was then aligned with relevant theoretical frameworks, including Hofstede's Cultural Dimensions Theory, Berry's Acculturation Theory, and the Theory of Planned Behaviour (TPB). By integrating these theories, the analysis provided insights into how cultural influences shape food-related practices and attitudes among international students in Portugal.

Thematic analysis was carried out manually, a method well-suited for small-scale qualitative studies and ensuring rigorous and reliable findings (Wolff et al., 2019). The analysis process followed several key phases. Initially, we immersed ourselves in the data by reading the transcripts multiple times to gain a comprehensive understanding and to note initial impressions and trends.

In the coding phase, we employed an inductive approach, generating codes based directly on the content of the transcripts (Braun & Clarke, 2012). This phase involved creating initial codes that reflected participants' experiences and perspectives. As we progressed, we continuously reviewed new data excerpts to determine if existing codes were applicable or if new codes were necessary, refining the coding framework iteratively.

Once coding was complete, we searched for themes by organizing related codes into broader categories (Braun & Clarke, 2012). These themes aimed to capture significant patterns in the data, such as trends in food consumption and waste behaviours. A key aspect of this phase was examining how these themes related to the theoretical frameworks employed in the study. We reviewed the developing themes in relation to Hofstede's Cultural Dimensions Theory, Berry's Acculturation Theory, and the Theory of Planned Behaviour. This involved assessing how themes related to cultural dimensions such as individualism versus collectivism, acculturation strategies like integration or assimilation, and behavioural intentions influenced by attitudes, subjective norms, and perceived behavioural control. This process ensured that the themes not only captured meaningful patterns but also aligned with the theoretical constructs guiding the study.

The reviewing phase involved a repetitive process where we verified the coherence and relevance of the themes against both the coded data and the theoretical frameworks. This quality-checking step was crucial to ensure that the themes accurately represented the

participants' experiences and were consistent with the theoretical perspectives (Braun & Clarke, 2012).

In the defining and naming phase, we articulated each theme's unique and specific aspects, summarizing their essence and relevance to the study's objectives and theoretical frameworks (Braun & Clarke, 2012). The final report included a presentation of the themes, supported by data excerpts, demonstrating how the findings related to Hofstede's dimensions, Berry's acculturation strategies, and TPB constructs.

By integrating these theoretical perspectives into the thematic analysis, we were able to provide a comprehensive understanding of how cultural background and personal experiences influence food consumption and waste behaviours among international students, aligning the findings with established theories and offering insights into their practical implications.

Results

In our analysis of the focus group extract concerning food consumption and waste behaviours among international students from diverse cultural backgrounds, we have used three distinct theoretical frameworks: Hofstede's Cultural Dimensions Theory, Berry's Model of Acculturation, and the Theory of Planned Behaviour (TPB). Each theory provides unique insights that enhance our understanding of how cultural values, acculturation processes, and individual and contextual factors influence food-related practices within international student populations.

By integrating these three theoretical perspectives, we aim to provide a comprehensive understanding of the intricate interplay between cultural values, acculturation processes, and individual factors shaping food consumption practices and food waste behaviours within the international student community. This integrated approach not only facilitates a deeper exploration of our focus group data but also offers practical implications for promoting sustainable food practices and fostering cultural sensitivity in diverse cultural contexts.

Cultural Influences on Food Consumption Behaviours

Hofstede's Cultural Dimensions Theory offers a comprehensive framework for examining cultural values such as individualism versus collectivism and uncertainty avoidance (Hofstede et al., 2010). These dimensions allow us to explore how societal norms and values shape food consumption behaviours across different cultures, elucidating why certain practices like communal eating or food waste patterns are prevalent in specific cultural contexts.

Participants presented food consumption behaviours as being closely tied to cultural values and traditions. In many cultures, food acts as a conduit for social interaction, family cohesion, and community bonding. Whether through communal eating, festive celebrations,

or the symbolic meaning attached to food, these behaviours reflect a universal understanding that food is more than nourishment—it is a vital part of the social fabric that binds individuals and communities together.

To further examine the relationship of cultural values with food consumption behaviours through Hofstede's dimensions of Individualism vs. Collectivism, we can draw on the insights from various participants who highlighted the significance of communal eating and shared experiences in their respective cultures. In collectivist cultures, food consumption is often centred around group activities and shared experiences. The emphasis on communal eating highlights the importance of social connections and collective well-being. Food serves to bring people together, reinforcing familial ties and strengthening community bonds.

For instance, in Kenya, communal eating is a norm. A participant's account emphasizes that dining alone is rare, with people typically seeking company during meals, whether at work or home. This practice fosters social connections and reinforces community bonds.

"In my cultural context, typically for dinner and even lunch people, it's not common to eat alone. So, for a lot of people, even at work, if you don't know each other and you want to go out and eat something outside the office, if you didn't carry your food, you typically will look for someone to eat with. So, eating alone is not common. You basically eat with friends. Friends or if it's family or if you're at work, you. You can even, like, look for a colleague to go and eat with. But it's a time to eat, talk, then eat, talk and connect. So that's how it is for a lot of Kenyans. "(FG4, P4, Kenyan).

Similarly, in Nigeria, food serves as a powerful medium for connection. The participant highlights how sharing meals allows for deep, meaningful interactions, showcasing food as an integral part of social life and cultural identity.

"Food culture is a very easy way to connect with people. I don't know if you understand what I'm saying, but it allows you to interact with them on a deep level. It's quick, almost like a miracle, to be honest. It's a big deal for them, and even for my tribe, the Yoruba tribe in Nigeria." (FG3, P4, Nigerian)

In the Middle Eastern and Arab cultures, sharing meals is a deeply ingrained practice, particularly during significant times like the month of fasting. The tradition of neighbours sharing food underscores the importance of communal living and support within the community.

"In my culture, sharing is a very important and very common concept. It's typical to have neighbours knocking on your door to share a meal. For example, 'Here, I made this today, enjoy!'. It's a common thing in the Middle East and Arab culture. It can be more and more

common in some seasons, like the month of fasting. It's very common to have a very big table full of food and different types. "(FG1, P3, Jordanian).

On the other hand, it appears that, except for the Jordanian participant who mentioned food waste as an issue in Middle Eastern culture due to the emphasis on generosity and hospitality, none of the other participants directly addressed food waste in their cultures. The Jordanian participant highlighted that the culture of sharing meals and the importance of generosity often lead to a significant amount of food being prepared, which can result in a high level of food wastage.

While the participants from Ghana, Nigeria, and Pakistan spoke about the cultural importance of sharing meals and serving ample food, they did not explicitly mention concerns about food wastage. This suggests that their cultural emphasis may be more on hospitality and abundance rather than efficiency in food consumption.

"In my culture, sharing is a very important and very common concept. It's normal to see or hear your neighbour knocking on your door. Want to share a meal with you? Like a plate? Here you go. I made this today. It's a common thing in the Middle East and Arab culture. It can be more and more common in some seasons, like the month of fasting. It's very common to have a very big table full of food and different types. And there is a very big food wasting issue in the Middle East. I guess one of the highest in the world per capita. Like how much food is wasted every year. Unfortunately, because of this concept of generosity and hospital ability. Like you need to show and give as much as you can. And unfortunately, much of that gets wasted. "(FG1, P3, Jordanian)

"It is expected that on that special day, you cook a variety of dishes for people to come, come and enjoy and celebrate with you. That is their way of celebration. So, food is really, really important from where I'm coming from and the quantity of food. I noticed that a lot of people from the Western world eat very small quantities. So, you see small food being served at a particular time. For my whole country, you dare not sell food in small portions. It has to be served in quantities for the people to be satisfied or full. Then they really appreciate you. But little, little food on the table. Oh, no way." (FG2, P2, Ghanian)

"Nigeria is very big on weddings. Every weekend there is a wedding. So, imagine. And, you know when there's weddings, there's food you get. So, there's a lot of people venturing into weddings. There's. There's a different segment of the wedding food business." (FG3, P4, Nigerian)

“It is very common in our culture. And it is very like, you can say the consistent habit of the people that they invite other people's other friends, relatives on, like, dinner, lunch, or any food party with a variety of food and invitations to the meal.” (FG4, P1, Pakistani)

In Muslim countries, religion plays a crucial role in fostering sensitivity towards food waste due to Islamic teachings that emphasize frugality and moderation in consumption (Baran et al., 2024). However, when it comes to cultural or religious practices, there is often a strong inclination to prioritize hospitality and generosity, which can lead to large quantities of food being prepared for social gatherings or religious events. This cultural emphasis on abundance and hospitality sometimes conflicts with efforts to minimize food waste, as the cultural norms encourage ensuring guests are well-fed and cared for. Therefore, while religious teachings promote awareness of food waste (Baran et al., 2024), cultural practices may sometimes overshadow these efforts, highlighting a complex interplay between religious principles and cultural traditions in shaping attitudes towards food consumption and waste in Muslim societies.

