The influence of Instagram food-related content on eating behaviour and the role of mindfulness and self-control

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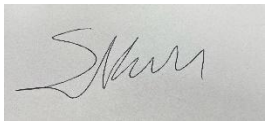
DECLARATION

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for a degree or other qualification at this University or elsewhere. All sources are acknowledged as references.

Stelina Kanaki



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ABSTRACT

This thesis explores the influence of food-related content on Instagram on eating behaviour and food consumption. The study is motivated by the prevalence of social media and the increasing amount of food-related content, which can negatively impact users' eating practices. Research on influences on eating behaviour has been extensive and continues to evolve, especially with new factors emerging in modern society, such as the digitalisation era. The study employs the Food Well-Being model, a comprehensive framework for understanding eating behaviours, which has not yet been applied to online environments. Through diary methods, this research examines the effects of food socialisation, food marketing, and food literacy on eating behaviour within Instagram.

The key findings include:

The source and type of food content, as well as the emotions elicited by this content, significantly influence food consumption.

Different sources (e.g., friends vs. influencers) lead to different eating patterns; notably, while content from friends tends to lead to unhealthy eating, content from influencers is associated with healthier consumption.

Viewing unhealthy foods does not result in unhealthy eating, whereas viewing healthy food content is strongly correlated with healthier consumption.

The study also investigates the potential of mindfulness interventions to counteract the strong influences of social media on unhealthy eating patterns. The findings show a strong positive correlation between mindfulness and healthy consumption. However, further research is needed to determine whether all facets of mindfulness predict healthy eating, as this study identified only two significant predictors. Given the potential of mindfulness interventions, future campaigns should also aim to target larger-scale communities and groups to maximise the impact of these findings.

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CHAPTER 1: GENERAL INTRODUCTION

This chapter provides an introduction of the pertinent conceptual and empirical literature concerning consumer behaviour, with a particular focus on social media influences on eating behaviour and the role of social marketing strategies in promoting healthy eating habits. It commences by outlining the challenges brought about by the increasing prevalence of obesity and exploring the intricacy of eating behaviour and its underlying factors that contribute to excessive and/or unhealthy eating. An outline of the impact of social media on behaviours and more especially on eating behaviour will follow, as well as the selection of Instagram as a context for this study will be discussed, highlighting the food posts prevalence on Instagram compared to other platforms. From a social marketing perspective, a short mindfulness intervention was selected as a mitigating strategy for this thesis. This approach leverages the concept of mindfulness, which is described along with its associated physical and psychological benefits. The literature which illustrates the relationship between mindfulness and healthier eating behaviours resulting in better weight management, as well as healthier lifestyle, is reviewed. Next, self-control, an important factor in healthy eating, is discussed. Low levels of self-control have been shown to hinder healthy eating, and its relationship with mindfulness is examined. The chapter covers an overview of the existing literature that highlights the importance of mindfulness in enhancing self-control, and outlines the goals of the current study in examining how self-control affects the connection between mindfulness and eating behaviour influenced by social media.

1.1. UNHEALTHY EATING CONSEQUENCES

Studies on eating behaviours in the social sciences aim to investigate the factors driving consumption and the eating habits that may lead to long-term health risks, economic burden, poor mental well-being, and social inequalities (Hruby et al., 2016). The weight related health problems are well established and examined by health professionals. Obesity is a major public health concern worldwide, including in the United Kingdom due to itsassociation with chronic comorbidities that results in physical and/or psychological symptoms, impacting both the quality of life and the life prevalence (NHS, 2023).

According to the latest Health Survey for England in 2022,25.9% of adults in England are obese with a further 37.9% classified as overweight (Baker, 2023). Research has also focused on the link between obesity and COVID-19, showing that obesity and overweight are considered risk factors to COVID-19 serious infection (Kompaniyets et al., 2021; Malik et al., 2020). A significant increase in individuals' weight and unhealthy habits has been observed during COVID-19 (Zeigler, 2021; Bhutani et al., 2021). According to Kriaucioniene et al. (2020), despite individuals cooking homemade food during the lockdowns, which might be expected to be healthier, the dishes were high in calories, and the overall quantity consumed was greater. This information aligns with findings showing that during COVID quarantines, food posts on social media predominantly featured unhealthy foods and drinks, which increased the risk of developing unfavourable health outcomes (Gerritsen et al., 2021; Kucharczuk and Oliver, 2022).

Rising obesity rates translate to increasing costs for the NHS. The latest information about NHS' obesity costs comes based on obesity numbers during the 2014/15 and estimated that the NHS spent £6 billion on overweight and obesity related illnesses in a year (2014/15) while this may rise to £9.7 billion per year by 2050 (Department of Health, 2017; Holmes, 2021). Beyond direct healthcare and productivity costs, unhealthy eating also contributes to broader societal costs. These include increased insurance premiums (Lehnert et al., 2013), social welfare expenditures (Correll, 2010), and economic losses due to reduced quality of life (Thorpe, 2005). Moreover, individuals with diet-related health issues often experience higher rates of absenteeism and/or presenteeism (i.e. suffer from reduced productivity due to illness-related fatigue or discomfort) from work which impact overall workplace efficiency and economic output (Howard et al., 2012).

Finally, in a more individual level, overeating and overweight may lead to poor mental well-being as well as to social inequalities. Numerous studies have found a significant association between poor dietary patterns and increased risk of mental health disorders like depression and anxiety (Contreras-Rodriguez et al., 2023). Diets high in processed foods, sugar, and unhealthy fats can negatively affect brain function and mood regulation (Contreras-Rodriguez et al., 2023; Gibson-Smith et al., 2020). For example, the consumption of refined sugars and trans fats is linked to inflammation and oxidative stress, which are thought to contribute to mood disorders as well as cognitive decline (Vermeulen et al., 2017). Conversely, diets rich in fruits, vegetables, and whole grains are associated with better mental health outcomes as well as emotional stability (Roca et al., 2016).

While the prevailing evidence underscores the negative impact of poor dietary patterns on mental health, it is crucial to consider the complex relationship between comfort foods, snacking, and emotional well-being. Individuals turn to snacks and comfort foods for immediate emotional relief and a sense of happiness (Van Strien et al., 2019). The enjoyment derived from eating these foods, which are mostly unhealthy, is often linked to the release of neurotransmitters such as dopamine, which providing temporary pleasure and mood enhancement (Troisi and Wright, 2017). However, this happiness is frequently short-lived and may be accompanied by longer-term negative consequences such as weight gain, self-doubt, decreased self-esteem, and exacerbated mental health issues.

Therefore, while snacking and comfort foods can offer short-term emotional relief and a fleeting sense of happiness, it is essential to emphasise the importance of balanced eating. A well-rounded diet that includes a variety of nutrients supports both immediate pleasure and long-term health. Further research into the roots of (un)healthy eating and its underlying mechanisms, particularly in the context of social media influence, is crucial for developing effective strategies.

1.3. THE MULTIDIMENSIONAL EATING BEHAVIOUR

Although the literature indicates the role of biological factors such as hunger, appetite, and taste, in the regulation of food intake, much research highlights also that eating behaviour is influenced by a multitude of factors, such as taste, enjoyment, marketing cues, social and psychological factors (Emilien and Hollis, 2017; Robinson et al., 2014; Wansink, 2007); as highlighted in the Food Well Being Model model too. Consumer behaviour research studies have extensively looked at eating behaviours influenced

by environmental cues, television-viewing, and social interaction; or as coined by Food Well Being model, Food Marketing and Food Socialisation. Television-viewing has been found to have a negative impact on eating behaviours especially among young adults (Barr-Anderson et al., 2009). Nevertheless, in a modern society social networking sites (SNS) are a medium which potentially is used more than television among predominately young adults (Riehm et al., 2019; Dixon, 2022); therefore, habits and behaviours are deemed to be influenced in the digital context. For example, primary research indicates that social media posts distract young adults from making positive food choices but there is no clear evidence so far regarding the social media factors that shift individuals' attention towards specific types of eating habits (Vaterlaus et al., 2016). Research has increasingly highlighted the significant impact of peer influence on eating behaviours through social media. For instance, users often modify their eating patterns to mirror the consumption habits displayed by their peers online (Chung et al., 2021). This phenomenon is not new, as similar behaviours have been observed in face-to-face interactions (Cruwys et al., 2015). Moreover, food marketing has a profound influence on dietary choices, both online and offline (Ellison et al., 2023). It plays a pivotal role in shaping eating habits, driving consumers towards both healthier diets (Norman et al., 2016) and less healthy ones (Finlay et al., 2022).

In this context, food literacy could potentially buffer the effects of food socialisation and food marketing. Food literacy encompasses not only the ability to access and understand information about nutrition but also the skills needed to critically evaluate and make informed decisions. However, it is important to note that food literacy, according to Food Well Being model, may include the emotional connection with food too. This emotional connection leads to more subjective and emotional decisions based on the individual's relationship with food (Bublitz et al., 2013).

The convergence of peer influence and targeted food marketing on social media, as well as food literacy as depicted by Food Well Being model, creates a powerful dynamic that can significantly shape individual eating behaviours, necessitating a deeper understanding of these interactions to better address public health concerns. Despite research efforts to address various influences of online contexts on eating behaviour, the dynamic nature of eating behaviours, as illustrated in the Food Well Being model, and the expanding role of social media necessitates more targeted inquiries and replication studies to establish knowledge.

1.3. CONSUMER BEHAVIOUR AND EATING

Understanding the factors that influence consumer eating behaviours is essential for promoting healthier dietary practices and addressing public health concerns related to nutrition. Consumer behaviour encompasses the study of individuals' actions and decision-making processes when acquiring, using, and disposing of goods and services.

Consumer behaviour, as explored by Manuere et al. (2022), encompasses a complex interplay of psychological, social, and cultural elements. This includes how individuals' emotions, knowledge, and cultural background influence the choices they make as consumers. In consumer behaviour theory these have been coined as affect and cognition influences. Affect refers to the emotional responses evoked by products or brands, while cognition encompasses the rational thought process involved in evaluating options and making decisions. The interaction between affect and cognition shapes consumers' overall eating experience and satisfaction with a product or service which may influence their consumption later on (Solomon, Russell-Bennett and Previte (2012).

Furthermore, Tanrikulu (2021) emphasises the importance of consumption values in shaping these decisions. These values represent not only practical considerations but also emotional attachments to products or brands. In essence, while emotions and cognition are vital components of consumer behaviour, one's underlying values provide additional insight into why they make the choices they do when consume. Food consumption/or eating behaviour values encompass both utilitarian and hedonic aspects, reflecting consumers' functional and emotional needs (Kokkoris and Stavrova, 2021). Overall, by leveraging emotional appeals and connections and providing compelling rational arguments, policies can enhance their efforts and foster positive behavioural change.

Olsen and Grunert (2010) explore the role of satisfaction, norms, and conflict in families' eating behaviour. Their study underscores the importance of social dynamics within family units in shaping dietary practices. By examining factors such as satisfaction with food choices and adherence to social norms, the authors provide valuable insights into the interpersonal dynamics that influence eating behaviours within familial contexts. Therefore, taping to previous arguments around the affect and cognition informing consumer behaviour overall and eating behaviour more precisely, social dynamics could be counted as affect responses to one's consumption.

To further bolster the argument around the role of the factors influencing consumer behaviour one must see the marketing messages employed in food brands. According to Guèvremont (2019) marketing strategies and brand messaging aiming to positively influence eating behaviour, use nutritional information, emotional stimuli to encourage behaviour change towards more nutritious dietary patterns. Incorporating insights from these diverse perspectives on consumer behaviour and eating, this thesis aims to

examine the complex interplay between individual preferences, social influences, and marketing online strategies in shaping dietary practices.

1.4. INSTAGRAM AS A CONTEXT

Social media have been chosen as the context of this research due to its global usage, with approximately 4.64 users worldwide , according to the Digital 2022: Global Overview report (Kemp, 2022). There has been a 10% increase inactive users on social media platforms since January 2021, equating to around 424 millionnew users. This increase coincides with the early days of COVID-19 lockdowns in 2020, highlighting the growing significance of social media platforms as a means to communication and link to the external world (Kemp, 2022). In the UK alone, in January January 2022, 84% of the population use social media spending an average of 1 hour 48 minutes daily (Kemp, 2022).

Instagram has been selected to be the target context of this research as it is positioned as the third most utilised social media platform after Facebook and YouTube. However, according to Statista, Instagram is the most used social media platform worldwide across the age groups 18-24, 25-34, 35-44 and across genders (Dixon, 2023). On contrary, Facebook demographics show that despite being used across all age groups, females are underrepresented compared to the distribution on Instagram use (Dixon, 2023). According to Cucu (2022) among the fast-moving consumer goods (FMCG), the three social media platforms where they get the more attention are TikTok, Instagram and Facebook. While platforms like YouTube and TikTok boast extensive content, their formats and user demographics did not fully align with the specific criteria of this study (Ceci, 2022). Unlike Instagram, which is renowned for its pervasive presence of food-related content and user-friendly features such as easy access through hashtags, YouTube's predominantly video-based format and TikTok's

focus on short-form, entertainment-oriented content diverges from the research focus. Nevertheless, Tik-Tok would be the more suitable context for studies' focus being on young adults (under 22 years old). Instagram's suitability for investigating the influence of social media on eating behaviours in a diverse age-range and among genders is further underscored by its robust content of food-related posts, as evidenced by studies conducted by Cavazza, Graziani, & Guidetti (2020), Reagan et al. (2020), and Vassallo et al. (2018), which have highlighted the platform's prominence as a source for food-related discussions and content consumption.

Moreover, research has shown that social media may influence on multiple facets of individuals' lives such as well-being (Brooks, 2015), life satisfaction (Orben et al., 2019), purchases (Goodrich and De Mooij, 2014), eating behaviour (Hawkins et al., 2020), drinking behaviour (Roberson et al., 2018), body satisfaction/body image (Jarman et al., 2021), customer loyalty (Zhang and Ling, 2019).. Visual cues, in particular, yield significant influence, as studies have demonstrated that visual attractiveness can shape food choices (Starke, Willemsen and Trattner, 2021). Given its popularity, social media also serves as a medium where marketers use their techniques to influence consumers, including their eating habits (Du Plessis, 2017; Qutteina, De Backer and Smits, 2019). Several interventions and campaigns have been introduced in literature and practice to promote healthy behaviours in terms of eating building upon behavioural change theories (Bastami et al., 2018; Elbel et al., 2013; Velema et al., 2018).

1.5. SOCIAL MARKETING AND HEALTHY EATING

As demonstrated in a previous section, understanding, and influencing eating behaviours is a complex endeavour, especially in the context of promoting health and

well-being. In recent years, social marketing has emerged as a valuable approach for addressing health-related issues, including those related to dietary habits. According to Carins and Rundle-Thiele (2014) review of social marketing initiatives focused on dietary behaviour between 2000 and 2012, marketers have engaged diverse approaches and strategies to promote healthy eating across various populations, ranging from mass media campaigns to community-based interventions. While the effectiveness of social marketing campaigns was highlighted, the review also underscored the importance of understanding target audiences and tailoring interventions to address their specific needs and preferences. Similarly, Gordon et al. (2006) review on social marketing nutrition, physical activity and substance misuse interventions targeted different populations ranging from school settings to supermarket and churches resulted in concluding the effectiveness of such interventions whilst highlighting the limitations in terms of the execution of the interventions as well as the research designs measuring the effects.

In a study by Brennan et al. (2020), young adults' perceptions of eating for health were examined from a social marketing perspective identifying the consumption values and social norms as discussed earlier. The research explored whether dietary choices were influenced by moral considerations and societal norms. Findings suggested that while young adults recognised the importance of healthful eating, their dietary decisions were often influenced by factors beyond simple health considerations, such as convenience, taste, and social norms which further supports the overall complexity of consumer behaviour in terms of food decision making.

Building on previous research, Dix et al. (2021) investigated the effectiveness of health promotion campaigns targeting young adults using social marketing principles. The study introduced the concept of “living and eating for health segments” which aimed

to categorise individuals based on their motivations and behaviours related to dietary choices. Despite the common anecdotal belief that healthy eating is solely reliant on strong willpower (Vallis, 2019), research has demonstrated that compliance with healthy eating is influenced by various internal and external factors (Higgs and Ruddock, 2020; Honkanen et al., 2012).

While mindfulness as a strategy has been proven significantly efficient and successful within consumer behaviour (Kumar et al., 2024) and is widely suggested and encouraged for its benefits, its integration into social marketing campaigns remains limited. Interventions grounded in social marketing techniques and behavioural decision theory are particularly effective in encouraging consumers to adopt more intentional consumption habits. For instance, social marketing frameworks emphasise strategies such as pledges and recognition to enhance the nonmonetary benefits of mindful practices (Bahl et al., 2016). A practical example of this is the mindfulness app Insight Timer, which rewards users with a star each time they reach a meditation milestone, acknowledging and reinforcing their commitment to mindfulness. Similarly, behavioural decision theory can promote mindful consumption through environmental "nudges" that subtly influence consumer behaviour. For example, the comedians Rhett & Link ran an online campaign urging drivers to disconnect from their smartphones and focus on being “in the moment” (Get Off the Phone Song, 2013). However, the impact of such messaging would be significantly amplified if it were part of a brand's authentic commitment to mindful consumption, rather than an isolated campaign. The clothing and gear brand, Patagonia serves as a leading example of this approach, encouraging consumers to reflect before making purchases and offering options for repairing, reusing, and recycling their products. Despite these potential advantages, the integration of mindfulness into social marketing is still limited. Many social

marketing campaigns do not fully explore or utilise mindfulness principles, often relying on traditional approaches that may not address the underlying psychological and emotional factors influencing behaviour. This gap underscores the need for further research and practical integration of mindfulness principles into social marketing efforts to enhance their efficacy in fostering positive behavioural change.

1.6. MINDFULNESS AND SELF-CONTROL

This thesis set out to investigate factors that influence individuals' decision-making regarding food choices in a social media context. In particular, this study explores the interaction with Instagram healthy and unhealthy content that influence eating behaviour, as well as the role of self-control and mindfulness on eating behaviour. Mindfulness is a psychological construct that has its roots in Eastern contemplative traditions and has been associated closely with the practice of meditation (Shapiro et al., 2006). Scholars who have studied and conceptualised mindfulness defined it as a state of consciousness, one's ability to be present and non-judgmental awareness (Kabat-Zinn, 2015). The overall goal of mindfulness is to attend to moment-to-moment experiences with a non-judgmental and non-elaborative mindset. Mindfulness is divided in state and trait; state mindfulness can be increased immediately after a mindfulness-based training programme, while it is assumed that something more lasting, of generally being more mindful in life often referred mindfulness as a trait.

This study will further look at eating behaviour under the lenses of consumer behaviour theory that could capture the underlying mechanisms of the decision-making process. Research has demonstrated the positive effects of mindfulness in various healthy behaviour such as alcohol and tobacco use, physical activity and safe sexual

intercourse practises (Sala et al., 2020) and eating in particular (Jordan et al., 2014; Stanszus, Frank, and Geiger, 2019).

A concept that has been closely related to eating behaviour as well as to mindfulness is the self-Control (Elkins-Brown, Teper, and Inzlicht, 2017; Friese, Messner, and Schaffner, 2012). The suggestion is that individuals who practice mindfulness meditation are more equipped to recognise their moment-to-moment emotions, which leads to an improvement in their self-control (Elkins-Brown et al., 2017; Teper and Inzlicht, 2013). Self-control is the capacity to restrain oneself from engaging in impulsive behaviour and instead, act in ways that align with long-term goals and therefore, in the context of health improvement, self-control is a crucial factor to consider, irrespective of the target population (Gillebaart and De Ridder, 2019). In eating behaviour, for example, it has been proven that individuals with high levels of self-control would eat healthier, regardless of any cravings for more calorific and less healthy food, because their self-control would lead to goal attainment which is to lose weight or/and to adopt a healthy lifestyle (McCathy et al., 2017). Moreover, self-control refers to the capacity to alter one's own responses, especially to bring them into line with standards such as ideals, values, morals, and social expectations, and to support the pursuit of long-term goals as previously mentioned (Baumeister et al., 2007). While both mindfulness and self-control have been studies both individually and jointly in relation to the concept of healthy eating, this study will investigate further their implications in an online context which is a more unpredictable and less constrained setting in terms of environmental cues associated with unhealthy/heathy eating (McCathy et al., 2017).

1.7. SUMMARY

This thesis intends to investigate the influence of Instagram's food related content on individuals' eating behaviour in terms of healthiness and whether mindfulness and self-control moderates this relationship. In particular, the focus is on different types of foods shown on Instagram, emphasising on their nutritional value and whether exposure to foods of low nutritional value would influence individuals' food choices. Moreover, mindfulness and self-control have been assessed in whether could improve eating behaviour overall and minimise the food cues influences. The overall aim of this study is to explore the factors (e.g. environmental cues such as indulgence photos, social interaction) that influence eating behaviours in the context of image-based social media (i.e. Instagram) and examine the role and interaction of mindfulness and self-control.

This research hastheoretical, methodological, and practical implications. To start with, in terms of theoretical contributions, the proposed research will contribute to the social marketing literature with regards to eating influences in the context of social media use. Moreover, it will be adding to the literature of mindfulness and self-control. Mindfulness with regards to eating behaviour is important to be explored further as research shows that there is a positive perspective showing how consumers can improve their eating patterns and reduce unhealthy eating, yet it is not an established relationship because of the lack of evidence so far (Bahl et al., 2013; Campbell & Mohr, 2011; Haws et al., 2016). Furthermore, this study aims to also add to the Food Well-Being model which includes psychological, physical, emotional, and social relationships with food at the individual and societal levels (Bublitz et al., 2013) as it examines three of its domains in a social media context while it has been only explored in face-to-face circumstances so far.

Regarding the methodological contributions, this study employs quantitative diaries that have not been widely used in research. There are many reasons that researchers do not prefer diaries, either qualitative or quantitative, as a method of data collection even though it is a very effective tool for studies examining human behaviour (Burton, and Nesbit, 2015). Some of these reasons are that it is a time consuming both for the researcher and the participants, there is the risk of high turnover rates because of its length and the daily commitment and finally, it is a costly method as it requires participants commitment which would be facilitated by incentives (Siemieniako, 2017). Therefore, this study explores the relationship between Instagram Influences, Eating behaviour and mindfulness and self-control through diaries which may show a different tendency than previous studies that have not employed a naturalistic methodology grasping the behaviour.

As far as the practical implications of the research are concerned, based on the findings, policy makers could build new strategies or develop more effective techniques in order to reduce unhealthy eating patterns. These techniques and policies may include mindfulness interventions and/or mindfulness components as this research shows that its effectiveness may lead to healthier lifestyles in terms of eating behaviour. Moreover, looking at the effect of food cues online, moving forward food policies may be adopting more regulations about food posts or about the availability of information online. More on this study's contribution to knowledge and practice will be discussed in the Conclusion chapter.

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

The purpose of this chapter is to introduce the key streams of literature relevant to the eating behaviour process as it has been approached in this thesis and to identify the key concepts informing the theoretical framework for this research as far as eating influences as influenced on social media concern, as well as the role of self-control and mindfulness that moderate this relationship. For this purpose, the chapter begins with an introduction to eating behaviour as it has been reviewed in the literature so far. The Food Well-Being model will then be introduced as a conceptual basis for the drivers of eating behaviour, and links will be made to specific Food Well Being elements in relation to social media exposure. Then, the theory of self-control and the mindfulness as a proposed practice towards healthier lifestyles will be discussed against the eating behaviour.

2.2. EATING HEALTHY

Even though there are long discussions about what is classified as healthy and unhealthy eating and the metrics that distinguish a healthy diet compared to unhealthy, nutritionists and health professionals have reviewed several diets and have concluded in a few types of foods as well as amounts that could classify as healthy. According to the NHS Eatwell program as issued by the Department of Health of England a healthy diet refers to a well-proportioned and diverse diet that involves consuming the appropriate quantity of food and beverages to maintain a healthy weight; this entails eating a variety of foods in the correct portion sizes (NHS, 2022). While, BMI can give an indication of what healthy weight means, healthy eating is harder to describe and thus, there is not one single definition thereof.

According to WHO (2020), for a healthy diet the rule of thumb would be that the energy intake as measured by calories should be balanced with energy expenditure which depends on individuals' daily activities. Based on the aforementioned definition, a healthy diet is very unique and personal for each individual based on their habits and way of living. For example, an individual who engages in physical activity has a higher energy expenditure and therefore, may be able to consume more calories and remain at the same weight compared to a non-physically active individual. As far as types of foods concern, WHO highlights that a healthy diet should include fruits, vegetables, legumes, such as lentils and beans, nuts and whole grains such as oats, unprocessed maize, wheat, brown rice. Both unhealthy eating and overconsumption can lead to obesity (Vallis, 2016).

The decisions consumers make regarding food are influenced by a multitude of factors, including cultural norms, personal preferences, advertising, social influences, and perceived health benefits. In recent years, there has been a shift towards more health-conscious consumer behaviour, driven by increased awareness of the link between diet and health outcomes (Goukens and Klesse, 2022). Individuals are paying more attention to nutritional labels, seeking out organic and natural products, and demanding transparency from food companies regarding ingredients and sourcing practices (Goukens and Klesse, 2022). This tendency has led to online platforms promoting healthy eating choices; and from a heavily unhealthy online environment, there is a slight shift in more healthy and sustainable content (Cuesta-Valiño et al., 2020). Mobile apps, wearable devices (such as smart watches), and online platforms provide consumers with access to information and tools for tracking their dietary intake, setting nutrition goals, and making informed food choices. The combination of digital innovations and consumers' access to knowledge on food and

nutrition enables individuals to take control of their health and make healthier decisions. Nevertheless, this subtle change requires a stronger practical and theoretical background to sustain and maintain in the long-term; particularly nowadays where trends and focuses change rapidly. Therefore, this study contributes to the understanding of the dynamics of online content and eating behaviour. For this purpose, eating behaviour will be conceptualised according to the Food Well Being model, which offers a more holistic and ecological view of the behaviour while addressing various influencing factors, including marketing, literacy and social.

2.3. FOOD WELL-BEING MODEL AND EATING BEHAVIOUR

Eating behaviour is the result of various factors and evaluations within consumer behaviour. Consumer behaviour is driven by evaluation of a number of external and internal factors, as well as cognitive and affective processes. Eating behaviour also follows a similar pattern, as demonstrated by Block et al. (2011), who presented a five-dimensional model that encompasses all relevant influences at individual and societal level. These influences are evaluated across five domains: Food Availability, Food Policy, Food Socialisation, Food Literacy, and Food Marketing as show in Figure 1. Each of these domains portrays a set of influences on eating behaviour.

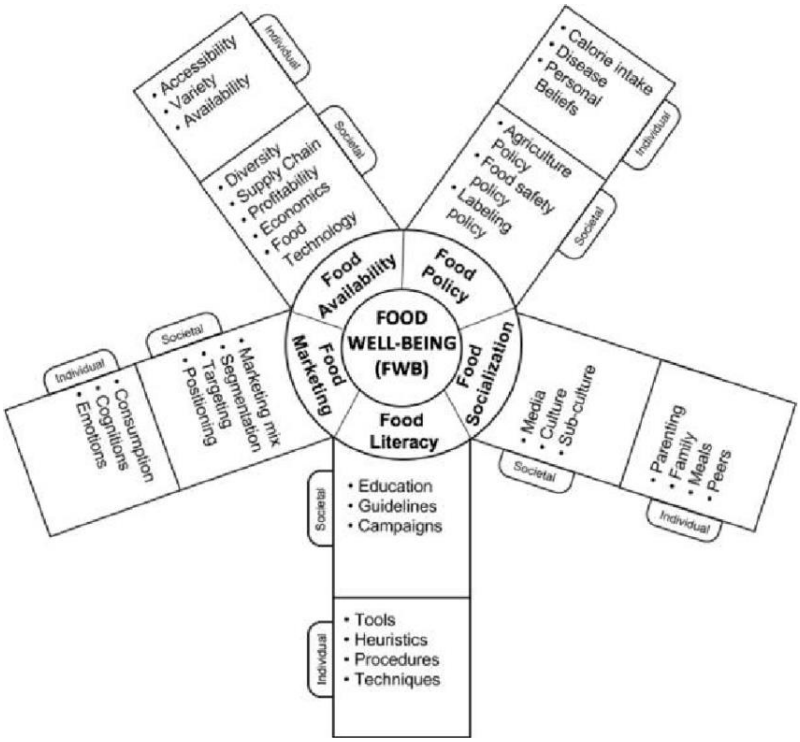


Figure 1 The Food Well Being Pinwheel (Block et al., 2011)

Expanding on Block et al.'s work, Bublitz et al. (2013) enhanced the model by illustrating individuals' motivators, goals, and influences. This extension assists in comprehending and applying the FWB model by not only illustrating eating components but also describing personal, interpersonal, and societal factors, along with the deliberative and automatic influences inherent in eating behaviour.

To date, research has employed the Food Well-Being model to explain and assess various eating behaviours, such as preferences between healthy and tasty foods (Mai & Hoffmann, 2015), food literacy (Cullen et al., 2015; Palumbo, 2016), healthier food choices (Mai & Hoffmann, 2015), and morality in food decisions (Askegaard et al.,

2014); yet none of the studies have addressed the online environment as a mean of influence.

Food Socialisation: The first domain of the Food Well Being model pertains to the cultural significance of food within societies. This domain includes both the learned eating behaviour within the society one lives in and the influences in the individual level from family and the extended social circle. Food is linked to various emotions, moral values, religious practices, and health-related aspects of individuals' lives as integral parts of a society. The act of eating, along with associated rituals, serves as a social identity for both adults and children, influencing their expressions of affection and social interactions. The process of socialisation begins in childhood, with the family playing a pivotal role in providing information, encouraging conformity, and offering support (Ochs & Shohet, 2006). As individuals mature, they develop their own social connections and tools for interacting with their surroundings. Food socialisation is a prevalent aspect of social interactions in many cultures, where individuals learn about food practices from family and school during their youth, and from other social settings as they grow older, encompassing both explicit and implicit means (Bublitz et al., 2019).

Social factors, particularly peer and social influences, are extensively studied in eating and consumer research. The presence, absence, or body type of others can significantly impact food decision-making, with individuals often consuming more when in a group or when others in the group are eating larger portions, mimicking their behaviour (Higgs & Thomas, 2016). This behaviour has been examined from various perspectives, with studies suggesting that in collaborative contexts, individuals may

purchase more food than needed to demonstrate generosity, leading to overconsumption and food waste (Scott & Vallen, 2019). This pattern may extend to social media environments, where users may not be aware of the intentions behind food-related posts. For instance, individuals viewing others consuming unhealthy food online may unknowingly overconsume, not recognising that those showcasing the foods are paid influencers promoting specific brands (Lee and Wan, 2023). Similarly, Hawkins et al. (2020, 2021) studies showed that the level of norm association plays a role in one's consumption. In their studies, descriptive norms as well as perception of frequency of consumption would influence the both the energy-dense and healthier foods consumption, while injunctive norms, is positively correlated to unhealthy food consumption but not healthy. This implies that various types of norms and the individuals who embody them may elicit different influential dynamics for an individual. The current thesis opts to investigate this further by exploring the difference in influence between friends/family and influencers/agents posts.

Other types of social influences have been explored in research too and it was foundthat individuals adopt eating behaviours based on the presence or absence of others. For instance, McFerran et al. (2009) found that consumers are more likely to eat smaller portions when served by an obese waitress compared to a thin one. Despite the established impact of socialisation on eating behaviour, social marketing has predominantly focused on addressing social influences in drinking behaviour rather than eating behaviour. For example, studies by Sönmez Güngör et al. (2022) and Knox et al. (2019) have explored the influence of social norms on adolescents' drinking behaviour, highlighting the role of peers' and family's attitudes. Given that the historical motivation for eating behaviour often involves food socialisation, there is a critical need for social marketing to address this aspect, particularly focusing on food

socialisation occurring on platforms like Instagram where food content is more prevalent.

Media, encompassing both traditional and social media, as well as marketing, are recognised as influential socialisation agents (Wang, Yu, and Wei, 2012). Understanding the interplay between the processes outlined by the socialisation component of the FWB model in diverse everyday environments offers opportunities for enhancing overall FWB. Additionally, while there is existing research on influences in face-to-face environments, limited knowledge exists regarding how perceived biases about one's identity and characteristics in an online platform may influence eating behaviour. For instance, research by Abell and Biswas (2022) indicates that individuals engage more with social media influencers promoting healthy foods compared to those promoting unhealthy foods, and this preference is linked to individuals' perceptions of the influencer's (un)healthy consumption habits. At the same time, studies on eating broadcasts, known as 'mukbang,' which are becoming increasingly widespread, while highlight the impact of this content on public health, they show that the vast majority of these videos predominantly display overconsumption and unhealthy eating behaviours resulting to increasing the appetite, compliance with unhealthy eating behaviour and disordered eating (Kang et al., 2020, von Ash et al., 2023, Zahirah et al., 2023). Besides, most studies on social media and food marketing focused on the promotion of unhealthy foods (Bragg et al, 2021; Folkvork et al., 2020; Vassallo et al., 2018).

Food Literacy: The second fundamental element of the FWB model is Food Literacy. Understanding food and its nutrients, categorised as food literacy, plays a crucial role in shaping the quality of dietary choices and can contribute to promoting healthier

decisions. However, Block et al. (2011) argue that mere possession of nutrition knowledge is insufficient to fulfil an individual's pursuit of food goals and well-being. Consequently, while the terms "food knowledge" and "food literacy" are often used interchangeably, Block et al. (2011) distinguish food literacy as processed knowledge both in a societal and individual level. While on a societal level, food literacy encompasses mainly just nutritional knowledge displayed on labels; on an individual level, it extends beyond academic and clinical knowledge to include personal experiences and memories with food. Numerous studies have explored the relationship between food literacy from different perspectives and eating behaviour, shedding light on its impact on dietary choices, nutritional intake, and overall health outcomes. Research findings, overall suggest that food literacy improve dietary patterns, including fruits and vegetables consumption (Lee et al., 2022; Vettori et al., 2019; Wijayaratne et al., 2018). These findings are further supported by the selection of food literacy intervention in social marketing studies promoting healthy eating (Abdi et al., 2020; Kelly and Nash, 2021; Velpini et al., 2022).

Moreover, the influence of food literacy on eating behaviour extends beyond nutritional knowledge to encompass practical food skills and socio-cultural factors. For example, a qualitative study by Lee et al. (2017) explored the role of food literacy in shaping food-related practices and attitudes among low-income families. The findings highlighted the importance of cooking skills, budgeting strategies, and cultural food traditions in influencing dietary choices and meal preparation behaviours. This study emphasises the need to consider socio-economic and cultural factors when designing food literacy interventions to address diverse populations' unique needs and preferences.

In terms of the impact of the emotional knowledge and the personal experience with the food, the concept of food-evoked nostalgia (Reid et al., 2022) highlights foods not necessarily linked to cognitive knowledge but emphasises the emotional connection, often representing a positive experience. Similarly, Batat et al. (2019) introduced the experiential pleasure of food, encompassing both cognitive and emotional pleasure derived from food consumption. Research has extensively referred to this eating practise as emotional and external eating. Emotional and external eating refer to the commencement of eating triggered either by internal emotional signals, such as psychological distress, or external environmental cues, such as readily available appealing food, food advertising, or specific times of the day (Kerin et al., 2019). Given that this study is assessing external environmental cues (Instagram content), it will address Food Literacy in terms of emotional knowledge, investigating how an individual's current emotional state or potential emotional connection with specific food(s) could influence their food intake.The third component of FWB is Food Marketing which is another external and oftentimes not cognitively evaluated influence of eating consumption. **Food Marketing:** It is widely acknowledged that marketing practitioners employ traditional strategies, encompassing product, promotion, place, and price, to influence consumers' attitudes and choices concerning food (Block et al., 2011; Scott & Vallen, 2019). Traditional marketing research underscores the substantial influence of marketing cues on eating behaviour, often operating unconsciously, and resulting in mindless consumption decisions (Scully et al., 2012; Wansink, 2007). Consumers may be unknowingly influenced by factors such as package size, shape (Hollands et al., 2015), and graphics on packages (Madzharov and Block, 2010).

Research consistently demonstrates that the influential power of food marketing tends to steer individuals toward specific, often unhealthy, energy-dense, and nutrient-poor food choices (Scott & Vallen, 2019).