In Italy, sharing meals, especially during weekends or holidays, is a significant cultural practice. This collectivist tendency is evident in the way families and groups come together to cook and share food, reinforcing family ties and community spirit.

"Sharing food in Italy, it's quite a big thing. Especially during weekends or holidays, we often share meals. If it's a big group, everyone cooks something and then we share it. It's very common that the whole family gathers for lunch or dinner, sitting at the same table." (FG1, P2, Italian).

The dimension of Individualism vs. Collectivism seems, therefore, to relate to the reported food consumption behaviours. In collectivist cultures, the emphasis on communal eating and sharing food is not just a matter of tradition but a reflection of deeper cultural values that prioritize social connections and collective well-being.

Conversely, in more individualistic cultures, food consumption often reflects a different pattern. Some European cultures considered more individualistic, such as Germany, often value personal independence and self-reliance (Hofstede & Minkov, 2010). This cultural stance manifests in social gatherings where the primary focus is on the interaction and company, rather than the food itself. The casual approach to food—often limited to snacks unless a meal is explicitly planned—echoes the importance of individual choice and a less structured approach to hosting. As a German participant noted:

"If I get invited to somebody's home, I would not expect to be well fed or like to have dinner or food, except if we're specifically meeting to have lunch or dinner together. I would say it's common to have snacks lying around. "(FG3, P3, German).

The contrasts and tensions arising from these two cultural perspectives are also illustrated in some participants' accounts. For example, one American participant described the contrast between their experiences in the U.S. and their current life in Portugal with an Argentinian partner. They noted that while Americans tend to eat on the go due to busy lifestyles, both Argentinian and Portuguese cultures place a higher value on sitting down to share meals.

The following extract illustrates the impact of and tension emanating from considering both individualistic and collectivist cultural values on food consumption behaviours. The participant's American background reflects a more individualistic approach, characterized by eating on the go and prioritizing personal schedules. However, exposure to Argentinian and Portuguese cultures, which emphasize communal dining, has shifted the participant's viewpoint, highlighting the adaptability and influence of cultural norms on food-related behaviours.

"So, where I'm from, in the United States, I think it's less common for people to have the tradition of sitting down and eating together all the time. You know, people like to eat on the go and are very busy all the time. But my parents were always very serious about dinner. We all eat dinner together. And now I'm living in Portugal. I lived in Argentina, and I'm living in Portugal with my boyfriend, who's Argentinian. And it's interesting because I noticed that these cultures are more likely to want to sit down and have a meal together as a group. And it's more of a tradition and a ritual, you know, to eat together. But we just are the two of us, and so we're a little more relaxed about it. So, I'm from the States, where people are usually rushed, used to sitting down and eating dinner with my family more. And now that I'm living in Portugal with an Argentinian, and their cultures tend to do it more, doing it less." (FG5, P2, American)

Another example of the referred tensions came from participants from countries where collectivism has been traditionally present but increasingly challenged by competing values, like Japan. According to Luo (2024), Japan is traditionally viewed as a collectivist society, where strong interpersonal relationships and a sense of mutual obligation are emphasized. This cultural framework often results in individuals relying heavily on their in-groups, such as family, for support, and reciprocating with loyalty and cooperation. The emphasis on community, shared interests, harmony, and tradition is deeply embedded in various aspects of Japanese life, including work, education, and healthcare. For instance, teamwork and

collective decision-making are highly valued in enterprises, while schools focus on fostering a sense of collective honour and teamwork among students. Historical, geographical, and social factors have contributed to the development of this collectivist culture, with Japan's agrarian history, feudal past, and island geography promoting a reliance on collective strength.

Additionally, Luo (2024) identifies Japan as a high uncertainty avoidance culture, characterized by a strong preference for predictability and stability. This cultural trait influences various aspects of Japanese life, including food-sharing practices. The traditional social protocols in Japan emphasize consensus, resisting change, and adhering to established norms, which aligns with the collectivist values of harmony and community. These protocols often result in written rules, regulations, planning, rituals, and ceremonies, which add structure to life and ensure social expectations are clearly established and consistent.

This need for structure is evident in the way Japanese people approach food-sharing, according to our participants' accounts. While communal eating and gathering are traditional practices, modern lifestyles seem to have imposed a shift towards more private and individualized dining experiences. The reluctance to invite others into private spaces and the preference for dining only with immediate family members may reflect an effort to maintain control and predictability in social interactions. For instance, one of the Japanese participants mentioned that inviting others into their private space can be seen as burdensome. This suggests a move away from the traditional collectivist practice of sharing meals with extended family or friends regularly.

"I think in Japan mostly, we are losing a kind of connection with relatives. So, if there is a traditional day or something, our cousin's family comes and we eat, order sushi or pizza, or order something to share. But then in daily life, my mom normally cooks something for my parents and my sister and myself only. So, it's quite private. And it is a little bit embarrassing for my mom or tiring to invite someone into our private space." (FG5, P1, Japanese).

"I'm not quite sure how popular it is to have a dinner party in Japan. But if I talk about my family, I guess my family has, like, never invited another family to a dinner. If we have a special dinner or special meal, we usually go out to eat at restaurants. But I would say some families and some people invite others to their home. Maybe they order sushi, or they eat Japanese hot pot if it's winter. "(FG4, P3, Japanese).

"In Japan, hosting home parties is uncommon, except for family gatherings with relatives. During these occasions, the host typically prepares a large amount of food to warmly welcome and take care of their guests." (FG1, P2, Japanese)

However, traditional values still play a crucial role during special occasions and events. For instance, all Japanese participants highlighted New Year's Day (January 1st) remains an important time for Japanese families to gather and share meals. On such occasions, the collective spirit is strongly evident as families come together to celebrate and share food, maintaining the tradition of valuing collective experiences and relationships.

"When it comes to sharing meals with family, I don't think it's particularly important, perhaps because of my personal experience. My father was often not at home due to work, and when he did come home, it was very late. As a result, I have no memories of eating together with my parents when I was a child. […] However, on special occasions, like January 1st, it is very important for Japanese people to gather with family and eat together. On these special days, we truly value sharing food with others." (FG1. P2, Japanese).

In this sense, Japanese food-sharing practices highlight the interplay between collectivist cultural values and individualistic lifestyles. While the collectivist emphasis on community and shared experiences remains significant, especially during special occasions, daily practices reflect a more individualized and private approach to dining. This complexity underscores the dynamic nature of cultural influences on food practices in Japan, where traditional values and modern lifestyles intersect, leading to unique patterns of social interactions around food.

Acculturation and Adaptation in Food Practices

Berry's Model of Acculturation (Berry, 1980) provides insights into how international students adapt to new cultural environments while maintaining connections to their original cultural identities. By categorizing accounts considering acculturation strategies such as integration and separation, this model helps us understand how students' cultural backgrounds influence their food-related behaviours and preferences in a foreign academic setting such as Portugal.

During the interviews, our participants expressed a nuanced approach to culinary adaptation in Portugal, reflecting a dual commitment to both maintaining their original cultural food identity and engaging positively with Portuguese cuisine. This balanced approach not only highlights their individual experiences but also underscores broader themes of cultural diversity and integration within Portugal's multicultural society.

We can observe how participants navigate their culinary experiences particularly through the lens of integration, where individuals maintain their cultural identity while actively participating in the larger society. However, we also identified some experiences that lean more towards separation rather than integration.

For instance, the Japanese participants express a strong affinity for Portuguese cuisine due to shared elements such as seafood and spices, which are familiar from their own culinary traditions. They find comfort and familiarity in these aspects of Portuguese food, illustrating how they integrate aspects of Portuguese cuisine into their own cultural preferences while maintaining their Japanese culinary identity.

“We have a lot of influence from Portugal, and similarly, Southeast Asia, including Malaysia and Singapore, has been significantly influenced by Portuguese cuisine. When I came to Portugal, I found that many of the foods here were quite familiar to me.” (FG5, P1, Japanese)

“As a Japanese person, I think we really love Portuguese food because there are a lot of seafood and then spices, the spices that they use are quite familiar with us, our food.” (FG5, P1, Japanese)

Similarly, the Jordanian participant finds it relatively easy to adapt to the Mediterranean ingredients available in Portugal which align with their culinary background. This adaptation reflects an integrated approach where they incorporate local ingredients into their cooking while preserving their culinary heritage.

"There isn't much difficulty in adapting to the ingredients available in Portugal. This is likely due to the Mediterranean influence, which aligns with my culinary background. Common ingredients such as olive oil, cheeses, and bread are easily accessible and familiar." (FG1, P3, Jordanian)

Conversely, both the Ghanaian and Kenyan participants shared their experiences adjusting to life in Portugal while maintaining their culinary traditions from home. The Ghanaian participant mentioned the challenge of finding corn flour in Portugal that tastes similar to what they are used to from Ghana. Despite this, they are grateful for the availability of other familiar Ghanaian food items locally, which helps them continue preparing their traditional dishes. Similarly, the Kenyan participant talked about the distinct taste of maize flour in Portugal compared to Kenya, noting that many Kenyans often ask for maize to be brought from home due to its unique flavour. They also emphasized the importance of using Kenyan spices in their cooking, showing a strong preference for preserving their cultural food identity through specific ingredients and flavours from their home country. These extracts show us how both participants prioritize the preservation of their food culture heritage over integrating Portuguese culinary practices, showcasing a separation strategy in their approach to food adaptation in a different country, at least when referring to home cooking.

"I've lived in Portugal close to two years, and let's say, luckily, there are a lot of food stuff that I can identify with from my country, so you can make the best out of it. The only thing is, sometimes the taste might not be the same. The taste might be different. So, for instance, there's a corn product, a dry corn, which is milled into powder. "(FG2, P2, Ghanaian*)*

"The ingredients here are quite similar to what I used to have back home in Portugal, so I've been able to mostly cook the same dishes. However, the maize flour (corn flour), which is essential for me, tastes very different. Many Kenyans will ask someone going to Kenya to bring back maize because it's distinct. Along with that, we also rely on a few Kenyan spices. That's the main distinction, I would say." (FG4, P4, Kenyan)

Several participants explicitly expressed their intention to integrate into Portuguese culture by adopting local food practices, particularly seafood, which is a significant aspect of Portuguese cuisine. This approach reflects their engagement with the host culture while maintaining their overall cultural identity.

For example, the German participant mentions how they initially seldom ate seafood before coming to Portugal but decided to embrace it as part of their cultural integration process.

"Before coming to Portugal, I would almost never eat any seafood. And after coming, I sort of forced myself because I told myself, okay, it's the culture you want to sort of integrate this experience with. Started eating fish and I actually liked it. "(FG2, P3, German)

"There are many more options, particularly with seafood, which I'm eating more frequently now. "(FG1, P3, Jordanian)

"I think I consume less meat, like red meat, and more seafood and vegan/vegetarian food than before." (FG5, P3, Syrian)

"I think I eat less meat than I would back home. And especially red meat, […] but I am eating more seafood because, yeah, Portugal, and there are so many things to try, so I'm eating more, more of that. "(FG3, P5, Bosnian)

"I started to open a little bit more while I lived in Portugal and am opening myself to seafood. "(FG2, P1, Venezuelan)

The participants from Japan mentioned several ways in which Portuguese culinary traditions have influenced their food habits since moving to Portugal. They noted a shift from traditional Japanese breakfasts centred around rice to adopting bread and coffee, which is more common in Portugal. This change can be seen as reflecting an assimilation into Portuguese breakfast norms.

“I've noticed that the food in Japan is very different from what I find in Portugal. For example, I can't easily find some items in local supermarkets here that are common in Japan. I've been in Portugal for eight months now […]. Since then, I've had to completely change my eating habits. While bread is common in both countries and Japan has its own bakeries, I used to eat white rice and a typical Japanese dish for breakfast. Now, I eat bread and drink coffee instead.” (FG4, P3, Japanese)

“I believe I ate more bread when I arrived, as in Japan we typically eat rice. However, in Europe, there is a greater variety of bread, and I found European bread to be the best. I really enjoyed eating bread daily, and that was the biggest change for me. “(FG5, P1, Japanese)

The participants shared their experience of balancing their cultural dietary practices from Japan with integrating into Portuguese food culture. They also mentioned challenges such as the availability of ingredients for preparing traditional Japanese meals like lunchboxes (bento). Instead, they have opted for simpler meals like fruits, veggies, and snacks for lunch.

“And for lunch, when I lived in Japan, I always prepared my lunch in, like, bento (a small lunchbox). And I also prepared, like, a Japanese meal. But it is difficult here. So, I just changed it for some fruit and a veggie and snacks instead.” (FG4, P3, Japanese)

Regarding adapting traditional recipes, they mentioned experimenting with European-style dishes like *otto* (*risotto*) using local ingredients. This adaptation process reflects integration by blending elements of their Japanese culinary heritage with Portuguese culinary traditions.

“The rice in Japan is different from the rice in Europe, so I tried to make something like risotto. It might be more Italian, but it's still risotto. I didn't usually cook this in Japan, but here I tried to integrate it with European styles. “(FG1, P2, Japanese)

Challenges in this process include sourcing specific Japanese ingredients and adjusting to different cooking methods and flavours prevalent in Portugal. Additionally, they have embraced European-style dinners like pasta and tortillas, which are readily available and suited to local ingredients.

“For dinner, I usually eat pasta or a tortilla. I mean, something that I can cook, I can prepare here in Portugal in terms of ingredients. Yeah, I cook with ingredients that I can easily find in Portugal. “(Japanese)

"I typically eat pasta as a side dish. My ideal meal consists of three or four different foods that I want to serve. In Japan, it's usual to have three or four types of dishes on the table. For instance, rice, soup, and fish are common for dinner. This represents their typical dinner

setup. However, due to my busy schedule and lack of ingredients, I haven't been able to do this lately. So, that's the reason." (FG1, P2, Japanese)

All Japanese participants highlighted that vegan and vegetarian options are less mainstream and accessible in Japan compared to Portugal. This cultural contrast poses a challenge as they navigate the adjustment of their dietary habits and expectations upon moving to a country where such options are more widespread. Their experience underscores the complexity of adapting to a different culinary landscape while recognizing and managing cultural differences.

"And at first, I was not really into that kind of vegan practice, and I was not really enjoying the vegan food because it's very. It's not common in Asia yet. But then nowadays, I started enjoying it." (FG5, P1, Japanese)

"Yeah, there's no biggest change about my food choices, but I'm more caring about vegetarians and vegans. (...) There's no friends in Japan who are vegetarians. It's not a common culture in Japan yet. […] So that's why I was so surprised when I came to Portugal. And they are quite like they are on the menu. Like this is before vegan menus or like, this is vegan restaurants. So, I tried vegan burger, vegetarian burgers. And I think, yeah, it's just one with a change that I experienced. "(FG1, P2, Japanese)

Consumer Attitudes and Behaviours Towards Food Consumption and Waste

Using the Theory of Planned Behaviour (TPB) enriches our analysis by focusing on the cognitive factors that drive individual behaviours (Ajzen, 1991). TPB examines how attitudes, subjective norms, and perceived behavioural control shape students' intentions regarding food purchasing, preparation, and waste disposal. This theory is instrumental in identifying some facilitators and barriers to the behavioural outcomes reported in our focus group discussions among international students.

During the interviews, participants consistently emphasized family and health as their paramount values, often linking these values to their food consumption choices. Their preference for fresh and nutritious foods indicates a prioritization of natural, preservative-free options, driven primarily by a desire to maintain good health rather than opting for pre-packaged or frozen foods.

The Theory of Planned Behaviour (TPB) is used here to elucidate decision-making processes regarding these food preferences by emphasizing attitudes (evaluations of a certain practice), subjective norms (what is expected by relevant others), and perceived behavioural control (factors that facilitate or hinder adopting that behaviour).

When asked about the role food plays in their lives and daily routines, all participants consistently expressed a preference for fresh vegetables, highlighting their superior taste and nutritional benefits. This positive attitude towards fresh food reflects deeply ingrained cultural and familial norms that prioritize health and quality in dietary choices. For instance, a Pakistani participant's comments illustrate a cultural norm where fresh food is highly valued, aligning with the subjective norms—here, the cultural expectation to cook fresh food—strongly influences behavioural intentions and actions.

"In our culture, in Pakistan, we very rarely use this type of frozen or prepared food. We always, like, in our homes, everywhere, they always cook fresh food." (FG4, P1, Pakistani)

Subjective norms also play a significant role, as evidenced by the French participant's statement reflecting the importance of family values and attitudes towards food quality, indicating a positive attitude toward fresh food consumption.

"In my family, quality food has always been highly valued, especially by my parents. As I mentioned earlier, my mom was always cooking; I can't recall ever eating pre-made food during my childhood, and I still don't prefer it now. I genuinely enjoy cooking myself, so I usually prepare meals using fresh ingredients." (FG4, P2, French)

However, practical considerations such as cost, availability, and convenience also play significant roles in shaping their food consumption habits. Perceived behavioural control is illustrated by the Kenyan participant's remark, which reflects both a cultural attitude towards fresh food and practical constraints like energy costs. This statement highlights the balance between a preference for fresh ingredients and the recognition of external factors that affect the ability to maintain this preference.

"I think for me also, like, back home, we all use a lot of the fresh ingredients, and if it's mostly fresh ingredients, but there's something that I think is, can be frozen, but how it's like is for a lot of people because of energy consumption and everything." (FG4, P4, Kenyan)

Additionally, the Brazilian participant's comment illustrates the interplay between attitudes toward fresh food and perceived behavioural control, where convenience factors intervene in the decision-making process while still prioritizing fresh ingredients.