Building on the discussion in the previous section about Food Literacy and its connection to emotional knowledge, studies suggest that marketing strategies not only affect the amount of food consumed but also influence the thoughts and feelings associated with food choices (Achar et al., 2016; Lunardo, Saintives & Chaney, 2021; Shepherd and Raats, 2006). Emotion-evoking messages and cues have been widely used in marketing to attract attention and potentially influence consumers, making both the emotion-eliciting cues and the emotions linked to specific foods influential factors shaping food choices.

As social media serves as an environment influencing behaviour differently from traditional spaces, its online nature adds complexity to its role as a marketing technique. Despite its significance, social media marketing has not been integrated into the FWB model. This research aims to explore how social media content impacts food decision-making, recognising that such content may intentionally or unintentionally endorse specific brands, foods, and attitudes (Ventura, Cavaliere and Ianno, 2021; WHO, 2022). Social media platforms serve as spaces where both brands and users can promote their choices, including food preferences (Roy, Datta & Mukherjee, 2019; Rundin & Colliander, 2021). The content on social media is a collaborative effort between consumers and brands, an aspect known as "presumption," which involves both production and consumption of media content (Trivedi, Pandey, and Trivedi, 2022; Zajc, 2015). Little is known about how different

content channels on social media may influence users' eating behaviour, and further exploration of this topic will be discussed in the Instagram section later .

Given the holistically nature of the Food Well Being and its broad approach on the ecological framework of eating, the last two components are Food Availability and Food Policy which are heavily assessed in the upstream and macro and physical level environment (Story et al., 2008); rather than the downstream or the social environment. Food policy encompasses a broad range of governmental actions, regulations, and interventions aimed at influencing various aspects of the food system, including production, distribution, consumption, and waste management (Lang, 1999). These policies are designed to address diverse societal goals, such as ensuring food security, promoting public health, supporting sustainable agriculture, and reducing environmental damage.

Food policy plays a crucial role in shaping public health outcomes by influencing dietary patterns and nutritional intake. Policies aimed at reducing the consumption of unhealthy foods high in sugar, salt, and saturated fats, while promoting the consumption of fruits, vegetables, and whole grains, can have significant impacts on population health. These policies have been implemented through, but not restricted to, sugar tax on beverages (Fearne et al., 2022), marketing limits on unhealthy foods (Taillie et al., 2019), food labelling regulations (Marcotrigiano et al., 2018), information provision and education campaigns (Goodman et al., 2021).

Additionally, food policy plays a central role in promoting sustainable food systems that minimise environmental impact and conserve natural resources, mitigating water shortages, climate change and preserving biodiversity (Lang et al., 2009). Overall, food policy plays a critical role in shaping the future of food systems and addressing

pressing societal challenges related to food security, public health, environmental sustainability, and social equity. All the aforementioned interventions have been implemented through the EATWELL project carried out across the European Union, including the UK showing the significance of food policy interventions in reducing pressing societal issues linked to unhealthy eating (Traill et al., 2013).

As far as Food Availability concern, it refers to the physical presence and accessibility of a wide range of foods within a given geographic area or community (Bublitz et al., 2013). It encompasses various factors, including the availability of grocery stores, supermarkets, farmers' markets, food distribution networks, and food assistance programmes. Access to a diverse and abundant supply of nutritious food is essential for promoting food security, supporting healthy eating habits, and reducing the risk of malnutrition and diet-related diseases (National Food Strategy, 2020).

In many parts of the world, disparities in food availability exist, with some communities having limited access to fresh, healthy foods, while others have a surplus of options. These disparities can be influenced by a variety of factors, including socio-economic status, geographic location, transportation infrastructure, land use patterns, and food retailing practices (Krukowski et al., 2010). Low-income neighbourhoods, rural areas, and urban food deserts are particularly vulnerable to limited food availability, which can contribute to higher rates of food insecurity and poor dietary outcomes resulting in risk for obesity.

Food availability is influenced by the presence and distribution of various types of food outlets, including supermarkets, grocery stores, convenience stores, corner stores, and fast-food restaurants. In many urban areas, low-income neighbourhoods often lack full-service grocery stores and are instead served by smaller convenience stores

or fast-food outlets, which may offer limited selections of fresh produce and healthy food options (Taylor and Ard, 2015). This phenomenon, known as "food deserts," can make it challenging for residents to access nutritious foods and maintain a balanced diet.

Global studies have examined a variety of initiatives aimed at understanding the food practices of vulnerable households and identifying solutions to these challenges. Studies based in the United States tested various programmes such as nutrition assistance and initiatives such as opening a supermarket or healthy food financing incentive designed to improve local food consumption and found that while each programme individually was insufficient to make a significant impact, their combined efforts yielded substantial results (Cantor et al., 2020). The residents in the areas studied increased their intake of healthy foods when both programmes were implemented together (Cantor et al., 2020; Ghosh-Dastidar et al., 2017). These findings underscore the necessity of holistic approaches in promoting healthier diets, not only at the individual level but also within broader communities.

Moreover, transportation infrastructure and mobility constraints can further exacerbate issues of food availability, particularly in rural and isolated communities. Limited access to reliable transportation options or to excessive travel time to reach a retail store with healthy choices can make it difficult for individuals to travel to grocery stores or farmers' markets located outside their immediate area, leading to reliance on convenience stores or processed foods available within walking distance (Su et al., 2017).

In conclusion, food availability is another critical determinant of food security and dietary quality, with implications for public health, nutrition, and social equity.

Addressing disparities in food availability requires a multi-faceted approach that addresses the complex interplay of socio-economic, geographic, and environmental factors. Nevertheless, this study's theoretical framework will address the influence of social media on eating behaviour. Therefore, a less streamlined, more individualised approach will be followed to enable to conceptualise consumer behaviour in a social media context.

2.4. SOCIAL MARKETING AND EATING BEHAVIOUR

While commercial marketing has proven highly effective in encouraging the intake of specific foods, and obesogenic environments are becoming more prevalent, recent marketing approaches are focusing on overcoming the health problems caused by obesity and overweight. Although there are segments of society, particularly among younger generations, that are transitioning towards more sustainable and healthy consumption patterns, this trend is not universal (Ermawati et al., 2024). Among others, high levels of deprivation, limited access and availability, as well as lack of knowledge about nutrition, which have been addressed in FWB, continue to challenge the overall shift towards healthier behaviours. Nevertheless, in modern society, social media and digital technology interactions are influential in promoting healthier choices. However, given the prevalence of social media use among the younger generation, these influences may be more pronounced within specific demographics. Social marketing is one approach that strives to develop policies and interventions aimed at preventing unhealthy behaviours. Therefore, in this thesis, the combination of digital technology and health interventions will be further examined to evaluate its overall effectiveness.

Over the years, updated definitions have been suggested in order to describe the development of the field and expanded use of social marketing which is to create value for individuals and society through social marketing techniques and concepts. The current agreed by Boards of Australian Association of Social Marketing, European Social Marketing Association and International Social Marketing Association have decided the global consensus definition of social marketing: “Social Marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good. Social Marketing practice is guided by ethical principles. It seeks to integrate research, best practice, theory, audience, and partnership insight, to inform the delivery of competition sensitive and segmented social change programmes that are effective, efficient, equitable and sustainable.” (iSMA, 2024)

Social marketing heavily focuses on individuals’ insights as it aims to facilitate positive behavioural change, the welfare of the individual and the society instead of focusing on profits or on benefiting the organisations which is also what distinguishes social marketing from other types of marketing (Brambila-Macias et al., 2011; Gordon et al., 2006). In his systematic review, Truong (2014) found that most studies which employed social marketing were on topics such as: general public health, smoking prevention, smoking cessation, alcohol cessation, chronic illness, immunisation, vaccination, children health, physical activity which encompass the most health-critical conditions.

Social marketing has been also proposed as an effective approach to promote healthy eating (Carins and Rundle-Thiele, 2014; Pettigrew, 2016). Assuming that customer cooperation is necessary for marketing success and that consumer motivation for

healthy goals comes mostly from the consumer, independent of triggers and policies, it is suggested that social marketing can foster this motivation (Sherrington, 2017). It has been studied and applied in the context of eating behaviour extensively as it has been repeatedly found to improving diet and tackling unhealthy eating (see research reviews Carins & Rundle-Thiele, 2014 and Pettigrew, 2016).

However, the eating process is complex and difficult to explain because eating patterns vary among individuals as well as in different occasions. There are studies using social marketing interventions that failed to find improvement in diet (McGill et al., 2015) and this might occur because of the complexity behind the eating behaviour and the limited understanding existing around the need to energy-dense food consumption and its negative outcomes (Brambila-Macias et al., 2011; Brennan et al., 2020). In order for social marketing strategies and interventions to be successful, there is a need for a deep understanding of eating behaviour and its motivation and/or influences towards specific type of foods. Moreover, for strategies to be effective, it is crucial to clearly define the level of the strategy. Interventions have used downstream, midstream, and upstream social marketing strategies to target various changes. Each level plays a crucial role in shaping dietary behaviours and promoting healthier eating habits. While social marketing has traditionally taken a downstream focus, there are initiatives currently that inform about the macro level too (Wood, 2016). This research adopts a downstream focus, as it is more appropriate for the areas explored in this thesis which are the eating influences of Instagram food related posts; nevertheless, mindfulness which will be incorporated could be as well as used and promoted in other level of social marketing focuses.

So far, many different areas of influence on eating behaviour have been explored in social marketing projects to facilitate healthy eating. For example, one of the key drivers, according to FWB model, to healthier eating is food literacy. Therefore, the assumption is that the more educated on food knowledge individuals are, the more they will comply with healthier choices. Alaimo et al. (2015) using a more upstream social marketing intervention in low-socioeconomic status schools and communities explored the eating behavioural change among school children. Teachers and staff members received nutrition education and were encouraging the healthy food intake as well as to incorporate nutrition education in their own schedule in classroom. After a year since the intervention took place in schools, the researchers found that the students assigned in experimental group where the intervention has applied decreased their consumption of whole grain bread whereas control group remained the same. Similar significant results were found after the educational intervention by Rangelov et al. (2018) and Blitstein et al. (2016) justifying the importance of knowledge in relation to eating behaviour. Studies targeting food literacy are aimed mostly at school aged children because eating behaviours are formed from early age and therefore, policy makers may aim to increase food knowledge early on, before they develop long-term behaviours.

Other social marketing interventions on eating behaviour benefit more from the traditional marketing benchmarks -the 4 P's (product, place, price, and promotion). Such an intervention was used in a study by Velema et al. (2018) where they chose to target a worksite cafeteria, following a more downstream approach, and decided to add promotion techniques to prices in some healthy choices. Essentially, they increased the prices in snacks while they decreased the prices in healthy "better" choices. They also included in the cafeteria combos consisted of healthy snacks and

sandwiches which had additional discount. They had significantly positive effects as employees purchased for their lunch healthier choices than they used to before the price adjustments have been made. Advertising power has been also assessed in another study by Haynes-Maslow, Hofing and Marks (2020), where they employed advertisement towards healthier eating while nudging nutrition facts, and the results were similarly positively significant. In this study, they incorporate various marketing channels such as television, radio, digital media, billboards, gas pump toppers, posters, and promotional materials as well as digital and mobile ads in mobile phones, tablets and computers. While correlational assumptions could not be made as baseline data was lacking, they claimed that participants showed awareness of the campaign messages which means that it may have potentially influenced their behaviour. Based on that, in the current research baseline metrics would be taken into account to further evaluate the results of the intervention.

Food socialisation and the influence of others have been also explored within social marketing research. Research shows that individuals adopt eating behaviours based on other's presence or absence. However, social marketing has not addressed the social influence as a target of eating behaviour; rather, it has been addressed in drinking behaviour. For example, Sönmez Güngör et al. (2022) and Knox et al. (2019) conducted studies looking at the social norms influence on adolescences' drinking behaviour and found that peers' and family's perceived or actual attitudes would determine their own behaviour. In Buyucek et al.'s (2016) systematic review, where they examined stakeholder theory in social marketing techniques targeting general behaviours, they found that the presence of others may be significantly influential towards healthy choices. They also suggested that given the importance of others in every single one's personal behaviour, individuals should be educated in order to be

able to promote and encourage healthy behaviours and minimise harm instead of encouraging, unconsciously or not, unhealthy behaviours. Social marketing research aiming in healthier eating has assessed various of techniques such as communication strategies (Jebarajakirthy et al., 2023), healthy food advertising (Hussain et al., 2022), exposure to food cues (food in motion) (Amar, Gvili and Tal, 2021), food packaging cues (Kuster-Boluda and Vila-Lopez, 2022). For the current study, the attention will shift from external factors like the ones that have been implemented so far to more internal to the individual. As mentioned at the beginning of this chapter, social marketing is based on the voluntarily participation of the consumer and requires their internal motivation towards behavioural change; therefore, for the purposes of this study, mindfulness intervention will be employed to positively influence participants' eating behaviour while looking at the eating behaviour as it is influenced on Instagram from a food literacy, food socialisation and food marketing perspective.

2.5. SOCIAL MEDIA AND EATING BEHAVIOUR

Social media refers to online platforms and websites that enable users to create, share, and exchange information, ideas, and content in virtual communities and networks. These platforms facilitate various forms of communication, including text, images, videos, and audio. Users can interact with each other through features such as likes, comments, shares, and direct messaging. Social media platforms vary in their purposes and functionalities, ranging from social networking sites like Facebook and LinkedIn to microblogging platforms like Twitter and multimedia sharing platforms like Instagram, TikTok and YouTube. Social media has become an integral part of modern communication, allowing individuals and more collective initiatives such as businesses

to connect, engage with audiences, share information, and build communities on a global scale.

Research on social media is emerging because of its prevalence use among individuals. Social media have become an important part of many individuals' lives in the UK. In January 2024, 82.8% of the equivalent of UK population use social media and spend more than 1 hour and 42 minutes on their phones for social media (Kemp, 2023; Zivkovic, 2024). Even though the current research could have potentially explored any social media platform, the selection of Instagram was made on the basis of a number of factors. Firstly, according to statistics, while 49% of social media users fall into the age group 30-49, Instagram in particular is predominately (30%) used by individuals in 25–34-year-old group, while TikTok has significantly younger users (Dixon, 2023). These age groups have been found to be increasingly important for studying eating behaviour, as they exhibit a very low level of health engagement (Brennan et al., 2020).Secondly, Instagram among other social media photo-generated and sharing platforms is the one where users can stay connected with other users that are not necessarily their close friends (compared to Facebook and SnapChat for example where connections are made based on own's personal network) and at the same time, they can generate their own content (contrary to Pinterest where users upload content found on the Internet and not their own) shared both publicly and privately with their followers. Thirdly, it has been selected for this study because of its use across all different age groups; namely, 18-24, 25-34, 35-44 and across genders while on Facebook demographics show that despite being used across all age groups, females are underrepresented compared to the distribution on Instagram use (Dixon, 2023). As far as the YouTube concerned, even though it is one

of the prominent social media platforms used, it is not photo generated as it required for this study.

For example, in some social media (e.g. YouTube, Telegram, Reddit) users usually provide information while the personal interaction remains low while in other social media (e.g. Facebook, Instagram, TikTok, Twitter, SnapChat, WhatsApp) the interpersonal interaction is the main driver in using them. Furthermore, in social media such as Instagram or/and Facebook, users tend to present more about their personal life and habits. In this thesis, the interactive nature of the media where users can see other users' post is where the focus will be on as this characteristic is the novel aspect of the media that affected people's behaviour (Bigne et al., 2018).

The influence coming from media is not a recent phenomenon. Media such as TV, radio, newspapers, magazines, and the Internet have been always seen to influence consumer behaviour overall and eating behaviour, more specifically. There has always been media that affected people's perception about their self and body image, which are now called the "traditional media" (e.g. magazines and television); however social media is different than traditional media in the following three ways. First and foremost, social media has an interactive character that lacks from traditional media. Social media users can communicate and interact with other users and content too unlike traditional media. This socialisation in social media create an environment where parasocial relationships are developed and they play an important role in users' behaviours online (Hess, Dodds & Rahman, 2022). Following from this point, users on social media create their own content and share their own experiences which in traditional media is not common. Finally, in social media, users often post their comments positively or negatively about the content which may further influence

attitudes and it was not a feature of traditional media (Fardouly & Vartanian, 2016). Each of these features are linked to food marketing, food socialisation as well as food literacy as explained from FWB model which inform this thesis.

Looking at the evolution of consumer behaviour and eating behaviour from a media perspective, previously much attention has been paid to the role of television viewing regarding eating behaviour;research has identified two ways of influences, exposure to unhealthy food advertisement and distraction. As far as the latter is concerned, television has been seen as a means that would swift individuals' attention from their food consumption and therefore will unconsciously consume more (Marsh et al., 2013). Spending long time on screen -while the application is similar to social media in the case- has been characterised as "physical activity displacement", meaning that TV viewing displaces time that could have spent being active and exercising (Cleland et al., 2018). From a consumer behaviour perspective as discussed earlier, individuals' decision-making process can be influenced by external and/or internal stimuli which is FWB's stance too, therefore, TV viewing from a more indirect perspectives such as distraction or displacement could be as strong influences as any other more related to the behaviour itself; such as food advertising.

Food marketing and advertising experiments have overall showed a tendency in increased food consumption (Harris et al., 2009). However, within this tendency there are controlled variables, such as gender. According to Anschutz et al. (2010) women are more likely to to consume more snacks when exposed to food commercial than men. Similarly, different age groups respond differently to food exposure; children are more inclined to unhealthy eating following food exposure than adults (Harris et al., 2009). Despite any other factors, it's evident that media and food promotions

significantly affect how people interact with food. These advertisements are passed through every aspect of the food environment, influencing food-related behaviours to varying degrees. To steer the existing food environment towards healthier habits, it's crucial to consider all its aspects. Given that media and advertising reach across multiple levels of this environment, it seems a logical starting point for this endeavour and therefore, given the prevalence of social media nowadays, research on capturing influences in this context is needed.

Research shows that the excessive use of social media may create fatigue, anxiety, depression (Dhir et al., 2018; O'Reilly et al., 2018), substance abuse (Bányai et al., 2017) and can also negatively interfere with academic performance (Maqableh et al., 2015), work and social life (Zheng & Lee, 2016), self-esteem and narcissistic levels (Andreassen, Pallesen & Griffiths, 2017). Moreover, social media use is correlated with eating pathology and disorders as individuals who excessively use social media tend to adopt problematic eating patterns (Becker et al., 2011; Ferguson et al., 2014; Mabe, Forney & Keel, 2014). Social media users express themselves online by posting their dietary habits; recipes, food photos, restaurant reviews (De Solier, 2018; Javed et al., 2021). At this end, users may present the version of themselves that they perceive as more appealing, both in terms of physical attractiveness but also in terms of behaviours (Bernritter et al., 2022). For example, when it comes to healthy choices, users may use the "like" bottom more when they look at photos of healthy lifestyle or share photos where they endorse socially accepted behaviours such as exercising, eating healthy. Studies show that people who use social media are primarily affected by the posts generated by other users; this stems from the fact that users tend to

compare themselves to others and would start doubting their body image and way of living (Hawkins et al., 2020; Ferguson et al., 2014).

Another aspect of social media that makes their influence more profound is that on these platforms, users will be followed by and will interact with their own group of friends, family and acquaintances. Thus, the familiarity may raise different kinds of concerns such as peer competition (Chua & Chang, 2016). Research shows that the two main social influences online involve the perfect body image as presented from users and individuals' tendency to compete towards their peers based on appearance features (Holland & Tiggemann, 2016). However, even if there is evidence that proves causality between social media use and body dissatisfaction, as well as disordered eating in terms of portions, skipping meals and food quality, there is not much research done on how social media use affects health behaviour in general and especially, healthy eating (e.g. portion size, type of food). While Andersen et al. (2021) provided an overview of research on the impact of food photography on appetite, the specific cues that influence eating behaviour have yet to be fully explored. For instance, the review speculates two hypotheses: either sharing images of healthy food may satisfy the desire to present oneself as a health-conscious individual online, potentially reducing the motivation to maintain healthy eating habits, or sharing photos of indulgent foods might trigger the drive to make healthier eating decisions. However, there remains a gap in understanding the importance of the source or the type of food presented, as well as the specific behaviours that result from each type of exposure (Andersen et al., 2021).

Murphy et al. (2020) found that users would rate their peers who post unhealthy food photos more favourably compared to those who posted healthy foods. However, for

these contradictory findings, one should take into account food socialisation in terms of social norms that are involved. For example, individuals tend to align their behaviour to those who are socially closed, therefore, if their peers online and other accounts they follow are displaying a healthy behaviour, they would be impelled to show a healthier lifestyle themselves but if their following accounts (peers and others) post unhealthy related activities, they would then follow their lead (Higgs et al., 2019). These behaviours are not only related to eating but in drinking (Litt, Rodriguez & Stewart, 2021), travelling (Lyu, 2016) and green behaviour such as purchasing green products (Pop, Săplăcan & Alt, 2020).

Nonetheless, Abell and Biswas (2023) found that individuals may have liked more photos with influencers promoting a healthy food and the influencer with the healthy food received a higher number of gazes but when the influencer was not present, the unhealthy food image received more frequent gazes. This means that when users are presented only with a food image would pay more attention to the unhealthy one while if the food is accompanied by a model's presence, they would counterbalance their attention. These findings may align to perceptions about body image and food; suggesting that an (un)healthy body image is linked to (un)healthy food consumption. Contradicting findings are coming from Lee and Wan (2023) who supported that users do not follow popular mukbang (= audio visual show online where the host (over)eats various -mainly unhealthy- foods) based on their attractiveness but based on their hedonic value. Additionally, social media could be a tool to get informed about nutritional values and health behaviours and seek support or motivation towards a healthier lifestyle (Vaterlaus et al., 2015). Individuals between the ages of 18 and 35 have indicated that they utilise social media as a means of obtaining health-related social support from individuals in their network (Oh et al., 2013).

Another study that addressed the link between social media use and their influence on healthy eating behaviours and lifestyle (exercise), was conducted by Vaterlaus et al. (2015) and found that 1. social media could be both a motivator and a barrier to exercise while they promote both healthy and unhealthy lifestyles, 2. they acknowledge that the food content online may influence their decision on eating, 3. the visual content may trigger them to overeat or to eat less healthy. However, this qualitative research gives a first indication of how social media may affect healthy choices; nevertheless, given the qualitative nature and self-report measures the generalizability of the results is limited (Vaterlaus et al., 2015).

Given “fitspiration” popularity, Raggatt et al. (2018) conducted research to explore the perceived influence of fitspiration content and how individuals engage with this content. Results showed that overall, the majority of the participants did not engage with the content in terms of reacting to it by a like or a comment or even engaging in similar activities (such as workout or eat healthier than they usually did) but they were only passively observing. Nevertheless, approximately all participants stated that they feel encouraged by the content which means that further research would help to identify ways to motivate social media users to be actively engaged with health-related posts. This means though that social media content may potentially influence users’ behaviour unconsciously in the long term

In conclusion, social networks have been studied extensively lately based on its popularity among adults. It has been found that food-related social media posts affect user’s way of living and among others, eating habits (Hawkins et al., 2020). The research on the underlying mechanisms of eating is still in its infancy and therefore the aim of this study will partially be to fill the existing gaps. Essentially, it would be of

utmost importance to first explore the relationship between Instagram, which is an image-based platform involving myriad food related stimuli and influencers whose content is mainly food. The scope of this study differs from other studies that investigated social media use and healthy behaviours in two ways. First, this study is specifically focused on the eating behaviour per se rather than exercise, BMI or body dissatisfaction which will enable in depth investigation of the eating behaviour drivers or influences in a social media context. Second, Instagram platform will be the context of this study because it combines both the food related content (Food Marketing - photos) and the social aspect (Food Socialisation - peers' posts).

Therefore the first research question that this study will aim to answer is:

RQ1: Does exposure to food-related content on Instagram affect (un)healthy eating behaviour?

2.6. SOCIAL MEDIA AND FOOD SOCIALISATION

Social interaction online which has become prevalent mainly because of the use of social media, social norms that affect eating have started to be examining online (Hawkins et al., 2020). According to the concept of Food Socialisation as explained within Food Well Being, food consumption is influenced by social factors and influences starting at a young age and evolving throughout an individual's lifetime. Social influences are as well considered within the overall consumer behaviour as external influences as part of decision making capturing the culture, subculture, social status, and family influences (Hawkins et al., 1998). Additionally, social influence has been a longstanding focus within social psychology and social marketing emphasising the impact of social factors on decision-making process towards a behavioural change and better choices. One of the roles of social media on individuals' lives is to learn

about their peers' attitudes, views, beliefs and behaviours. Therefore, social influences that are addressed in face-to-face situations are expected to interfere in a virtual reality too. Online social influences have been studied in a number of behaviours –such as pages that users "like" based on their peers' "likes" (Kim et al., 2015), alcohol consumption (Boyle et al., 2016; Pegg et al., 2018), online product ratings and feedback (Sridhar and Srinivasan, 2012) as well as the social media use per se (Carpenter & Amaravadi, 2016). As far as the eating behaviour is concerned, findings revealed that the more participants perceived Facebook users to consume fruit and vegetables, the more participants consumed themselves (Hawkins et al., 2020). Similarly, the more participants believe that online users consume high-density snacks, the more they tend to consume themselves. However, while social media interactions may implicitly communicate norms about others' eating habits and influence one's own eating behaviour, this does not necessarily translate to an impact on BMI. This suggests that while social media can shape short-term eating behaviours, it may not have a significant effect on long-term weight outcomes. On the opposite side, Raggatt et al. (2018) also found that liking norms (both in terms of what they personal like and by pressing the like button on Facebook) do not necessarily predict immediate behaviour but it is speculated that it may potentially influence future behaviours. This finding signals the longstanding effect of social influence on eating behaviour, which may lead to maladaptive behaviours in the long run.

A social network analysis revealed that adult peer relationships can influence maladaptive eating behaviours, such as eating disorders, through social influences and perceived support (Chung et al., 2021). Peer groups shape one's relationship with food, extending from in-person interactions to social media influences. A US study found a link between high social media engagement (e.g., Facebook, Twitter,

YouTube, Instagram) and eating concerns among young adults (Sidani et al., 2016). This study examined the association between social media use and eating concerns in men and young adults aged 19 to 32 years. It found significant differences between men and women in social media use and eating concerns, but no significant interaction between social media use and gender or age on eating concerns. This indicates that social media-related eating concerns are not confined to young women, as men and older individuals are also affected.

As previously mentioned, on social media there is tendency for unhealthy and less nutritional value foods to be presented; therefore, from a social influence stance, consumption of unhealthy snacks online, may be more related to social endorsement and approval. Consuming unhealthy snacks is less likely to receive a negative judgement, within a social media context (Clark, Algoe, & Green, 2018). Therefore, according to research, one reason why unhealthy posts are more prevalent on social media is because they are socially endorsed (Hawkins et al., 2020, 2021; Murphy et al., 2020). However, there are contradicting findings suggesting that more likes are expected for photos where healthy food is presented (Abell & Biswas, 2022). Yet, in the last study where the results showed otherwise, they also found that besides participants liking the healthy food photo more, they would spend more time gazing at the unhealthy food photo. According to Seal et al. (2022) food gazing results in hunger which more often results in excessive and unhealthy consumption unless the photos more gazed prime healthy foods. Nevertheless, as section (next) discussed, the vast majority of food social media posts involve glamorising and idealising unhealthy foods.

Therefore, while food gazing could be beneficial if the food exposed to is a healthy and sustainable option, the reality of social media is currently otherwise.

While social influence has been broadly examined, the means of the influence has yet to be established. One of the reasons Instagram was selected as the medium for this study is that content is produced both by celebrities and social media influencers, as well as by other users who may be in the individual's closer social circle.

Murphy et al. (2020) investigating the adolescences' responses in terms of likes, share and recognition to unhealthy, healthy and no food posts from peers, celebrities and brands found that unhealthy food evoked posts had more positive responses than the other two types of posts. Furthermore, participants rated their peers who posted unhealthy food most favourably which aligns to previous work on social norms and unhealthy eating. In the same study where they also measured the eye fixation time for each post they found that participants spend more time looking at the unhealthy posts opposed to the other two types. Additional evidence comes from a study by Molina (2019) where University students were asked to access mHealth mobile applications where users upload and others rate their meals based on how much they like the content. The researcher found that students' intended behaviour was to purchase the meals that have been highly rated regardless of the nutritional value of the meal. However, since the mHealth applications mainly encourage good eating habits, the stimuli provided did not differ significantly in terms of healthiness. Nevertheless, this study informs us about the influence of the visual stimuli as well as the stimuli rating by other users on eating behaviour. This means that the more other users' like something, the more participants would be inclined to try it regardless its healthiness. This is also something that this study will explore given that participants

will be exposed to visual cues in their personal Instagram feed, not manipulated by the researcher. However, the dynamics of their peers, celebrities and brands' content was not measured. Social comparison on social media has found to be more powerful in terms of influence when from friends rather than influences with regards to body comparison (Ho et al., 2016), clothing choice (Wilson and MacGillivray, 1998) and alcohol consumption (Corcoran et al., 2023). But the influencer versus peer debate is still ongoing with only very limited evidence pointing the peers (non-celebrity/influencers) strong influence towards certain behaviours (Rajaraman et al. 2021). While both influencers and friends significantly influence consumers, research has identified differences in how users perceive influencers or other celebrities versus close friends, which may result in varying degrees of influential power in terms of eating (Walla et al., 2023). Influencers, particularly those focused on health, fitness, or nutrition, are perceived as more credible sources compared to friends, which makes their recommendations and choices regarding healthy eating more influential (Wellman, 2023). Additionally, social media users tend to follow positive influencers who consistently promote healthy lifestyles and eating habits, creating a stable and reinforcing narrative that encourages healthier food choices (Nabors et al., 2024). In contrast, the content shared by friends is more variable and less predictable, as users cannot control the consistency or health focus of their friends' posts. This suggests that food-related content from influencers/brands is likely to have a more consistent and positive impact on encouraging healthier food consumption. Evidence from offline studies on eating behaviour suggests that individuals are more likely to consume high-density foods when they are with an eating partner, regardless of whether the partner chooses high-energy or low-energy density foods (Robinson and Higgs, 2013). This tendency is attributed to the familiarity with the eating partner, which may lead

individuals to feel more comfortable in their choices, often without the restraint imposed by social conventions to appear healthy in front of others (Salvy et al., 2007). It is also linked to the emotional ties associated with friends which, in turn, can lead to unhealthy eating behaviour (Woolley and Fishbach, 2017). This highlights the potential for exposure to food-related content from influencers and brands to shape healthier eating behaviours.

Therefore, drawing from the first research question it is hypothesised that

H1a: Individuals exposed to food-related content from friends will consume unhealthier food.

H1b: Individuals exposed to food-related content from influencers, will consume healthier food.

2.7. SOCIAL MEDIA AND FOOD MARKETING

The utilisation of social media has significantly altered the way consumers search for and select products and services. Platforms like Facebook, Instagram, and Twitter have become prominent sources of information and communication channels, particularly for food-related topics (Simeone and Scarpato, 2020). These platforms are increasingly used by food brands, influencers, and marketers to promote products, often blurring the lines between user-generated authentic content and advertising (Campbell and Farrell, 2020). This trend is evident in the widespread use of visually appealing food photography, hashtags, and sponsored posts, which effectively capture consumer attention and influence their food choices.

However, the influence of food cues has been a focus of research long before the advent of social media. These cues, which include visual, olfactory, and contextual signals associated with food, play a significant role in influencing eating behaviours (Van der Laan et al., 2011). The concept of "cue-reactivity" is central to understanding how food cues drive consumption. Cue-reactivity theory posits that environmental stimuli, such as the sight or smell of food, can trigger automatic physiological and psychological responses that increase the likelihood of eating (Boswell and Kober, 2016).

In the context of social media, the impact of food cues is amplified. Social media platforms present a virtually endless array of food options and provide users with a space to acquire recipes, share, and showcase meals they have prepared or consumed. The prevalence of food cues in these digital environments not only reinforces traditional triggers but also introduces new ones, making it easier for users to engage with food content on a more personal and immediate level (Ayyıldız and Şahin, 2022).

This constant exposure to food content, often curated to appear desirable and aspirational, can create challenges for making informed food choices. The content on these platforms is frequently biased toward promoting less healthy, high-calorie foods, with little emphasis on healthier alternatives (Dunlop, Freeman and Jones, 2016). This bias is driven by the marketing strategies of food companies that capitalize on social media's visual and interactive nature to create appealing narratives around their products, a practice that users often emulate. Social media content, enhanced by various filter features and the emphasis users place on content creation, tends to be visually appealing and follows a more promotional aesthetic rather than raw and

authentic post which has been contributed to food well-being (Machin, Moscato and Dadzie, 2021). The integration of social media marketing with user-generated content further complicates the decision-making process for consumers. Influencers and everyday users alike often promote food products, sometimes without clear disclosure of sponsorship, which can lead to the normalisation of unhealthy eating habits (Boerman et al., 2017; Coates et al., 2019). The pervasive marketing of fast food, sugary snacks, and beverages on these platforms has been shown to contribute to poor dietary choices, particularly among younger audiences who are more impressionable and engaged with social media (Vassallo et al., 2021).

According to Andersen et al. (2021) a user generated social media platform could have a dichotomous influence in eating behaviour. For example, they suggested that taking a photo of a food may stimulate appetite but also in the long term, taking photo of the food may result in more mindful eating as users would be more conscious about their eating behaviour. Similarly, Machin et al. (2021) suggested that food photography can promote food well-being when used as part of an eating measurement design. They proposed that incorporating food photography into an individual's eating rituals may make them more mindful of their food choices, potentially reducing the likelihood of unhealthy food consumption. Yet, a clinical trial that aimed to explore the relationship between the exposure to food-related photos and eating patterns found that viewing food pictures will result in higher external and compulsive eating than viewing non-food related pictures (Neter et al., 2018). Contrary to the researchers' expectations, appetising food pictures did not affect food cravings, or the type or amount of food ordered from a hypothetical menu however, social media time spent did. Overall, the findings suggest that individuals who were more exposed to food related content on

their social media, were more likely to order less healthy choices and consume bigger food portions.

In addition to promoting specific food products, social media marketing strategies often involve creating and reinforcing social norms around eating behaviours. For example, the portrayal of indulgent, high-calorie foods as part of a desirable lifestyle can encourage users to align their consumption patterns with these depicted norms. This social endorsement can lead to the overconsumption of unhealthy foods while underrepresenting nutritious options, thereby impacting overall food well-being (Machin et al., 2021).

The increasing sophistication of targeted advertising on social media, driven by algorithms that track user preferences and behaviours, means that consumers are frequently exposed to food-related content tailored to their interests and habits (Montgomery and Chester, 2009). This raises concerns about the potential for reinforcing unhealthy eating patterns. The combination of visually appealing content, social endorsement, and targeted advertising creates a potent mix that can significantly influence consumer behaviour, often to the detriment of healthier food choices.

This study will focus specifically on Instagram as it is an image-oriented platform and according to Hu, Manikonda and Kambhampati (2014) content analysis on categories of posts on Instagram, food posts were among the most popular ones. To date, the studies on investigating how Instagram posts affect users' eating behaviour are limited but there are studies which have used Instagram as a reference platform to explore travel choices influenced by photos posted on Instagram (Nixon, Popova & Önder, 2017; Terttunen, 2017), purchasing decision (Michelle & Susilo, 2021) and work-out

intentions among males (Peng et al., 2019). Also, Lee & Wan (2023) reported that viewing users consuming unhealthy food online will lead to overconsumption both in terms of eating and food purchase, as well as an eating outside tendency (Rajput and Sharma, 2021).

Vassallo et al.'s (2018) content analysis on food related images' frequency on Instagram and the marketing strategies used in this context showed that sugary grocery foods (e.g. Nutella) had the highest numbers of posts. Moreover, they claimed that many times, brands also repost user generated content (or/and influencers) rather than by their contracted photographer which gives support to the notion that users not only passively view the uploaded images but also, actively engage with the behaviours exposed to the brands' posts. Finally, even though some brands had healthy meal choices (among others, Burger King, Dominos, KFC, McDonald's, Starbucks, Subway, and Taco Bell), they did not usually promote them on their Instagram accounts (Vassallo et al., 2018).

Therefore, following from the two previoushypotheses, which explored the food socialisation from Food Well Being model, hypothesis H2 and H3 aim to investigate further food marketing online and its influence in unhealthy food consumption regardless the content's source.

H2: Those who are exposed to food-related content are expected to consume unhealthier food.

H3a: Viewing unhealthy food-related content, will result in unhealthier food consumption.

H3b: Viewing healthy food-related content, will result in healthier food consumption.

2.8. SOCIAL MEDIA AND FOOD LITERACY

The third element of the Food Well-Being model to be explored in this research is food literacy, specifically in relation to emotional influences on food consumption. This section aims to deepen the investigation by examining the relationship between emotions and food consumption, particularly within the context of social media.

Traditionally, the term food literacy has been narrowly defined as the knowledge and skills related to food, such as understanding nutrition, preparing meals, and making informed food choices (Cullen et al., 2015). However, the Food Well-Being model broadens this concept by exploring food literacy through multiple dimensions, one of which is the emotional aspect of food and eating (Block et al., 2011). According to the FWB model, food literacy is not only about cognitive knowledge but also encompasses the emotional connections that individuals form with food. These emotional connections often arise from memories and experiences associated with specific foods, linking food consumption to feelings of comfort, nostalgia, or well-being (Reid et al., 2022). For instance, certain foods may evoke memories of childhood, family gatherings, or cultural traditions, highlighted by food socialisation too, which can significantly influence one's food preferences and eating behaviours. Individuals who are aware of their emotional responses to food and understand the influence of these emotions are better equipped to make mindful food choices. Conversely, those who are less aware may be more susceptible to emotional eating, which can lead to unhealthy eating habits (Warren et al., 2017). Notably, mindfulness interventions have proven effective in reducing emotional eating and promoting healthier eating behaviours (Mantzios et al., 2017).

In the era of excessive social media use, emotional responses to food and eating have been exacerbated. Research consistently indicates that social media can significantly influence eating behaviours through food socialisation, food marketing, and food literacy, particularly by amplifying emotional triggers that drive food consumption. Eser et al. (2022) found that social media platforms often exacerbate negative emotions by presenting idealised images of food and lifestyles, which can contribute to feelings of inadequacy, stress, or anxiety. These heightened negative emotions can lead individuals to use food as a coping mechanism, resulting in unhealthy eating behaviours. For example, individuals may turn to comfort foods or high-calorie snacks as a way to manage their emotional distress, ultimately reinforcing patterns of emotional eating and contributing to poorer dietary choices (Cai et al. 2024; Macht, 2008). These findings underscore the role of social media not just in shaping food preferences, but in amplifying emotional triggers that drive maladaptive eating behaviours.

Nevertheless, in the context of food literacy, it is the emotions triggered by food-related content, rather than by other types of social media content, that are most relevant. Gutjar et al. (2015) identified over fifteen distinct emotions, both positive and negative, that can be elicited by food. These emotions may arise from intrinsic sensory cues, such as taste, or extrinsic cues, such as packaging and appearance. On platforms like Instagram, where food is often visually highlighted, these cues can evoke a wide range of emotions, which may in turn influence eating behaviours. Food-specific emotions, such as food nostalgia, have been shown to play a pivotal role in improved food consumption. For instance, Reid et al. (2022) found that nostalgic foods are frequently associated with positive emotions, which can enhance overall well-being. Building on this, Lee et al. (2023) suggested that food nostalgia can unlock positive memories that

improve mood and positively impact food intake. While food nostalgia has been proposed as a potential avenue for enhancing well-being (Layous & Kurtz, 2022), the impact of social media displayed food cues on emotions and eventually eating remains less clear. Specifically, it is uncertain whether these cues reinforce positive outcomes or contribute to unhealthy eating patterns. In many cases, social media use may trigger negative emotions, which can exacerbate unhealthy eating habits, as previously demonstrated. Although the emotions triggered by depicted lifestyles or body images on social media have been widely studied and shown to affect eating behaviour (Rodgers et al., 2021; Young et al., 2022), the emotions elicited by food-related content remain understudied. This leaves a significant gap in understanding not only emotional eating but also broader aspects of food well-being.

Social media users are constantly exposed to an overwhelming array of food-related content (Coates et al., 2019). Understanding how this exposure influences emotional well-being and subsequent eating behaviours is crucial for developing interventions that promote healthier eating habits. Recognising and reflecting on emotional responses to food cues, especially on social media, can potentially improve eating behaviours. Mindfulness, as a tool for acknowledging and resisting emotional decision-making, may help mitigate the impact of these triggers on eating patterns. Given the power of social media to shape perceptions and behaviours, it is essential to investigate how emotional experiences elicited by food-related content influence consumption patterns.

The following hypotheses are proposed to explore the relationship between the emotional experience of food-related content on social media and its influence on food consumption:

H4: High emotional impact due to exposure to food-related content on social media will lead to unhealthier food consumption

By addressing these hypotheses, this study aims to fill the gap in understanding how emotional experiences derived from food-related content on social media influence eating behaviours. The findings could have significant implications for public health strategies and social media content regulation, particularly in promoting food well-being and mitigating the risks associated with unhealthy eating patterns. In this study, the suggested strategy to improve eating behaviour is mindfulness which will be discussed next.

2.9. MINDFULNESS AND HEALTHY BEHAVIOURS

Mindfulness has its roots in Eastern contemplative traditions, particularly within Buddhism, where it is a core component of meditation practices. It has been defined as a state of consciousness that involves being fully present and engaged in the moment, with a non-judgmental awareness of one's thoughts, feelings, and surroundings (Shapiro et al., 2006). Although mindfulness is often associated with meditation, it encompasses much more than that. The principles of mindfulness, as outlined by Gethin (2015, as cited in Vaughan, 2018), include the observation of four key elements: 1) the body, 2) feelings, 3) the state of mind, and 4) mental qualities. These principles encourage a holistic awareness that extends beyond meditation into everyday life and decision-making.

Hahn (1976) suggests that mindfulness involves paying attention to the body, including the breath, posture, and physical sensations. It also involves being mindful during everyday activities and recognising the body as consisting of the four elements: earth, water, fire, and air. Mindfulness also includes observing feeling, such as pleasant, unpleasant, or neutral, and state of mind which can be affected by desire, aversion, or delusion. Mental qualities that can obstruct meditation, such as desire, ill-will, depression and doubt, should also be observed. Mindfulness is commonly practiced in Buddhism, through meditation or everyday actions, in order to achieve a clear and calm state of mind

While mindfulness has traditionally been practiced within clinical and mental health settings, it has since been applied to a broader range of contexts, with new terms such as mindful marketing emerging (Tobias Mortlock, 2023). Recent research on mindful marketing and consumption has gained significant attention due to growing environmental awareness among companies and consumers. Mindful marketing emphasises a balanced approach that moves away from consumerism, while mindful consumption focuses on making informed choices that benefit society, businesses, and individuals. This emerging focus also highlights the need for further research to advance the research agenda in the field of mindful marketing and consumption (Kumal et al., 2024). Marketers and policymakers have recognised the potential of mindfulness to promote healthier lifestyles and encourage mindful decision-making (Kaur and Luchs, 2022; Tewari et al., 2022; Zhang et al., 2021). This has led to its application in areas such as green, ethical and sustainable consumption. For instance, Daniel, Gentina, and Kaur (2023) found that mindfulness positively correlates with green purchase intentions and ethical self-identity as well as frugal purchasing, where participants prioritising their needs over their wants (Kaur and Luchs, 2022).

Moreover, mindfulness has been applied to health-related behaviours, including physical activity, healthy eating, sleep, and alcohol consumption, with research indicating that mindfulness enhances healthy behaviours and reduces unhealthy ones (Bahl et al., 2016; Sala et al., 2020). In the context of consumer behaviour, mindfulness plays a crucial role in helping individuals make healthier and more deliberate choices. Peter and Brinberg (2012) and Mantzios et al. (2017) suggest that consumers who are aware of their needs and emotions are better equipped to make healthier decisions. This awareness is particularly important when examining the factors that trigger eating behaviours and the lack of deliberate action. Mindfulness is expected to mitigate unhealthy eating by helping individuals become more attuned to their physical needs and goals while also reducing the influence of external cues and distractions. As demonstrated in the three discussed aspects of Food Well-Being; Food Socialisation, Food Marketing, and Food Literacy, awareness of the underlying motivations driven by food related external cues can lead to more mindful and potentially healthier choices.

Similarly, mindfulness has been linked to ethical behaviour in the workplace, where it has been shown to foster an ethical work environment (Kalafatoğlu & Turgut, 2017; Williamson, 2020). Zhang et al. (2021) conducted a comprehensive review of mindfulness interventions across different settings, including the workplace, where they found that mindfulness is positively associated with job satisfaction, performance, and interpersonal relationships, while negatively associated with burnout, stress, and mental distress. These findings were consistent across other contexts, such as educational settings, where mindfulness improved performance and reduced stress-related responses (Dawson et al., 2020).

Given the focus of this study on understanding the triggers of eating behaviour and the role of mindfulness in mitigating these triggers, the following research question is proposed:

Therefore, the second research question of this study is:

RQ2: To what extent does mindfulness influence eating behaviour in terms of healthy food consumption?

As the environment becomes more conductive to overeating and to variety of stimuli around individuals that to minimise any health consequences experts in medicine, nutrition, and public health are recommending that individuals become more conscious of their food choices, promoting moderation, and prioritising a healthy diet (Peitz et al., 2021).

The role of mindfulness has been investigated in many aspects of physical health, such as weight management (Olson & Emery, 2015), healthy food consumption (Jordan et al., 2014) and food portion management (Cavanagh et al., 2014) and results showed that overall mindfulness was negatively linked with unhealthy weight or activities. It is also negatively associated with binge and emotional eating (Levin, Dalrymple, Himes & Zimmerman, 2014) and in turn, the mindfulness construct was also associated with reduced risk of obesity (Camilleri et al., 2015), diabetes (Pivarunas et al., 2015) and lower Body Mass Index (BMI) (Moor, Scott & McIntosh, 2013). Further support on the positive effect of mindfulness on healthier eating behaviours and weight management can be also found in large scale meta-analysis

and systematic reviews such as Carrière et al. (2018), O'Reilly et al. (2014) and Ruffault et al. (2017).

In Van De Veer, Van Herpen and Van Trijp (2016) study, they assessed whether long-term mindfulness practices and short-term practice would influence the mindfulness trait as well as. Results showed that both short-term and long-term mindfulness practices would positively influence individual trait overall. Moreover, mindful consumers are better able to sense the physiological consequences of how much they have eaten. Overall, the research supports that mindful attention to the body and environmental cues could potentially rotate individuals to a healthier lifestyle and eating behaviours. Mindfulness has been found to have long lasting effects on individuals' behaviours, however there is not much evidence about eating behaviours as research is still in its infancy and there are no findings of longitudinal studies. Nevertheless, cross-sectional studies have included in their sample both people who practised mindfulness before and participants who were only exposed to a one-time mindful intervention and the two groups did not differ significantly with respect to their results (Bahl et al., 2013, Van de Deer et al., 2015). In Bahl et al. (2023) quantitative study with college students, there was a significant negative correlation between unhealthy food consumption and mindfulness –however, the results of the study were limited in terms of generalisability due to the use of convenience sampling, which only included students who had previously participated in mindfulness programs. This raises questions about the effectiveness of mindfulness interventions in broader populations. However, overall, the findings suggest that mindfulness may have significant long-term benefits.

A review on mindfulness influence on eating behaviours and obesity revealed that mindfulness interventions were mostly successful when researchers involved meditation practices tailored to eating behaviour, rather than general meditation practices such as breathing exercises (Mantzios & Wilson, 2015). For example, in two experimental studies where the mindful raisin practice exercise were assessed, the results were significant and participants reduced chocolate consumption (Mantzios, Egan & Asif, 2020; Mantzios, Skillett & Egan, 2020). However, this contradicts other research suggesting that mindfulness as a behavioural act (including observing, non-judging, acting with awareness, describing, and allowing emotions to be experienced) improves eating towards healthier practices (Alberts et al., 2012; Tewari et al., 2022) and also, it only examines consumption of one specific food.

Regardless of whether mindfulness was tested as trait or practice of meditation, studies showed decreased food consumption (Bahl et al., 2013; Papies et al., 2012; Van De Veer et al., 2015; Vaughan, 2018). However, the studies described above did not focus on the type of food (healthy VS unhealthy) which is something the current research study will aim to investigate with regards to mindfulness. Mantzios et al. (2020a, 2020b) accounts for chocolate consumption, however, it does not examine the overall consumption; which could have been the case that participants reduced chocolate consumption but what about other food type consumption. From a general point of view, since we are living in a society where individuals face distractors and triggers from a variety of mediums, mindfulness would be beneficial not only in relation to food consumption. The use of technology in our everyday life, not only for work related purposes but also for socializing and entertainment, increase individuals' mindlessness and automatic way of thinking and processing which may have a negative impact on health and well-being (Charoensukmongkol, 2016). More research

on the effect of mindfulness and eating behaviour under other situations and contexts would give a clearer picture of mindfulness effectiveness and the current research aims to add on this literature gap too.

Therefore, it is hypothesised that (between groups):

H5a: Those exposed to mindfulness activities would consume healthier food than those who do not; regardless of food socialisation, food marketing and food literacy.

H5b: Mindfulness moderates the relationship between the source of food-related content and unhealthy food consumption. Specifically, individuals exposed to both mindfulness activities and food posts from friends will consume healthier food than those exposed to food posts from friends without any mindfulness activities.

H5c: Mindfulness moderates the relationship between the type of food exposure and unhealthy food consumption. Specifically, individuals exposed to both mindfulness activities and unhealthy food posts will consume healthier food than those exposed to unhealthy food posts without any mindfulness activities.

H5d: Mindfulness moderates the relationship between emotions elicited by food-related content and unhealthy food consumption. Specifically, individuals exposed to mindfulness activities who experience a high emotional impact from food content will consume healthier food than those who experience a high emotional impact without any mindfulness activities.

Finally, while existing literature has examined various aspects of mindfulness practice, particularly focusing on the benefits associated with the total duration of mindfulness

engagement over a lifetime (Verhaeghen, 2021), there remains a significant gap regarding the duration of daily mindfulness practice. This distinction is crucial because the effectiveness of mindfulness interventions may depend not only on the cumulative experience but also on the specifics of daily practice duration.

Lloyd et al. (2018) reviewed the utility of home practice in mindfulness interventions and highlighted that the length of daily practice is a substantial variable influencing the effectiveness of mindfulness-based interventions. Their review underscores that both short and long daily mindfulness practices can yield positive outcomes, including improvements in psychological distress, as observed in experimental research on mindfulness interventions for depression, anxiety, and stress (Strohmaier, Jones, and Cane, 2021) as well as general well-being (Fincham et al., 2023). These findings suggest that mindfulness practices, irrespective of their duration, have the potential to benefit participants' mental health and well-being.

However, most research addressing the length of mindfulness practice has involved experienced and long-term practitioners, which may introduce bias (Strohmaier et al., 2021; Lloyd et al., 2018). The effects of practice duration could differ significantly for individuals who are new to mindfulness or who have not engaged in long-term practice. To provide a more representative perspective, the current study aims to include participants from the general public, thereby replicating a realistic scenario and examining what duration of daily mindfulness practice yields beneficial results, in relation to eating behaviour.

Moreover, most studies investigating the length of mindfulness practice have been conducted in clinical settings, leaving a gap in understanding how daily practice duration affects outcomes such as eating behaviour. Galante et al. (2023) emphasised

the importance of practice length as a variable influencing mindfulness outcome in non-clinical populations. Despite this, research specifically examining how the duration of daily mindfulness practice impacts eating behaviour is non-existent.

Given this context, the next hypothesis will explore whether the duration of daily mindfulness practice affects its effectiveness in promoting healthy eating behaviours. If it is found that the length of daily mindfulness practice significantly influences its effectiveness in fostering healthy eating, then mindfulness-based interventions could be more effectively tailored to enhance healthy eating habits. This would involve incorporating optimal daily practice durations into intervention designs to maximise their impact on dietary behaviour.

So, it is hypothesised that for those exposed to mindfulness activities (within-groups):

H6a: The more time spent on mindfulness activities, the healthier their food consumption.

H6b: The relationship between the type of food exposed (healthy vs. unhealthy) and unhealthy food consumption is moderated by time spent on mindfulness activities. Specifically, individuals who spend more time on mindfulness activities and are exposed to food posts from friends will consume healthier food than those who spend less time on mindfulness activities and are exposed to food posts from friends.

H6c: The relationship between the source of food-related content (friends vs. influencers) and unhealthy food consumption is moderated by time spent on mindfulness activities. Specifically, individuals who spend more time on mindfulness activities and are exposed to unhealthy food posts will consume healthier food than

those who spend less time on mindfulness activities and are exposed to unhealthy food posts.

H6d: The relationship between the emotions elicited by food content and unhealthy food consumption is moderated by time spent on mindfulness activities. Specifically, individuals who spend more time on mindfulness activities and experience high emotional impact from food posts will consume healthier food than those who spend less time on mindfulness activities and are experiencing high emotional impact from food posts.

2.10 SELF-CONTROL AND EATING BEHAVIOUR.

Self-control, defined as the ability to regulate one's emotions, thoughts, and behaviours in the face of temptations and impulses, plays a crucial role in making deliberate and healthy choices (Baumeister et al., 2007). Maintaining a healthy diet is often unsuccessful due to insufficient voluntary control over attention when deciding what and whether to eat. According to the Food Well-Being framework, eating behaviour is influenced by various factors, including food literacy, marketing, and socialisation. Each of these factors exerts its own pressures and temptations, making self-control essential for maintaining an individual's food well-being (Goukens and Klesse, 2022). For example, within the context of food socialisation, where eating behaviours are shaped by cultural norms, family habits, and peer influence both online and offline, self-control is necessary to make healthier choices despite social pressures (Cruwys, Bevelander, and Hermans, 2015). Similarly, while food literacy empowers individuals with knowledge, without self-control, this knowledge may not

translate into healthier eating habits, especially when food literacy involves an emotional connection with food. As Block et al. (2011) emphasise, food literacy extends beyond knowledge to include the ability to apply that knowledge in real-world situations, where self-control plays a pivotal role. The Food Well Being model also acknowledges that emotional states can undermine self-control, leading to unhealthy eating patterns (Macht, 2008). Additionally, marketing techniques such as product placement, social media influence, and targeted advertisements are designed to undemine consumers' self-control, making it harder to resist unhealthy options (McCarthy et al., 2017). Like mindfulness, higher levels of self-control are associated with individuals who are better equipped to navigate these marketing pressures and maintain healthier eating patterns (Rosenthal and Dietl, 2022). While each factor examined in this study, socialisation, marketing, and literacy, presents unique challenges, self-control is the common thread that determines whether individuals can resist temptations and adhere to healthier eating habits. However, it is important to recognise that self-control is not a static trait but a resource that can be depleted over time (Baumeister et al., 1994). Continuous exposure to temptations can weaken self-control, making it harder to maintain food well-being. Mindfulness could serve as a strategy to exercise and sustain self-control, helping individuals consistently manage these pressures.

Several studies have demonstrated that dietary self-control, essential for a healthy diet, diminishes when attention is diverted from food-related decisions by other tasks (Tanajewski et al., 2023). In the context of social media, particularly Instagram, users often invest significant cognitive resources into viewing content. This activity can occupy their cognitive load as well as their attention, thereby influencing their decision-making processes regarding food selection and consumption. While RQ1 focused on

the influence of the source and the type of food-related content on eating behaviour and the moderating effect of mindfulness on this relationship, RQ2 will add significant value by introducing the concept of self-control. This will help further justify and support strategies, such as the mindfulness intervention, for better balancing one's diet, even when distracted by non-food-related thoughts or tasks.

Self-control has been applied to a variety of different topics within consumer research such as overeating (Horwath et al., 2020), hedonic eating (Tanajewski et al., 2023), sugar intake (Phipps et al., 2023), alcohol drinking (Stein and Witkiewitz, 2019), impulsive and luxury buying (Dhaliwal et al., 2020; Sultan et al., 2012), and overspending (Vosgerau et al., 2019). Individuals with low self-control have been found to give up on dieting more easily, go back to their drinking habits more readily, cheat more often and they have less control of their emotions (Friese & Hofmann, 2009). Self-control has been also accounted as moderator to mindfulness effectiveness across different concepts and behaviours, such as life satisfaction (Liang et al., 2022), ethical consumption (Li et al., 2021), internet addition (Song & Park, 2019), sport performance (Shaabani et al., 2020), and physical exercise (Stocker, Englert & Seiler, 2019). On the other hand, an antidote to low resources of self-control may be mindfulness that train one’s attention and awareness (Friese, Messner & Schaffner, 2012; Elkins-Brown, Teper & Inzlicht, 2017). According to Friese and Hofmann (2009), self-control has been seen as the ability to control impulses (Tornquist, 2019).

Self-control plays a pivotal role in regulating eating behaviours and maintaining a healthy diet. Research claims that the ability to resist temptations and make conscious, healthy food choices is essential for preventing overeating and managing weight

(Hofmann et al., 2014). However, the modern food environment, albeit online, characterised by the abundance of highly palatable and energy-dense foods, poses significant challenges to self-control. Individuals often struggle to adhere to a healthy diet, as poor voluntary control of attention can lead to impulsive eating decisions, such as overeating, unhealthy dieting, snacking, poor nutritional choices. This lack of dietary self-control is further exacerbated when attention is diverted away from food-related decisions which could be the case when navigating on social media where the number of cues is overwhelming (Lonergan et al., 2019).

Research has shown that individuals with high self-control are better equipped to manage their eating habits. They can resist the allure of unhealthy foods and make more nutritious choices, even in the face of temptation (Fan & Wang, 2022). For example, Horwath et al. (2020) illustrated that individuals exposed to images of palatable foods had increased activation in brain regions associated with visual processing and reward. This heightened responsiveness can lead to a greater likelihood of choosing high-calorie foods and snacking more frequently, contributing to unhealthy eating patterns and weight gain.

Similarly, during food exposure, individuals demonstrate a stronger effort to self-control (as measured by heart rate variability) to resist eating (Geisler et al., 2016). This finding is further supported by Giese et al. (2015), who found that while self-control is generally associated with eating decision-making, exposure to food advertisements diminishes this effect. Specifically, self-control did not predict healthy or unhealthy eating, suggesting that food cues have a stronger influence on food intake. However, this study was conducted among children and adolescents, and

cognitive self-control has been found to have developmental and age-related performance variations (Friedman et al., 2009).

Research has also focused on the conceptualisation of self-control as a trait or state self-control (Baumeister & Alquist, 2009; de Ridder, Lensvelt-Mulders, Finkenauer, Stok & Baumeister, 2012; Tornquist, 2019). State self-control is the current behaviour that depends on a variety of factors such as previous self-control efforts, a shift in motivation, environmental factors, time and situation (Tornquist, 2019). State self-control compared to trait is not an “across situations” and over time ability –rather it is one simple behaviour at the spot –for example, someone resisted temptation eating the second cookie (De Ridder and Gillebaart, 2017). Previous research investigated the factors that strengthen or worsen self-control. One of the models that seeks to explain the differences in factors and circumstances that a person goes through and whether they result in self-control or failure is the strength model of self-control. For example, there are studies showing that higher levels of self-control result in lower unhealthy snack consumption (Haynes, Kemps and Moffitt, 2016; Honkanen et al., 2012). Horwath, Hagmann and Hartmann (2020) showed that individuals with lower levels of self-control result in more eating for pleasure in the absence of physical hunger. Moreover, Smith et al. (2023) suggested that control over behaviours (i.e., behavioural impulsivity) and control over attentional deployment involve distinct control processes, each of which are involved in unhealthy eating habits.

Combining self-control and mindfulness offers a comprehensive approach to improving eating behaviours. Self-control provides the foundation for making healthier

food choices, while mindfulness strengthens this foundation by increasing awareness and reducing impulsive reactions (Friese et al., 2012). Mindfulness, on the other hand, allows individuals to become more attuned to their bodily cues and emotional states, enabling them to make conscious decisions rather than reacting automatically to external stimuli online or offline (Elkins-Brown et al., 2017).

This interaction becomes especially relevant in the context of social media, where users are constantly exposed to food-related content that can undermine self-control. Research suggests that the frequent exposure to tempting food images and advertisements on platforms like Instagram and TikTok can lead to cravings and impulsive eating behaviours (Turner and Lefevre, 2017). Social media's influence on eating behaviours is rooted in its ability to trigger immediate emotional and physiological responses to food content, making it harder to maintain self-control.

Given that self-control is a limited resource that can be depleted over time, mindfulness can serve as a valuable tool in managing these pressures. Mindfulness practices help to regulate attention, decrease emotional reactivity, and reduce impulsivity, which in turn can help individuals to resist the temptations posed by food content online (Du, Kerkhof and van Koningsbruggen, 2021). By enhancing awareness of their eating triggers, individuals may exercise stronger self-control, even in environments filled with distractions and temptations like social media. Mindfulness, therefore, plays a crucial role in maintaining self-control over time, which is essential for sustaining food well-being in the modern digital landscape.

In summary, the integration of mindfulness and self-control within the Food Well-Being framework offers a robust strategy for managing the challenges posed by social media and other external influences on eating behaviour. By cultivating mindfulness,

individuals can maintain stronger self-control, even in environments saturated with temptations, thereby improving their overall food well-being.

Therefore, the third research question is:

RQ3: To what extent does mindfulness interventions influence participants' self-control levels?

The hypothesis towards this research question is formed as follows:

H7a: Mindfulness intervention will lead to higher levels of self-control than before the intervention (within group).

H7b: Mindfulness intervention will lead to higher levels of self-control than without the intervention (between groups).

H7c: Mindfulness intervention moderates the relationship between self-control and healthy food consumption. Specifically, individuals who have undergone the mindfulness intervention and have high self-control will consume healthier food compared to those with high self-control who have not undergone a mindfulness intervention.

H7d: Mindfulness intervention moderates the relationship between self-control and social media influence in terms of eating. Specifically, individuals who have undergone the mindfulness intervention and have high self-control will report lower levels of social media influence in terms of eating compared to those with high self-control who have not undergone a mindfulness intervention.

Table 1 Research Questions and Hypotheses

Research Questions	Hypothesis	Variables
RQ1: Does exposure to food-related content on Instagram affect (un)healthy eating consumption?	H1a: Individuals exposed to friends' food posts will consume unhealthier food.	Independent Variable (IV): Food socialisation (Source of content, friends) Dependent Variable (DV): Food consumption
	H1b: Individuals exposed to influencers' food posts, will consume healthier food.	IV: Food socialisation (Source of content, influencers) DV: Food consumption
	H2: Those who are exposed to food-related content are expected to consume unhealthier food	IV: Food marketing (food content) DV: Food consumption
	H3a: Viewing unhealthy food-related content, will result in unhealthier food consumption.	IV: Food marketing (type of food content; unhealthy) DV: Food consumption
	H3b: Viewing healthy food-related content, will result in healthier food consumption.	IV: Food marketing (type of food content; healthy) DV: Food consumption
	H4: High emotional impact due to exposure to food-related content on social media will lead to unhealthier food consumption	IV: Food marketing (food content) Mediator (Med): Food literacy (emotional impact)

		DV: Food consumption
RQ2: To what extent does mindfulness influence eating behaviour in terms of healthy food consumption?	H5a: Those exposed to mindfulness activities would consume healthier food than those who do not; regardless of food socialisation, food marketing and food literacy.	IV: Mindfulness activities DV: Food consumption
	H5b: Individuals exposed to both mindfulness activities and food posts from friends will consume healthier food than those exposed to food posts from friends without any mindfulness activities.	IV: Food socialisation (Source of content, friends) DV: Food consumption Moderator (Mod): Mindfulness activities
	H5c: Individuals exposed to both mindfulness activities and unhealthy food posts will consume healthier food than those exposed to unhealthy food posts without any mindfulness activities.	IV: Food marketing (type of food exposed; unhealthy) DV: Food consumption Mod: Mindfulness activities
	H5d: Individuals exposed to mindfulness activities who experience a high emotional impact from food content will consume healthier food than those who experience a high emotional impact without any mindfulness activities.	IV: Food marketing (food content) Med: Food literacy (emotional impact) DV: Food consumption Mod: Mindfulness activities

	H6a: The more time spent on mindfulness activities, the healthier their food consumption.	IV: Mindfulness time spent DV: Food consumption
	H6b: Individuals who spend more time on mindfulness activities and are exposed to food posts from friends will consume healthier food than those who spend less time on mindfulness activities and are exposed to food posts from friends.	IV: Food socialisation (Source of content, friends) DV: Food consumption Mod: Mindfulness time spent
	H6c: Individuals who spend more time on mindfulness activities and are exposed to unhealthy food posts will consume healthier food than those who spend less time on mindfulness activities and are exposed to unhealthy food posts.	IV: Food marketing (type of food exposed; unhealthy) DV: Food consumption Mod: Mindfulness time spent
	H6d: Individuals who spend more time on mindfulness activities and experience high emotional impact from food posts will consume healthier food than those who spend less time on mindfulness activities and are experiencing high emotional impact from food posts.	IV: Food marketing (food content) Med: Food literacy (emotional impact) Mod: Mindfulness time spent
RQ3: To what extent does mindfulness	H7a: Mindfulness intervention will lead to higher levels of self-control than before the intervention.	IV: Mindfulness DV: Self-Control within-groups

interventions influence participants' self-control levels and healthy food consumption ?	H7b: Mindfulness intervention will lead to higher levels of self-control than without the intervention.	IV: Mindfulness DV: Self-Control between-groups
	H7c: Individuals with high self-control who have undergone the mindfulness intervention will consume healthier food compared to those with high self-control who have not undergone a mindfulness intervention.	IV: Self-Control DV: Eating Behaviour Mod: Mindfulness between-groups
	H7d: Individuals who have undergone the mindfulness intervention and have higher self-control will report lower levels of social media influence in terms of eating compared to those with high self-control who have not undergone a mindfulness intervention	IV: Self-Control DV: Eating Behaviour Mod: Mindfulness between-group

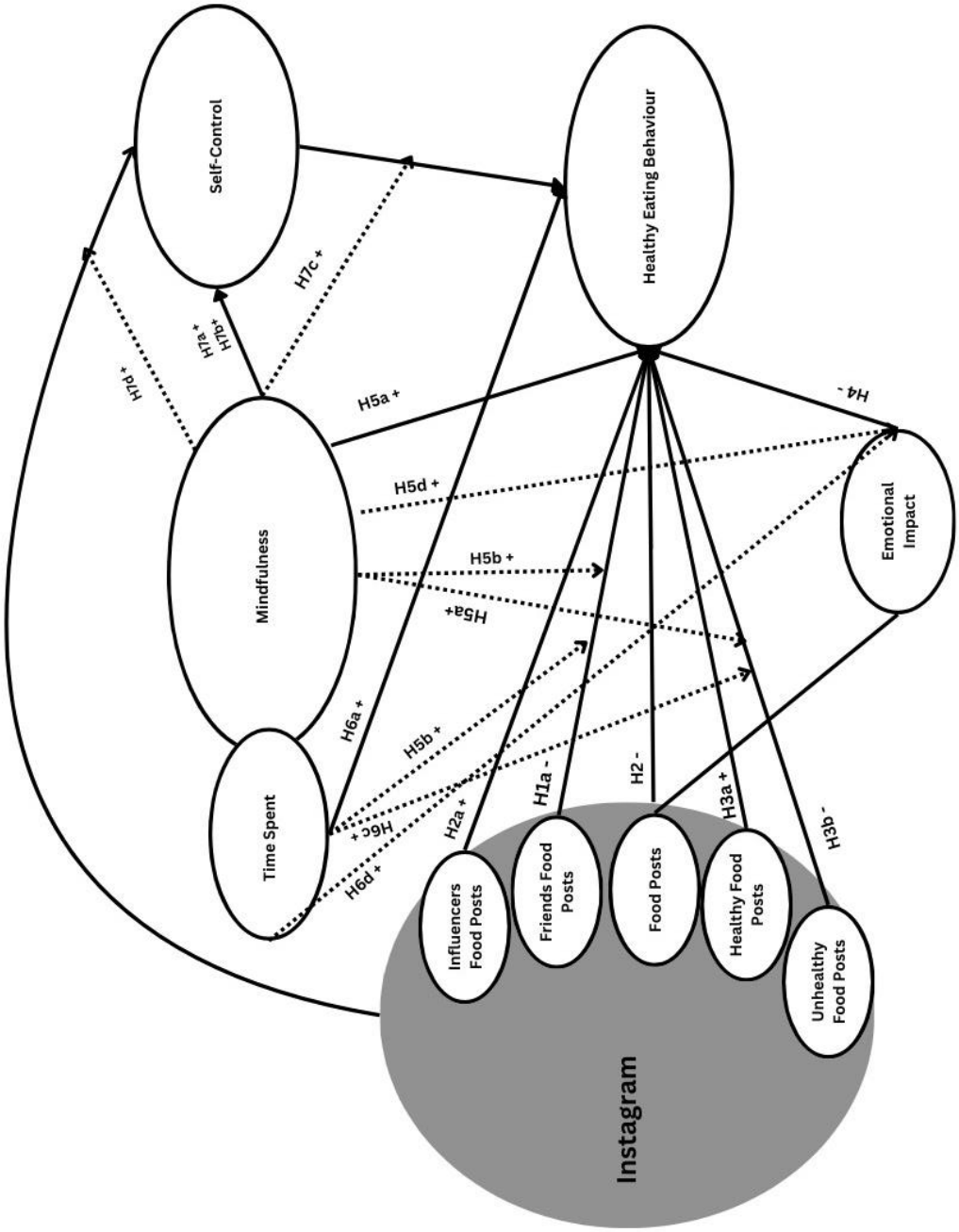


Figure 2 Conceptual Model

CHAPTER 3: METHODOLOGY CHAPTER

3.1 INTRODUCTION

This chapter begins with a research philosophy discussion which will lead to the study's philosophical stance. Then, the research design will be described followed by other approaches that have been considered. A description of the sample, recruitment and data collection process will be provided, followed by an overview of the chosen measurement tools for the purposes of this thesis and their fit to the conceptual framework of the study. Finally, research ethics will be discussed.

3.2 RESEARCH PHILOSOPHY & RESEARCH PARADIGMS

In any social discipline it is important to be aware of the research philosophy that informs the study (Creswel, 2009; Deshpande, 1983). Recent views on the research philosophy suggest that a philosophical framework can be seen as a research paradigm or paradigm of inquiry that underlines how scientific research should be conducted (Collis & Hussey, 2013). Essentially, a paradigm can be defined as a "set of assumptions about the social world which provides a philosophical and conceptual framework for the study of that world" (Filstead, 1979, in Ponterotto, 2005, p. 127) and has originally been inspired by Kuhn (1962). The research paradigm is a manual for researchers in a particular subject that leads to the understanding of the studied phenomenon (Majid, 2019). Moreover, the research philosophy will also facilitate the researchers to then decide the research methods and design used to investigate specific research questions; therefore, this is the basis for a study to be conducted (Majid, 2019). However, since there is no single way to study, understand and explain

social life and human behaviour, research paradigms allow studies to be conducted and understood through different angles. Research paradigms have two assumptions; ontology and epistemology (Creswel, 2009; Hughes, 1997). Each aspect contributes to the identification of how the knowledge has been accomplished. In the field of research, ontology pertains to the fundamental nature of reality, whereas epistemology refers to the connection between the researcher and the phenomenon being studied (Creswell, 2007). The study's aims and methodology will be supported and evaluated based on the two aspects. According to Crotty (1998), the identification of a study's research philosophy is essential to be taken into account at the start of the study as it will increase the research's credibility and enable the researcher to select the relevant research methods and research design. Next the two assumptions will be described and the scope of the current study in terms of where it stands within the research paradigm will be explained.

3.2.1. ONTOLOGY

Ontology focuses on the nature of reality, it captures the beliefs about reality; single reality versus many realities (Saunders et al., 2009). The concept of ontology forms the predictions of the researchers and the social actors regarding the way reality exists; whether it is consisted of objective (objectivism) or subjective entities (constructionism) which are constructed based on social standards (Bryman, 2012; Saunders et al., 2009). According to Burell and Morgan (1979) ontology is the answer to scientists' question of whether reality is objective or subjective. The objectivist approach specifically states that social phenomena should be looked at as objective constructs as they are independent to social actors, and they can be viewed as separated constructs. On the opposite side, constructivism supports that social

phenomena are dependent on social actors as their behaviours and perceptions are those forming these constructs and thus, they are interrelated. Objectivism and constructivism have been referred in different terms in literature such as realism and relativism or subjectivism respectively (Holden & Lynch, 2004; Peter, 1992); nevertheless, for the current work they will be referred as objectivism and constructivism. These two perspectives would be further discussed next. To sum up, ontology aims to come to an answer to whether there are certainties in this world that could alleviate existing doubts or there are not absolute answers to questions and therefore everything could be true or false at the same time (Hughes & Sharrock, 1997).