"When I find pre-peeled and pre-cut vegetables at the supermarket, I buy them because they're fresh and make cooking easier and faster." (FG3, P2, Brazilian)

Similarly, the participant from Venezuela stated the role of cost in decision-making, with affordability overriding preferences for fresh, organic, or pesticide-free options.

"I also tried to buy fresh products, but sometimes it can be a little bit expensive here. So, we usually, when we are cooking veggies, maybe we can buy it frozen. We know that it's not

the most sustainable kind of way to consume these kinds of products, but it's cheaper for us. And I think maybe later, when I get into a better situation, maybe I could afford a little bit more, like something more organic or without pesticide, that kind of stuff. "(FG2, P1, Venezuelan)

Some participants noted how convenience plays a crucial role, with participants preferring canned foods to streamline meal preparation.

"I use mostly fresh foods, like I buy fresh vegetables. and so on. I do buy canned beans, things like that, because it's just easier than, I don't know, I don't have the self-discipline yet, putting the raw beans and water and letting them soak overnight and then cooking the next day. "(FG2, P3, German)

"It depends. Some things, I will shop fresh, but some things, like beans, I'll buy the precooked beans that are in a glass jar and then some things, for example, meat, I like to buy it from the butcher." (FG3, P3, Zimbabwean)

These examples illustrate how practical considerations such as cost, availability, and convenience influence food consumption choices, even among individuals who value fresh produce. This aligns with the TPB tenets, which posits that attitudes towards food (in this case, favouring fresh produce) are related to cultural and familial norms, while perceived behavioural control (choosing frozen or canned due to practical reasons) is shaped by economic and logistical constraints.

Participants from Nigeria, Kenya, Ghana, and Japan emphasized the fundamental importance of food for health and balanced nutrition. Despite their diverse cultural backgrounds, these participants shared a common understanding that food plays a critical role in maintaining health and providing essential energy for daily activities.

"When I cook for myself, I don't usually focus on nutrition. My mother or grandmother, however, always ensures meals are nutritious and well-prepared. Their approach influences my choices, leading me to consume more nutritious food and consider nutritional value more carefully." (FG1, P2, Japanese)

"I think food is critical and it's more looking at it from a health point of view. We eat food to be healthy, to be able to get energy to go about our daily lives. And so, if you look at people who decide to go off some diet and eat some particular dishes, you notice that at a point in time, they do lack some nutrients from their body. […] basically, food is really important. It helps us in terms of health. It helps us with the energies that we need to be able to go up day to day activities." (FG2, P2, Ghanaian)

Moreover, in collectivist societies, according to Erzse et al., (2023), the influence of older generations in preparing nutritious food highlights the communal value placed on health. This generational involvement indicates that health and nutrition are collective priorities, with knowledge and practices passed down to ensure the well-being of the entire family. The collective approach to food preparation and nutrition reinforces social bonds and demonstrates the interconnectedness of individual health and community well-being.

When considering meal planning and its impact on food consumption patterns, individuals often fall into two categories: those who meticulously plan their meals in advance and those who decide what to eat spontaneously. The choice between these approaches can significantly influence dietary habits and nutritional intake.

Half of the participants in the study were married, reflecting a demographic where family and communal values are central to daily life. Additionally, a significant portion of the participants was over 30 years old, suggesting a demographic more likely to prioritize health and stability in their meal planning decisions. In fact, in this study, planners tended to be older and more likely to be married, and mostly from collectivist countries, indicating a connection between life stage and the preference for planning meals ahead of time. This sociodemographic profile suggests that age and marital status play a role in shaping meal planning behaviours, influenced by factors such as household responsibilities, family structure, and life stage. These individuals prioritize structured meal planning to efficiently manage dietary needs, aligning with their roles and responsibilities within their households.

"In the supermarket, I like to do bulk cooking. So, I do bulk buying and bulk cooking. Then I portion the cooked food into smaller quantities. So, whenever I pick one out of the freezer, I defrost it. Then it serves as a meal, and it is done." (FG2, P2, Ghanaian)

Secondly, subjective norms play a role in guiding behaviour based on perceived social expectations. Married individuals or those in stable relationships may feel a stronger normative pressure to plan meals effectively, as it aligns with their roles as caregivers and household managers. This social expectation reinforces their inclination towards structured meal planning as a responsible behaviour necessary for family well-being.

"I have kids, so I need to have a plan. Otherwise, there'll be utter chaos in our household. And my wife is not really into cooking. She's an artist, so I do most of her cooking. So there has to be a plan. We couldn't run a household without a plan. "(FG3, P3, Zimbabwean)

Lastly, older adults and married individuals may perceive higher control over their meal planning capabilities due to their accumulated experience and shared responsibilities within their households. This sense of control seems to empower them to adopt and maintain

structured meal planning routines, confident in their ability to manage dietary needs and household obligations.

"It's an important thing to discuss every day with my partner. Like what we will eat today, what we will have today. We plan it ahead most of the time. And I'm working from home, so that helps to have this discussion and to plan the meal and prepare the meal together." (FG1, P3, Jordanian)

In contrast, individuals who decide what to eat spontaneously often include younger adults or singles who value flexibility and immediate satisfaction in their food choices. This group may prioritize convenience and variety over strict adherence to nutritional goals, often adapting their meals based on cravings, social activities, or availability of ingredients.

"I found that in Portugal, it's easy to be in the grocery store every day if you don't plan what you need to do and how you need to eat and so forth. "(FG3, P4, Nigerian)

"I've never been that organized to have a meal plan. Usually, I decide a day or two or one day in advance, and I hate cooking, so I really cook it out of necessity, not out of enjoyment." (FG3, P1, North American)

"I don't really plan it. I used to sometimes when I had my life a bit more organized. Nowadays I just go to the grocery store and buy what looks nice. And then when I get home, I think about what I'm going to cook with it, and it always ends up being useful in some way." (FG2, P3, German)

Food waste – attitudes and challenges. The attitudes towards food waste presented by the participants are shaped both by cultural values and personal beliefs and experiences. In the Ghanaian example, the parent emphasizes the importance of finishing food due to the awareness of hunger elsewhere, instilling a strong attitude against wasting food. The German participant mentioned that their parents emphasized not wasting food due to awareness of global hunger, indicating a normative influence within their family unit.

"In my house, you have to eat what is on the plate because I keep telling my kids that there are people in Sudan who are dying of hunger, so there's no need for you to waste food. So anytime the food is being served, you have to be present. Is this quantity okay for you? And that is what is put on your plate. You don't have to take more. If you take more in my house, I'll force you to finish the food. "(FG2, P2, Ghanaian)

"Like my parents would always say, you know, there's children in Africa who are dying of hunger, you don't waste food. And it pretty much does the same. If they have leftovers, I put them in the fridge and try to either create something new out of it, use it for the next meal, or just. Just eat it the day after." (FG2, P3, German)

Similarly, the Kenyan participant highlighted that food waste is discouraged due to economic reasons and the cultural norm of finishing all food on the plate. Subjective norms, or perceived social pressures, also play a significant role. In Ghanaian and Kenyan cultures, there is a strong normative expectation to finish all food served, driven by communal values and societal expectations.

"For us in Kenya, mostly, food waste is very discouraged, because of course there is like, you understand that not everyone can afford to eat all meals, so you really must finish everything on your plate. So, it's very rare to have. It's not many people who will not finish their food. And if maybe you cooked a bigger portion of food and you didn't serve everything, then that maybe will be carried the next day as lunch for your kids, or maybe you will. It has lunch for you for work." (FG4, P4, Kenyan)

The Japanese participant mentioned a deep cultural value ('mottainai') that considers wasting food as shameful, reinforcing a highly negative attitude towards food waste. These are deeply ingrained and influence how individuals perceive and approach food consumption and waste. In Japan, cultural values ('mottainai' and 'mokbanai') create a societal norm against food waste, influencing individual attitudes and behaviour through collective expectations.

"I believe food waste is unacceptable. In Japan, there's a deep cultural value placed on not wasting food, encapsulated in the word 'mottainai'. It signifies the idea that wasting food is a great shame. Similarly, 'mokbanai' conveys that wasting food is undesirable. Growing up in this culture has taught me the importance of respecting food and minimizing waste." (FG1, P2, Japanese)

In these examples, individuals presented themselves as exerting control over food waste through practices such as storing leftovers for future meals (Kenyan and German examples) or creatively using leftovers (German example). The Japanese participant's upbringing in a culture that values minimizing waste ('mottainai') enhances their perceived control over avoiding food waste by instilling habits of respect and resourcefulness towards food deeply rooted in their cultural background.