Objectivism argues that social phenomena do not depend on social actors, instead they exist regardless (Lincoln, Lynham and Guba, 2011). Therefore, objectivism is based on the rationale of the facts and that there is no bias of external factors. According to Davies et al. (1993) the aim of social sciences whose predominant focus is to assess humans' behaviour, is to find the most objective manner to predict reality (Bahari, 2010). The research approaches and tools used in objectivism are usually predefined for research design; such as forecasting research, laboratory experiments, large-scale surveys where the results are straight-forward while allowing only some room for interpretation by the researcher (Holden & Lynch, 2004).

Contrary to objectivism, subjectivism supports that social phenomena exist because of the social actors' presence (Saunders, Lewis and Thornhill, 2009). Unlike objectivism that is based on facts and separation from social actors, subjectivism is based on opinions, ideas, viewpoints, emotions which require researchers' interpretation in the process. According to Morgan and Smircich (1980) "The core of

ontological assumptions on subjectivist approaches to social science is that reality is a projection of human imagination" (Holden & Lynch, 2004, p. 24). Subjectivist approach has been majorly linked to qualitative research designs. Researchers' contribution to the interpretation of the results is very prominent on subjectivism as the aim is to have a deeper understanding and compresence of the examined phenomenon. Thus, the central view of subjectivism which is the main difference between the approaches is that the study's results are based on the researcher's appreciation and interpretation of the different constructions and meanings in participants' experiences (Holden & Lynch, 2004).

3.2.2. EPISTEMOLOGY

Apart from the ontology stance that discussed above, there are assumptions of an epistemological nature too. Epistemological assumptions are the grounds of the actual knowledge and how this knowledge can be communicated from and to other human beings (Burell & Morgan, 1979). The epistemological assumptions involve ideas regarding the form of obtaining knowledge and how can this knowledge be classified as true or false. Moreover, Burell and Morgan (1979) suggested that apart from the dichotomy of true or false within the concept of knowledge, the determination of it should be also taken into account; specifically, can this knowledge be acquired or is it coming from social actor's personal experience. Differently put, Holden & Lynch (2004) suggested that epistemology determines what is acceptable knowledge in a discipline.

According to Bahari (2010) and Antwi & Hamza (2015) there are two main epistemological assumptions under which a study can stand depending on how reality is shaped; these are: positivism and interpretivism – constructivism.

Positivism (also known as logical positivism) is frequently linked with scientific study primarily adopting quantitative data and follows the rules of science which are absolute and they do not leave room for further interpretation (Lastrucci, 1963). According to Antwi and Hamza (2015) for positivists the purpose of conducting research is to reach a scientific explanation; the main goal for positivists is to predict patterns of human activity in a set of situations which will be based on methods including deductive logic with empirical observation of human behaviour. Another characteristic of positivists is that they perceive empirical facts as something external to personal ideas and thoughts, the acts and the behaviours are governed by stable cause and effects interactions and their aim is to add knowledge to these interactions (Antwi & Hamza, 2015, Marczyk, DeMatteo & Festinger, 2005). Usually, they look for this new knowledge and explanations in quantitative experimental research designs (Antwi & Hamza, 2015).

Positivism, though in social sciences, has been criticised because of its dogmatic approach to absolute certainty. While trying to distance from this approach, Heisenberg and Bohr emphasised on the probability and they argued that “no matter how faithfully the scientist adheres to scientific method research, research outcomes are neither totally objective, nor unquestionably certain” (Crotty, 1998, cited in Habib, 2020). This -less strict than positivism- view has been coined as post-positivism (or logical empiricism).

Post-positivist research share a lot of qualities with positivist research while the first allows research to be seen broader and less specialised, theory should be considered to explain practice without only relying on facts, researchers involvement is central in any approach of research and finally, there is no only one correct way to collect data and use any given information (Habib, 2020). Post-positivism, much like logical

positivism, is commonly linked with quantitative research and places emphasis on deductive reasoning and hypothesis testing for validating theories (Creswell and Clark, 2008). While scientific method and hypothetical deduction are still significant, structured qualitative approaches and inquiries are considered more important than in positivism, according to Guba and Lincoln (2005). Generally, post positivists maintain that there is a single reality, but to get a more complete understanding of it, numerous perspectives on that reality much be combined (Healy and Perry, 2000).

Interpretivism – constructivism approach usually derives its answers and explanations from qualitative research as researchers who follow this approach perceive the world as constructed, interpreted and experienced by people's interaction with each other and with the wider systems that they live in and are involved (Antwi & Hamza, 2015). The main purpose of this approach is to understand a specific phenomenon through interpretation and not to generalize the results to the general population. Moreover, researchers who follow this approach usually do not manipulate or control the variables that they are testing, rather they apply natural unfolding real-world situations in their research methodologies. Both approaches, positivism and interpretivism – constructivism share the notion that human's behaviour may be patterned; however, the difference between the two is that positivists see the patterns as a chain reaction (laws of cause and effect) whereas interpretivists view the patterns as frameworks that are developed through the dynamic social interaction among the individuals (Neuman, 2003).

3.3. THIS RESEARCH PARADIGM

A researcher's epistemological approach is the foundation that will directly influence the methodology and the methods of the study. The nature and source of the initial knowledge will inform the research strategy; thus, the chosen research position shows

how data about a researched phenomenon should be collected, examined and finally, interpreted. In this section, the approach of the current study will be identified based on the research questions.

Following from Dessart, Veloutsou and Morgan-Thomas (2015), this study adopts an objective ontology and a post-positivistic epistemology. This study is grounded in an objective ontology that assumes the existence of a reality that exists independently of our interpretations. The primary goal of this study is to accurately represent this reality. This study's research questions main focus is to examine causal connections and discover concrete and impartial relationships between healthy eating behaviour, Instagram food-posts, mindfulness practice and self-control. Adopting a post-positivist perspective, this study employs a quantitative research approach that involves a series of logical steps to identify and establish causal relationships.

3.4. DESIGN

For the purpose of the study's research questions, an experimental design was adopted, as well as a diary method. The research questions examine relationships between mindfulness practice, self-control-levels, Instagram food-related contentexposure and healthy eating behaviour. Following other mindfulness related intervention studies, the experimental design was selected in order to test the effectiveness of the mindfulness intervention towards eating behaviour (Alberts et al., 2012; Mantzios et al., 2020; Marchiori & Papies, 2014). Moreover, the experimental design serves this study's query about Instagram practices and the content participants are exposed to across two weeks.

The variables for each hypothesis are demonstrated in Table 1. The diary method was chosen as participants would require completing a short mindfulness intervention

(Arch et al., 2016; Marchiori & Papies, 2014) and tracking eating and Instagram practices throughout these days is important in order to be able to assess the change -if any- in their food consumption. Diary studies have been conducted and referred in research as “daily life method” (Reily et al., 2023) to investigate several behaviours, including eating (Li et al., 2020). According to Kirkpatrick et al. (2019) for a dietary measure to be unbiased and valid, the same dietary components should be measured and include the same reference measurement. Moreover, they claimed that “characteristics beyond mean intake, such as the proportion of a group with intakes below or above a threshold, may also be of interest and cannot be estimated based on data for a single day because of the need to account for day-to-day variation” (Kirkpatrick et al., 2019, p. 1803).

According to Drescher et al. (2007) count measures that are usually applied in nutrition research have two major disadvantages. First, they do not distinguish if being obese depends on the variety of healthy and unhealthy foods such as fruits and sweets respectively and second, they do not distinguish between the distribution of each of a category. Essentially, one can consume x amount of calories only by eating unhealthy foods that are risk for the health and the other can consume the same amount of calories only by eating a larger portion of healthy foods while obtaining all the necessary nutritional goods. The current research project aims to overcome this limitation by asking participants to complete a food diary where they will document foods and amounts, they had per day. Therefore, for the diaries, structured layout was employed in order for the researcher to be able to have the same reference measurement and dietary components recorded. Food and portion recommendations were derived by NHS EatWell Guide (NHS, 2022) as participants were all UK based

and NHS Eatwell guide is a policy tool and captures government recommendations on healthy eating and balanced diet.

3.4.1. WHY INSTAGRAM

Instagram is a mobile app that allows its users to share photos and videos with their Instagram community as well as other social networking sites such as Facebook or Twitter. Users can take photos and videos within the app or use those stored on their mobile devices. Unlike other social networks, Instagram allows users to edit and filter their content before sharing it. Users can also add location information and captions, which often include hashtags. Hashtags originated on Twitter and consisted of keywords, sentences, or abbreviations prefixed with a hash (#), such as #instafood (Willers & Schmidt, 2017). By using hashtags, users can not only emphasise certain information within their posts but also view all posts within the Instagram community that include the same hashtag, suggesting that they are related to a similar topic (Hu et al., 2014; Landsverk, 2014). Instagram users can follow other users to see the contents they share and are known as "followers".

Mejova et al. (2016) state that gastro-porn was originally introduced by Alexander Cockburn in 1977, describing it as "proffering coloured photographs of various completed recipes". Nowadays, the #Foodporn hashtag is part of a larger lifestyle trend in which users define their own interpretation of what food pornography is. The number of posts featuring the #foodporn hashtag has increased significantly during the Covid-19 pandemic as food photos have become a means of display. Yildirim and Doğan (2022) found that desserts, pasta, burgers, and French cuisine are the most commonly associated foods with the #foodporn hashtag. Digital media platforms have led to an increase in the glamorous display of foods, transforming the relationship

between humans and food into a social interaction activity on social media (Seal et al., 2022). The #foodporn hashtag is among the most popular hashtags on social media, especially visual platforms like Instagram, usually featuring close-up shots of delectable dishes. As of January 2023, Instagram boasts nearly 295 million posts related to #Foodporn (Instagram, 2023).

Ngqangashe and colleagues (2021) identify food porn as one of the reasons why adolescents consume food media, along with other entertainment-related motives. The importance of the visual component in food selection is supported by the idea that "the first taste is always with the eyes" (van der Laan et al., 2011, p. 296). Decorte and colleagues (2022) discovered that the combination of active and passive exposure to food media among emerging adults, as well as the role of personal contacts in incidental food media exposure, creates a complex process of food media consumption that is part of the social media users' food media experiences.

3.4.2. WHY ONLINE

Behavioural research studies started to use the Internet as a mean of recruitment and testing in the late 1990s (Kraut et al., 1998, Lanitis, 2020, Young, 2009). Initially, the benefits identified by the researchers were: the large sample that Internet recruitment and testing would attract, the low cost, the data entry that would be less time consuming since online tools export the participants' responses directly and the diversity of the population that researchers could reach (Casler et al., 2013). One of the concerns was that crowd-sourced and social media recruits will not be trustworthy or participants will not be motivated but research showed otherwise, findings revealed no significant results between traditional and online sampling and testing (Gosling et al., 2004).

This research was supposed to be conducted through face-to-face experiments but due to COVID-19 restrictions, the methodology was switched to online. Nevertheless, this switch did not cost any reliability and/or validity to the research. Uittenhove, Jeanneret and Vergauwe (2022) in their research on the effectiveness of remote testing in behavioural research found that data quality depends more on who they test (participant pool) rather than how they are tested (remotely VS face-to-face). Results also showed that online testing results in a small and acceptable loss of data quality compared to in-person testing, therefore, they concluded that online research in behavioural research should be encouraged.

Many research tools have been created to facilitate online recruitment and testing both for qualitative and quantitative methodologies (Moises, 2020). According to Moises (2020), the most common data collection technique in quantitative research is the survey. Online surveys are made with the aid of several software and/or tools such as Qualtrics, Microsoft Office (i.e. Google Forms) (Vasantha and Harinarayana, 2016), Amazon Mechanical Turk, Survey Gizmo, Research Now SSI, and Opinion Access (Moises, 2020).

Aside from the surveys, the current research also employs diaries as part of their methodology. Diary studies fall under the Experience sampling methods (ESM) which is a remote research method. Diaries have been suggested as an alternative of observations for online studies (Morrell-Scott, 2018). For example, during the COVID-19 pandemic, utilising diaries to replace the direct observation was the most appropriate for phenomenological or ethnographic research (Amicarelli and Bux, 2021; Buecker, S. and Horstmann, K.T., 2021). Nevertheless, eating behaviour has a

long-time tradition to be studied using diary method (look at Brogan and Hevey, 2013; Li et al., 2020; Mak et al., 2012; Hsu and Raposa, 2021).

Lastly, one consideration taken for this particular research study was to conduct it as a lab experiment, which could have potentially addressed the mindfulness activities more accurately. Nevertheless, beyond the circumstantial and environmental situations that dictated the methodology of this study, there are several reasons a field experiment was preferred.

First, following the previous discussion on diary studies, the nature of a diary study demands a level of flexibility and greater participant autonomy. This autonomy allows participants to document their eating habits in real-time and in their natural environments, leading to a more accurate and realistic representation of their eating behaviours (Boynton and Richman, 2014; Li et al., 2021); and the diaries in this study were designed in a software where participants could save their progress and continue filling in the next section later to minimise any recall bias. Conducting the study online enables participants to complete their diaries at their convenience, reducing the artificiality that can occur in a controlled laboratory setting.

Moreover, the current study aimed to reflect the impact of mindfulness on eating behaviours over a sustained period. To achieve this, consistent monitoring of participants' behaviour was necessary. Online methodologies facilitate this continuous observation more effectively than in-person experiments, as participants can be prompted regularly to engage with mindfulness activities and report their eating habits without the need for constant physical supervision (Louch et al., 2016; Reizer et al., 2019). This approach also supports the aim of this study, which is to create a robust

environment for mindfulness interventions that can be incorporated into various life stages and circumstances where the provision of instruction might be uncertain.

Additionally, online experiments offer logistical advantages, such as reaching a larger and more diverse sample population. This broader reach enhances the generatability of the findings and allows for the inclusion of participants from various ages, and backgrounds. For example, while this study focuses on mindfulness, including only individuals who are engaging in these activities would have not allowed further justification of the findings. The asynchronous nature of online studies also minimises scheduling conflicts, making it easier for participants to engage with the research at times that suit their daily routines (Falk and Heckman, 2009).

In summary, while a field experiment might have offered certain advantages in addressing mindfulness activities more accurately, the decision to conduct this research as an online/field experiment was guided by practical and scholar considerations. The flexibility and autonomy provided by an online format, paired with the need for consistent monitoring and the logistical benefits, made it the most suitable approach for this study.

3.4.3. SAMPLE

A convenience and snowballing sampling was employed as sampling approach following previous doctorate projects -examining similar concepts; namely, eating behaviour, social media influences and mindfulness – examples (see Hawkings, 2021; Lanitis, 2020), the participants were gathered through a combination of methods including personal networks, email, and social media platforms such as Facebook and Instagram. Advertisements were also placed on pages related to food and mindfulness. Moreover, the study has been advertised through flyers displayed at the

University of York, City Council of York and local markets in the York area. Additionally, it has been advertised through University of York forum Staff Digest and additionally has been circulated in undergraduate students' email lists. The study's flyer (Appendix 1) included a QR code where participants could access information about the study requirements and contact details if they wanted to get involved. There were two inclusion criteria: participants should be older than 18 years old and have an Instagram account. By examining a general population and not restricted to weight-specific individuals, the research aims to explore how digital food-related content affects the dietary habits of individuals regardless of their current weight status. This approach allows for a broader understanding of the potential risks associated with unhealthy eating patterns that can develop over time. Moreover, the emphasis on non-pathogenic individuals ensures that the findings are applicable to a wider audience, highlighting the preventative measures that can be taken to mitigate future health risks.

214 invitations were sent online, 76 individuals signed the consent form and initiated the surveys. Seven of them engaged with the study for less than 2 days, thus, they were not included in the raw data. A total of 69 participants ranging in age between 18 and 56 completed the study. Most of the lab-based experimental studies which examine mindfulness in relation to eating behaviour employed undergraduate students in return of course credits who were assigned in control and experimental groups and completed a single laboratory testing including a brief mindfulness exercise and sample sized ranged between 80 and 400 (Arch et al., 2016; Hong et al., 2014; Mantzios et al., 2020). Similar sample sizes ranging from 90 to 650 participants were employed in research which had online surveys on mindfulness and eating that were completed once (Giannopoulou et al., 2020; Hopfer, 2021; Jordan et al., 2014). A priori power analysis using the G*Power 3.1.9.4 indicated that with two comparison

groups, effect size of 0.5 and power of 0.95, a minimum total sample of 54 participants was required.

Participation was voluntary but participants had the chance to enter a prize for one of thirty £20 Amazon Vouchers.

3.4.4. MEASUREMENT TOOLS

3.4.4.1. SCREENING QUESTIONNAIRE

This survey started with a welcoming note including researcher's contact information in case participants did not remember their participation number that they should type for the survey to move to the main questionnaire. The consent form was followed along with a link to the information sheet of the study which has been already sent to participants as an attached file in the first communication with the researcher. The main questionnaire (Appendix 4) collected basic demographic information such as age, gender, level of education, and ethnicity. Then, questions about the frequency of Instagram use, food related accounts, frequency of food related posts they see or post followed. Finally, participants had to respond to questions about frequency of mindfulness practices.

3.4.4.2. MINDFULNESS INTERVENTION

Most of the studies examining the relationship between mindfulness as a trait and the weight related outcomes; measuring for type of food consumption, dietary habits and BMI used cross-sectional designs (Vaughan, 2018). Most studies on the relationship between mindfulness and eating behaviours and patterns focus on adolescent and adult samples (Pivarunas et al., 2015). One study by Bahl et al. (2013) who measured the level of mindfulness (measured in hours and types of meditation performed) in

their research among college students to examine whether this could eliminate mindless behaviours concerning food, used questionnaires to assess mindfulness, eating disorders (overeating versus skipping meals) and context. Supplementary, they also measured stress levels, satisfaction (quality of life), social desirability and eating habits. There is support by Papies et al. (2012) that mindful attention can prevent spontaneous reactions elicited by attractive food. Overall, even if they detected different types of mindfulness techniques used among college students, results showed that compared to the larger group of students who did not report meditating, those who practice meditation were marginally less likely to report skipping meals or overeating and they also reported lower levels of stress regarding university. This article adds support to the fact that mindless eating is a common behaviour regardless of what causes it.

For the purposes of this study, mindfulness intervention techniques were decided through literature review and the guidance of an experienced mindfulness practitioner from the University of York Open Door service. The specific exercises were selected based on the five facets of Mindfulness as suggested in the Five Facet of Mindfulness Questionnaire which are: Observation (5-4-3-2-1 exercise) (Appendix 5), Description (Categories Exercise) (Appendix 7), Mindful Actions (The chocolate/raisin exercise) (Appendix 8), Non-Judgement (Sense Awareness) (Appendix 9), Inner Experience (Stay with Emotion exercise) (Appendix 10), and Non-reactivity (Body Awareness) (Appendix 6). These exercises have been derived from the mindfulness practitioner's database of exercises and they were aligning with the focus of exercises used in previous eating behaviour studies where mindfulness exercises were included (Dalen et al., 2010; Mantzios, Skillett and Egan, 2020; Stanszus, Frank and Geiger, 2019).

In most of the exercises, participants were instructed to take some actions (ex. Take a seat in a quiet place where you are free from distractions, setting a timer for 5, 7, and 10 minutes helps you commit to the meditation; With your eyes closed, your gaze low and soft, turn your attention to your breath…). The worksheets (Appendices 5-10) aimed to keep the participant engaged with the procedure. Similar intervention procedures have been used in mindfulness courses and relevant research (Alberts & Raes, 2012; MacKenzie et al., 2006). Participants were receiving different exercises every day through the 14 days to simulate the traditional mindfulness sessions which use a variety of exercises. Many of the studies examining mindfulness intervention effectiveness towards healthy eating are either cross-sectional (Mantzios et al., 2020) or they were examining weight outcomes, measuring participants weight Day 1 and then at the end of the intervention which lasted for 8-10 weeks (Systematic Review; Yu et al., 2020). This means that participants did not have to complete daily diaries throughout the experiment. Moreover, mindfulness practitioners claim that mindfulness benefits may be experienced within the first few weeks while for brain rewiring it requires eight short weeks (Mindfulness Supervision, 2022). However, results on immediate effects of mindfulness show that improvements start showing after the first four days of practising it while in two weeks, cognitive performances are noticeably improved (Kane, 2022). For the current study, two weeks of mindfulness were employed in order to both meet the criteria for mindfulness effective practise and the expectations of a long daily diary study.

Participants were advised and expected to follow the mindfulness intervention first and then keep a diary of their meals and snacks; however, the online nature of this study does not allow us to control for that. They were free to devote as much or as little time

as they wish to the worksheet activities and diary. The time they spent was then captured in the daily diary.

3.4.4.3. FIVE FACET MINDFULNESS QUESTIONNAIRE (FFMQ)

The Five Facet Mindfulness Questionnaire (FFMQ) is a 39-item questionnaire used to analyse individual's dispositional mindfulness (Baer et al., 2006; Appendix 11). The FFMQ is based on a factor analysis of the items of the five most widely used mindfulness questionnaires, including the Mindful Attention Awareness Scale (Brown and Ryan, 2003), the Freiburg Mindfulness Inventory (Walach et al., 2006), the Southampton Mindfulness Questionnaire (Chadwick et al., 2008), the Kentucky Inventory of Mindfulness Skills (Baer et al., 2004), and the Cognitive and Affective Mindfulness Scale (Feldman et al., 2004), and in this way encompasses diverse conceptualizations of mindfulness (Hsu & Forestell, 2021). It includes five psychometrically subscales of mindfulness: observing, describing experience, acting with awareness, non-judging of experience, and non-reactivity to inner experience (Gill & Hodgkinson, 2007). The FFMQ uses a Likert method (from 1 [Strongly Disagree]–5 [Strongly Agree]) to determine the frequency with which elements of mindfulness occur. Possible scores on the FFMQ range from 39 to 195, with overall higher scores reflecting higher levels of mindfulness. Internal consistency was $\alpha = 0.82$ and $a = 0.92$ for pre-test and post-test assessment respectively in the current study. FFMQ has been widely used in studies exploring mindfulness as part of the eating behaviour (Ali et al., 2017; Vaughan, 2018).

The FFMQ is regarded as the most comprehensive approach to assessing mindfulness as it covers various aspects of mindfulness (Bergomi, Tschacher, & Kupper, 2013). However, like most self-report measures, it has limitations, such as the

response-shift phenomenon, where participants' internal standards of comparison shift when they practice or experience something (Fisher, 2014). This could cause different interpretations of the scale items and potentially affect the validity of the measure across different populations. Another limitation is the social desirability bias, where participants may respond with the "right answer" to present themselves favourably. Additionally, the lack of a clear distinction between scales can make it difficult to compare research findings and lead to misleading conclusions. Nonetheless, the FFMQ is used in this study as it is suitable for the general population and allows examination of different facets of mindfulness. It should be noted that the participants in this study were not selected based on their overall mindfulness ability, and there were no outliers in mindfulness levels in the pre- and post-tests.

3.4.4.4. FOOD CRAVING QUESTIONNAIRE (FCQ-T)

The FCQ-T-r (Meule et al., 2014; Appendix 12) was used to measure the frequency and intensity of food craving experiences. It consists of 15 items (e.g., “I find myself preoccupied with food.”, “If I eat what I am craving, I often lose control and eat too much.”), and responses are scored on a 5-point scale (from 1 [Strongly Disagree] to 5 [Strongly Agree]). Higher scores indicate more frequent and intense food craving experiences. The FCQ-T-r demonstrated high retest-reliability over six months (Meule et al., 2014), supporting the stability of trait-level food craving experiences. Internal consistency was α = 0.89 and a = 0.93 for pre-test and post-test assessment respectively in the current study.

Several self-report measures have been created to evaluate food cravings. Each of these measures has a different approach to the concept of craving. The Attitudes to Chocolate Questionnaire (ACQ) (Benton et al., 1998) and the Orientation toward

Chocolate Questionnaire (OCQ) (Cartwright and Stritzke, 2008), for example, focus on measuring cravings specifically related to chocolate and address the relationship between craving and feelings of guilt or the conflict between approach and avoidance inclinations during the experience of craving. The Food Craving Inventory (FCI) (White et al., 2002) measures cravings related to different classes of food, such as high fats, sweets, carbohydrate/starches, and fast-food fats. The Questionnaire on Craving for Sweet or Rich Foods (QCSRF) (Toll et al., 2008) assesses the intensity of craving for sweet or rich foods and includes questions related to both momentary and past-week craving. These instruments evaluate habitual cravings related to specific types of food and are limited to certain aspects of food cravings.

In contrast to other food craving questionnaires, the FCQs were designed to evaluate cravings for a wide range of foods, without any restrictions or emphasis on categories like chocolate. Moreover, the FCQs take into account various aspects of food cravings, including cognitive, behavioural, and physiological dimensions. Lastly, the FCQs include two versions that assess both current and habitual food cravings.

For the current study, the trait reduced version of the FCQs (FCQ-T) was used which consists of 15 items and items are scored on a 6-point scale ranging from never to always. Internal consistency of the total scale is very high ($\alpha > 0.90$) across different versions and samples (Meule et al., 2012). According to Mason et al. (2017), those with higher scores on the FCQ-T-r tend to consume high-calorie snacks more frequently and engage in more thinking related to eating such foods. In addition, research by Meule, Richard, & Platte (2017) suggests that higher FCQ-T-r scores are linked to weight gain over time through unconscious eating.

Regarding the reason why the FCQ-T was selected and not the FCQ-S is the sensitivity they have in the results. To begin with, the FCQ-T and FCQ-S scores have a weak positive correlation, and FCQ-S scores are associated with overeating but not as consistently as FCQ-T scores (Meule et al., 2014). One reason for this could be that individuals who experience food cravings more frequently (i.e., "high trait cravers") are more likely to experience craving during data collection. Another possibility is that completing eating-related questionnaires may trigger current food cravings, especially in high trait cravers. Despite occasional correlations between absolute FCQ-T and FCQ-S scores, recent research has found that increases in FCQ-S scores during cognitive tasks involving pictures of palatable foods are positively correlated with FCQ-T scores, indicating that FCQ-T is a valid measure for assessing susceptibility to food-cue elicited craving, which can be evaluated using FCQ-S. Additionally, Tiggemann and Kemps (2005) found that FCQ-T scores predicted craving intensity when participants were asked to imagine their favourite food.

Therefore, in this study, the shortened version of FCQ-T was utilised, which omits items related to positive reinforcement, relief anticipation, hunger, and guilt. The selected version includes 5 items related to lack of control overeating, 5 items related to preoccupation with food, 2 items related to intentions and plans to consume food, 2 items related to emotions before or during food craving, and 1 item related to cues that may trigger food craving. This was done because the study does not examine these aspects, and the Dutch Eating Behaviour Questionnaire already covers emotional and external eating behaviours that are not included in the FCQ-T.

This measurement in the current study is used as an indicator of eating behaviour, as it reflects patterns related to healthy or unhealthy eating.

3.4.4.5. DUTCH EATING BEHAVIOUR QUESTIONNAIRE (DEBQ)

Another tool for eating behaviour measurement in this study that would give more information in terms of specific eating patterns such as restrained, external and emotional eating are investigated using the Dutch Eating Behaviour Questionnaire (Van Strien et al., 1986; Appendix 13). This self-report contains three scales: “restraint eating,” “external eating,” and “emotional eating.” Emotional eating corresponds to the tendency toward overeating in response to negative emotions. External eating corresponds to the tendency toward overeating in response to food-related stimuli. Regarding the restrained eating, research shows that restrained eaters are more likely to be influenced by food cues (Alblas et al., 2021). All of these measures exhibit high internal consistency and have undergone precise factorial analyses (Van Strien et al., 1986, Wardle, 1987). Responses are scored on a 5-point scale (from 1 [Never] to 5 [Very Often]). Internal consistency was α = 0.90 and a = 0.92 for pre-test and posttest assessment respectively in the current study.

The Dutch Eating Behaviour Questionnaire (DEBQ) was developed in the eighties with the aim of improving the understanding of the complex eating behaviour patterns exhibited by obese individuals (van Strien et al., 1986). However, it is currently widely used for general population. Its main purpose was to isolate the restraint construct. Moreover, van Strien and colleagues (1986) were also interested in measuring emotional and external eating behaviour. The DEBQ consists of 33 items that are distributed by three behavioural dimensions: restrained eating - 10 items (e.g. “If you have put on weight, do you eat less than you usually do?”), emotional eating - 13 items (e.g. “Do you have a desire to eat when you are depressed or discouraged?”) and external eating - 10 items (e.g. “If you have something delicious to eat, do you eat it

straightaway?"). Each item has a five-point response form at (1-5): never (1), seldom (2), sometimes (3), often (4) and very often (5).

The DEBQ has been found to have a reliable and consistent three-factor structure across various groups such as men, women, and individuals with different weight status. It has high test-retest reliability and internal consistency, as well as good validity in terms of measuring eating behaviours. The DEBQ is widely used in clinical and research settings and has been extensively used in normal-weight, overweight, and obese individuals to assess their eating behaviours. (Malesza & Kaczmarek, 2021).

For the purposes of this study, the DEBQ has been used to measure the emotional, the restrained as well as the external eating before and after the mindfulness intervention and additionally to examine whether participants who record excessive Instagram use are having higher levels of the three constructs.

3.4.4.6. BRIEF SELF-CONTROL SCALE (BSCS)

The original version of the 13-item BSCS (Tangney et al., 2004; Appendix 14) was sent to participants. The 13-item BSCS is a short-form of the full 36-item SCS developed by the same authors. The benefit of using the short-form version is the reduction in participant burden (Morean et al., 2014). Additionally, in previous research, the short-form achieved a reliability very similar to the full version. Tangney et al. (2004) reported coefficient alphas (Cronbach, 1951) for the BSCS of .83 and .85 for their first and second samples, respectively. These values were very close to the reliability of the SCS (α = .89) which suggests similar performance between short and long forms. The 13 items of the BSCS all consist of a 5-point rating scale: 1 (not at all like me) and 5 (very much like me); with maximum score of 65 and minimum of 13.

Internal consistency was α = 0.80 and a = 0.84 for pre-test and post-test assessment respectively in the current study.

For this scale, participants were asked to rate themselves on a five-point scale from 1, not at all, to 5, very much likely to items such as “I am good at resisting temptation” and “I find it difficult to break bad habits”. This questionnaire intends to measure individual differences in the disposition to control impulses, thoughts and emotions and to suppress undesirable behaviour which in this case occurs eating. It has been widely used in eating behaviour studies for overweight and normal weight individuals (Danner et al., 2012; Verstuyf et al., 2013).

3.4.4.7. SCALE OF EFFECTS OF SOCIAL MEDIA ON EATING BEHAVIOUR (SESMEB):

Eating behaviour practices influenced by social media were measured using the Scale of Effects of Social Media on Eating Behaviour (SESMEB) questionnaire with a total of 18 questions (Keser et al., 2020; Appendix 15). This tool has been used as an eating behavior tool that encompasses influences on eating as well as eating behavioral patterns, making it suitable for exploring RQ3. The SESMEB uses a Likert method (from 1 [Never]–5[Always]) to determine the level of being affected in regard to food behaviour by social media. Items that have used are: “I see and consume any food on social media that are not my food habit”, “The foods/dishes that I see on social media arouse my desire to eat”, “On the days I use social media for a long time, my desire to eat increases and I eat more”; the completed questionnaire can be found in Appendix 15.

Minimum 18 and maximum 90 points from SESMEB scale can be taken as total point. Internal consistency was α = 0.93 and a = 0.95 for pre-test and post-test assessment

respectively in the current study. This scale has not been extensively used as it is relatively new, and it has not been applied in many studies yet.

3.4.4.8. DAILY FOOD AND INSTAGRAM DIARY (FOOD DIARIES)

The daily diary was created in a survey form to be more user-friendly, accessible from smart mobile phones and less time consuming than if it was in an open-ended diary where participants would have to type down their daily practises. It consists of 110 items –however while using the Qualtrics software, the skip logic was used on multiple occasions. Participants had to complete multiple choice questions (portion sizes regarding each category of food they had) as well as some Likert scales.

The diary consisted of 8 sections as appears in Appendix 16: 1. Welcome and Participation Number justification, 2. Measurement Criteria, 3. Breakfast Section, 4. Lunch Section, 5. Dinner Section, 6. In between meals - Snacks Section, 7. Social Media and Mindfulness (only applicable to experimental group) Section.

Section 1: The diary starts by asking participants to enter their participation number. Researcher's contact information was included as well in case they have forgotten their individual case number and they wished to reach out for help.

Section 2: Moving on, it was the measurement section where no action was required by the participants but details on food measurement criteria using their hands was included.

Section 3, 4, 5: Then, the first meal category would follow. There were three main meal categories (i.e. breakfast, lunch and dinner) as well as a snack category afterwards. The three main meal sub-sections were identical in terms of food categories and questions sequence. Each of the main category included 27 questions. The food

categories for all the 3 meals were based on the “Eat Well Guide” by NHS which shows how much of all the food categories individuals shall consume to keep a healthy weight. The Eat Well Guide suggests that for a balanced diet individuals should try to get the balance across the 6 food groups over a day or even a week. The 6 food groups are: 1. Fruits and Vegetables, 2. Potatoes, Bread, Rice, Pasta or other starchy carbohydrates, 3. Dairy or Dairy Alternatives, 4. Beans, Pulses, Fish, Eggs, Meat and other Protein, 5. Oils and Spreads and 6. Foods high in fat, salt and sugar such as snack and confectionary foods. Portions sizes have been also identified through the Eat Well project of NHS where they refer to the optimal portion sizes which will serve as a baseline for the analysis.

The levels of participants’ healthy eating practices were attributed to a continuous variable (called Food Consumption) created to indicate the overall unhealthy eating behaviour. Namely, F&V were coded in a 5-point Likert scare 0-None to 6-more than 5 portions according to The Eatwell Guide, NHS and The British Nutrition Foundation that suggest that for a healthy and balanced diet at least 5 portions of a variety of fruit and vegetables a day should consumed. For the Milk and Dairy consumption, Eatwell Guide suggests that for a healthy and balanced diet individuals should consume lower fat dairy and alternatives; therefore, the data was coded from 0 – None to 2 – High in fat. As for Meat, Fish and Protein coding, again The Eatwell Guide and the British Nutrition Foundation was consulted, and the coded scale included the recommended portion sizes per day from 1 – Less than Recommended serving to 3 – More than recommended serving. Similarly for Bread, Cereal and Carbohydrates, the coding was based on the guides suggested above and they included recommended servings per day, from 1 – Less than Recommended serving to 3 – More than recommended serving. Regarding snacking, although research suggests that a single snack has a

modest impact on the diet in terms of energy and the impact of the varying nature of snacks on overall diet quality is likely to be limited (Marangoni et al., 2019); according to Hartmann et al. (2013) increasing snack frequency is associated with an overall unhealthier dietary behaviour and could be a threat to an otherwise healthful living (Tam et al., 2010). Taking the above into consideration, the '1 - No' or '2 - Yes' question about snacking contributes to the overall food consumption score, adding +1 if 'Yes' and 0 if 'No.' Additionally, any specific snack mentioned by the participant in the text box was evaluated based on the measurement criteria of the category to which it belongs.

For each food group, there was a question where participants could identify the food of the category they had and would indicate the portion they had based on the measurement criteria they were given at the Section 2 of the diary. At each question, there was a reminder of the portion sizes using their hands as measurement. The Food Diary in detail can be found in Appendix. Since the diaries were developed in Qualtrics software, skip logic was included in every food group in order to make sure that participants will only focus on the questions that are related to them and their eating practices.

Section 6: Participants were asked about their snack consumption in the three meal sections as well, but an additional In-between meals section was included in case they consumed snacks outside of the typical mealtimes.

Section 7: This 25 items section was included to record Instagram practices and their daily influences on food and emotions that would in turn, affect eating practices. First off, participants were asked about the time they spent on Instagram on the day and whether they would be on Instagram while having their meals or during the preparation

time of their meals. Secondly, since this study is exploring the influence of food-related content on Instagram, they were asked about the daily interaction they had with food-related posts and the type of the food they were exposed to. The questions on Food Cravings (question Q91), Emotions (question on emotional state overall, Q95; enjoyment, Q96; dissatisfied feelings, Q97 on Food Diary Questionnaire) and Consumption (question Q94 on Daily Diary Questionnaire) were all self-completed 5-points scale questions (From 0 - Not at all to 5 – Very much) and the answers are based on participants' experience and their ability to assess this experience. Similarly, the type of food participants viewed were assessed from the Likert type question Q90 (From 0 - Mostly Healthy to 5 – Mostly Unhealthy).

For the experimental group, two more questions were added regarding their mindfulness practices and the time they spent on it on the day and they were in Likert scale format. These questions did not appear in the control group food diary.

Table 2 summarises the variables and the tools through which each one has been captured.

Table 2 Summary of Variables and Capturing Tools

Summary Table of Variables and the capturing tools	
Variable	**Capturing Tool(s)**
Source of Content	Food Diary – Section 7 (H1a, H1b, H5b, H6b)
Food Posts	Food Diary - Section 7 (H2)
Type of food posts	Food Diary - Section 7 (H3a, H3b, H5c, H6c)
Emotional impact	Food Diary - Section 7 (H4, H5d, H6d)

Mindfulness activities	1. Five Facet Mindfulness Questionnaire (FFMQ) (H7a, H7b, H7c, H7d) 2. Food Diary – Section 7 (H5a, H5b, H5c, H5d)
Mindfulness time spent	Food diary - Section 7 (H6a, H6b, H6c, H6d)
Self-control	Brief self-control scale (H7a, H7b, H7c, H7d)
Healthy Eating Behaviour	1. Food Diary - Sections 3,4,5,6 (H1a, H1b, H2, H3a, H3b, H4, H5a, H5b, H5c, H5d, H6a, H6b, H6c, H6d) 2. Scale of effects of social media on eating behaviour (H7d) 3. Dutch Eating Behaviour Questionnaire (H7a, H7b, H7c) 4. Food Craving Questionnaire (H7a, H7b, H7c)

3.4.5. DATA COLLECTION

The study used online surveys to obtain the data. The surveys included screening questionnaire where they will have to answer questions regarding demographics (i.e. age, gender, nationality) and their social media use (i.e. frequency accessing Instagram, time spent on Instagram, food related accounts they follow, posts they upload) and mindfulness practice (i.e. familiarity with mindfulness, frequency of mindfulness exercises). The baseline and final questionnaires were identical and included the Food Craving Questionnaire, the Five Facet Mindfulness Questionnaire, the Dutch Eating Behaviour Questionnaire, the Self-Control Scale, and the Social Media Practices Questionnaire. Finally, their daily eating and Instagram practices have been monitored by daily food diaries which were in a survey form.

The study participation included4 steps:

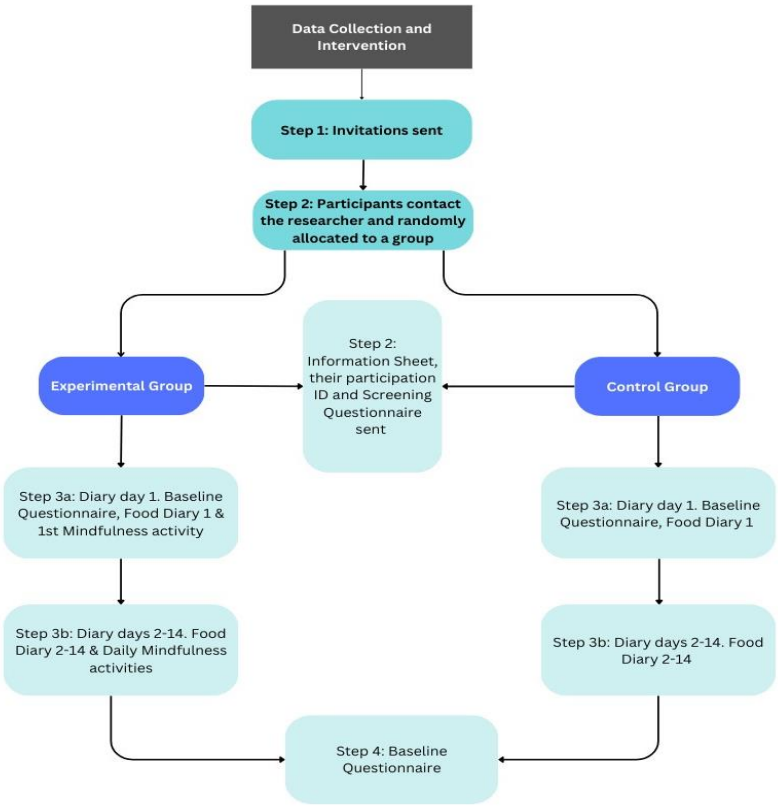
Step 1: Recruitment phase took place as explained in Sample section (3.5.1.)

Step 2: Potential participants initiated communication with the researcher online and they were sent the Information Sheet (Appendix 3). Participants were given a unique ID number and so their names were not used in the study documents to minimize the use of personal information, and they were asked to complete the screening questionnaire (Appendix 4) online which included the consent form, demographic questions (e.g. age, gender, nationality) and questions regarding their use of Instagram (e.g. how much time they spent on it, food related accounts they follow, food related posts they upload). More on the survey can be found in the Measurement Tools section. The screening questionnaire served as a basis to examine gender and age differences with regards to Instagram use, levels of mindfulness and self-control.

Step 3: As soon as the participants filled in the surveys indicated in Round 2, the 14 consecutive food diary days started. Day 1 participants would receive the Baseline questionnaire and the Food Diary Day 1. From Day 2 until Day 14, participants received a Food Diary via daily emails including reminders. The experimental group would additionally to the diaries receive daily mindfulness activities. The Food Diaries between experimental and control group differ in two mindfulness related questions that were only included in experimental participants' group. Participants spent from 12 to 78 minutes daily for the Food and Instagram practices diary.

Step 4: Once participants have completed the 14 days of diaries, they were asked to complete the Baseline questionnaire again and this was the end of the procedure. (The procedure is depicted in Table)

Table 2. Data Collection Diagram



3.4.6. DATA ANALYSIS

The data generated from the study was subject to statistical analysis (Rounsefell et al., 2020; Underdown, 2021). The data was gathered through the survey tool Qualtrics licensed by University of York and resulted in one thousand one hundred seventy three (1,173) completed surveys including the screening questionnaire (Appendix 4), the baseline and final surveys where the FFMQ (Appendix 11), FCQ-T (Appendix 12),

DEBQ (Appendix 13), BSCS (Appendix 14), and SESMEB (Appendix 15) were included and finally, the 14 days daily diaries for sixty-nine (69) participants. The data was then exported to Microsoft Excel (Office 16) to get coded and finally, it was analysed using SPSS 28.0.1.1. As a result of the different types of data collection (questionnaires and diaries), the final coded data gathered were divided across two SPSS datasets.

3.5. RESEARCH ETHICS

The current research was done in high ethical standards and got approval from the ELMPS Ethics Committee making sure that the research aligns with the Code of Practice and Principles for Good Ethical Governance of the University of York. Participation in the study was voluntary and anonymised with the participants being treated with respect and the freedom to withdraw at any point. It is considered a low-risk study, nevertheless because of potential distress associated with eating behaviours and eating disorders, participants were debriefed at the end of the study discussing potential worries they may have had.

Participants signed a consent form before their participation, and they also read the Information Sheet before signing the consent (Appendix 2). They have also been given information about available support (e.g. Open Door services at the University of York, Mental Health charities from NHS). Additionally, the researcher is an experienced trained psychologist and could address the potential participant's distress through her professional and supportive manner. Participants were also free to withdraw at any point during the study without giving any reason. The timeframe for withdrawal was indicated on the Information Sheet and it was one month after the start of the participation in the study and, therefore, personalised for each participant.

Following the University's Research integrity and ethics policies, data was kept securely in encrypted folders on the University's database. Finally, in terms of anonymity since the main correspondence between the researcher and the participants was the email exchange, the researcher has access to participants' emails without requesting any further identification information. However, this was an issue known to participants and some of them used email IDs that did not include any form of personal identification while others have contacted the researcher from their personal emails including their names and surnames. To minimise confidentiality breach, emails sent and received have been deleted right after the end of each participation day and participants' data on Qualtrics could only be identified by their unique participation ID number which was also how they have been identified in SPSS. The lack of complete anonymity in the use of emails in data collection has been addressed in marketing related research and scholars suggested that research including email correspondence may result in fewer response rates which have possibly been reflected in the current study (Michaelidou and Dibb, 2006).

Another ethical consideration is the researcher's involvement in the study. In social research, researcher's involvement in the recruitment or/and analysis may potentially result in breaching ethical principles (Fox et al., 2003). In the current study, data was mainly quantitative and collected online which could imply that the researcher could not affect the data at the point of collection. However, the researcher was involved in the design of some of the questionnaires, as well as the recruitment but the effect that this involvement may have caused was kept to the minimum given that there was not any in-person interaction between the researcher and the participants. In terms of the questionnaires, both screening and diary questionnaires were designed by the researcher, following general guidelines for demographic questionnaires, social media

use and engagement, food diary questionnaires as indicated in the Food Diary section earlier.

CHAPTER 4: RESEARCH FINDINGS

4.1. OVERVIEW

This chapter will outline the statistical results for the study. It beginswith the demographic characteristics of the sample, includinggender, gge, generation groups, education level, ethnicity and nationality. Next, the the results related to the study's hypotheses results are presented, with a brief discussion of the outcomes A more detailed discussion will follow in the Discussion chapter.

4.2. DEMOGRAPHICS

The participants' age ranged from 18 to 56 (M=29.47, SD=6.86). Twenty-one were male and 48 were female. Most participants were White, British or Greeks and had a Master's degree or equivalent, while all participants were UK residents. The following table includes the range, the mean and standard deviation of the demographic data.

Table 3 Summary of Demographics

	N		Frequency (%)
Gender	69	Male	30.4
		Female	69.6
Generation Group	69	Gen Z	21.7

		Millenials	75.4
		Gen X	2.9
Level of Education	69	College	8.7
		Bachelor’s Degree	23.2
		Master’s Degree	49.3
		Doctorate or Higher	18.8
Ethnicity	69	White or White British	75.4
		Black or Black British	5.8
		Asian or Asian British	10.1
		Other	8.7
Nationality	69	British	33.3
		Greek	33.3

Chinese	10.1
Indian	4.3
Italian	4.3
Cypriot	2.9
German	2.9
Other	8.9

4.3. RESEARCH QUESTION 1: DOES EXPOSURE TO FOOD-RELATED CONTENT ON INSTAGRAM AFFECT (UN)HEALTHY EATING BEHAVIOUR?

4.3.1. HYPOTHESES 1 RESULTS

H1a: Individuals exposed to friends' food posts will consume unhealthier food.

The following tables outline how often participants were viewing food related posts from their friends and from influencers (including influencers, restaurants and food blogs) during the 14 days of the study. Participants reported that it was more likely to view food related posts from influencers accounts rather than their friends.

Table 4 Percentage of Food Content generated from friends

	N	%

Less than 35%	765	79.2
Between 35-65%	157	16.3
Above 65%	44	4.6

Table 5 Percentage of Food content generated from influencers

	N	%
Less than 35%	121	12.5
Between 35-65%	732	75.8
Above 65%	113	11.7

The Kruskal-Wallis H was statistically significant ($H(2)=49.61$, $p<.01$), confirming the H1a.

Within social media platforms, users are frequently exposed to a diverse array of content from various sources, ranging from influencers and brands to peers and friends. Despite this wide exposure, research on eating behaviour within the context of social media has not fully addressed the nuances of these different sources of influence. Offline, the role of familiarity in social interactions, particularly the influence

of friends and family on eating habits, has been extensively studied and well-documented. These studies consistently show that friends and family are the primary sources of influence when it comes to unhealthy eating behaviours (Chung et al., 2021; Nabors et al., 2024; Salvy et al., 2007). This gap in the research is significant because the dynamics of online interactions differ from those offline. On social media, the reach and frequency of exposure to food-related content are exponentially greater, and the influence of familiar sources, such as friends and peers, can be amplified. Social media creates a virtual environment where users are constantly engaging with content shared by those within their social circles. This content is often more persuasive because it is perceived as more authentic and trustworthy, given the pre-existing relationships between users.

H1b: Individuals exposed to influencers' food posts, will consume healthier food.

On the other hand, H1b focused on the influence of influencers' food posts on eating behaviours, with the expectation that their content would lead to healthier food consumption. This hypothesis was based on the documented role of influencers on social media, who often portray themselves as figures promoting lifestyle improvements and healthy habits and are perceived as credible sources of advice on healthy diets (Wellman, 2023).

The Kruskal-Wallis H was statistically significant ($H(2)=109.06$, $p<.01$), confirming the hypothesis that exposure to influencers' food posts would lead to healthier food consumption.

However, these two hypotheses focused purely on food socialisation, while factors related to food marketing (such as the type of food and the quantity of posts) were

also expected to influence eating behaviours online. These aspects will be further explored in H2 and H3.

4.3.2. HYPOTHESIS 2 RESULTS

H2: Those who are exposed to food-related content are expected to consume unhealthier food.

88.4% of the participants reported following food-related accounts (such as influencers, food blogs, and restaurants), while 11.6% reported that they do not. The specific food-related accounts they follow can be found in Appendix 17. However, as noted in the previous hypothesis, food content on Instagram also comes from friends and peers in users' feed (Qutteina et al., 2019).

Therefore, the following table outline how often participants were viewing food related posts on their Instagram. The majority of the participants were viewing food related posts 2-4 times a week and 4-6 times a week.

Table 6 Frequency of food related posts

	N	%
Daily	16	23.2
4-6 times a week	22	31.9
2-4 times a week	22	31.9

Once a week	8	11.6
Less than a week	1	1.4

The Kruskal-Wallis H test was applied towards H2 to the daily food diaries and a significant effect emerged: participants exposed to food posts on Instagram exhibited significantly higher levels of unhealthy food consumption ($H(4) = 163.425$, $p < .01$). These findings support H2, which posited that increased exposure to food-related posts would correlate with higher unhealthy food consumption.

However, the Kruskal-Wallis H test indicated no statistically significant difference in the FCQ-T scores at baseline when comparing the quantity of food-related content viewed ($H(4) = 3.85$, $p = .427$). Similarly, the test revealed no significant association between the reported quantity of food-related content viewed at baseline and higher levels of scores on the DEBQ ($H(4) = 7.72$, $p = .103$).

While the baseline data from the FCQ-T and DEBQ did not show significant relationships with the quantity of food-related content exposure, the analysis of participants' self-reported daily consumption and their documented exposure to food posts throughout the 14-day period revealed a clear link. This suggests that the influence of food-related content on Instagram may be more immediately impactful in daily contexts, rather than being reflected in more general, baseline attitudes or behaviours.

4.3.3. HYPOTHESES 3 RESULTS

H3a: Viewing unhealthy food-related content, will result in unhealthier food consumption.

The frequency of the type of foods they were viewing during the 14 days of the study can be found at the Table 16 below. The content was mainly unhealthy types of food as per participants' self-reports.

Table 7 Frequency of food type posts

	N	%
Mostly Healthy	163	17.1
Mostly Unhealthy	409	43
Both	379	39.9

For H3a, the Kruskal-Wallis H test was employed to examine the association between viewing unhealthy food-related content online and unhealthier food consumption. The test results indicated that there was no statistically significant overall association between these variables ($H(1)=2.16$, $p=.141$). This means that the initial hypothesis, that viewing unhealthy food-related content would lead to an increase in unhealthier food consumption, was not confirmed.

However, further analysis revealed more nuanced findings when the effect of unhealthy food content viewing was tested across different types of food selection. Specifically, the consumption of fruits and vegetables showed a significant association

with the type of food viewed online (H(1)=4.62, p<.05). The data indicated that more exposure to unhealthy food content was significantly correlated with fewer fruits and vegetables consumed. This suggests that individuals who view more unhealthy food posts may be less inclined to consume healthier options such as fruits and vegetables.

Similarly, significant results emerged for snacking behaviour in relation to unhealthy food viewing (H(1)=4.62, p<.05). Individuals exposed to more unhealthy food posts were found to engage in greater snacking consumption, implying that such content may increase the frequency of snacking, often associated with less healthy eating habits.

Furthermore, unhealthy food-related content was significantly associated with higher consumption of carbohydrates (H(1)=1.19, p<.05), milk and dairy products (H(1)=17.94, p<.05) as well as confectionary (H(1)= 64.91, p<.05). These findings suggest that exposure to unhealthy food content may lead to increased intake of calorie-dense and less nutritious foods.

The analysis found no statistically significant relationship between viewing unhealthy food content and the consumption of meat, fish and protein (H(1)=23.94, p=.611) or fast-food (H(1)=19.04.94, p=.236). This might suggest that the consumption of these food categories is influenced by factors other than just exposure to unhealthy food content.

Overall, while H3a was not supported by the data, the results reveal a tendency for individuals exposed to unhealthy food-related content to adjust their eating behaviours in specific ways, particularly by reducing their intake of fruits and vegetables and increasing their consumption of snacks, carbohydrates, and dairy products while other

food categories, such as fast-food and meat, fish and protein remained unchanged. These findings are consistent with previous research, such as studies by Hawkins et al. (2021) and Liu (2023), which indicate that exposure to unhealthy foods and beverages tends to increase the intake of certain types of foods, including vegetables and carbohydrates.

H3b: Viewing healthy food-related content, will result in healthier food consumption.

The H3b was confirmed, with the Kruskal-Wallis H test revealing a significant relationship between healthy food-related content viewing and healthier food consumption ($H(3)=21.03$, $p< .01$). This result suggests that the more individuals are exposed to healthy food content, the more likely they are to make healthier food choices.

Similarly, Friedman test's results showed significance between the healthy food-related content viewing and higher fruit and vegetable consumption ($\chi(1)= 782.68$, $p< .05$), lower snacking ($\chi(1)= 55.88$, $p< .05$), lower milk and dairy products consumption ($\chi(1)= 224.63$, $p< .05$), lower fast-food consumption ($\chi(1)= 451.73$, $p< .05$) and lower confectionary consumption ($\chi(1)= 323.56$, $p< .05$).

Nevertheless, no significant association was found between viewing healthy food-related content and the consumption of carbohydrates ($\chi^2(1) = .83$, $p = .362$) or meat, fish and protein ($\chi^2(1) = .00$, $p = .969$). While protein consumption remained unaffected by both healthy and unhealthy food-related content, as both analyses yielded insignificant results, carbohydrate consumption was expected to be lower in response to healthy food-related content on Instagram, consistent with the pattern observed with unhealthy content viewing.

These results underscore the findings related to H3a, suggesting that specific types of food may be influenced by particular content online, while others are not. This selective influence aligns with previous research, which indicates that some foods are more responsive to online content than others (Hawkins et al., 2021).

These findings underscore the importance of content type in shaping dietary choices (Alblas et al., 2021; Andersen et al., 2021) and suggest that promoting healthy food content could be a more effective strategy for encouraging healthier eating behaviours; however, the promotion of unhealthy food online may prove harmful.

4.3.4. HYPOTHESIS 4 RESULTS

H4: High emotional impact due to exposure to food-related content on social media will lead to unhealthier food consumption.

For the H4 self-assessed emotions were examined in relation to the unhealthy food consumption.

The following table outlines how often participants' emotional state was influenced by food posts viewing across the 14 days. Almost 400 diary entries out of 966 reported that to a small extent their emotional state was influenced by the food posts on Instagram during the day.

Table 8 Percentage of food posts influence emotional state

	N	%
Not at all	175	18.1

To a small extent	395	40.9
To some extent	317	32.8
To a moderate extent	72	7.5
To a large extent	7	.7

The following tables outline how often participants experienced daily enjoyment as influenced by food posts viewing across the 14 days. In almost 34% of the dairies, participants reported daily enjoyment to some extent because of the food-related posts viewed on Instagram..

Table 9 Percentage of food posts influence in daily enjoyment

	N	%
Not at all	115	11.9
To a small extent	243	25.2
To some extent	326	33.7
To a moderate extent	216	22.4

To a large extent	66	6.8

Table 10 Percentage of food posts influence in daily dissatisfaction

	N	%
Not at all	343	35.5
To a small extent	484	50.1
To some extent	125	12.9
To a moderate extent	14	1.4

The Kruskal-Wallis H test showed that there is a statistically significant difference in unhealthy consumption between the different extents of emotional state influence ($H(4)=303.49$, $p< .01$) with a mean rank of 715.86 for the large extent, 707.64 for a moderate extent, 627.74 for some extent, 405.63 for the small extent and 245.77 for not at all. This means that individuals' emotional state due to food-related content viewed influenced their unhealthy food consumption. Specifically, the more participants perceived that their emotional state was impacted by the food-related content, the unhealthier their food consumption became.

Similarly, when enjoyment and dissatisfaction due to food-related content on Instagram were assessed separately in relation to unhealthy food consumption, the Kruskal-Wallis H test revealed a significant difference in unhealthy consumption based on the extent of enjoyment felt. Specifically, for enjoyment, the test showed a significant difference ($H(4)=302.17$, $p<.01$), with the highest mean rank of 761.27 for participants who felt enjoyment "to a large extent," decreasing progressively towards those who felt enjoyment "not at all." This indicates that the more enjoyment participants perceived due to food-related content viewed, the unhealthier their food consumption became. While this finding aligns with the study's expectations, it contradicts previous research suggesting that negative feelings are associated with unhealthier eating, while positive feelings are linked to healthier eating (Hoppener et al., 2019; Evers et al., 2010; Spoor et al., 2007; Masheb et al., 2006).

Similarly, the Kruskal-Wallis H test revealed a significant difference in unhealthy consumption based on the extent of dissatisfaction felt. Specifically, for enjoyment, the test showed a significant difference ($H(3)=241.55$, $p<.01$), with the highest mean rank of 639.25 for the moderate extent (nobody reported to a large extent) while decreasing progressively towards to the not at all extent. This indicates that the more dissatisfaction participants perceived due to food-related content viewed, the unhealthier their food consumption became; supporting previous studies indicating that negative feelings lead to overconsumption and unhealthy eating behaviour (Hoppener et al., 2019).

Overall, these results support H4, indicating that food-related content viewed online can evoke emotional responses that, in turn, influence eating behaviour in a non-favourable manner. Specifically, the study found that higher levels of perceived

emotional impact, enjoyment and dissatisfaction due to food-related content were associated with unhealthier food consumption, highlighting the complex interplay between online media and dietary choices and the need to further explore the impact of food-related content online.

4.4. RESEARCH QUESTION 2: TO WHAT EXTENT DOES MINDFULNESS INFLUENCE EATING BEHAVIOUR IN TERMS OF HEALTHY FOOD CONSUMPTION?

Before exploring the hypotheses related to the influence of mindfulness activities on healthy food consumption, a Wilcoxon Signed-Ranks test was conducted to determine whether there were any differences in mindfulness levels among participants in the experimental group before and after the 14-day mindfulness intervention. The results revealed a significant increase in overall mindfulness levels following the intervention (mean rank = 20.11) compared to before (mean rank = 12.71), $Z = -2.48$, $p < .05$.

Further analysis of the different facets of mindfulness showed that the Observing Facet scores before the intervention (mean rank = 12.62) did not significantly differ from those after the intervention (mean rank = 18.44), $Z = -1.65$, $p = .099$. Similarly, the Describing Facet scores before the intervention (mean rank = 14.00) were not significantly different from after the intervention (mean rank = 16.65), $Z = -1.04$, $p = .298$.

However, the Awareness Facet scores showed a marginally significant increase, with scores before the intervention (mean rank = 15.30) being lower than those after the intervention (mean rank = 16.33), $Z = -1.86$, $p = .062$. The remaining two facets also showed significant improvements: the Non-Judgmental Facet scores before the

intervention (mean rank = 15.15) were significantly lower than after the intervention (mean rank = 18.93), Z = -2.27, p< .05, and the Non-Reactivity Facet scores before the intervention (mean rank = 10.67) were significantly lower than after the intervention (mean rank = 17.57), Z = -2.82, p< .05.

These results suggest that while overall mindfulness levels, along with the Awareness, Non-Judgmental, and Non-Reactivity facets, significantly improved after the intervention, the Observing and Describing facets remained unchanged. Nevertheless, these findings provide a strong basis for proceeding with the investigation of the mindfulness-related hypotheses in the study.

Moreover, a Wilcoxon Signed-Ranks test indicated that the FCQ-T scores before the intervention among experimental group participants (mean rank = 18.06) were significantly higher than after the intervention (mean rank = 9.75), Z = -3.84, p < .05. This suggests that the mindfulness intervention may serve as an effective coping mechanism for cravings, which are a strong predictor of unhealthy food consumption (Alberts et al., 2010).

However, the Wilcoxon Signed-Ranks test yielded two non-significant results for the DEBQ scores. The DEBQ scores before the intervention (mean rank = 17.59) were not significantly different from those after the intervention (mean rank = 17.33), Z = -1.53, p = .126. Similarly, no significant differences were found for any of the DEBQ subscales. The restrained eating scores before the intervention (mean rank = 17.23) did not differ significantly from those after the intervention (mean rank = 13.19), Z = -0.14, p = .89. The emotional eating scores before the intervention (mean rank = 17.14) were not significantly different from those after the intervention (mean rank = 17.67), Z = -1.86, p = .07. Lastly, the external eating scores before the intervention (mean

rank = 13.15) did not significantly differ from those after the intervention (mean rank = 17.29), Z = -1.27, p = .21.

While the DEBQ is a reliable measure of certain eating behaviours, further insights will be gained from the exploration of participants' food diaries in the following analysis, which will depict food consumption more pragmatically and accurately.

4.4.1. HYPOTHESES 5 RESULTS

H5a: Those exposed to mindfulness activities would consume healthier food than those who do not; regardless of food socialisation (source), food marketing (type of food exposed) and food literacy (emotions elicited by food content).

To examine H5a regarding the effects of the mindfulness intervention on consumption, the 14-day diaries were divided into two periods: the first 7 days and the last 7 days. This allowed for the assessment of any differences in consumption patterns before and after the intervention. Previous studies have demonstrated that even short-term mindfulness practices can yield significant effects on various psychological and behavioural variables (Arch et al., 2016). Therefore, a 7-day interval was deemed an appropriate duration to assess the impact of mindfulness on participants' consumption patterns in this study. The following table outlines the statistics’ summary for the scores on the first 7 days and the last 7 days scores for control group and experimental group.

Table 11 Food consumption scores for the first and last 7 days across groups

	Control		Experimental	
	N	M(SD)	N	M(SD)
First 7 days	35	67.37(12.3)	34	61.91(10.3)
Last 7 days	35	68.37(11.3)	34	61.62(11.8)

The Mann-Whitney U Test revealed no significant differences in the unhealthy food consumption scores for the first 7 days of the diary between control group (Mean Rank=39.49) and experimental Group (Mean Rank=30.38), U= 438, z= -1.89, p= 0.06. However, it generated statistically significant differences unhealthy food consumption scores for the last 7 days of the diary between control group (Mean Rank=40.01) and experimental Group (Mean Rank=29.84), U= 419.50, z= -2.11, p< .05. These results confirm H5a that expected that those exposed to mindfulness activities would consume healthier food than those who did not. In addition to these analyses, further examination was conducted to explore differences in consumption across various types of foods. This approach aimed to provide a more comprehensive understanding of mindfulness effectiveness in dietary patterns by considering the diversity of food choices and their impact on overall consumption.

The following table outlines the statistics' summary for the scores on the food categories, namely, "Fruits and Vegetables" (F&V), "Milk and Dairy" (M&D), "Meat, Fish, Protein" (MFP), "Bread, Cereals and Carbohydrates" (BCC), "Snacking" (SNC), "Confectionary Foods" (CF) and "Fast Food" (FF) across experimental and control group during the 14 days. The scores highlight how much of each category of food participants had daily based on health recommendations of The NHS Eatwell Guide and the British Nutrition Foundation. Therefore,

Table 12 Food categories consumption across groups

	Control		Experimental	
	N	M(SD)	N	M(SD)
F&V	482	3.98(1.10)	469	3.84(1.14)
M&D	482	.96(.78)	469	.83(.74)
MFP	482	1.80(.62)	469	1.70(.59)
BCC	482	1.98(.66)	469	1.59(.82)
SNC	482	1.38(.48)	469	1.34(.47)

CF	482	.71(.78)	469	.63(.75)
FF	482	.43(.76)	469	.36(.66)

The Mann-Whitney U Test results revealed notable differences in dietary behaviours between the control group and the experimental group, which underwent mindfulness activities, when different types of food were analysed. Specifically, the experimental group showed significantly higher daily consumption of fruits and vegetables compared to the Control group ($M = 459.46$ vs. $M = 493$, $U = 105056$, $z = -1.95$, $p < .05$). This suggests that the mindfulness intervention effectively encouraged healthier eating behaviours, particularly in the consumption of fruits and vegetables. This finding aligns with previous research, which has demonstrated that mindfulness can significantly impact dietary habits, notably by increasing the intake of fruits and vegetables (Jordan et al., 2014; Beshara et al., 2013). These studies suggest that mindfulness enhances participants' awareness, one of the key facets of mindfulness, of their food choices and fosters a more deliberate and mindful approach to diet, leading to healthier decisions.

Similarly, the experimental group consumed significantly less milk and dairy products than the control group ($M= 454.53$ vs. $M= 496.89$, $U= 102959$, $z = -2.54$, $p< .05$). Specifically, the control group exceeded the recommended daily servings of milk and

dairy products, while the experimental group's consumption was aligned with dietary recommendations.

The experimental group also consumed protein aligned with dietary recommendations, after the mindfulness activities, compared to control group (M= 457.91 vs. M= 493.60, U= 104547, z = -2.27, p< .05). The results were similar for bread, cereals, and carbohydrates consumption where control group consumped significantly more that the recommended dietary servings compared to experimental group who followed the mindfulness activities (M= 544.85 vs. M= 405.24, U= 79843, z = -8.41, p< .05). The findings align with previous literature, which highlights that mindfulness interventions can help manage cravings for high-carbohydrate foods and improve overall diet quality (Alberts et al., 2012).

However, the mindfulness intervention did not result in significant differences in snacking habits, confectionery food consumption, or fast-food intake between the groups. Specifically, no statistically significant differences were found in snacking practices (U= 109144.50, z= -1.10, p= .27), confectionery foods consumption (U= 107701.50, z= -1.38, p= .17), or fast-food consumption (U= 109431.50, z= -1.08, p= .28). This suggests that while mindfulness activities can influence certain aspects of diet, some eating behaviours might be more resistant to change (Mantzios et al., 2020). These habits may require more targeted interventions or a longer duration of mindfulness practice to see a significant impact.

Overall, the findings indicate that mindfulness activities can promote healthier eating patterns, particularly in increasing the intake of fruits and vegetables and reducing the consumption of certain macronutrients. However, they also highlight the challenge of altering dietary habits like snacking, confectionery, and fast-food consumption,

suggesting that mindfulness may need to be combined with other strategies to achieve comprehensive dietary improvements.

H5b: Mindfulness moderates the relationship between the source of food-related content and unhealthy food consumption. Specifically, individuals exposed to both mindfulness activities and food posts from friends will consume healthier food than those exposed to food posts from friends without any mindfulness activities.

For H5b, the linear regression analysis did not yield significant results, indicating no evidence that mindfulness moderates the relationship between the source of food content and unhealthy food consumption (R^2= 761.94, F(3, 29)= 2.23, p= .106). Despite findings from H1a, which suggested that the source of food-related content influences unhealthy food consumption, and H5a, which indicated that mindfulness has a positive impact on improving food consumption habits, hypothesis H5b was not supported. This result suggests that while mindfulness can positively influence food consumption, it may not have sufficient power to moderate the strong influence of the source interaction in a social media environment.

H5c: Mindfulness moderates the relationship between the type of food exposure and unhealthy food consumption. Specifically, individuals exposed to both mindfulness activities and unhealthy food posts will consume healthier food than those exposed to unhealthy food posts without any mindfulness activities.

For H5c, the linear regression analysis did not yield significant results, indicating no evidence that mindfulness moderates the relationship between the source of food content and unhealthy food consumption (R^2= 352.02, F(3, 29)= .92, p= .445). However, this result, though contrary to the prediction, is not surprising given the findings of H3a. Therefore, further analyses were conducted to investigate

mindfulness as a moderator between exposure to unhealthy food content and different types of food categories, as was done in H3a.

The linear regression analysis yielded significant results, showing that mindfulness moderates the relationship between the source of food content and both fruits and vegetables consumption (R^2= 16.58, F(3, 465)= 4.31, p< .05) and snacking (R^2= 3.00, F(3, 465)= 4.52, p< .05). However, no significant moderation effects were found for milk and dairy (R^2= 2.36, F(3, 465)= 1.43, p= .233), meat, fish, and protein (R^2= 1.42, F(3, 465)= 1.37, p= .250), carbohydrates (R^2= 1.69, F(3, 465)= .85, p= .467), confectionery (R^2= .37, F(3, 465)= .22, p= .883), or fast-food (R^2= .25, F(3, 465)= .19, p= .904). These results suggest that mindfulness moderates the relationship between viewing unhealthy food-related content and healthy food consumption for specific categories, such as fruits and vegetables, as well as snacking. However, mindfulness does not appear to moderate this relationship for other food categories, including milk and dairy, meat, fish, and protein, bread, cereals, and carbohydrates, confectionery, or fast food. This implies that mindfulness interventions might be particularly effective in promoting the consumption of healthier foods like fruits and vegetables or in regulating snacking behaviour. However, to impact other food categories effectively, such interventions may need to be tailored or combined with additional strategies (Warren et al., 2017). This finding helps explain why existing literature has primarily focused on the influence of mindfulness on specific foods, such as chocolate and raisins (Mantzios et al., 2020), snacking behaviour (Vasiļjeva et al., 2023), and fruit consumption (Arch et al., 2016), rather than on a broader range of food categories. The non-significant results across many food categories in this study suggest that mindfulness may have a more pronounced effect on certain foods or behaviours, which aligns with the more targeted approach taken by previous research.

H5d: Mindfulness moderates the relationship between emotions elicited by food-related content and unhealthy food consumption. Specifically, individuals exposed to mindfulness activities who experience a high emotional impact from food content will consume healthier food than those who experience a high emotional impact without any mindfulness activities.

For H5d, the linear regression analysis yielded significant results, indicating that mindfulness activities moderate the relationship between the high emotional impact of food content and unhealthy food consumption (R^2 = 1277.15, F(3, 37) = 4.29, p< .05). Similarly, when positive and negative emotions were tested separately, the results remained significant. Specifically, the linear regression analysis indicated that mindfulness activities moderate the relationship between high enjoyment from food content and unhealthy food consumption (R^2 = 886.28, F(3, 37) = 2.69, p< .05), as well as the relationship between high dissatisfaction from food content and unhealthy food consumption (R^2 = 947.35, F(3, 37) = 2.92, p< .05). The confirmation of H5d provides further support to existing literature on mindfulness, demonstrating that mindfulness interventions are particularly effective for emotion regulation (Dutt et al., 2019; Canby et al., 2015). Specifically, this research shows that mindfulness is also successful in mitigating the correlation between high emotional impact and unhealthy eating behaviour. Consequently, these results suggest that mindfulness could serve as a valuable tool for reducing unhealthy eating behaviours, particularly in environments like social media where emotional impact is often amplified due to the amount of food content users are exposed, whether through negative or positive emotions. This insight is particularly relevant for social marketing strategies, which can leverage mindfulness interventions to promote healthier eating habits and counteract the heightened emotional influences prevalent in digital spaces.

4.4.2. HYPOTHESES 6 RESULTS

H6a: The more time spent on mindfulness activities, the healthier their food consumption.

Towards the H6a the Kruskal-Wallis H test indicated no statistically significant difference in healthy food consumption based on the time spent on the daily mindfulness practice ($H(2) = 4.03$, $p = .13$). This finding rejects the H6a. However, further analyses were conducted on individual food categories to explore any effects that may emerge within each category.

The Kruskal-Wallis H test revealed a statistically significant difference in fruit and vegetable consumption based on daily mindfulness frequency ($H(2) = 10.89$, $p < .001$), with mean ranks of 211.67 for 15-30 minutes, 253.56 for 30-60 minutes, and 233.41 for more than 1 hour. Notably, the highest mean rank was observed for the 30-60 minutes mindfulness group, suggesting that mindfulness practice may be more effective in influencing fruit and vegetable consumption when practiced for almost an hour daily.