Following our exploration of attitudes towards food waste and cultural influences, we then delved into participants' personal initiatives aimed at reducing food waste in their daily lives. The attitudes towards food waste reduction in these statements are characterized by a strong aversion to wasting food. Participants expressed a dislike for food waste and emphasize the importance of using leftovers effectively.

"Personally, me, I just take what I can eat. I try not to cook the amount that I cannot finish." (FG4, P3, Japanese)

“I don't like it. I don't like to have food waste. So, if you find something as mundane as extra rice, I'll put it in the fridge, and I'll use it sometime during the week for fried rice. You know, fried rice makes very good leftovers.” (F3, P3, Zimbabwean)

A Japanese participant indicated the habit of storing excess food in the fridge for future meals, reflecting an attitude of thriftiness and practicality.

“So, if I cook too much at home, I will definitely keep them in the fridge and eat them the next day for breakfast or for lunch. “(FG3, P3, Japanese)

The French and American participants also expressed a strong dislike for wasting food and discussed the convenience of using leftovers in Tupperware for meals on the go.

“I really hate wasting food. If I have too much, I will keep it for the next few days. And yeah, it's nice also like this, you can also have food to put in a Tupperware, if you are going to the uni, if you go to work or whatever. “(FG3, P2, French)

"I try to be good about not wasting any food. I mean, for when we finish eating well, whatever we have left over, we'll put in Tupperware and save it for the next day (...) I'll like to smell it or check something first because sometimes I'll eat things a little after." (FG5, P2, American)

All participants demonstrated a high perceived behavioural control over reducing food waste. They described specific strategies such as storing leftovers in the fridge and planning meals to minimize excess food. For example, the Italian participant plans meals carefully, demonstrating a proactive approach to managing food consumption. This perceived control empowers individuals to take actions that align with their attitudes towards minimizing food waste.

"I typically buy ingredients that I can use throughout the week to minimize food waste. I plan my meals with consideration for how much I can eat at each sitting. If there’s any leftovers, I store it in the fridge and often eat it the next day." (FG1, P1, Italian)

Also, subjective norms, or perceived social pressures, are reflected in these statements through the cultural value of minimizing waste and practicality in food consumption. Additionally, some participants mentioned that when they are unable to finish their food at a restaurant, they choose to take the leftovers home as a takeaway to avoid wasting food.

The Bosnian participant's habit of requesting restaurants to pack leftover food reflects a normative influence against waste. Similarly, Pakistani cultural and religious practices

encourage minimizing food waste by taking leftovers home for later consumption, aligning with societal values of thriftiness and respect for food resources.

"If I'm eating dinner somewhere and I can't finish my meal, I have asked them to, you know, pack it so I can take it home because I don't want to waste the food." (FG3, P5, Bosnian)

"In our religious and cultural practices, there is a strong emphasis on not wasting food. Typically, people only take what they can eat. For instance, when dining out at a restaurant, if there is leftover food, it is common in our country—and we follow this practice as well—to ask the waiter to pack it up. We take it home and use it later, either the next day or later in the evening." (FG4, P1, Pakistani)

"I usually shop weekly on weekends, and I know what I'm consuming each week. This helps me limit waste because I buy according to my consumption. However, I do still waste some items, like bread. I try to store things in the fridge carefully to consume as much as possible. Most days, I cook dinner for the same day or the next day to save time. To limit waste, I only buy what I know I can eat. "(FG5, P3, Syrian)

The American participant highlighted challenges with food waste, particularly with fruits and vegetables that often spoil before they can be consumed. They attribute this to a lack of consistency in their eating habits compared to their intentions when purchasing healthy items. This discrepancy between intention (to eat healthily) and actual behaviour (choosing chips over fruits and vegetables) highlights the influence of attitudes and perceived behavioural control on food consumption choices. According to TPB, intentions to eat healthily are mediated by perceived behavioural control, which includes factors like self-regulation and environmental constraints such as food spoilage.

"The main food waste that I have trouble with is if I have too much, like, fruits, I go to the supermarket, and I have a productive mentality, and I'm like, I'm going to be healthy. I'm going to do good, and I buy all these fruits and vegetables, and then I eat chips, and then fruits and vegetables go bad. So, it's maintaining consistency and eating what I hope to eat when I go to the supermarket. "(FG5, P2, American)

Among those who mentioned food wastage, bread was consistently highlighted as the most wasted item. Additionally, fruits and vegetables were noted to spoil quickly in Portugal's humid weather conditions, contributing to their wastage.

The Japanese participant contrasts cultural practices regarding bread consumption between Japan and Portugal. In Japan, bread is typically sliced and consumed before it becomes stale. However, in Portugal, where whole loaves are common, the participant finds it

challenging to consume the bread before it hardens. This discrepancy in bread consumption norms influences their attitude towards wastage; they express guilt in overthrowing away bread that has become too hard.

"I think it's bread. So, here, people buy a loaf, like, how to say loaf? And it's very uncommon in Japan. Is everything sliced? So normally in Japan, I can consume before the expiration day, but here you must slice, and then after two days or three days, it's going to get kind of solid. And I cannot cut it anymore. I feel guilty, but I just threw it away. But when I went to the Portuguese friend's house, people threw the bread and then leftovers without any hesitation, and I found it's very, oh, very kind. I can, you know, if you don't need to, I can. […} But I say, are you Catholic? That's what they mentioned. I feel like I'm fortunate. I had a kind of culture shock in terms of the way food was wasted here. "(FG5, P1, Japanese)

The American participant highlights challenges with food spoilage in a humid environment, affecting items like bread, fruits, and vegetables. They describe efforts to salvage bread by moistening it or using the oven, but sometimes these methods fail. This experience underscores their perceived behavioural control over food preservation; however, environmental factors such as humidity pose challenges beyond their control.

"The bread will get hard sometimes. And depending on the kind, sometimes I'll try to put a little bit of water on it and put it in the oven, but sometimes it doesn't even work. It gets really hard, or it gets old because of things. Everything's so humid here. And same with the fruit. That happens quickly. So, I've had trouble consistently not letting my food go bad. Some of, like, the fruits and vegetables and bread here, but with food scraps after we cook and stuff, we usually save those only unless there's, like a half portion left or something, then I sometimes will throw it away. And it's not good, but we try to eat leftovers. "(FG5, P2, American)

The Syrian participant also identifies bread and fruits as commonly wasted items. They attribute wastage to forgetting about perishables or not being in the mood to consume them. This attitude suggests a certain level of ambivalence towards food wastage, influenced by personal circumstances and lifestyle habits.

"Bread. Unavoidable, I guess. Fruits. Sometimes it gets fast. Yeah, fruits and bread. What else? Yeah, sometimes for dinner, if I by mistake, like to do extra, like from what I eat, usually I save it like and eat it. And the next day, dinner. But because mostly I'm outside, other than dinner time, weekends, maybe my kitchen is light. So, my waste is light. "(FG5, P3, Syrian)

As we explored how participants address personally adopted initiatives in their food consumption to reduce waste, it becomes evident how these strategies impact their daily lives

and choices. The extracts show participants employing effective strategies to reduce food waste. The Zimbabwean uses a "first in, first out" method to prioritize perishables, while the Brazilian preserves food through freezing and refrigeration. These approaches reflect their commitment to sustainability and impact their daily choices by promoting mindful consumption and resource management.

"My mentality is we eat what we kill, even though we're not in the wild hunting. It's. I don't know if you have done accounting before. There's an inventory control system that they call Fifo (first in first out). It's first in, first out. So, whatever is in the house, if we have oranges, they're about to spoil. We'll eat the oranges before we get out to the blueberries." (FG3, P3, Zimbabwean)

"In the morning, I start my day with a protein shake mixed with fruit. However, I often find that fruits like bananas, strawberries, and blueberries go bad quickly after I buy them. To prevent wastage, I wash and dry the berries, then freeze them. If I notice bananas starting to go bad and I still have a couple left, I put them in the fridge where they last longer. Another strategy I use is to freeze meals that I know will last longer than I can eat them fresh. This way, I can avoid wasting food by preserving it for later use." (FG3, P2, Brazilian)

Tackling the issue of food waste among international students. When asked about initiatives that could address the issue of food waste, particularly considering the challenges faced by international students, most participants highlighted the importance of education and technological solutions in addressing food waste. For instance, the Italian participant emphasized teaching about food conservation from a young age to instil habits that reduce waste. The German participant suggested raising awareness about food production and utilizing practical tools like freezers and Tupperware.