In contrast, no statistically significant differences were found in the consumption of other food categories based on daily mindfulness frequency. Specifically, the Kruskal-Wallis H test showed no significant difference in milk and dairy consumption ($H(2) = 0.81$, $p = .66$), meat, fish, and protein consumption ($H(2) = 3.51$, $p = .17$), bread, cereal, and carbohydrates consumption ($H(2) = 3.33$, $p = .19$), confectionery consumption ($H(2) = 2.89$, $p = .23$), snacking ($H(2) = 0.76$, $p = .15$) or fast food consumption ($H(2) = 0.43$, $p = .81$).

These results suggest that while daily mindfulness activity duration may influence consumption of certain food categories, such as fruits and vegetables, it does not appear to significantly impact consumption patterns for other food categories.

H6b: The relationship between the type of food exposed (healthy vs. unhealthy) and unhealthy food consumption is moderated by time spent on mindfulness activities. Specifically, individuals who spend more time on mindfulness activities and are exposed to food posts from friends will consume healthier food than those who spend less time on mindfulness activities and are exposed to food posts from friends.

For H6b, the linear regression analysis emerged significant results, indicating that mindfulness moderates the relationship between the source of food content and unhealthy food consumption (R^2= 367.57, F(3, 465)= 30.17, p< .01). Despite findings from H5b, which suggested that mindfulness activities did not moderate the influence of the source of food-related content on unhealthy food consumption between the groups, significant results emerged when the duration of mindfulness activity was tested within the experimental group.

H6c: The relationship between the source of food-related content (friends vs. influencers) and unhealthy food consumption is moderated by time spent on mindfulness activities. Specifically, individuals who spend more time on mindfulness activities and are exposed to unhealthy food posts will consume healthier food than those who spend less time on mindfulness activities and are exposed to unhealthy food posts.

For H6c, the linear regression analysis did not yield significant results, indicating no evidence that time spent on mindfulness activities moderates the relationship between

the type of food content exposure and unhealthy food consumption (R^2 = 31.35, F(3, 465)= 2.18, p= .089). However, significant results emerged when individual food categories were tested. Specifically, for fruits and vegetables consumption, the analysis showed significant moderation by time spent on mindfulness activities (R^2= 16.58, F(3, 465)= 4.31, p< .05). Similarly, time spent on mindfulness activity significantly moderated the relationship between unhealthy food content exposure and snacking (R^2= 2.98, F(3, 465)= 4.5, p< .01).

In contrast, no significant results were found for other food categories: Milk and Dairy (R^2= 2.36, F(3, 465)= 1.43, p= .233), Meat, Fish, and Protein (R^2= 1.42, F(3, 465)= 1.37, p= .250), Bread, Cereal, and Carbohydrates (R^2= 1.70, F(3, 465)= .85, p= .467), Confectionery (R^2= .37, F(3, 465)= .22, p= .883), and Fast Food (R^2= .25, F(3, 465)= .19, p= .904). These results suggest that the duration of mindfulness activity moderates the relationship between exposure to unhealthy food content and consumption patterns only in specific food categories.

H6d: The relationship between the emotions elicited by food content and unhealthy food consumption is moderated by time spent on mindfulness activities. Specifically, individuals who spend more time on mindfulness activities and experience high emotional impact from food posts will consume healthier food than those who spend less time on mindfulness activities and are experiencing high emotional impact from food posts.

For H6d, the linear regression analysis emerged significant results, indicating that mindfulness moderates the relationship between the emotions elicited by food content and unhealthy food consumption (R^2= 671.02, F(3, 465)= 65.62, p< .01).

When individual positive and negative emotions were tested; linear regression results yield significance for both; namely enjoyment (R^2 = 724.01, F(3, 466) = 110.11, p < .001) and dissatisfaction (R^2 = 445.31, F(3, 466) = 57.30, p < .001).

4.5. RESEARCH QUESTION 3: TO WHAT EXTENT DOES MINDFULNESS INTERVENTIONS INFLUENCE PARTICIPANTS' SELF-CONTROL AND HEALTHY FOOD CONSUMPTION?

4.5.1. HYPOTHESES 7 RESULTS

H7a: Mindfulness intervention will lead to higher levels of self-control than before the intervention (within group).

To test for differences within the experimental group that underwent the mindfulness activities, a Wilcoxon Signed-Ranks test was conducted to determine whether there were any changes in self-control levels as self-reported in the BSCS before and after the 14-day mindfulness intervention. The results revealed a significant increase in overall self-control levels following the intervention (mean rank = 16.93) compared to before (mean rank = 15.55), U= 522, Z = -2.03, p< .05.

H7b: Mindfulness activities will lead to higher levels of self-control than without the activities (between groups).

To test the differences in self-control between the control and experimental groups after the mindfulness activities, analyses were conducted on baseline surveys to identify any initial differences between the groups that may need to be considered in the further analysis.

BASELINE

The Mann-Whitney U test revealed that self-reported self-control levels, as measured by the BSCS, did not differ between the control group (M= 36.44) and the experimental group (M= 33.51) at baseline, U= 544, Z= -.61, p= .54.

Similarly, the Mann-Whitney U test did not emerge any significant results in baseline for self-reported mindfulness levels, as measured by the FFMQ, between the control group (M= 38.23) and the experimental group (M= 31.68) at baseline, U= 482, Z= -1.36, p= .17. Mann-Whitney U tests were conducted for the individual mindfulness facets. The results showed no significant differences for Observation, Description, Action Awareness, and Non-Reactivity scores, but significant differences were found for Non-Judgmental thoughts scores (see Table).

Table 13 Mindfulness Facets Baseline Mann-Whitney U Results between groups

Mindfulness Facet	Group	Mean Ranks	U	Z	p
Observation	Control	39.14	450	-1.75	0.08
	Experimental	30.74			
Description	Control	35.87	564	-0.37	0.71
	Experimental	34.10			
Action Awareness	Control	37.21	517	-0.93	0.35
	Experimental	32.72			
Non-Reactivity	Control	38.99	455	-1.69	0.09
	Experimental	30.9			
	Control	27.76	341	-3.05	<.05

Non-Judgmental thoughts	Experimental	42.46

To explain the significant difference in Non-Judgmental thoughts scores between the control and experimental groups at baseline, a Kruskal-Wallis H test was conducted to identify any differences in mindfulness frequency at the baseline level between the two groups. The results revealed that participants in the experimental group (Mean Rank = 74.50) engaged in mindfulness practices more often than those in the control group (Mean Rank = 34.97), $H(1) = 35.20$, $p < .05$. This indicates that although the experimental group participants practiced mindfulness more frequently, and this was not reflected in their baseline FFMQ scores, some mindfulness facets, such as Non-Judgmental thoughts, may be more sensitive to differences in practice frequency than others.

FINAL

The Mann-Whitney U test revealed that self-reported self-control levels, as measured by the BSCS, differ significantly between the control group (M= 29.44) and the experimental group (M= 40.72) in final BSCS measurement, after the mindfulness activities have been followed for 14-days and completed, $U= 400$, $Z= -2.34$, $p < .05$ confirming H7b.

Similarly, the Mann-Whitney U test emerged significant results in final survey for self-reported mindfulness levels, as measured by the FFMQ, between the control group (M= 29.89) and the experimental group (M= 40.26), $U= 416$, $Z= -2.15$, $p < .05$.

In the final FFMQ survey, the Mann-Whitney U test revealed significant differences between groups in Action Awareness and Non-Judgmental thoughts scores, but not in Observation, Description, or Non-Reactivity scores (see Table).

Table 14 Mindfulness Facets Final Mann-Whitney U Results between groups

Mindfulness Facet	Group	Mean Ranks	U	Z	p
Observation	Control	33.40	539	-.67	.50
	Experimental	36.65			
Description	Control	31.01	555	-1.68	.09
	Experimental	39.10			
Action Awareness	Control	39.66	408	-2.25	<.05
	Experimental	40.50			
Non-Reactivity	Control	33.69	549	-.55	.58
	Experimental	36.35			
Non-Judgmental thoughts	Control	33.69	548	-.06	<.05
	Experimental	36.35			

These results indicate that, although the mindfulness activities shared with the experimental group were targeted at all five facets and were expected to improve them significantly compared to the control group's, some facets—such as Observation, Description, and Non-Reactivity—may be more resistant to change than others, like

Action Awareness and Non-Judgmental thoughts (Baer et al., 2006; Shapiro et al., 2006).

H7c: Mindfulness intervention moderates the relationship between self-control and healthy food consumption. Specifically, individuals with higher self-control who have undergone the mindfulness intervention will consume healthier food compared to those with higher self-control who have not undergone a mindfulness intervention (between groups).

For testing H7c, baseline scores were first calculated to determine whether there were any differences between the control and experimental groups in their cravings and eating behaviour, as measured by the FCQ-T and DEBQ, respectively, as well as to explore the relationship between the two for each group.

BASELINE

In terms of FCQ-T scores, the Mann-Whitney U test did not reveal a significant difference in the scores between the control group (M= 31.17) and the experimental group (M= 38.94), U= 461, z= -1.61, p= .11, showing that both groups scored similarly in the FCQ-T.

However, the Mann-Whitney U test yield a statistically significant difference in DEBQ scores between the control group (M= 40.13) and the experimental group (M= 30.01) in baseline, U= 420, z= -2.09, p< .05. These results suggest that the control group was

more likely to engage in restrained, emotional, and external eating than the experimental group.

However, when examined each subscale individually, the Mann-Whitney U Test revealed no significant differences in the DEBQ Restrained Eating scores between Control group (M=38.32) and Experimental Group (M=31.77), U = 482, z = -1.36, p = 0.17. It also generated no significant differences in the DEBQ Emotional scores of the Control group (M=38.51) and Experimental group (M=31.59), U = 475.50, z = -1.44, p = 0.15 and no statistically significant difference for DEBQ External Eating between the Control group (M=37.40) and Experimental group (M=32.67), U = 513.50, z = -.981, p = 0.33. This may mean that results for each sub-scale were not strong enough to show significance separately while the overall score was.

Finally, at baseline, there was a positive relationship between FCQ-T and DEBQ scores in both groups: control group, r=.46, n=35, p<.05 and experimental group, r=.67, n=34, p<.05. These results indicate that higher self-reported cravings, as measured by the FCQ-T, were associated with higher levels of emotional, external, and restrained eating, as measured by the DEBQ.

FINAL

In terms of FCQ-T scores, the Mann-Whitney U test revealed a significant difference in the scores between the control group (M= 42.59) and the experimental group (M= 27.19), U= 329, z= -3.19, p< .05. The lower FCQ-T scores in the experimental group suggest that participants experienced fewer food cravings.

The Mann-Whitney U test yield a statistically significant difference in DEBQ scores between the control group (M= 40.12) and the experimental group (M= 30.03) in the

final survey, U= 421, z= -2.10, p< .05. Despite this significant difference, the similarity in means suggests that the experimental group's scores remained consistent with their levels before the mindfulness activities.

When examined each subscale individually, the Mann-Whitney U Test revealed significant differences in the DEBQ Emotional Eating scores between Control group (M= 39.29) and Experimental Group (M= 30.83), U= 449, z= -1.75, p< .05 but not in the DEBQ Restrained scores of the Control group (M= 37.62) and Experimental group (M= 32.46), U= 506, z = -1.07, p= .28 and in DEBQ External Eating between the Control group (M= 38.87) and Experimental group (M= 31.24), U= 463, z= -1.58, p= .11. This suggests that, while the total DEBQ scores were similarly significant between the final and baseline surveys, there was a significant difference in the emotional eating subscale that was not present at baseline. This indicates that mindfulness and improved self-control may be particularly effective in addressing the emotional aspect of eating behaviour.

At the final surveys, there was a positive relationship between FCQ-T and DEBQ scores in the control group, r=.59, n=35, p<.05 but not in the experimental group, r=.31, n=34, p=.07. These results indicate that while the relationship between self-reported cravings, as measured by the FCQ-T, and higher levels of emotional, external, and restrained eating, as measured by the DEBQ, remained significant among the control group participants, this relationship was no longer significant for the experimental group. According to previous research showing that food cravings are associated with unhealthier food consumption and eating behaviour overall (Abdella et al., 2019), these findings were expected. This suggests that the mindfulness activities may have

helped the experimental group participants resist their food cravings more successfully, breaking the previous pattern.

For testing H7c, only participants from both the control and experimental groups who scored higher than 26 on the BSCS (indicating high self-control, calculated based on the minimum and maximum possible scores on the BSCS) in the final survey were included. The linear regression analysis yielded significant results, indicating that mindfulness moderates the relationship between self-control and healthy food behaviour (R^2= 522.81, F(3, 465)= 48.12, p< .05). This suggests that participants from the experimental group who underwent the mindfulness activities and had a BSCS score higher than 26 reported healthier food consumption compared to individuals from the control group who, despite having similarly high BSCS scores, did not engage in mindfulness practices, confirming the H7c hypothesis.

H7d: Individuals who have undergone the mindfulness intervention and have higher self-control will report lower levels of social media influence in terms of eating compared to those with high self-control who have not undergone a mindfulness intervention.

For testing H7d, similarly to H7c, only participants from both the control and experimental groups who scored higher than 26 on the BSCS (indicating high self-control, calculated based on the minimum and maximum possible scores on the BSCS) in the final survey were included. The linear regression analysis yielded significant results, indicating that mindfulness moderates the relationship between self-control and social media influence in terms of eating and potentially healthier eating behaviour, as depicted in SESMEB (R^2= 32.61, F(2, 37)= 17.23, p< .05). This

suggests that participants from the experimental group who underwent the mindfulness activities and had a BSCS score higher than 26 reported less social media influence in terms of eating and potentially healthier eating behaviour compared to individuals from the control group who, despite having similarly high BSCS scores, did not engage in mindfulness practices, confirming the H7d hypothesis.

Table 15 Reserach Questions and Hypotheses with Findings

Research Questions	**Hypothesis**	**Variables**	**Finding**
RQ1: Does exposure to food-related content on Instagram affect (un)healthy eating consumption?	H1a: Individuals exposed to friends' food posts will consume unhealthier food.	Independent Variable (IV): Food socialisation (Source of content, friends) Dependent Variable (DV): Food consumption	Confirmed H(2)=49.61, p<.01
	H1b: Individuals exposed to influencers' food posts, will consume healthier food.	IV: Food socialisation (Source of content, influencers) DV: Food consumption	Confirmed H(2)=109.06, p<.01
	H2: Those who are exposed to food-related content are expected to consume unhealthier food	IV: Food marketing (food content) DV: Food consumption	Confirmed H(4)= 163.425, p< .01

	H3a: Viewing unhealthy food-related content, will result in unhealthier food consumption.	IV: Food marketing (type of food content; unhealthy) DV: Food consumption	Rejected H(1)=2.16, p=.141
	H3b: Viewing healthy food-related content, will result in healthier food consumption.	IV: Food marketing (type of food content; healthy) DV: Food consumption	Confirmed H(3)=21.03, p< .01
	H4: High emotional impact due to exposure to food-related content on social media will lead to unhealthier food consumption	IV: Food marketing (food content) Mediator (Med)= Food literacy (emotional impact) DV: Food consumption	Confirmed H(4)=303.49, p< .001
RQ2: To what extent does mindfulness influence eating behaviour in terms of healthy food consumption?	H5a: Those exposed to mindfulness activities would consume healthier food than those who do not; regardless of food socialisation, food marketing and food literacy.	IV: Mindfulness activities DV: Food consumption	Confirmed U= 419.50, z= -2.11, p< .05
	H5b: Individuals exposed to both mindfulness activities and food posts from friends will consume healthier food than those exposed to food	IV: Food socialisation (Source of content, friends) DV: Food consumption	Rejected R^2= 761.94, F(3, 29)= 2.23, p= .106

	posts from friends without any mindfulness activities.	Moderator (Mod): Mindfulness activities	
	H5c: Individuals exposed to both mindfulness activities and unhealthy food posts will consume healthier food than those exposed to unhealthy food posts without any mindfulness activities.	IV: Food marketing (type of food exposed; unhealthy) DV: Food consumption Mod: Mindfulness activities	Rejected R^2= 352.02, F(3, 29)= .92, p= .445
	H5d: Individuals exposed to mindfulness activities who experience a high emotional impact from food content will consume healthier food than those who experience a high emotional impact without any mindfulness activities.	IV: Food marketing (food content) Med= Food literacy (emotional impact) DV: Food consumption Mod: Mindfulness activities	Confirmed R^2 = 1277.15, F(3, 37) = 4.29, p< .05
	H6a: The more time spent on mindfulness activities, the healthier their food consumption.	IV: Mindfulness time spent DV: Food consumption	Rejected (H(2) = 4.03, p = .13)

	H6b: Individuals who spend more time on mindfulness activities and are exposed to food posts from friends will consume healthier food than those who spend less time on mindfulness activities and are exposed to food posts from friends.	IV: Food socialisation (Source of content, friends) DV: Food consumption Mod: Mindfulness time spent	Confirmed (R^2= 367.57, F(3, 465)= 30.17, p< .01)
	H6c: Individuals who spend more time on mindfulness activities and are exposed to unhealthy food posts will consume healthier food than those who spend less time on mindfulness activities and are exposed to unhealthy food posts.	IV: Food marketing (food content) DV: Food consumption Mod: Mindfulness time spent	Rejected (R^2 = 31.35, F(3, 465)= 2.18, p= .089)
	H6d: Individuals who spend more time on mindfulness activities and experience high emotional impact from food posts will consume healthier food than those who spend less time on	IV: Food marketing (food content) Med: Food literacy (emotional impact) DV: Food consumption Mod: Mindfulness time spent	Confirmed (R^2= 671.02, F(3, 465)= 65.62, p< .01)

	mindfulness activities and are experiencing high emotional impact from food posts.		
RQ3: To what extent does mindfulness interventions influence participants' self-control levels and healthy food consumption ?	H7a: Mindfulness intervention will lead to higher levels of self-control than before the intervention.	IV: Mindfulness DV: Self-Control within-groups	Confirmed U= 522, Z = -2.03, p< .05
	H7b: Mindfulness intervention will lead to higher levels of self-control than without the intervention.	IV: Mindfulness DV: Self-Control between-groups	Confirmed U= 400, Z= -2.34, p< .05
	H7c: Individuals with high self-control who have undergone the mindfulness intervention will consume healthier food compared to those with high self-control who have not undergone a mindfulness intervention.	IV: Self-Control DV: Eating Behaviour Mod: Mindfulness between-groups	Confirmed R^2= 522.81, F(3, 32)= 48.12, p< .05
	H7d: Individuals who have undergone the mindfulness intervention and have higher self-control will report	IV: Self-Control DV: Eating Behaviour Mod: Mindfulness between-group	Confirmed R^2= 32.61, F(2, 27)= 17.23, p< .05

	lower levels of social media influence in terms of eating compared to those with high self-control who have not undergone a mindfulness intervention		

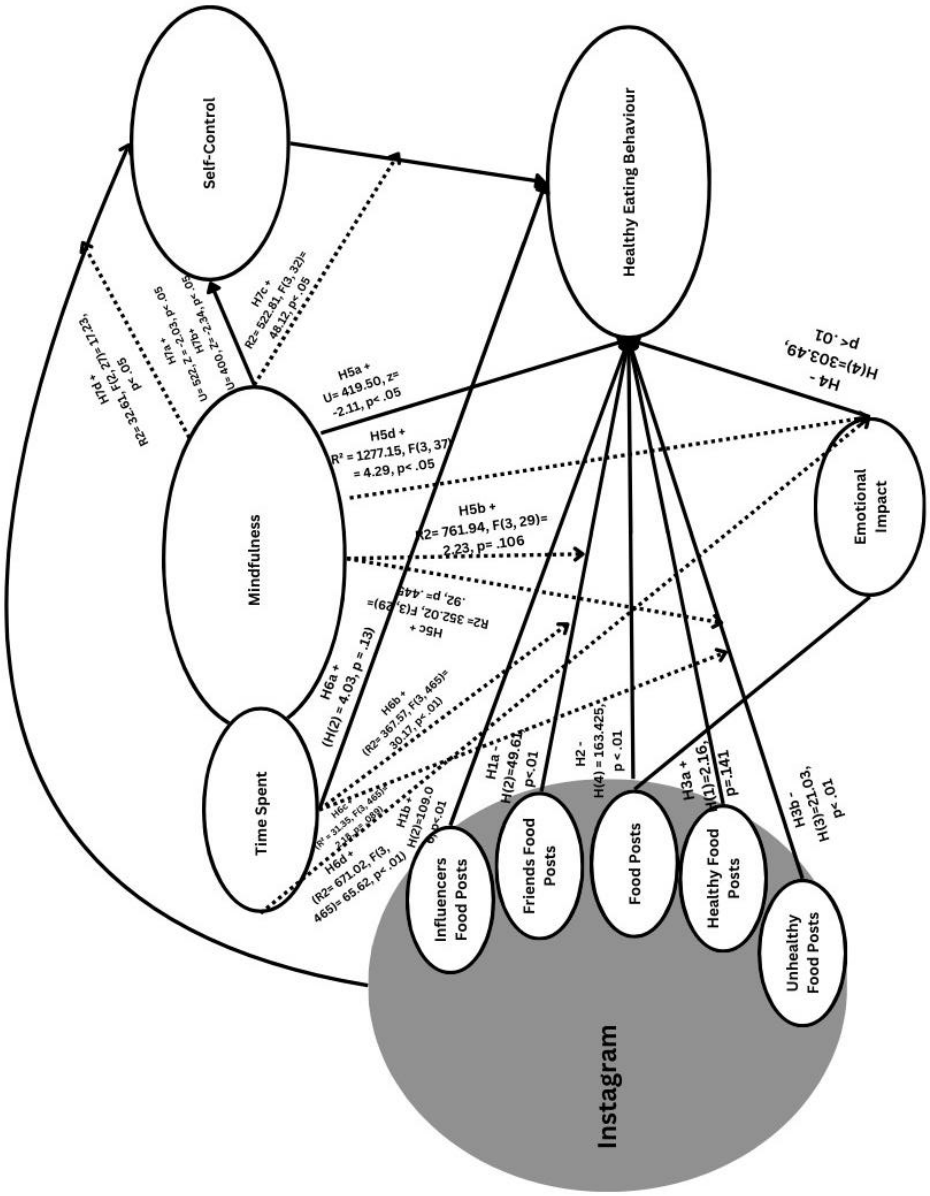


Figure 3 Conceptual Model with Results

CHAPTER 5: DISCUSSION

5.1. OVERVIEW

This chapter aims to connect the study's findings with the research hypotheses and provide interpretations grounded in the existing literature. The intersection of food and media has become increasingly prominent, with food content now pervasive across social media platforms (Leer & Povlsen, 2016; Lewis, 2020; Ventura et al., 2021). However, much of the existing research tends to overlook the integrated role of social media in shaping food-related behaviours, often examining it as an isolated factor rather than as part of a broader, intertwined dynamic. This thesis explores the influence of Instagram's food-related content and social influence on individuals' eating behaviours, examining how mindfulness and self-control (e.g., Braun et al., 2012; Dalen et al., 2010; Horan & Taylor, 2018; Mantzios & Wilson, 2014) moderate this relationship. Additionally, this work contributes to the discussion on using online mindfulness interventions in social marketing programs that promote healthy eating (Bahl et al., 2016; dos Santos et al., 2021).

5.2. FOOD-RELATED CONTENT ON INSTAGRAM AND INFLUENCES ON EATING BEHAVIOUR

To address the first research question - whether exposure to food-related content on Instagram influences (un)healthy eating behaviours - this study conducted a series of hypothesis tests (H1, H2, H3, H4) to examine the impact of such exposure on users' consumption patterns, particularly in relation to unhealthy eating.

H1 is rooted in the concept of food socialisation as outlined in the Food Well-Being model, which suggests that eating behaviour varies and is reinforced based on one's social environment. This includes the eating behaviours learned through family

traditions and community practices, as well as the influence of individuals who have a strong impact on one's food choices. Building on this, the context of this study is Instagram, a platform that exemplifies social media's defining characteristic: its emphasis on user interactions through visual content. Instagram's unique social environment amplifies the influence of food-related content shared within one's network, making it a pertinent medium for examining how social interactions and visual food cues impact eating behaviour. This social element suggests that the social influences, well-documented in offline environments, also extend into social media contexts (Cruwys et al., 2015; Robinson et al., 2014). However, the specific mechanisms through which social influences operate online remain underexplored. This study hypothesised through H1a and H1b, that different sources of social media food content, particularly posts from friends versus influencers, would have varying impacts on users' eating behaviours. Both hypotheses were confirmed.

The rationale behind H1a was that friends' food posts would likely lead to unhealthier food consumption due to the strong social connections, inherent comparisons among peers, and the more authentic content they upload compared to influencers, similar to the influences observed in offline situations (Nabors et al., 2024). The confirmation of H1a aligns with previous research highlighting the impact of social connections on dietary behaviours, where familiarity and emotional ties often lead to indulgence (Salvy et al., 2007; Woolley and Fishbach, 2017). The desire to fit in or align with the perceived norms of one's social group can lead individuals to subconsciously prioritise the immediate gratification associated with unhealthy eating, which is often seen as more indulgent or enjoyable. For example, Hawkins et al. (2020) found that norms related to approval by one's social group can guide the consumption of high energy-dense foods, as individuals may be influenced to choose these foods to gain social

approval or to conform with group behaviours. Although unhealthy eating is generally viewed negatively in social circles, foods associated with unhealthy eating often receive more endorsements, such as likes, compared to healthier options (Brooks et al., 2022; Philp et al., 2022).

In contrast to the influence of friends, the dynamic with influencers or food-related accounts, as reflected in the confirmation of H1b, demonstrates a distinct pattern. Influencers frequently curate content that showcases an aspirational lifestyle, prominently featuring balanced diets, fitness routines, and overall well-being. This idealised portrayal, while potentially inducing some pressure, generally exerts a more positive influence on followers' eating behaviours (Alwafi et al., 2022).

The results of H1b align with the notion that influencers' content, characterised by its aspirational nature, tends to promote healthier eating practices (Pilgrim and Bohnet-Joschko, 2019). Influencers are often perceived as experts or role models within their specific domains, which enhances the credibility of the healthy behaviours they advocate (Hess et al., 2022). Followers are inclined to view the dietary advice and habits promoted by influencers as aspirational goals rather than direct comparisons. This perception is supported by research indicating that aspirational content, coupled with the influencer’s perceived success and discipline, motivates individuals to adopt healthier behaviours in an effort to emulate these idealised lifestyles (De Veirman et al., 2017). In this case, although the type of content was not controlled, the results suggest that even when influencers share posts about unhealthy foods, their overall impact still promotes healthier eating. This is likely because influencers' content is generally aspirational and authoritative. Followers might see an influencer’s

occasional indulgence as part of a balanced and healthy lifestyle rather than an encouragement to overindulge.

Furthermore, influencer content tends to be less personal and emotionally charged compared to the posts of friends. This relative lack of close social ties diminishes the social pressure or emotional connection typically associated with peer interactions (Walla et al., 2023). Consequently, viewers are more likely to perceive influencer content as a guide to achieving a desirable lifestyle and well-being rather than as a standard to be met within their social circles. This perspective is reinforced by research suggesting that inspirational and authoritative messaging can effectively encourage healthier eating by presenting it as an attainable goal without the immediate social pressures of peer comparison (Peng et al., 2019).

H2 and H3 are related to another aspect of the Food Well-Being model explored in this thesis: Food Marketing. This aspect refers to the ways in which food-related messages, advertisements, and promotions influence individuals' dietary choices and behaviours. In this thesis, the focus was specifically on online food marketing, examining the impact of food content posted on social media platforms. This includes analysing the influence of the different types of foods featured, both healthy and unhealthy, and understanding how these varied representations affect consumer and eating behaviour and align with the broader framework of food well-being.

The hypothesis H2 posited that individuals exposed to food-related content would show increased consumption of unhealthy food. The study's results confirmed this hypothesis, as observed in the increased unhealthy food consumption recorded in the food diaries. However, further analysis revealed that unhealthy eating behaviours, as measured by the FCQ-T and DEBQ (including emotional eating, external eating, and

restrained eating), were unaffected. These findings highlight a discrepancy between actual consumption patterns and self-reported behavioural responses related to unhealthy eating. This discrepancy suggests a potentially promising outcome, indicating that while Instagram and other online food cues may influence food choices, they might not significantly impact underlying eating behaviours.

The non-significant results for the FCQ-T and the DEBQ in this study align with previous research indicating that exposure to appetising food pictures does not necessarily heighten food cravings. Neter et al. (2018) observed that viewing such images did not significantly increase cravings, potentially due to the satiation effect, where visual exposure to food may temporarily diminish the desire to consume (Hawkins et al., 2020). Furthermore, Andersen et al. (2021) highlighted that the act of creating and sharing food photos, rather than mere viewing, has a more pronounced impact on consumption behaviours. Their findings suggest that active engagement in food-related content creation could be a stronger driver of consumption than passive viewing, potentially leading to both positive and negative effects depending on the type of food content involved. However, in the current research, where engagement in food-related content creation was not explored, the non-significant results of the behavioural aspect may be explained by the lack of this active engagement component.

In contrast, research focusing on actual food consumption, such as Lee and Wan's (2023) study on mukbang live streaming, provides a different perspective, similar to the current study. Their work demonstrated that visual cues from such content could lead to significant overconsumption of food, both in terms of purchasing and actual intake. This finding supports the results observed in the current study regarding

increased unhealthy food consumption recorded in food diaries. Moreover, these findings are consistent with the broader literature on the impact of visual food cues on consumption behaviour (Boswell and Kober, 2016). For instance, Van der Laan et al. (2011) found that exposure to appetising food images can trigger automatic eating responses, particularly in individuals with higher levels of dietary restraint.

The discrepancy between the findings from the FCQ-T and DEBQ and the observed increase in unhealthy consumption in food diaries suggests that while visual exposure to food content may not directly impact cravings or behavioural aspects, it can still influence actual consumption patterns. This effect may be mediated by other factors, such as situational contexts, that are not captured by craving or behaviour assessments alone.

In terms of H3, H3a suggested that viewing unhealthy food-related content would result in increased unhealthy food consumption. This hypothesis was not supported by the study's findings. While previous research, such as that by Rajput & Sharma (2021), indicated a positive correlation between viewing unhealthy food content and behaviours; such as high BMI and overconsumption, the current study did not find a significant effect. Rajput & Sharma's study, conducted during the COVID-19 lockdown, might have been influenced by unique conditions, such as restricted access to restaurants and increased tendencies to overeat, which could have skewed the results.

However, the findings of the current study revealed an interesting pattern: while there was no overall significant increase in unhealthy food consumption linked to viewing unhealthy content, specific types of food did show unhealthy consumption. Notably, there was a decrease in the intake of fruits and vegetables while there was an increase

in snacking, carbohydrates, and milk and dairy products. This suggests that exposure to unhealthy food content might selectively influence certain dietary choices while leaving others unaffected.

Previous research supports these findings. For example, a study by Dunlop et al. (2016) found that the type of food being viewed in media content could influence specific food cravings and consumption patterns, with certain food categories like snacks and fast-food being more susceptible to visual cues. Additionally, evidence from Giese et al. (2015) indicates that food advertisements can lead to an increased preference for the advertised food type, which may explain why some categories like carbohydrates and snacks were more influenced than others.

The absence of increased consumption of meat, fish, protein, and fast-food might indicate that these food types are less susceptible to visual cues or that individuals are more conscious of reducing these particular food groups due to health concerns. Additionally, these foods are often more expensive, and as the majority of participants were young adults, they may not have had the financial resources or time to afford them regularly. Conversely, snacks, carbohydrates, and dairy products might be more immediately accessible and affordable, making them more susceptible to visual cues and thus leading to an increase in their consumption following exposure to unhealthy food-related content.

H3b proposed that exposure to healthy food-related content would lead to healthier food consumption, and this hypothesis was confirmed by the study. This result aligns with marketing research that demonstrates a link between healthy food advertisements and increased healthy food intake (Giese et al., 2015). In particular, the study observed a notable increase in the consumption of fruits and vegetables,

which suggests that exposure to healthy food-related content had a positive impact on the intake of these nutritious foods. Similarly, the findings are consistent with previous research on social media indicating that visual exposure to healthy content can effectively encourage the consumption of specifically grapes and cookies (Hawkins et al., 2020). Nevertheless, the current research stands out as the only study to systematically address a broad spectrum of food categories in the context of both healthy and unhealthy food content viewing. By examining a wide array of food types, including fruits, vegetables, carbohydrates, snacks, dairy products, protein, confectionary, and fast foods, this study offers a nuanced understanding of how different categories are uniquely influenced by the type of food content viewed. However, taking the H2 and H3 findings together, a conclusion can be drawn that while food content viewing does not influence unhealthy eating behaviour overall but it does reflect at the immediate unhealthy food consumption

Finally, in examining Food Literacy from Food-Well Being model, H4 tested the relationship between the emotions evoked by food-related content and subsequent unhealthy food consumption. The results supported the hypothesis, revealing that feelings evoked by food related content viewed and more specifically, both positive feelings (enjoyment) and negative feelings (dissatisfaction) triggered by viewing food content online were associated with an increase in unhealthy food consumption. This finding aligns with previous research, such as Wu et al. (2024), which suggests that the emotions elicited by food visuals can significantly influence eating behavior.

The concept of emotional eating, where individuals consume food in response to emotional states rather than hunger, is well-documented in the literature. Specifically, the notion of "food nostalgia," which refers to the emotional memories tied to specific

foods, has been shown to influence food choices and consumption patterns (Reid et al., 2022). However, food nostalgia itself does not necessarily lead to unhealthy food consumption, as the emotional ties to specific foods can vary significantly (Mugel et al., 2019). This study, however, did not focus solely on food nostalgia but rather examined the broader emotional connections with food, which may be influenced by a range of personal factors beyond the individual's relationship with specific foods. These factors could include cultural background, personal experiences, and emotional states, all of which can shape how individuals respond to food cues and influence their eating behaviours (Evers et al., 2010). The findings of the current study are also consistent with broader research indicating that eating in response to emotional stimuli often results in the consumption of unhealthy foods (Eşer Durmaz et al., 2022). Emotional eating is generally characterized by the intake of high-calorie, energy-dense foods, which are often consumed in larger quantities during periods of emotional distress or heightened emotional arousal. The study by Kemp et al. (2013) supports this, highlighting that emotional responses to food cues can override physiological hunger cues, leading to overeating and preference for less healthy options.

To sum up, while food nostalgia may have positive aspects, such as enhancing food well-being by connecting individuals to comforting or culturally significant meals, the findings from this study underscore the complexity of emotions in food-related decision-making. For instance, while negative emotions are often associated with unhealthy eating as a means of emotional regulation (Cai et al., 2024), this study reveals that even positive emotions, like enjoyment, when triggered by visually appealing foods, can lead to unhealthy food consumption. This suggests that the impact of food-related content on food consumption is multifaceted, with the emotional

appeal of food cues driving unhealthy consumption regardless of whether the emotions are positive or negative.

First, the data showed that the vast majority of food related content overall across participants was coming from influencers and food accounts therefore the pool of content online leans towards influencers and food related accounts posts compared to previous research where they have not examined the sources of the content (Qutteina et al., 2019; Murphy et al., 2020); therefore, the results may be skewed. Moreover, research on social influence in offline circumstances focuses mainly on in-group and out-group behaviours that the individuals copy; resulting in a tendency to copy in-group behaviours (Higgs and Ruddock, 2020). However, in this research, influencers and food-related accounts who have been considered as out-group reference behaviour which may have reflected differently by the participants; meaning that users follow, and track influencers and food business accounts based on their preferences and therefore, they may not be exposed to out-group accounts. Finally, Hawkins et al. (2021) pointed out that digital social settings have a distinctive way of conveying approval, which differs from the way social interactions are perceived in everyday peer interactions. Therefore, this more salient approval that comes by "following" someone or "liking" a post may result in a different pattern of influenced behaviour.

5.3. MINDFULNESS AND EATING BEHAVIOUR

The RQ2 of this study sought to examine the influence of mindfulness interventions on eating behavior, specifically in relation to healthier food consumption. To address this, a series of hypotheses between control and experimental groups (H5a, H5b, H5c,

H5d) and within experimental group (H6a, H6b, H6c, H6d) were tested, exploring different contexts and interactions involving mindfulness practices.

The hypothesis H5a proposed that individuals who engage in the mindfulness intervention would consume healthier food compared to those who do not, regardless of other factors such as food socialisation, food marketing, or food literacy. The confirmation of this hypothesis aligns with a growing body of literature that suggests mindfulness can directly influence eating behaviours in a positive way (Carrière et al., 2018).

Several studies have consistently found that mindfulness interventions lead to healthier eating behaviours, even in the presence of external influences. For example, Arch et al. (2016) conducted a study where participants who completed a brief mindfulness exercise demonstrated reduced consumption of unhealthy snacks compared to a control group. Similarly, Jordan et al. (2014) examined the effects of a mindfulness-based intervention on dietary behaviours and found that participants in the mindfulness group significantly increased their consumption of fruits and vegetables. This increase occurred even when controlling for external factors such as exposure to food advertisements or social eating cues. Furthermore, Mantzios et al. (2020) explored the impact of mindfulness on chocolate consumption. They found that individuals who practiced mindfulness ate less chocolate compared to those who did not, despite being exposed to strong food cues. This suggests that mindfulness can override the impulse to consume unhealthy food, even when individuals are exposed to tempting marketing or social situations.

While the evidence generally supports the findings of H5a, some research suggests that the effectiveness of mindfulness in promoting healthier eating may be context-

dependent. For instance, Winkens et al. (2023) found that while mindfulness reduced overall caloric intake, the effect was less pronounced in environments with pervasive unhealthy food cues, such as fast-food restaurant environment. This indicates that while mindfulness can be effective, its impact may be moderated by the intensity of external influences. H5b, H5c, and H5d further explored the role of mindfulness as a moderator in different contexts, revealing that mindfulness alone might not be sufficient to counteract the effects of strong external cues such as source of food posts or unhealthy food content. While H5b and H5c were not confirmed, suggesting that mindfulness did not significantly offset the impact of unhealthy food posts or social influences, H5d confirmed that mindfulness can mitigate the impact of high emotional responses to food content, promoting healthier eating behaviours despite these emotional triggers. Yet, in H5b and H5c, some food categories such as meat, fish and protein, milk and dairy, carbohydrates and fruits and vegetables were significantly improved towards a healthier consumption compared to the other categories.

This finding is partially supported by previous research. For example, Mantzios and Wilson (2015) highlighted that mindfulness may not be equally effective across all food types. Their research demonstrated that while mindfulness reduced the consumption of high-calorie snacks, it did not significantly affect the intake of low-calorie, healthy foods. This suggests that mindfulness might be more effective at curbing unhealthy eating consumption rather than actively promoting the consumption of healthier food choices.

Similarly, Arch et al. (2016) found that a mindfulness intervention specifically reduced caloric intake from fast food. However, in the current study, fast food consumption remained unchanged. This discrepancy may be attributed to differences in study

settings: Arch et al.'s research was conducted in a controlled laboratory environment, whereas the current study was conducted in participants' natural settings. This real-world context, combined with the influence of Instagram content, exposed participants to additional factors that may have affected their food consumption, as evidenced by the findings of H1, H2, H3, and H4.

Another reason why H5c and H5d were not confirmed, while H5d was, may be attributed to the specific variables examined and their interaction with mindfulness. More specifically, mindfulness interventions have been shown to primarily impact emotional regulation and awareness (Hoppener et al., 2019). These interventions help individuals better understand and manage their emotional responses, which can influence their eating behaviour, particularly when emotional impact is high.

In contrast, while mindfulness can improve self-awareness and emotional regulation, it may not be sufficient to counteract external influences such as social and marketing factors on its own. Thus, the lack of support for H5b and H5c, which involved mindfulness in conjunction with food posts from social sources and specific food types, respectively, might be attributed to the strong influence of external food cues that mindfulness alone could not mitigate. On the other hand, H5d was confirmed because mindfulness was particularly effective in situations where the emotional impact was significant, highlighting its strength in managing emotional responses rather than combating external food cues.

The other set of hypotheses under RQ2 aimed to investigate the moderating effect of the time spent on mindfulness activities on the relationship between various influences (such as social media exposure, type of content exposure and emotional impact) and food consumption within the experimental group. These hypotheses tested whether

the duration of less than 15 minutes, 15-30 minutes and more than 30 minutes of mindfulness practice could enhance the effectiveness of mindfulness in promoting healthier eating behaviour, particularly in the context of social media influences. The specific durations were selected based on previous research investigating this relationship, particularly in contexts where mindfulness duration has been extensively studied within clinical populations, psychological conditions, and its impact on emotional states (Strohmaier et al., 2021), but little is known about the impact of mindfulness duration outside of these contexts (Galante et al., 2023). However, to develop comprehensive guidelines for future campaigns or policies that incorporate mindfulness, the current study aimed to investigate the impact of mindfulness duration on eating behaviour, particularly in the context of social media influences.

H6a hypothesised that increased time spent on mindfulness activities would lead to healthier food consumption. However, this hypothesis was not supported by the data. The rejection of H6a suggests that simply spending more time on mindfulness exercises does not automatically translate into better eating habits. This finding aligns with research by Strohmaier et al. (2021), which indicated that the length of mindfulness practice did not significantly affect the reduction of distress or anxiety, which are factors related to eating behaviour. Additionally, Lloyd et al. (2018) found that while longer mindfulness practice could improve treatment outcomes, this effect was contingent on the quality of the practice rather than the duration alone. In the context of the current study, these results suggest that the effectiveness of mindfulness in promoting healthier eating may depend more on the quality of engagement rather than the amount of time spent practicing. This may be attributed to the fact that participants were instructed to complete the exercises independently at their own convenience. Despite detailed instructions, the results might have differed

if the mindfulness exercises were conducted in the presence of a mindfulness instructor (Canby et al., 2014).

H6b, on the other hand, was confirmed, indicating that individuals who spent more time on mindfulness activities and were exposed to food posts from friends consumed healthier food compared to those who spent less time on mindfulness activities. This finding contrasts with the results of H5b, which showed no significant difference between the experimental and control groups in terms of food consumption influenced by viewing friends' posts. The discrepancy between H5b and H6b suggests that the duration of mindfulness practice may play a critical role in moderating the influence of social cues on eating behaviour.

A possible explanation for this result could be that sustained mindfulness practice enhances an individual's ability to stay present and attuned to their internal cues, such as hunger and satiety, rather than being easily swayed by external stimuli like friends' food posts. Longer mindfulness sessions might help individuals build a stronger foundation of self-regulation and attentional control, which in turn enables them to better resist the subtle pressures of social influence (Galante et al., 2023).

Additionally, the strong effect of mindfulness on emotional regulation could further explain why longer mindfulness practice improved food choices in the context of social influences. Social influences, such as food posts from friends, are often more closely tied to emotional responses (Peng et al., 2019), and extended mindfulness activities can enhance an individual's ability to manage these emotional reactions effectively. Consequently, individuals who spent more time on mindfulness activities were better equipped to resist the emotional impact of social cues, leading to healthier food choices, as indicated by the confirmation of H6b.

In contrast, H6c, which examined the effect of mindfulness duration on healthy food consumption in response to unhealthy food posts, was not supported by the findings. This suggests that while mindfulness may enhance emotional regulation, it might not be as effective in moderating responses to direct food cues like unhealthy food posts. Unhealthy food posts may trigger more automatic or habitual reactions rather than emotional responses (Hollands et al., 2015), which could be less influenced by mindfulness practices compared to the emotional responses elicited by social influences. As a result, the duration of mindfulness practice did not significantly alter healthy food consumption in this context, highlighting a limitation in the ability of mindfulness alone to counteract the impact of marketing cues such as unhealthy food posts (O'Reilly et al., 2014). The findings also suggest that the intensity and pervasiveness of unhealthy food cues in social media may overpower the benefits of mindfulness, particularly when it comes to making healthier food choices. This outcome is consistent with research by Winkens et al. (2023), which found that mindfulness overall had limited effectiveness in environments saturated with unhealthy food cues, such as fast-food settings.

Finally, H6d was confirmed, reinforcing the effectiveness of mindfulness practice in situations where individuals experience a high emotional impact from food posts. This finding highlights mindfulness' particular strength in managing emotional responses, aligning with the results of H5d. Pidgeon et al. (2013) support this, showing that mindfulness enhances emotional regulation by increasing awareness and reducing reactivity to emotional stimuli, which in turn leads to decreased emotional eating. The current research illustrates that longer time spent on mindfulness can be particularly beneficial in scenarios with strong emotional triggers, as it helps individuals manage

their emotional responses more effectively, leading to healthier eating habits despite emotional challenges.

Taking all the findings from RQ2 together, it can be concluded that while mindfulness generally has a beneficial influence on food consumption, several important considerations must be addressed. Firstly, mindfulness interventions do not uniformly affect all food categories in response to Instagram food influences. The impact of mindfulness varies depending on the type of influence, whether social, marketing, or emotional. For instance, while mindfulness proves effective in moderating emotional responses to food posts, it may be less effective in counteracting automatic or habitual reactions triggered by unhealthy food cues. Finally, while the time spent on mindfulness appears to have a nuanced and potentially positive effect on healthy eating, further research is needed to more precisely evaluate how different durations of mindfulness practice influence eating behaviour.

5.4. MINDFULNESS, SELF-CONTROL AND INSTAGRAM INFLUENCES

Finally, RQ3 investigated the impact of a mindfulness intervention on self-control and its subsequent influence on eating behaviour, including the effect of social media on eating. Unlike RQ1 and RQ2, which utilised daily measures for mindfulness and food consumption, self-control was assessed only at the baseline and final surveys. Consequently, RQ3 focused on evaluating overall eating behaviour rather than daily food consumption. All hypotheses (H7a, H7b, H7c, and H7d) within this research question were confirmed, highlighting significant findings regarding the effects of

mindfulness on self-control and its impact on eating behaviour in response to social media influences.

Data analysis supported both H7a and H7b, showing that self-control significantly increased for the experimental group from the baseline to the final survey (H7a) and also compared to the control group (H7b). This finding is consistent with existing literature, which has documented that mindfulness practices enhance self-control. For instance, Bowlin and Baer (2012) and Canby et al. (2015) found that mindfulness training improves self-regulatory abilities, which is crucial for managing various behaviours, including eating. Mindfulness helps individuals become more aware of their impulses and responses, which can translate into better self-control (Friese et al., 2012) as well as reduced impulsivity in decision making (McCarthy et al., 2017; Rosenthal and Dietl, 2022).

The results also confirm hypothesis H7c, highlighting the intertwined relationship between self-control and mindfulness. Specifically, H7c confirmed that mindfulness moderates the relationship between self-control and eating behaviour. Individuals with higher self-control who underwent the mindfulness intervention reported helathier eating behaviour compared to those with similar levels of self-control who did not undergo the intervention. This supports findings from Du et al. (2021), which indicate that self-control, facilitated by mindfulness, contributes to improved well-being. Additionally, in Friese et al. (2012) study where the intwined relationship of mindfulness and self-control were examined, found that mindfulness intervention will lead to better emotional regulation even when self-control is depleted. This supports findings from Du et al. (2021), which indicate that self-control, facilitated by mindfulness, contributes to improved well-being compared to situations where

mindfulness was not implemented. Additionally, Friese et al. (2012) found that mindfulness interventions enhance emotional regulation, even when self-control resources are depleted. However, the relationship between mindfulness and self-control in the context of eating behaviour is still underexplored. Therefore, more research is needed to fully understand their combined influence on eating habits.

Finally, the confirmation of H7d underscores the effectiveness of mindfulness in mitigating the impact of social media influences on eating behaviour. As demonstrated by the hypotheses within RQ1, both the content of food posts and their social aspects, along with emotional responses, can significantly influence eating behaviours. This influence is particularly evident in relation to the consumption of specific food categories.

However, by fostering greater self-control, mindfulness interventions help individuals resist these external cues and display a healthier eating behaviour. This aligns with findings from Haynes et al. (2016), who demonstrated that mindfulness enhances individuals' ability to regulate their responses to unhealthy food-related stimuli, thereby reducing the impact of social media on dietary decisions. Furthermore, research by Haws et al. (2016) suggests that increased self-control can buffer against the persuasive effects of marketing and social influences. This evidence collectively highlights the role of mindfulness not only in improving self-control but also in moderating the effects of social media on eating behaviour, emphasising its potential as a practical tool for managing dietary choices in the digital age.

Therefore, the study supports the notion that mindfulness improves self-control and additionally, contributes to healthier eating behaviour and reduced susceptibility to social media food influences.

CHAPTER 6: CONCLUSIONS

6.1. OVERVIEW

This chapter will provide an overview of the findings and their interpretations. As discussed in the previous chapter, this thesis offers valuable insights into Instagram's social, marketing and emotional influences on eating consumption and behaviour, as well as the beneficial role of mindfulness practise. The research highlights how mindfulness mediates self-control in relation to healthier eating. However, every study has its limitations. This chapter will address both the limitations and strengths of the research. Based on these limitations and the identified literature gaps, recommendation for future research will be proposed. Finally, the chapter will discuss the practical and theoretical implications of the findings for social marketing and consumer, emphasizing how these insights can inform strategies and enhance understanding of consumer behaviour in the context of social media and mindfulness interventions..

6.2. SUMMARY OF FINDINGS

The current thesis aimed to explore the influence of Instagram's food-related content on individual's eating behaviour and food consumption. Additionally it examined whether mindfulness and self-control,factors previously shown to positively influence healthier eating behaviour and food consumption (e.g., Braun et al., 2012; Dalen et al., 2010; Horan & Taylor, 2018; Mantzios & Wilson, 2014)- moderate this relationship.

Eating behaviour is recognised in the literature as a complex and multifaceted process, with underlying mechanisms that remain only partially understood, making it a challenging area of research (Emilien & Hollis, 2017). Despite these challenges, the

importance of promoting healthy eating has become increasingly urgent due to the alarming consequences of unhealthy eating at both personal and societal levels. Unhealthy food consumption and overconsumption have been examined from various perspectives, yet there is a growing consensus among researchers that eating behaviour must be analysed beyond biological factors alone. This research adopts a broader lens, exploring the social, marketing, and emotional dimensions of food consumption as depicted in the food well-being model (Block et al., 2010), particularly within the context of social media, specifically Instagram.

Instagram, with its highly interactive and visually-driven platform, is one of the most widely used social media platforms globally, influencing users across all age groups (Dixon, 2023). Its pervasive presence makes it a significant factor in shaping eating behaviours, particularly through the social influences and food exposure it facilitates. This study investigates Instagram's role in influencing eating behaviour and consumption, focusing on how social influences, food-related content, and its emotional impact shape consumption patterns.

Furthermore, the study explores the potential of mindfulness as an intervention to promote healthier eating habits. While mindfulness has already been associated with healthier behaviours and improved self-control, its effectiveness in countering online influences on behaviour remains underexplored. By examining the intersection of mindfulness, social media exposure, and eating behaviour, this research contributes to a deeper understanding of how digital environments shape consumer behaviour and how interventions can mitigate the negative consequences of unhealthy diets.

6.2.1. RESEARCH QUESTION 1 SUMMARY

RQ1: Does exposure to food-related content on Instagram affect (un)healthy food consumption?

The confirmation of H1a, where individuals exposed to friends' food posts consumed unhealthier food, highlights the influential role of social connections in shaping dietary choices (Cruwys et al., 2015). This finding suggests that content shared by peers, regardless of whether it is healthy or unhealthy, can significantly impact eating behaviour. The familiar and relatable nature of posts from friends may lead individuals to lower their cognitive defences, causing them to be less critical of the food choices depicted. When these posts feature unhealthy food, the likelihood of unhealthier consumption patterns increases due to the perceived social norms and acceptance within one's social circle (Woolley and Fishbach, 2017). Even if friends share a mix of healthy and unhealthy foods, the influence of posts showcasing indulgent or less healthy options can have a stronger immediate effect, possibly due to the appeal of comfort or convenience foods in a social context (Nabors et al., 2024). This finding underscores the potential of social media as a powerful medium for social influence, where the norms and behaviours within one's social network can strongly dictate eating habits, leading to the adoption of less healthy eating patterns when exposed to certain types of food content.

This hypothesis was also confirmed. Individuals exposed to influencers' food posts were more likely to consume healthier food, highlighting the role of perceived credibility and authority in shaping consumer behaviour (Coates et al., 2019; Pilgrim and Bohnet-Joschko, 2019). Influencers, often viewed as experts or role models in particular domains, can effectively promote healthier eating habits through their content. The

effectiveness of influencer marketing in this context can be attributed to the persuasive power that comes from a combination of authority, aspirational appeal, and the often highly curated nature of the content, which presents healthy eating as not just a choice but a desirable lifestyle (Hess et al., 2022).

The confirmation of H2, which hypothesised that general exposure to food-related content on social media would lead to unhealthier food consumption, underscores the complexity of how such content influences eating behaviours. This outcome suggests that the mere presence of food-related content is not sufficient to trigger unhealthier eating habits. Instead, the impact of this content appears to be influenced by various factors, including the type of the food depicted, the source of the posts, and the emotional responses they evoke.

Given that H2 has been confirmed, this finding suggests that the immediate response to food-related content on social media does not necessarily lead to sustained unhealthy eating patterns as it has been previously suggested. While food-related content can indeed prompt unhealthy food consumption, factors like self-control, mindfulness, and the social media environment may mitigate these effects over time. This highlights the complexity of social media's impact on diet, especially in differentiating between immediate food consumption and longer-term behavioural aspects such as cravings and emotional, external, or restrained eating. Therefore, future research should consider these moderating factors to better understand how different types of food content can influence behaviour, necessitating a more nuanced approach to studying food-related content on social media. This understanding is crucial for developing more targeted and effective future campaigns.

The confirmation of H3a and H3b highlights the significant role that the type of food content plays in influencing consumption behaviour. The finding that viewing healthy food-related content leads to healthier food consumption (H3b) supports the idea that positive, health-oriented media can effectively cue healthier dietary choices, similar to H1b where influencers are advocates of healthier lifestyles than friends. This suggests that exposure to appealing, nutritious food images can reinforce or inspire better eating habits. However, the confirmation of H3a, where exposure to unhealthy food-related content leads to unhealthier food consumption, highlights the potent effect that unhealthy food imagery can have. This suggests that when individuals are presented with unhealthy food content, it can prompt less healthy eating choices, countering the promising effects of H3b. This emphasises the strong, almost automatic response such content can elicit, overriding cognitive resistance or health goals in the moment, similar to the effects of the traditional unhealthy advertising on television (Alblas et al., 2021).

Together, these findings demonstrate that the type of food content individuals are exposed to on platforms like Instagram significantly shapes their food consumption, although it may not always translate into broader behavioural response. Both healthy and unhealthy content exert measurable effects on consumption patterns.

Finally, the confirmation of H4, that high emotional impact due to exposure to food-related content leads to unhealthier food consumption, highlights the significant role of emotional engagement in influencing food consumption. This finding is consistent with studies showing that anticipated emotions drive decisions more powerfully than rational deliberation (Bou Saada et al., 2022). When food content elicits strong emotional responses, it can override healthier intentions, if any, and lead to immediate

gratification through the consumption of unhealthy foods. This underscores the potential danger of emotionally charged food content on social media, which can exploit viewers' emotional vulnerabilities to drive unhealthy consumption. For instance, research on food nostalgia has demonstrated that certain foods are strongly associated with specific memories within individuals, which can evoke significant emotional responses (Mugel et al., 2019). These emotional responses can, in turn, influence consumption and eating behaviour, potentially leading to unhealthy consumption.

Overall, the findings from RQ1 illustrate the intricate relationship between Instagram food-related content and food consumption. They underscore the importance of considering the source of the content, the type of content, and the emotional impact it has on individuals' food consumption and eating behaviours. The study also reveals notable insights into which specific food categories are more susceptible to influence, suggesting that future research should focus more precisely on these categories. Additionally, while this study primarily examined food consumption, the findings related to H2 highlight a need for further investigation into the differences between immediate consumption responses and broader eating behavioural patterns related to potential consumption.

6.2.2. RESEARCH QUESTION 2 SUMMARY

RQ2: To what extent does mindfulness influence eating behaviour in terms of healthy food consumption?

The confirmation of H5a indicates that individuals who engage in mindfulness activities tend to consume healthier food compared to those who do not, regardless of factors like food socialisation, marketing, and literacy. This highlights mindfulness as an

effective intervention for promoting healthier eating habits, aligning with previous research that views mindfulness as a means to improve dietary habits irrespective of environmental and situational factors (see review Sala et al., 2020).

Both H5b and H5c were rejected, indicating that mindfulness did not significantly moderate the effect of food posts from friends or unhealthy food posts on food consumption. This suggests that mindfulness activities alone do not substantially alter the strong influence of the content source (H1a) or the unhealthy food viewed (H3a) consistent with previous studies indicating that in pervasive unhealthy environments, such as fast-food restaurants, mindfulness has a less pronounced influence compared to other contexts (Winkens et al., 2023). However, while H3a showed no significant overall difference in unhealthy consumption, specific food categories such as fruits and vegetables, and snacks exhibited notable moderation effects due to mindfulness. This underscores the possibility that mindfulness may be more effective for certain food categories than others, suggesting that targeted interventions focusing on specific types of food might enhance overall dietary behaviours.

The confirmation of H5d shows that mindfulness helps individuals consume healthier food even when they experience a high emotional impact from food content. This underscores the role of mindfulness in mitigating the adverse effects of emotionally charged food content. This is consistent with literature demonstrating that mindfulness interventions are particularly successful in regulating emotional responses (Feldman et al., 2007; Hoppener et al., 2019).

Overall, the findings from H5a-d demonstrate that while mindfulness can be an effective tool for improving food consumption, its ability to mitigate the influences of Instagram’s social, marketing content as well as the emotional impact may be limited

in some cases. Instagram is a highly saturated environment with abundant food content, suggesting that more extended periods of mindfulness practice may be necessary to counteract its effects. Research supports that long-term mindfulness practice is more effective in various domains, including eating behaviour (Bahl et al., 2013). To further explore the impact of mindfulness duration, this study examined the moderating effect of time spent on mindfulness practice, as detailed in H6a-d.

The rejection of H6a suggests that the amount of time spent on mindfulness activities did not directly correlate with healthier food consumption, indicating that the duration of mindfulness practice alone may not be a sufficient predictor of dietary improvements. While clinical studies often support the benefits of extended mindfulness practice for mental health and obesity treatment, the durations used in this study may not be optimal for non-clinical populations (Strohmaier et al., 2021; Lloyd et al., 2018). The segmentation of mindfulness duration was based on previous studies conducted in clinical settings, which may not translate directly to the general population. Thus, further research is needed to determine the optimal duration of mindfulness practice for improving eating behaviour in non-clinical settings.

The confirmation of H6b indicates that individuals who spend more time on mindfulness activities and are exposed to food posts from friends consume healthier food compared to those who spend less time on mindfulness activities. This suggests that while mindfulness alone may not always lead to healthier eating in the context of food posts from friends (as indicated by the rejection of H5b), the positive effects of mindfulness are enhanced when practiced for longer durations.

The rejection of H6c implies that increased mindfulness time did not lead to healthier food consumption in the presence of unhealthy food posts, indicating that mindfulness alone may not counteract the influence of unhealthy food imagery.

However, when individual food categories were assessed separately, longer time spent on mindfulness positively influenced the consumption of fruits and vegetables as well as snacking. The other food categories remained unchanged, indicating that different food types respond differently to both social media influences and mindfulness practices. This finding aligns with existing research that highlights the benefits of mindfulness for specific food categories, such as fruits (Dutt et al., 2019), confectionery (Beshara et al., 2013), and carbohydrates (Marchiori and Papies, 2014). Nonetheless, the current study suggests that food types like meat, fish, protein, and fast food were largely unaffected by mindfulness interventions. Further research is needed to systematically analyse why certain food categories remain resistant to mindfulness and to refine strategies for promoting healthier eating behaviours.

The confirmation of H6d reveals that individuals who engage in mindfulness activities for longer and experience a high emotional impact from food posts are more likely to make healthier food choices. This finding aligns with broader research demonstrating that mindfulness enhances emotional regulation (Kabat-Zinn, 2015; Evers et al., 2010; Feldman et al., 2009). The interactive effect of mindfulness and emotional impact underscores the importance of incorporating mindfulness practices into interventions designed to manage emotional eating and improve overall dietary habits. Specifically, it suggests that mindfulness can help individuals better handle emotionally charged content on social media compared to other influences that are not closely linked to emotionally response. Future research should investigate how various aspects of

emotional impact and mindfulness practices can be effectively utilised to optimise eating behaviours across different contexts.

The findings across H6a-d reveal a non-linear relationship between mindfulness activity duration and food consumption patterns. Specifically, while the duration of mindfulness activities did not show a direct influence on overall healthy food consumption, it did moderate the impact of both the source of food content and the emotional impact of food-related content on unhealthy food consumption. This suggests that individuals who engaged in longer mindfulness practices were more likely to make healthier food choices when confronted with content from friends or emotions induced by food content.

This pattern of results can be attributed to several factors. First, the duration segments used in this study were based on evidence from clinical populations, which may not be fully applicable to non-clinical settings. Clinical research often involves longer durations for significant behavioural changes, such as improvements in mental health, which may not directly translate to dietary changes (Strohmaier et al., 2021). Therefore, the specific duration of mindfulness practice needed to impact non-clinical populations and distinct behaviours like eating habits requires further examination (Galante et al., 2023).

Additionally, the results indicate that mindfulness was particularly effective in moderating the effects of emotional charged variables related to food content, such as social and emotional responses. However, the influence of food marketing appeared to be less susceptible to this intervention. This suggests that while mindfulness can mitigate the emotional impact of food-related content, its effectiveness in countering marketing influences may be less pronounced.

6.2.3. RESEARCH QUESTION 3 SUMMARY

RQ3: How does mindfulness influence self-control and social media influence in terms of healthy eating?

The confirmation of H7a and H7b indicates that participants who engaged in the mindfulness intervention exhibited significantly higher levels of self-control compared to their levels before the intervention, as well as compared to control participants. This finding supports existing literature suggesting that mindfulness can enhance self-regulation by fostering greater awareness, emotional regulation, and control over one's impulses (Kabat-Zinn, 2015; Bowlin & Baer, 2012).

The confirmation of H7c shows that individuals who participated in mindfulness interventions and developed higher self-control were more likely to make even healthier food choices compared to those with high self-control but no mindfulness intervention. This suggests that mindfulness not only enhances self-control but also translates into healthier eating behaviours, reinforcing its role in dietary self-regulation even among individuals who already possess a strong capacity for healthier eating (Elkins-Brown et al., 2017). The intertwined relationship between mindfulness and self-control provides strong evidence of the essential role mindfulness plays in boosting healthier eating behaviours, even in saturated environments such as social media, which present numerous social, marketing, and emotional challenges related to eating. While strong self-control has been effective in improving diet (Rosenthal and Dietl, 2022), in the digital age where eating-related influences are amplified and persist through online interactions, self-control alone may not be sufficient (Liang et al., 2022). While self-control is a predictor of resisting temptation and therefore consume healthier, mindfulness enhances this by improving awareness and emotional

response, allowing individuals to identify their needs and external stimuli without necessarily being affected by them.

The confirmation of H7d highlights the significant impact of mindfulness in reducing the influence of social media on eating behaviours, even among individuals who already possess high levels of self-control, which has already been shown to positively influence resistance to social media's impact (Du et al., 2021). Specifically, the findings show that participants with higher self-control who also underwent mindfulness intervention were less likely to be influenced by social media content related to food, potentially leading to healthier eating behaviours compared to those with similar self-control but no mindfulness intervention. This outcome suggests that mindfulness offers an additional layer of defence against the pervasive and often unhealthy influences of social media. Overall, the results reinforce the conclusion drawn from the confirmation of H7c, highlighting the importance of integrating mindfulness practices into interventions aimed at promoting healthier eating. This is especially crucial in today’s digital age, where individuals are continuously exposed to food-related content that can undermine their dietary goals.

Overall, the findings from RQ3 indicate that mindfulness interventions effectively enhance self-control, which in turn leads to healthier food consumption and reduced susceptibility to social media influences.

6.3. IMPLICATIONS

The findings from this study suggest some implications, including theoretical contribution to the research streams examined in this study as well as practical

contributions for policy makers and interventions that can be particularly in the field of social marketing.

6.3.1. THEORETICAL CONTRIBUTION

This study offers significant theoretical contributions by exploring and extending the Food Well-Being model within the context of social media, while also shedding light on the interplay between mindfulness, self-control, and eating behaviour.

First, the research extends the application of the Food Well-Being model by examining its three core domains, food socialisation, food marketing, and food literacy, within the increasingly influential context of social media. This is a novel contribution, as the Food-Well Being model has not previously been explored in this setting, and it underscores the importance of understanding food-related behaviours in digital environments. The study opens up new avenues for research into how online platforms shape food consumption patterns and well-being.

Specifically, in terms of food socialisation, the study advances our theoretical understanding of how social media influences food consumption, particularly through the roles of friends and influencers. It demonstrates that both groups have a significant impact on food consumption, with friends' food content leading to unhealthier food choices, while influencers' food content is associated with healthier eating behaviours. While research on influencer marketing is growing rapidly (Campbell and Farrell, 2020; Coates et al., 2019), this study's findings suggest that this knowledge could be applied to further explore influencers' impact on promoting healthier behaviours beyond just eating. Moreover, the study highlights the significant role of user-generated content in online environments, contributing to the theoretical discourse on consumer behaviour by providing empirical evidence of how digital social interactions drive food-related

behaviours. Traditional studies have focused on how personal interactions and social networks affect food choices in face-to-face settings, providing valuable insights into offline social influences (Nabors et al., 2014). Similarly, research has highlighted how close relationships and social networks can shape eating behaviours through direct social interactions and shared experiences (Woolley & Fishbach, 2017). This research extends the existing literature by exploring the online dimensions of social influence on eating behaviour, providing a nuanced perspective on how digital interactions with friends and influencers affect dietary choices in ways that differ from traditional offline social contexts.

In terms of food marketing, this study makes several key theoretical contributions by elucidating how different types of food-related content on social media influence dietary behaviours. It expands the Food Well-Being model by incorporating the influential role of user-generated content in shaping eating behaviours, particularly in digital environments. Specifically, it advances our understanding of how user-generated content, particularly on platforms like Instagram, affects food consumption patterns. Firstly, the study highlights the differential impact of healthy versus unhealthy food content. It demonstrates that exposure to healthy food content is associated with overall healthier food consumption. This aligns with theoretical frameworks suggesting that positive food portrayals can encourage healthier eating habits by promoting food choices that align with desirable dietary goals (Amar et al., 2021). Conversely, the research reveals that unhealthy food content does not uniformly increase unhealthy food consumption across all food types. Instead, its effects are more pronounced in specific food categories, such as reduced fruit and vegetables and increased snacking. This finding underscores the importance of considering the category-specific impact of unhealthy food marketing, which deviates from traditional models

that might assume a general increase in unhealthy eating (Liu, 2023). By identifying that unhealthy content influences certain categories more than others, this study adds depth to our understanding of how digital food marketing can affect consumption patterns in a targeted manner.

The study significantly advances the Food Literacy domain of the Food Well-Being model and contributes to the broader literature on emotional eating by examining how emotional responses to food content on social media influence dietary behaviours. Traditionally, Food Literacy within the model has focused primarily on knowledge-based influences, with research emphasising aspects such as nutritional education and dietary information (Blitstein et al., 2019). However, studies have also explored the impact of emotional factors, such as food nostalgia, on food consumption patterns (Mugel et al., 2019; Layous and Kurtz, 2022). This study extends this line of research by integrating emotional responses to social media food content into the Food Literacy framework, thereby offering a more nuanced understanding of how emotional engagement with online food cues affects eating behaviours. This expansion underscores the importance of addressing not only cognitive knowledge but also emotional influences in food literacy literature. The findings reveal that emotional reactions to online food cues, such as positive and negative feelings, play a crucial role in shaping dietary choices and mainly towards unhealthy eating patterns. This addition provides a more comprehensive understanding of food literacy by incorporating the psychological and emotional factors that drive consumption patterns, which had previously been underexplored.

The research significantly extends the theoretical understanding of how mindfulness interacts with social media influences on eating behaviours. It reveals that mindfulness

can moderate the impact of social media content, particularly in terms of food socialisation, food marketing and food literacy, on dietary choices. This finding is crucial for understanding how mindfulness can act as a buffer against the persuasive power of online food content, which often varies in its impact depending on the source of food content, the type of food shown and the emotional impact food content has. The study also shows that mindfulness affects different food categories differently. For instance, while mindfulness moderated the impact of unhealthy food content on certain specific food categories (like fruit and vegetables and snacking), its effect on other categories (such as confectionary and fast-food) was less pronounced. This contribution helps refine the theoretical framework of food marketing by illustrating how mindfulness can selectively influence responses to various types of food content. This understanding refines existing theoretical models in consumer behaviour by demonstrating that the effectiveness of mindfulness as a moderator is context-dependent. It challenges and expands the traditional models, such as Theory of Planned Behaviour, Social Cognitive Theory, Health Belief Model, that may have assumed a one-size-fits-all approach to the influence of mindfulness on food-related behaviours (Dunn et al., 2011).

The study's findings also help expand the Food Well-Being model by incorporating the role of mindfulness in moderating food-related influences; such as socialisation, marketing and literacy. By adding the dimension of mindfulness and its selective effects on different food categories, the model becomes more comprehensive and reflective of real-world complexities in eating behaviours. Additionally, exploring the duration of time spent on mindfulness introduces a novel dimension to the research on mindfulness, particularly within non-pathogenic samples. This approach extends the theoretical framework of mindfulness by moving beyond the traditional focus on

clinical or pathological populations, often studied for stress reduction or mental health interventions. By examining how varying durations of mindfulness practices influence eating behaviors in non-pathogenic individuals, this research opens up new avenues for understanding how mindfulness can be integrated into daily life as a preventive strategy.

Finally, the study provides significant theoretical advancements by demonstrating that mindfulness not only improves self-control but also enhances it in response to challenging social media influences. Traditional self-control theories often view self-control as a broadly applicable skill (Du et al., 2021). This study extends these theories by revealing that mindfulness acts as a dynamic enhancer of self-control (Friese et al., 2012), particularly when individuals are exposed to complex external stimuli like social media. This contribution underscores the role of mindfulness as a context-sensitive tool that strengthens self-control abilities beyond general improvement.

In summary, this study not only validates and extends the Food Well-Being model within the context of social media but also deepens the understanding of how mindfulness affects dietary self-control. By integrating mindfulness into the Food Well-Being model, particularly in the context of social media platforms like Instagram, this study expands the framework to demonstrate how mindfulness can influence dietary behaviours and enhance self-control in the face of pervasive social media influences.

6.3.2. PRACTICAL CONTRIBUTION

This study provides a number of prsactical contributions in relation to the finings emerged in this thesis. While the impact of Instagram’s food content on eating patterns is complex and sometimes contradictory, the findings highlight the potential of social

media to both positively and negatively influence food consumption. These insights pave the way for developing targeted campaigns that promote healthier eating habits.

Firstly, given the significant impact of food consumption and eating behaviour influenced by social media, a key practical implication of this research is the need for more targeted online campaigns, particularly those embedded within social media platforms, to promote healthy eating. Instagram's vast reach, among a wide audience, can be used to disseminate messages about healthy eating and nutrition, targeting a broad audience with engaging and visually appealing content. While interventions targeting healthy eating have been previously applied, particularly within social marketing (see review by Alsharairi and Li, 2024), there has been limited application specifically on social media (Grantham et al., 2023).

More specifically, the findings suggest that different types of food content (healthy vs. unhealthy) influence eating behaviors in distinct ways. For example, viewing healthy food content leads to healthier eating habits, while viewing unhealthy food content does not significantly impact overall food consumption but does result in reduced fruit and vegetable intake and increased snacking. This underscores the value of crafting targeted social media campaigns that promote healthy food choices. Therefore, these campaigns could utilise healthy food content and encourage followers to engage with and share it to amplify its reach and impact. To counteract the influence of unhealthy food content, campaigns should focus on specifically educating the audience about the benefits of consuming fruits and vegetables and the risks associated with excessive snacking.