"In my view, education is the key solution to addressing any social issue. If we start teaching children from kindergarten or school about finishing their food and not wasting it, it becomes a natural habit because it's easy to understand. Once this becomes a routine, it becomes ingrained in everyday life. When it comes to international students, I think it varies based on how accustomed they are to cooking for themselves, understanding portion sizes, and their level of awareness about food conservation." (FG1, P1, Italian)

"I think having people become aware that this is an issue, and understanding how much energy goes into food production, is important. They should know that food often needs to be shipped and flown in from different places, how little the farmers are paid, and all the work that goes into preparing something. If people are more aware of that, they might develop a greater appreciation for it and waste less. I think also providing better ideas for making use of

their food is crucial. Some people might not realize that putting stuff in the freezer or investing in a set of Tupperware is actually a good investment." (FG2, P3, German)

Lastly, some participants highlighted the growing use of digital solutions in everyday life, influencing both consumption habits and the sourcing of food ingredients. The American participant focuses on using what's already at home and ordering imperfect produce from "Equal Food," despite occasional spoilage. A Japanese participant values early food education and admires the "Too Good To Go" app for reducing waste in Europe. The Brazilian participant suggested an app for bulk purchasing to manage portion sizes and highlighted volunteering at "ReFood" to distribute surplus food, promoting community-driven solutions to combat food waste. These initiatives reflect a trend towards integrating digital platforms into sustainable food practices and consumer choices.

"I try my best not to buy new things if I already have items at home, often opting to cook with what I already have on hand and regularly consuming leftovers. One practice I follow is ordering fruits and vegetables every two weeks from a company called Equal Food.
They source produce that local farmers can't sell due to imperfections like odd shapes or deformities. I'm not entirely sure if I'm preventing waste by doing this, as I wonder if these items would have been thrown away otherwise. Sometimes, I admit, I let some of these fruits and vegetables go bad, which might lead to more waste than if someone else had received them. Nonetheless, I believe this practice contributes positively to reducing waste." (FG5, P2, American)

"I agree that education is important. When I was in elementary school, we had a class about nutrition and food. We usually ate together in the classroom, and if there were leftovers, someone would try to eat them to avoid wasting food. This experience showed me how important education about food is. Additionally, I was pleasantly surprised by the "Too Good To Go" app when I came to Europe. It's a great initiative, but there's no equivalent app in Japan or many other countries. I think this system is a good idea." (FG1, P2, Japanese)

"I was thinking there could be an app for bulk purchasing, where if you need to buy a kilo of potatoes, you can join with others to make the purchase and only take home the amount you actually need. This could help prevent having half a bag of potatoes rotting at home. In terms of tackling food waste, I volunteer at ReFood, where we collect surplus food from restaurants and supermarkets. This includes food that's nearing its expiration date or doesn't meet aesthetic standards—like apples with a few bad spots that are still edible. We then distribute this food to low-income families. Something along these lines could be a way for people to come together and share food, rather than letting it go to waste." (FG3, P2, Brazilian)

Discussion

This study investigates how cultural values and acculturation processes influence food consumption and waste behaviours among international students in Portugal. The primary aim is to examine how cultural norms and traditions shape attitudes towards food consumption and waste, how international students adjust their food consumption in a new cultural context, and identify key factors such as attitudes, subjective norms, and perceived behavioural control relate to their intentions to reduce food waste.

Our key findings highlight the role of cultural values in shaping food consumption behaviours and attitudes towards food waste. Participants from collectivist cultures emphasized the importance of communal eating, which fosters social bonds and reinforces cultural identities through shared meals. This contrasted with participants from more individualistic cultures, who prioritize convenience and personal choice in their food selection. Traditional cultures often emphasize adherence to historical practices, aiming to preserve past traditions rather than adapting to future changes (Freedman, 2016). This adherence to tradition is evident in the collectivist emphasis on communal dining, which not only strengthens social ties but also reflects a commitment to long-standing cultural norms. In contrast, individualistic cultures, with their focus on convenience and personal autonomy, reflect a more adaptive approach to food consumption that aligns with modern lifestyles and values.

Participants from Ghana, Nigeria, and Jordan showed a strong conscientiousness about food consumption and waste. Our findings are consistent with Liu et al. (2021), who observed that collectivist cultures generally exhibit more pro-environmental behaviours at home, although this tendency can diminish when hedonic motivations are involved. Morkunas et al. (2024) further support this, showing that cultural beliefs shape negative attitudes towards leftovers and food waste, impacting individuals' intentions to reduce waste and highlighting the importance of societal norms in promoting waste-reducing behaviours.

Additionally, some participants emphasized the importance of providing ample food when hosting guests, noting that insufficient food could undermine the celebratory nature of an event. This observation aligns with the idea that collectivist cultures, often characterized by high uncertainty avoidance, enforce strict rules regarding food choices, while more tolerant cultures exhibit greater flexibility (Damen et al., 2019).

Németh et al. (2019) found similar dynamics among international students in Hungary, highlighting that food serves as more than mere sustenance—it is central to cultural identity, social cohesion, and community bonding. In collectivist cultures, such as those from Africa

and the Middle East, communal dining during social gatherings reinforces values of interconnectedness and collective well-being. This contrasts with individualistic cultures, where participants from the United States and parts of Europe tend to prioritize convenience and personal autonomy in their food choices. Like Németh et al. (2019), our research underscores the preference for private dining in individualistic societies, reflecting a focus on personal schedules and independence.

On the other hand, in individualistic cultures, food consumption patterns often mirror values of personal independence and self-reliance. For instance, in many European countries like Germany, which scores as more individualistic, the emphasis is placed on personal choice and less structured approaches to hosting (Hofstede & Minkov, 2010). The approach to food is typically more casual—often limited to snacks unless a meal is explicitly planned—reflecting a greater emphasis on personal autonomy and flexibility rather than formal dining traditions.

Djekic et al. (2021) further support these observations, showing that Hofstede's cultural dimensions significantly impact food choices. Individualistic and feminine societies, as well as those with lower power distance and uncertainty avoidance, exhibit distinct food choice patterns compared to more collectivist, masculine, and high-power distance cultures. For instance, in individualistic cultures like the United States and certain European countries, food consumption often emphasizes personal convenience and autonomy. An American participant contrasted their experiences in the U.S. with their life in Portugal with an Argentinian partner, noting that while Americans often eat on the go due to busy lifestyles, Argentinian and Portuguese cultures place a higher value on sitting down to share meals. This contrast highlights the adaptability and influence of cultural norms on food-related behaviours.

Our research reveals intriguing connections between cultural values and food practices in Japan, reflecting its unique position on this spectrum. As Németh et al. (2019) noted, food plays a significant role in ceremonies and holidays among Asian cultures. In our participants from Japan, traditional collectivist values are evident in mentions of practices such as communal dining during New Year's Day, which symbolizes unity and family ties. However, their accounts also portray how Japan's contemporary lifestyle increasingly reflects individualistic preferences, with a growing trend towards private dining within family circles. This shift highlights Japan's complex cultural dynamics, as it navigates between deep-rooted collectivist traditions and modern inclinations for predictability and personal autonomy. This duality aligns with Japan's high uncertainty avoidance culture (Luo, 2024), and in how Japan

occupies a nuanced middle ground between the poles of Individualism and Collectivism (Hofstede et al., 2010).

Our research uncovers several challenges related to food waste during cultural events, presenting a contrast to Németh et al. (2019) emphasis onthe communal benefits of such traditions. Our study shows that food waste can be a significant issue, especially during large cultural and social gatherings. In line with Mmereki et al. (2023), our findings indicate that in the South African context, cultural practices that involve preparing food in large quantities often result in substantial food waste. Despite the intent to foster community and celebration, this surplus food frequently goes uneaten and ends up in landfills, highlighting a critical area for intervention. Similarly, our exploration of food waste in Muslim societies reflects Baran et al.'s (2024) observations about the tension between Islamic teachings of moderation and the cultural practices of abundance during social and religious events. In our data, this tension is evident as participants from Muslim backgrounds expressed concerns about the excessiveness of food prepared for events, contrasting with their religious teachings advocating for moderation. This tension underscores the complex relationship between cultural practices, religious teachings, and sustainability concerns.

For example, Jordanian, Syrian, and Pakistani participants reported that during Ramadan, there is an abundance of food prepared for sharing, highlighting a divergence from expected food waste reduction. This suggests that while religion influences food waste behaviours, cultural practices such as those during Ramadan can still lead to significant food waste. This finding emphasizes the need to tailor food waste reduction strategies to accommodate both religious and cultural practices to enhance their effectiveness.

Using Berry’s framework has significantly enhanced our understanding of the acculturation experiences of international students, particularly concerning their dietary habits and food choices. Noyongoyo's (2011) study supports this by illustrating how acculturation strategies like integration and assimilation can be linked to food consumption patterns among international students. Our research reflects this dynamic, showing that Japanese participants, for instance, shifted from traditional rice-based breakfasts to adopting Portuguese-style breakfasts featuring bread and coffee. This assimilation highlights how Portuguese culinary traditions have influenced their food habits.

Both Németh et al. (2019) and our study address the challenges faced when encountering unfamiliar food environments abroad. Németh et al. emphasize difficulties such as finding familiar foods and adhering to dietary restrictions due to cultural differences. Our findings corroborate these challenges but also highlight how participants successfully integrate

Portuguese cuisine into their diets while preserving their cultural food identities. For example, despite occasional difficulties with taste preferences and ingredient availability, participants have shown resilience by blending traditional recipes with local ingredients. They have embraced new food habits, such as increased seafood consumption and incorporating more vegetarian and reduced meat options into their diets. This integration mirrors the findings of Noyongoyo (2011), who observed an increase in American dietary items among international students, such as TV dinners and packaged cakes, alongside a decrease in traditional foods from their home countries. An example from our study includes a German participant who initially seldom ate seafood but chose to embrace it as part of their cultural integration process in Portugal. Interestingly, some of these new dietary choices, particularly the increased consumption of vegetarian and reduced meat options, can be seen as more sustainable. Conversely, for those attempting to maintain their 'home' food habits, sustainability can be an issue due to the reliance on imported products. This challenge underscores the complexity of maintaining cultural food practices in a new environment, where adaptation to local food systems often becomes necessary for both practical and sustainability reasons.

Moreover, consumer choices, habits, attitudes, and perceptions significantly influence food waste levels, with cultural norms like expectations for perfect produce contributing to food waste as consumers reject imperfect items (O'Connor et al., 2023). This reflects TPB's emphasis on attitudes, as negative evaluations of "imperfect" produce lead to increased food waste. In our study, several participants noted how fruits and vegetables spoil quickly in Portugal's humid weather, leading to wastage. They also mentioned specific criteria for discarding food, such as considering "gooey" tomatoes unfit for consumption, which highlights how attitudes toward food freshness influence waste.

Consumer perceptions of expiration dates and food freshness, as illustrated by Japanese participants' careful attention to these factors, underscore TPB's attitudes and perceived behavioural control. Some participants focus on dairy product expiry dates or use sensory checks even after the expiration date. This variation shows how perceived behavioural control influences waste behaviours based on personal beliefs and practices. Similarly, Ozanne et al. (2022) observed that students often discard produce due to freshness loss or cosmetic imperfections, driven by a preference for quality and aesthetics, aligning with TPB's subjective norms and attitudes.

Furthermore, Lim et al. (2019) found that despite knowledge and positive attitudes towards sustainability, consumers often fail to act due to other factors like cost and taste preferences. This finding, echoed by Abraham et al. (2018), illustrates the gap between

attitudes and actual behaviour due to practical barriers, reflecting TPB's perceived behavioural control. In contrast, our study among participants from African countries and Japan underscores a collective prioritization of food for health and balanced nutrition, aligning with TPB's attitudes and subjective norms. Erzse et al. (2023) supports this by showing that collectivist societies emphasize health and communal values, influencing food-related behaviours.

Additionally, both our research and that of Ozanne et al. (2022) recognize demographic factors like age and living arrangements as influential in food waste behaviours. Ozanne et al. emphasize how these factors impact students' poor meal planning skills and organizational habits, such as their infrequent use of shopping lists. In contrast, our research highlights how older, married participants over 30-years-old often engage in structured meal planning, prioritizing health and family responsibilities and minimizing food waste. This contrast shows the varying impacts of age and life stage on food waste behaviours.

Lastly, our findings on participants´ personal initiatives and suggested strategies for reducing food waste align with TPB. This framework highlights how cultural norms and personal beliefs may shape food-related decisions. Data reveals that participants´ attitudes towards food waste are deeply influenced by their cultural values and personal experiences. For instance, Japanese participants practice waste minimization by storing excess food, whereas North American participants encounter challenges with food spoilage due to environmental factors.

Participants' strong aversion to food waste reflects attitudes shaped by cultural values, such as Ghanaian norms against waste and Japanese principles of 'mottainai'. Subjective norms also play a role, with cultural expectations driving practices like finishing all food and using leftovers effectively.

Our study also revealed that, despite these attitudes, perceived behavioural control varies among participants. For example, Japanese participants exhibited high perceived control through habits like storing excess food, while American participants struggled with food spoilage in a humid climate, affecting their ability to manage waste effectively. This discrepancy illustrates how environmental factors can influence perceived behavioural control. Similarly, Nunkoo et al. (2021) highlighted key themes related to attitudes and barriers to food waste, such as guilt over wasting food and lack of environmental awareness, which correspond to TPB's concepts of attitudes and perceived behavioural control. Barriers like inadequate policies and space limitations also reflect challenges in perceived behavioural control, impacting waste reduction efforts.

Participants noted practical strategies for reducing waste, such as using digital solutions like the "Too Good To Go" app and bulk purchasing apps. These strategies incorporate technological tools into sustainable practices and suggest that enhancing perceived behavioural control through education and technology can support waste reduction efforts (Alattar et al., 2020).

Participants emphasized the importance of early education on food conservation and the use of practical tools like freezers and Tupperware in enhancing their perceived ability to manage food waste. This is supported by Morkunas et al. (2024) review, which found that effective education and awareness initiatives empower individuals to feel more capable of managing their food waste, reinforcing TPB's focus on how perceived control impacts behaviour.

Addressing the limitations of our study provides us with valuable insights into its scope and offers guidance for future research directions. One notable limitation is our use of convenience sampling, which resulted in a relatively heterogeneous group of 18 participants. This could potentially limit how broadly we can apply our findings to the wider population of international university students in Portugal. To address this, future studies could benefit from using more diverse sampling methods, including a broader representation of various ethnic backgrounds and cultures. Specifically, our study had only Japanese participants, highlighting the need for a larger and more diverse sample of Asian participants to better capture the range of experiences and perspectives within this group. This approach would help ensure that our findings are more representative and capture a broader range of experiences related to cultural adaptation and food practices.

Another important point is that our study relied solely on qualitative interviews to explore participants' views on food waste, without quantitatively measuring food consumption and waste. This means we do not have precise data on how much food was wasted by our participants. To improve on this in future research, incorporating quantitative methods such as direct observations of food waste in places like students´ houses and garbage bins could provide more accurate insights. Additionally, asking participants to keep food diaries or conducting waste audits would help validate their self-reported behaviours and give us a clearer picture of food waste practices.

Practical Implications and Future Research

To reduce food waste among international students, we suggest implementing targeted educational programs that address both cultural and practical aspects of food management (Morkunas et al., 2024). Workshops could focus on meal planning, proper portion sizes, and

efficient use of leftovers. Encouraging students to participate in local cooking classes could also help them integrate Portuguese culinary practices with their traditional foods, promoting more sustainable eating habits. Additionally, creating a community platform where students can exchange tips, recipes, and surplus food could foster a culture of sharing and reduce waste. Engaging with campus dining services to offer culturally diverse menu options and smaller portion sizes could further support food waste reduction efforts.

Looking forward, there are several exciting directions for future research. Firstly, expanding our study to include a wider range of cultural backgrounds beyond international students would provide a more comprehensive understanding of how various migrant communities navigate food practices in Portugal. Longitudinal studies could also be valuable to track changes in food consumption behaviours and attitudes towards food waste over time as individuals become more acculturated or as cultural dynamics evolve. Additionally, exploring interventions aimed at promoting sustainable food practices and reducing waste within specific cultural contexts could help identify effective strategies that respect cultural values while promoting sustainability.

Conclusion

In conclusion, while our study provides valuable insights into how cultural influences shape food practices and waste management among international students in Portugal, addressing these limitations and exploring future research directions will further advance our understanding and support the development of inclusive and sustainable food systems globally.

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Appendix A

I'm excited to welcome you to this focus group discussion exploring the intersection of cultural influences and food consumption among international students. My name is Feyza Ozturk Altaher, and I'm a master's student in the Psychology of Intercultural Relations at Iscte. Under the supervision of Professor Carla Sofia Mouro, we are conducting this study to better understand how cultural backgrounds shape food consumption and waste behaviours.

Today, we're here to delve into essential topics related to food preparation, consumption, and waste within the context of diverse cultural perspectives. Your participation is valuable as we aim to gain insights that can contribute to reducing food waste while fostering cross-cultural understanding.

During our around one-hour session, we'll engage in an open and respectful dialogue. I encourage each of you to share your perspectives and experiences openly. To ensure clarity and effective discussion, I will pose questions and invite everyone to contribute. Feel free to share your thoughts at any time, but let's try to avoid speaking over each other to maintain clear recording and understanding.

Your contributions are integral to this research, and I'm excited to hear from each of you. Remember that all participation is confidential, and your insights will play a crucial role in advancing our understanding of this important topic. Do you have any questions? Let's start by saying something about ourselves, like your first name, area of study, where are you from, and favorite food. I will start.

"Originally from Turkey, I've been living here for the past two years. Food has always held a special place in my heart, and I enjoy exploring new flavours and cuisines. One of my favourite dishes from back home is sarma, delicious grape leaves stuffed with a savoury mixture of rice, herbs, and spices, often served with yogurt on the side."

[Take note of the order in which they speak in the first turns, this will make it easier to identify participants in the transcription]

First, I would like to ask you a general question about your food consumption habits. What role does food play in your life and daily routine?

As we are interested in the role of culture in food consumption, I will now ask you some questions about this related to your home culture / cultural background

1. In your culture, how significant is the act of sharing meals with others? How does this impact your food choices?
2. When trying to have a meal from your culture, do you use pre-packaged food or prepare it yourself with fresh products?
3. What role does hospitality play in your cultural dining experiences, and how does this influence your interactions with food?

Now I will ask you some questions about your experience here in Portugal

1. (Please start by saying how long have you been here?) Have you noticed any changes in your eating habits or food preferences since coming to Portugal? Can you give examples of these changes?
2. Can you describe how Portuguese culinary traditions have impacted the foods you regularly eat?
3. Describe how you balance maintaining your cultural dietary practices with integrating into Portuguese food culture. Have you adapted any traditional recipes from your culture to use more readily available ingredients in Portugal? What challenges have you faced in this process?
4. Besides the Portuguese culture, being an international student probably put you in contact with other cultures. How has exposure to different cultural backgrounds influenced your food consumption during your time in Portugal?

Now I’m going to make some questions about your personal choices

5. Please describe your typical dinner meal as an international student. Would that be your ideal meal, and if not, what factors prevent you from having it regularly?
6. Do you typically cook at home or prefer eating out, and what factors influence this choice? do you attribute any meaning to preparing meals yourself?
7. Do you plan your meals in advance or decide what to eat spontaneously? How does this affect your food consumption patterns? Are there differences in the types of food you consume on weekdays versus weekends?
8. For all of us there are some meals where we don’t eat everything. Does that happen to you? Are there some meals where this happens more often? Is this different depending on where or whom you are with? (for example, at home with parents, at the university with colleagues, at home with roommates)
9. How do you feel about that food waste? What do you do with the leftovers? Are there cultural practices or beliefs that influence how you handle food waste?
10. Food waste is nowadays identified as a major sustainability issue. Have you personally adopted any initiatives in your food consumption to ensure food waste reduction? And how have these impacted your daily life and choices?
11. As a final question I would like to know if you think there are initiatives that would help deal with this issue of food waste, thinking specifically of the challenges met by international students?
12. Anyone would like to add anything else before I close the session?

Thank you very much for taking the time to participate in this study.

Appendix B

INFORMED CONSENT

This study is part of a research project taking place at **Iscte – Instituto Universitário de Lisboa**,

The main goal of this research is to investigate the relationship between cultural influences and food consumption and waste behaviours among international students. Your participation in this study will involve sharing video recordings and/or photos, via WhatsApp, related to food preparation and consumption once a day for two weeks and afterwards participating in an online focus group session lasting approximately one hour with three to four other participants. Ultimately, the research aims to deepen our understanding of this multifaceted issue and provide insights that can guide interventions and policies to reduce food waste among international students while promoting sustainability and cross-cultural understanding.

Iscte is responsible for the processing of your personal data that are collected and processed exclusively for the purposes of the study, legally based on Article 6(a) *and/or* Article 9(2)(a) of the (GDPR).

The study is conducted by **Feyza Öztürk Altaher (feyza_altaher@iscte-iul.pt)**, who you may contact to clear up any doubts, share comments or exercise your rights in relation to the processing of your personal data. You may use the contact indicated above to request access, rectification, erasure, or limitation of the processing of your personal data.

Your participation in this study is **confidential**. Your personal data will always be processed by authorised personnel bound to the duty of secrecy and confidentiality. Iscte assures the use of appropriate techniques, organisational and security measures to protect personal information. All investigators are required to keep all personal data confidential.

In addition to being confidential, participation in the study is strictly **voluntary**: you may choose freely whether to participate or not. If you have decided to participate, you may stop your participation and withdraw your consent to the processing of your personal data at any time, without having to provide any justification. The withdrawal of consent shall not affect the lawfulness of processing based on consent before its withdrawal.

Your personal data, gathered for this study, will be initially transmitted to us via WhatsApp Web/Desktop for research purposes. Following this, the data will be directly stored in the Iscte SharePoint folder, ensuring it is not retained on researchers' personal smartphones or computers. Your data will be securely maintained in the Iscte SharePoint folder for a duration of 6 months. After this period, your data will either be destroyed or anonymized, ensuring that your identity remains confidential in the study's results. These results may be disclosed only for statistical, teaching, or communication purposes in scientific meetings, books, or articles. We prioritize the security and privacy of your information throughout this process.

Before providing consent, it is essential for participants to know that the study may collect various types of personal data, such as voice recordings, names, contact details, and other potential identifiers. Also, we acknowledge that email records containing your consent will be treated as personal data, handled in accordance with data protection regulations.

Please note that there are no expected significant risks associated with participation in the study. Iscte does not disclose, or share with third parties, information related to its personal data.

Iscte has a Data Protection Officer who may be contacted by e-mail: *dpo@iscte-iul.pt*. If you consider this necessary, you also have the right to submit a complaint to the Portuguese Data Protection Authority (CNDP).

I declare that I have understood the aims of what was proposed to me, as explained by the investigator, that I was given the opportunity to ask any questions about this study and received a clarifying reply to all such questions. **I accept** participating in the study and consent to my personal data being used in accordance with the information that was given to me.

_____ (place), _____/____/_____ (date)

Name: _____

Signature: _____

Appendix C

Participant Information Form

Welcome to our questionnaire! Your participation in this research will greatly contribute to our understanding of the subject matter. As food consumption is related to many individual, social, financial, and cultural factors, we would really appreciate it if you could respond to some questions regarding some of these aspects. Rest assured, all information provided will be anonymized and destroyed after analysis, ensuring your privacy and confidentiality. Thank you for your valuable contribution!

1. **Name**

2. **Age**

3. **Gender**

- ◯ Male
- ◯ Female
- ◯ Non-binary
- ◯ Prefer not to say

4. **E-mail Adress**

5. **Please specify the country where you were born**

6. Please specify the country of origin and your nationality

7. **Current Residence:**

Country:

8. **Current Residence:**

City/Town:

9. **Current Residence:**

Length of Residence in Portugal (in years):

10. **Previous Residency**

Have you previously resided in another country besides your country of origin (except Portugal)?

- ◯ Yes
- ◯ No

11. **If yes, please specify the country/countries and the duration of residency for each:**

12. **Current Educational Status (last complete degree):**

- ◯ Undergraduate/ Bachelor's Degree
- ◯ Postgraduate/ Master's Degree
- ◯ Doctoral/ Ph.D. Degree
- ◯ Other

13. **Current Enrollment as an International Student is for obtaining:**

- ◯ Undergraduate/ Bachelor's degree
- ◯ Postgraduate/ Master's Degree
- ◯ Doctoral/ Ph.D. Degree
- ◯ Other

14. **Employment Status:**

Occupation:

15. **Employment Status:**

Industry/Field:

16. **Marital Status:**

- ◯ Single
- ◯ Married
- ◯ Divorced
- ◯ Widowed
- ◯ Other

17. **In terms of managing expenses, how would you characterize the financial status of your household?**

- ◯ Comfortable or very comfortable
- ◯ Adequate
- ◯ Somewhat Strained
- ◯ Difficult or very difficult
- ◯ Prefer not to say

18. **Religious Affiliation (if any):**

19. **Spiritual Beliefs/Practices (if any):**

20. **Additional Comments or Information (optional):**

Appendix D

Debriefing/ Explanation of the Research

Thank you for participating in this research study. As mentioned earlier, this study focuses on "Cultural Influences on Food Waste Among International Students" with the aim of exploring food waste behaviours within this demographic. Our objectives include investigating cultural perspectives on food waste, understanding consumption behaviours, exploring attitudes towards waste reduction, and examining how interactions with diverse cultural backgrounds impact food waste behaviours.

Your participation in this study has been invaluable in contributing to our understanding of these important topics. Your insights and experiences have provided valuable data that will help us uncover the complex relationship between culture, food consumption practices, and food waste behaviors among international students. We are grateful for your involvement and appreciate the time and effort you dedicated to this research project.

In the context of your participation, there was no deception or concealment of information. You were informed about the research objectives and procedures, and your participation was entirely voluntary. Your personal information and responses will be kept confidential, and your privacy will be protected.

We remind that the following contact details can be used for any questions that you may have, comments that you wish to share, or to indicate your interest in receiving information about the main outcomes and conclusions of the study: **Feyza Öztürk Altaher (feyza_altaher@iscte-iul.pt)**.

If you wish to access further information about the study topic, the following sources can also be consulted: **Prof**. **Carla Sofia Mouro (carla.mouro@iscte-iul.pt)**.

Once again, thank you for your participation.