The study also found that friends' food posts tend to lead to unhealthy eating, whereas influencers' posts are more likely to encourage healthier food consumption. This

insight suggests a practical approach for designing social media campaigns. Collaborating with influencers to promote healthy eating habits can be particularly effective, given that influencer marketing is a rapidly growing field and many influencers already advocate for healthy lifestyles, including balanced diets and regular exercise. By leveraging the credibility and reach of influencers, campaigns can effectively target and engage a wide audience. Influencers can create and share content that not only highlights the benefits of healthy eating but also demonstrates how to incorporate these habits into daily life. Many influencers already share meal preparation videos, healthy snacking tips, and fitness routines, which can inspire their followers to adopt healthier behaviours (Alwafi et al., 2022). However, this approach should be systematic and consistent, rather than relying solely on the influencers' personal motivation. Therefore, policymakers and/or researchers should collaborate with influencers to develop a more structured and informed approach to health promotion. This partnership is crucial as many influencers might inadvertently provide misleading advice or promote health practices that are not evidence-based (Vasconcelos et al., 2021). Additionally, there is an opportunity to educate users about the potential impact of their own posts on their social circles, encouraging them to share healthier food content. Therefore, in addition to promoting healthy eating, practitioners should focus on educating individuals about the consequences of social media influences on their and others' eating behaviours. By strategically engaging influencers and guiding users, social media campaigns can more effectively promote healthier eating behaviours.

The study also shows that mindfulness can improve healthy food consumption, moderate the influence of social media, and enhance self-control in relation to healthy eating. This suggests that incorporating mindfulness practices into daily routines can

help individuals make healthier food choices, even when faced with external influences or challenges to self-control. This finding can be practically applied in upstream settings, such as schools, workplaces, communities, and healthcare facilities, where mindfulness programmes could be introduced to support better eating behaviours by nutritionists and health professionals. Additionally, mindfulness practices can be integrated into existing health and wellness programmes to enhance their effectiveness. This includes incorporating mindfulness exercises into nutrition education programs or using mindfulness as a component of weight management and dietary counselling services.

However, the results also revealed that not all facets of mindfulness were improved by the intervention used in this study. It can be hypothesised that the two facets which led to increased healthy consumption were action-awareness and non-judgmental thoughts. This finding has two practical implications: first, mindfulness-based interventions should focus on activities that specifically enhance these two facets; second, because the other three facets (observation, description, and non-reactivity) were more resistant to improvement, mindfulness practitioners should develop new techniques specifically aimed at enhancing these areas. Therefore, while the results are promising in terms of promoting healthy eating, efforts should be made to enhance all facets of mindfulness to determine if further improvements in eating or other behaviours can be achieved, even though not all facets showed improvement in this study.

While the findings suggest that mindfulness and social media interventions can influence eating behaviour, their effectiveness may vary in broader public contexts. The diverse nature of the general population, with varying levels of social media

exposure and mindfulness practice, presents challenges for universal application. Therefore, tailored approaches that consider individual engagement and contextual factors may be more effective.

Social marketing practitioners can utilise these findings to develop targeted campaigns aimed at promoting healthier eating habits among social media users. For example, a simplified yet detailed campaign that emerges from this study's findings and can be utilised in future research is as follows:

The campaign, titled "Mindful Instagram," is designed to enhance healthy eating habits through the integration of mindfulness practices. This initiative aims to leverage social media to spread awareness about mindful eating and demonstrate its benefits in improving dietary behaviours by incorporating mindfulness into everyday eating routines.

Targeting adult individuals who regularly use Instagram, the campaign will involve collaboration with a social media influencer who focuses on mindfulness and healthy living. The influencer will be instructed to launch a 30-day Mindful Eating Challenge, during which they will post daily content highlighting their mindful eating practices. This content will emphasise healthy foods, such as fruits and vegetables, and mindfulness activities aimed at enhancing Action-Awareness (e.g. body awareness) and Non-Judgmental Thoughts (e.g. the chocolate/raisin exercise).

To evaluate the campaign's effectiveness, metrics such as engagement rates, likes, and interactions with the influencer will be analysed. Additionally, at the end of the 30-day challenge, the influencer will share a link to a survey where users who have participated could give their feedback. Focus groups will be conducted among willing

participants to assess changes in eating behaviours and the impact of the mindfulness intervention.

This campaign utilises key findings from the current research, including the social media reach, the influencer's power to impact healthy eating, the provision of fruit and vegetable content, and mindfulness exercises designed to increase Action-Awareness and Non-Judgmental Thoughts.

In summary, the practical contributions of the study offer valuable insights into leveraging social media platforms, integrating mindfulness practices, and enhancing self-control to improve dietary behaviours. These findings can inform the development of targeted interventions, similarly to the one provided, and programmes that address eating behaviours in a variety of settings, from public health campaigns to educational and clinical environments to individual initiatives.

6.4. LIMITATIONS, STRENGTHS AND FUTURE WORK

This study has aimed to investigate how Instagram specific influences related to food content influences food consumption and eating behaviour as well as the moderating role of mindfulness.

Starting with the methodological advantages of this study, a notable strength is the use of a diary methodology, which is both quantitative and longitudinal. This approach allowed for the examination of various associations and the effectiveness of a short mindfulness intervention in improving eating habits. The study's strengths include its realistic approach to mindfulness, conducted without an instructor, which aligns well with participants' busy lifestyles. Additionally, the sample size was adequate for a 14-

day study, where participants were required to spend approximately one hour daily on diary entries and mindfulness exercises, facilitated by the online nature of the study. Another strength is the inclusion of a variety of age individuals exploring data across, at least, two generation groups.

Moreover, this study is pioneering in integrating the digital dimension into the Food Well-Being model, thereby enhancing our understanding of consumer behaviour related to eating in today's highly digitalised environment. Additionally, while the effects of mindfulness on eating behaviours have been explored in existing literature, this study is the first to systematically evaluate mindfulness specifically in the context of social media influences. This innovative approach offers a nuanced perspective on how mindfulness can interact with and potentially moderate the impact of social media on eating habits.Despite these strengths, there are several limitations. Firstly, methodologically, online surveys, while convenient, come with the risk of unregulated settings, potentially affecting the accuracy of participants' responses due to distractions or incomplete engagement (Lanitis, 2020). The flexibility of online participation could both facilitate honesty and introduce variability in how mindfulness exercises were performed or how accurately participants provide information of their food consumption. Self-selection bias is another concern, as participants with an interest in social media or healthy eating or mindfulness were more likely to participate. Previous studies, especially those on mindfulness, have noted that results may be skewed because participants were often individuals already familiar with mindfulness practices, which could affect the observed outcomes (Liang et al., 2022).While, the current study randomly assigned participants to different groups, ensuring that those with prior mindfulness experience were distributed across all groups, future research

would benefit from including a more diverse participant pool to minimise such biases and enhance the generalisability of the findings.

Secondly, the study's reliance on self-reported data introduces potential biases, including social desirability and recall biases. Participants may have reported more socially acceptable behaviours or inaccurately remembered their eating habits. Additionally, self-reported data can be influenced by participants' current mood or state of mind at the time of reporting, which may not reflect their actual behaviour. These limitations suggest that future research should consider incorporating more objective measures, such as direct observations, food diaries verified by third parties or conducted in a controlled environment, such as school, or digital tracking of eating behaviours through smart watches, to complement self-reported data and provide a more comprehensive understanding of the impacts of social media influences and mindfulness on food consumption. However, incorporating such measures could add complexity and financial constraints to the study; therefore, securing adequate funding may be necessary. While the limitations are unavoidable in self-reported scale and questionnaire studies, this study attempted to minimise them by including a 14-days diary, a mixed and repeated methods approach which may be appropriate to address some of the highlighted issues and shed light on the actual behaviour.

Additionally, while this study included mindfulness activities targeting all facets of mindfulness, the results indicated that only one facet showed significant improvement, while another was already elevated prior to the intervention. Future research should explore various mindfulness exercises and their specific impacts on each mindfulness facet as well as on eating behaviour. However, since Action-Awareness and Non-Judgmental Thoughts were sufficiently effective in promoting healthier food

consumption, future research should also focus on designing interventions that specifically target these aspects. Attempting to enhance all facets of mindfulness simultaneously may prove less effective, therefore, targeted interventions aimed at improving action-awareness and non-judgmental thoughts could lead to more significant improvements in eating behaviours and overall food well-being.

Furthermore, another crucial concern that has arisen, particularly in studies on social media (Jones et al., 2022; Riehm et al., 2019) and mindfulness (Kumar et al., 2024), is the lack of age and gender diversity. The study noted an overrepresentation of millennials and a predominance of female participants, which may limit the applicability of the findings to different age groups and genders. To improve the generalisability of the results, future research should aim to include a more balanced demographic that reflects a wider range of ages and genders. For example, research shows that men and women respond differently to social media influences (Cavazza et al., 2020), which suggests that their food consumption patterns may also differ as a result. This implies that future campaigns should be tailored to target specific gender-based influences effectively. However, mindfulness interventions in research have predominantly employed women (Bahl et al., 2013; Beshara et al., 2013; Canby et al., 2015; Dutt et al., 2019; Mantzios et al., 2020), which suggests that the effectiveness of mindfulness, as observed in this and other studies, could be influenced by gender-specific characteristics. To address this, future research on mindfulness should specifically explore its effects on male samples, examining individual facets as well. For instance, while this study found that the two facets most responsive to mindfulness intervention and effective in influencing food consumption were action-awareness and non-judgmental thoughts, this may differ in a male sample. Additionally, while the study did not address educational level and economic status, these factors could

significantly influence the impact of social media and mindfulness interventions. Future research should consider examining these variables to provide a more comprehensive understanding of the demographic factors that affect susceptibility to social media influences and the effectiveness of mindfulness practices. This would help to develop more targeted and effective strategies for diverse populations.

Moreover, examining the impact of various types of Instagram content, such as images, videos, and live feeds, could provide a deeper understanding of which content forms most significantly affect eating behaviour. Specifically, previous research indicates that engagement with food content, both in terms of interacting with relevant posts (Baldwin et al., 2018; Lee and Wan, 2023; Peng et al., 2019; Raggatt et al., 2018) and creating their own food posts (Baker and Walsh, 2020; Philp et al., 2022; Reagan et al., 2020), can influence eating behaviour and food consumption. While the current study found that unhealthy food content did not lead to overall unhealthy consumption, except in specific food categories, the results might have differed if participants had actively engaged with the content. This is a crucial finding that could benefit both research and practice by highlighting the importance of considering content engagement when analysing eating behaviour and developing interventions to promote healthy eating, thereby minimising the risk of unsuccessful campaigns.

Finally, while this research primarily focused on a downstream perspective of social marketing and mindfulness, particularly in a mid-stream context like Instagram, it is crucial to also consider mid- and upstream strategies for a more comprehensive approach. This study has identified several practical implications for mid- and upstream interventions, such as promoting mindfulness education in schools and developing policies to regulate unhealthy food content on social media. Future

research should explore how these insights can be adapted and scaled to broader interventions that address systemic and environmental factors influencing eating behaviour. For example, within the framework of Food Well-Being, the domains of Food Policy and Food Availability should also be further investigated in relation to social media platforms. By integrating findings from downstream interventions with mid- and upstream strategies, future studies can contribute to a more holistic approach to improving public health and food well-being.

Overall, by addressing the considerations mentioned and expanding the research scope, future work can provide a more comprehensive understanding of how mindfulness and social media influence food consumption and eating behaviour.

6.5. CLOSING REMARKS

In conclusion, this thesis provides compelling evidence of the impact that Instagram's food content has on users' eating behaviours and food consumption. It also demonstrates the potential of mindfulness as an effective intervention for promoting healthier eating habits, even in environments saturated with strong external influences. Instagram, with its highly visual and interactive nature, has largely supplanted traditional media, becoming a primary source of food-related content and interaction, particularly among younger adults. This research is particularly relevant in today's digital age, where social media has become a dominant force shaping consumer behaviour and public health outcomes. Eating behaviour, in particular, is shaped by various factors as depicted in Food Well-Being model, many of which are beyond an individual's control or awareness, such as the subtle yet powerful cues from social media. The prevalence of indulgent and visually appealing food photos, promoted by various social sources such as influencers and everyday users, can influence

individuals' emotional states and contribute to both healthy and unhealthy eating patterns in different ways. Particularly, this study highlighted the influential role of the source of food-related content on consumption patterns. Specifically, while food posts from influencers were associated with healthier food choices, posts from friends were linked to unhealthier eating habits. These findings align with existing research on the social influence of eating behaviour. Specifically, influencer content often features curated, health-focused food options and is seen as a credible source that may promote better dietary choices, whereas posts from friends might reflect more casual, less health-conscious eating habits due to the relatability and emotional ties individuals hold with them. Next, while social media content is diverse, unhealthy foods often dominate due to their visually appealing nature and widespread social endorsement from influencers and users. Interestingly, this thesis revealed that while unhealthy content does not universally encourage unhealthy food consumption, it does influence food choices within specific categories. However, this research also highlights that healthy food content leads to overall healthier food consumption, while some food categories remain unchanged. These findings suggest that the influence of social media content is selective and may vary depending on the type of food being promoted. Finally, the study explored how the emotions evoked by food-related social media posts influence food consumption. The results align with existing research on emotional eating, indicating that such emotions can lead to unhealthier food consumption and eating behaviours. Interestingly, while research generally shows a strong link between negative emotions and unhealthy eating, as well as positive emotions and healthy eating, the study found that both positive and negative emotions evoked by food posts were associated with unhealthier consumption. Mindfulness emerges as a promising countermeasure to counteract unhealthy

behaviours even when influenced by social media influences. Specifically, the facets of attention-awareness and non-judgmental thoughts in mindfulness can help individuals make healthier food choices by enhancing awareness physiological needs, as well as the external cues exposed. Additionally, mindfulness has a moderator to the already positive relationship between high self-control and healthy eating behaviour providing evidence that mindfulness tool can also reinforce self-control when depleted.

While these results are promising, further research is needed to address the limitations of this study. Future studies should broaden the participant pool and considering diverse demographic factors that could improve the generalisability of the findings. Moreover, further research is needed to identify social media cues that have not been explored, in terms of users' engagement with food posts and food influencers. Finally, a key direction for future studies is to examine the other two domains of Food-Well Being, namely Food Availability and Food Policy within social media to provide a more holistic framework of the model within the digital platform.

In terms of implications, a number of both theoretical and practical contributions have been made. Policymakers might consider regulations that promote healthy food posts on social media while limiting the reach of unhealthy food posts. Health providers could incorporate mindfulness training into dietary interventions to support individuals in developing better self-regulation and healthier eating habits.

Moreover, the Food Well-Being model could be enhanced by integrating the digital aspect into the framework, making it more relevant to today's online environment. Additionally, since three mindfulness facets were notably more responsive to change after the intervention, future theoretical work should examine each facet individually in relation to eating behaviour and potentially integrate it to Food-Well Being model too.

In summary, this thesis illustrates the complex relationship between social media and eating behaviours. By addressing the influence of social media and leveraging mindfulness, we can significantly combat unhealthy eating behaviours and mitigate their adverse consequences. This holistic approach establishes a foundation for future research and interventions aimed at fostering lasting, positive changes in public health and food well-being

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APPENDICES

APPENDIX 1 – Study Advertisement

WE ARE LOOKING FOR INSTAGRAM AND FOOD LOVERS to take part in our PhD study funded by the University of York!

As a compensation you will get the chance to win one of the 30 £20 Amazon Voucher.

For further information and contact details please scan the QR code:

APPENDIX 2 – Participant Consent Form

Participant Consent Form

Title of the study: The influences of Instagram food related content on eating behaviour and the role of mindfulness and self-control in addressing those influences.

Name of Researcher: Stelina Kanaki

Name of Supervisors: Dr Ariadne Kapetanaki, Dr Nadina Luca

Participant's No:

Please initial boxes

☐ I confirm that I have read and understood the information sheet for the above study.

☐ I have had the opportunity to ask questions.

☐ I understand that my participation will be anonymous and my data will be held with confidence by the researcher.

☐ I understand that I can withdraw from the study at any stage during the study or until **one month** after the end of my participation, without giving any reason, and that I can ask for my data to be destroyed if I wish.

☐ I understand that the data and the information I provide may be used for future research. Data will not include any personal information.

I agree to participate in this above study.

Participant’s name:

Participant’s signature:

_____

Date: _____

Signature (Researcher): _____Date: _____

APPENDIX 3 – Participant Information Sheet

Participant Information Sheet

October 2020

The influences of Instagram food related content on eating behaviour and the role of mindfulness and self-control in addressing those influences.

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and I will be at your disposal if you need further clarifications. This study has been reviewed and accepted by the University of York Research Ethics Committee.

Who is organising this study?

This research is organised and conducted by Stelina Kanaki (PhD student) and her supervisors, Dr Ariadne Kapetanaki and Dr Nadina Luca as part of the PhD in Management within the Management School of the University of York.

What are we interested in?

The aim of the study is to understand how social media and specifically image-generated platforms, such as Instagram affect one's eating behaviour and the role of mindfulness and self-control in eating decisions.

Who can participate in this study?

We are looking for adults 18-45 years old to take part in this study. Participants need to have an Instagram account (you will not be asked to share your Instagram's usernames) since the research involves Instagram platform and the engagement with food related accounts. Participants will be asked to do some mindfulness exercise in their own time that requires physical activity; therefore, participants are expected to be able physically to do so. Moreover, participants will be expected to complete a few online questionnaires and worksheets and therefore, to be able to understand and reply written to the questions.

What are we going to do?

This study will be held online and the communication with the researcher will be via emails. The researcher will be sending you questionnaires and tasks and you will be able to complete them in your own time and convenience. First, you will be asked to complete five questionnaires (Demographic Questionnaire, Emotion Awareness Scale, Mindfulness Questionnaire, Self-Control Questionnaire and Eating Habits Questionnaire). Completion of the questionnaires is estimated to take approximately 20 minutes. After sending the questionnaires back to the researcher, you will receive information about the next step which will require you to do some tasks, including watching videos and completing some mindfulness worksheets. The mindfulness worksheets will include some simple and easy mindfulness exercises that you will be asked to follow step-by-step and write down your experience. Throughout your participation in the study you will be asked to keep a diary, which will be structured by the researcher with questions that will guide you through and the main aim is to record your food practices (foods, snacks, meal preparation) during the day. Your participation in the study will involve some daily tasks over two weeks and you will

complete the necessary steps in your own time and convenience. Approximately, it requires no more than 15 minutes daily but you can take more time if you wish to. Last, you will be asked to complete again the questionnaires from the beginning of the study and this will be the end of the experiment. Overall, the participation time required by this study includes 20 minutes for completion of the questionnaires in the first phase of the study approximately 15 minutes daily over two weeks (but here you are allowed to allocate as much or as less time you like to the exercises and diary) and finally 20 more minutes to repeat the questionnaires from phase one. The minimum time required is about four hours in total.

What happens to the information I provide?

Participation in this study guarantees confidentiality of the information you provide. All data will be recorded anonymously and participants will not be identified in any of the reports; PhD thesis, future publications. The data will be stored in a statistical software and be analysed toward the research questions of the study. Afterwards, the results will be reported in the PhD thesis. The procedures for handling, processing, storage and destruction of your data meet the requirements of the General Data Protection Regulation (GDPR) and the UK Data Protection Act. No one apart from the researcher, the supervisors and authorised persons from the University of York will have any access to the information you provide. Your data and information will be stored in a securely locked filing cabinet for 5 years, and then they will be destroyed by our confidential shredding service. The data is being collected for this study only. If it is potentially useful for further studies, then further ethical approval would be sought. A summary of the results will be sent after request to the participants, once the study is complete.

What are the possible disadvantages and risks of taking part?

This is a low risk study. The participation will be anonymous and you will not be identified in any report of the study. You do not need to complete the questions that you do not wish to. You will also have the chance to withdraw from the study at any time during the study and until one month after the end of the participation. The researcher will keep track of the dates and you will be informed at the end of your participation the exact date that you will be able to withdraw. The only inconvenience to you may be time. However, the online nature of the participation gives you the possibility of completing the questionnaires and tasks at your own pace and not in an absolute timeline.

What are the possible advantages of taking part?

The aim of the current research is to explore eating behaviours while using a wide used platform: Instagram. There is evidence that food related content on social media can influence our eating behaviour and food practices. More research is needed to understand how social media food related content may influence people's eating behaviour and how mindfulness can help to understand such influences. Participants will have the chance to identify their own eating behaviour in this context and explore how mindfulness might affect their eating behaviour. Moreover, you will have access to information and tasks on mindfulness that you will be then able to use in the future. Apart from the personal benefits of the study, this study will identify eating behaviours that have been affected by an image-generated platform and therefore, the results will support future well-being and healthy eating programs that may reflect people's needs.

Finally, participants will have the chance to enter a prize draw for ten £30 Amazon Vouchers.

What will happen if I don't want to carry on with the study?

Your participation is voluntary and you are free to withdraw until one month after your participation, without giving any reason, and without your legal rights being affected. If you withdraw later than that, information collected cannot be erased and this information may still be used in the project analysis. A copy of the results of the study will be available for you if you wish to.

Contact for further information

If you have any questions or concerns about this research, you can contact the PhD researcher by email at styliani.kanaki@york.ac.uk, or the study supervisors at Ariadne.kapetanaki@york.ac.uk and nadina.luca@york.ac.uk. If you have any serious concerns about the ethical conduct of this study, please inform the University of York's ethics committee at elmps-ethics-group@york.ac.uk.

If you would like to take part, please complete and sign the consent form, and retain this sheet for your information.

APPENDIX 4 – Screening Questionnaire

Screening Questionnaire

1. Welcome Note and Participation ID Request

2. Consent Form (Appendix 2)

3. What is your gender?

- Male
- Female
- Non-binary/third gender
- Prefer not to say

4. What is your age?

5. Are you a UK resident?

- Yes
- No

6. Do you have an Instagram account?

- Yes
- No

7. How often do you use Instagram?

- Daily
- 4-6 times a week
- 2-3 times a week
- Once a week

- Once per month
- Never

8. (You can check your Instagram account to aid you in answering the following questions.)

Do you follow Instagram accounts with food related content?

- Yes
- No

9. Do you follow any of the following Instagram accounts? (Select as many as applicable)

- FoodyEating
- Hungry Twins
- Twisted
- BuzzFeed
- Tasty
- MassiveCravings
- DessertBae
- TasteMadeUK
- Proper Tasty
- My.Food.Craving
- RestaurantCravings
- Desserts.Pleasant

10. Do you follow any other account with food related content? If yes, could you name your 2-3 favourites?

11. How often do you see pictures posted on Instagram related to food?

- Daily
- 4-6 times a week
- 2-3 times a week
- Once a week
- Never

12. Do you post food-related pictures on your personal account?

- Yes
- No

13. Do you exercise any mindfulness techniques (such as breathing exercises, any kind of meditation) in your everyday life?

- Yes
- No

14. How often do you exercise mindfulness?

- Several times a day
- About once a day
- 3-5 days a week
- 1-2 days a week
- Every few weeks
- Less often
- Never

APPENDIX 5 – Mindfulness Exercise 5-4-3-2-1 Technique

5-4-3-2-1 Technique

Using the 5-4-3-2-1 technique, you will purposefully take in the details of your surroundings using each of your senses. Strive to notice small details that your mind would usually tune out, such as distant sounds, or the texture of an ordinary object.

What are 5 things you can see? Look for small details such as a pattern on the ceiling, the way light reflects off a surface, or an object you never noticed.

What are 4 things you can feel? Notice the sensation of clothing on your body, the sun on your skin, or the feeling of the chair you are sitting in. Pick up an object and examine its weight, texture, and other physical qualities.

What are 3 things you can hear? Pay special attention to the sounds your mind has tuned out, such as a ticking clock, distant traffic, or trees blowing in the wind.

What are 2 things you can smell? Try to notice smells in the air around you, like an air freshener or freshly mowed grass. You may also look around for something that has a scent, such as a flower or an unlit candle.

What is 1 thing you can taste? Carry gum, candy, or small snacks for this step. Pop one in your mouth and focus your attention closely on the flavors.

APPENDIX 6 – Mindfulness Body Awareness Exercise

Body Awareness Exercise

The body awareness technique will bring you into the here-and-now by directing your focus to sensations in the body. Pay special attention to the physical sensations created by each step.

1. Take 5 long, deep breaths through your nose, and exhale through puckered lips.

2. Place both feet flat on the floor. Wiggle your toes. Curl and uncurl your toes several times. Spend a moment noticing the sensations in your feet.

3. Stomp your feet on the ground several times. Pay attention to the sensations in your feet and legs as you make contact with the ground.

4. Clench your hands into fists, then release the tension. Repeat this 10 times.

5. Press your palms together. Press them harder and hold this pose for 15 seconds. Pay attention to the feeling of tension in your hands and arms.

6. Rub your palms together briskly. Notice and sound and the feeling of warmth.

7. Reach your hands over your head like you're trying to reach the sky. Stretch like this for 5 seconds. Bring your arms down and let them relax at your sides.

8. Take 5 more deep breaths and notice the feeling of calm in your body.

APPENDIX 7 – Mindfulness Categories Exercise

Categories Exercise

Choose at least three of the categories below and name as many items as you can in each one. Spend a few minutes on each category to come up with as many items as possible. You may also wish to note the items down.

Movies

Countries

Books

Cereals

Sports

Teams

Colours

Cars

Fruits &Vegetables

Animals

Cities

TV Shows

Famous People

For a variation on this activity, try naming items in a category alphabetically. For example, for the fruits & vegetables category, say “apple, banana, carrot,” and so on.

APPENDIX 8 – Mindfulness Chocolate Meditation

Chocolate Meditation

Take a few deep breaths. Slowly let go of any tension you might be holding in your muscles. You want to start your chocolate meditation as physically relaxed as possible.

Open the chocolate. Inhale the scent. Let it wash over you, like a wave of smell. Notice if your mouth is responding to it as well. Look at the chocolate. See how that affects all of your senses.

Break off a piece and look at it. Really let your eyes drink in what it looks like, examining every nook and cranny – the bubbles and the cracks, the individual grains of cocoa.

Now, if you're comfortable, close your eyes.

Finally!... take a small bite of your chocolate. Let it sit on your tongue and melt slowly in your mouth. Notice the flavours becoming completely absorbed in what you're experiencing right now. Notice the sensations in your mouth. Notice your breathing.

See if it's possible to hold the chocolate on your tongue and let it melt. Notice any resistance to that, or any craving or desire… not judging, just noticing.

Chocolate has over 300 different flavours. See if you can sense some of them.

After the chocolate has completely melted, very slowly swallow it. Feel the sensations and your body's response as it goes down your throat.

Notice how your mouth feels now. Notice the feeling of wanting, or not wanting, to take a second bite. Try to even follow the feeling of your hand coming up towards your mouth, and any emotions that arise. How does it feel? Once the chocolate is in your mouth, how does that feel?

If other thoughts drift into your mind as you're absorbing your chocolate, gently turn your attention back to the flavours and sensations you're experiencing now.

Repeat this with one other piece. This time, consider who grew the ingredients of this chocolate. Where they may have come from. The beings who made it possible for you to be eating it. The beings who made it possible for the plants to grow.

Say a word of thanks for the food you're about to eat.

When you're finished eating your chocolate, you might choose to continue your meditation. Or you might gently return to the sights, sounds and sensations around you.

APPENDIX 9 – Mindfulness Sense Awareness Meditation

Sense Awareness Meditation

➤ Set a timer for 3, 5, 7 minutes or more...

➤ Begin in a comfortable seat (your meditation posture) with your spine tall and neutral

➤ Close your eyes or keep a soft gaze towards the ground in front of you

➤ Breathe deeply yet quietly in and out through your nose

➤ Once you are settled, guide your awareness towards sound

➤ What is it that you hear?

➤ Without looking for sound, remain open to the arising of sound within your awareness

➤ Can you notice sound without judging or labeling the sound?

➤ As sound arises, become especially aware of any tendency to label what you hear as

good or bad, pleasant or unpleasant

➤ If or when you notice that the mind has wandered off to the other senses, to thoughts or

emotions, simply return your focus to sound (do this as many times as you need to)

➤ Remain present with the experience of sound until your timer stops

APPENDIX 10 – Mindfulness Staying with Emotions Exercise

Staying with Emotions

- Find a comfortable position and take a couple of full breaths. Your breathing can become shallow when you're stressed or upset, so try to feel your chest and belly expand when you breathe in and really let go when you breathe out.

- Let your attention gently move through your body from your head to fingertips to toes, watching for places you may be tensing or holding. It's common to clench your jaw or literally sit on the edge of your seat if you're feeling a difficult emotion. Do your best to kindly notice the tension and relax just a little in those areas.

- Feel the emotion that's with you right now. Where do you feel it most strongly? There might be one place or several places where you feel the emotion's physical expression–around your heart or solar plexus, throat or belly.

- See if you can be curious about the sensations. If you want to move away or resist them, that's totally natural. See if you can be with them with kindness and curiosity, just for a moment. Remember to breathe.

- You can use words to help you stay connected to the physical part of your experience, like “tight” or “swirling” or “hard,” whatever feels right for you.

- You’re just listening to your body’s expression in this moment. You’re not trying to make anything happen or stop anything from happening.

- You may have an emotional label come up, like “grief” or “fear.” That’s all part of the practice. Notice the label and bring your attention gently back to the physical sensation that’s here now.

- Does your experience change in some way when you apply an emotional label, like “sadness,” or a physical label, like “tightness?”

- You may have a thought or a story come up, remembering what someone did or said to you. That’s part of the practice, too. Just notice it and, if you can, also notice if the thought creates an echo in your emotions or physical sensations. Then come back again to whatever physical sensations are most prominent.

- If an emotion is physically uncomfortable, you can try to create a little space around it. Gently explore the area to see what else is there, any relaxation or openness. Or, see if you can find the edges and, right there, soften a little. Breathe into that space.

- You can do this practice for as long as you like: doing the best you can to let your thoughts and emotions go, and stay connected with the physical manifestation of your emotion.

APPENDIX 11 – Five Facet Mindfulness Questionnaire

Five Facet Mindfulness Questionnaire (FFMQ)

		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
1	I can usually describe how I feel at the moment in considerable detail.					
2	I'm good at finding words to describe my feelings.					

3	I criticize myself for having irrational or inappropriate emotions.					
4	I perceive my feelings and emotions without having to react to them.					
5	When I do things, my mind wanders off and I'm easily distracted.					
6	When I take a shower or bath, I stay alert to the sensations of water on my body.					
7	I can easily put my beliefs, opinions, and expectations into words.					
8	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.					
9	I watch my feelings without getting lost in them.					
10	I tell myself I shouldn't be feeling the way I'm feeling					
11	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.					
12	It's hard for me to find the words to describe what I am thinking.					

13	I am easily distracted.					
14	I believe some of my thoughts are abnormal or bad and I shouldn't think that way.					
15	I pay attention to sensations, such as the wind in my hair or sun on my face.					
16	I have trouble thinking of the right words to express how I feel about things.					
17	I make judgments about whether my thoughts are good or bad.					
18	I find it difficult to stay focused on what's happening in the present.					
19	When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.					
20	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.					
21	In difficult situations, I can pause without immediately reacting.					

22	When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.					
23	It seems I am "running on automatic" without much awareness of what I'm doing.					
24	When I have distressing thoughts or images, I feel calm soon after.					
25	I tell myself that I shouldn't be thinking the way I'm thinking.					
26	I notice the smells and aromas of things.					
27	Even when I'm feeling terribly upset, I can find a way to put it into words.					
28	I rush through activities without being really attentive to them.					
29	When I have distressing thoughts or images, I am able just to notice them without reacting.					
30	I think some of my emotions are bad or inappropriate and I shouldn't feel them.					

31	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.					
32	My natural tendency is to put my experiences into words.					
33	When I have distressing thoughts or images, I just notice them and let them go.					
34	I do jobs or tasks automatically without being aware of what I'm doing.					
35	When I have distressing thoughts or images, I judge myself as good or bad depending what the thought or image is about.					
36	I pay attention to how my emotions affect my thoughts and behavior.					
37	I can usually describe how I feel at the moment in considerable detail.					
38	I find myself doing things without paying attention.					
39	I disapprove of myself when I have irrational ideas.					

APPENDIX 12 – Food Craving Questionnaire

Food Craving Questionnaire (FCQ-T-r)

		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	When I crave something, I know I won't be able to stop eating once I start.					
2	If I eat what I am craving, I often lose control and eat too much.					
3	Food cravings invariably make me think of ways to get what I want to eat.					
4	I feel like I have food on my mind all the time.					
5	I find myself preoccupied with food.					
6	Whenever I have food cravings, I find myself making plans to eat.					
7	I crave foods when I feel bored, angry, or sad.					

8	I have no will power to resist my food crave.					
9	Once I start eating, I have trouble stopping.					
10	I can't stop thinking about eating no matter how hard I try.					
11	If I give in to a food craving, all control is lost.					
12	Whenever I have a food craving, I keep on thinking about eating until I actually eat the food.					
13	If I am craving something, thoughts of eating me consume me.					
14	My emotions often make me want to eat.					

15	It is hard for me to resist the temptation to eat appetizing foods that are in my reach.					

APPENDIX 13 – Dutch Eating Behaviour Questionnaire

Dutch Eating Behaviour Questionnaire (DEBQ)

		Never	Rarely	Sometimes	Often	Very often
1	If you have put on weight, do you eat less than you usually do?					
2	Do you try to eat less at mealtimes than you would like to eat?					
3	How often do you refuse food or drink offered because you are concerned about your weight?					
4	Do you watch exactly what you eat?					
5	Do you deliberately eat foods that are slimming?					

6	When you have eaten too much, do you eat less than usual the following days?					
7	Do you deliberately eat less in order not to become heavier?					
8	How often do you try not to eat between meals because you are watching your weight?					
9	How often in the evening do you try not to eat because you are watching your weight?					
10	Do you take into account your weight with what you eat?					
11	Do you have a desire to eat when you are irritated?					
12	Do you have a desire to eat when you have nothing to do?					

13	Do you have a desire to eat when you are depressed or discouraged?					
14	Do you have a desire to eat when you are feeling lonely?					
15	Do you have a desire to eat when somebody lets you down?					
16	Do you have a desire to eat when you are cross?					
17	Do you have a desire to eat when you are approaching something unpleasant to happen?					
18	Do you get the desire to eat when you are anxious, worried or tense?					
19	Do you have the desire to eat when things are going against you or when things have gone wrong?					

20	Do you have the desire to eat when you are frightened?					
21	Do you have the desire to eat when you are disappointed?					
22	Do you have a desire to eat when you are emotionally upset?					
23	Do you have a desire to eat when you are bored or restless?					
24	If the food tastes good to you, do you eat more than usual?					
25	If the food smells and looks good, do you eat more than usual?					
26	If you see or smell something delicious, do you have a desire to eat it?					

27	If you have something delicious to eat, do you eat it straight away?					
28	If you walk past baker, do you have the desire to buy something delicious?					
29	If you walk past a snackbar or a cafe, do you have the desire to buy something delicious?					
30	If you see others eating, do you also have the desire to eat?					
31	Can you resist eating delicious foods?					
32	Do you eat more than usual when you see others eating?					
33	When preparing a meal, are you inclined to eat something?					

APPENDIX 14 – Brief Self-Control Scale

Brief Self-Control Scale (BSCS)

		Not at all	To a small extent	To some extent	To a moderate extent	To a large extent
1	I am good at resisting temptation.					
2	I have a hard time breaking bad habits.					
3	I am lazy.					
4	I say inappropriate things.					
5	I do certain things that are bad for me, if they are fun.					
6	I refuse things that are bad for me.					
7	I wish I had more self-discipline.					

8	People would say that I have iron self-discipline.					
9	Pleasure and fun sometimes keep me from getting work done.					
10	I have trouble concentrating.					
11	I am able to work effectively toward long-term goals.					
12	Sometimes I can't stop myself from doing something, even if I know it is wrong.					
13	I often act without thinking all the alternatives.					

APPENDIX 15- Scale of Effects of Social Media on Eating Behaviour

Scale of Effects of Social Media on Eating Behaviour (SESMEB)

		Never	Seldom	Sometimes	Often	Always
1	Inclusion of a food on social media influences my view of that food					
2	When I use social media I forget that I am hungry					
3	I see and consume any food on social media that are not my food habit					
4	Even though I'm full, I eat a food/dish I see on social media					
5	When I see a news headline about foods/dishes/nutrition on social media, I read the continuation/content of the news					
6	When I see a new food on social media, I search its content					
7	I think that the foods on social media are more beneficial for health					

8	When I see a dish on social media, I look at the recipe and its content					
9	After I started using social media, my fast-food/cook-chill food consumption increased					
10	I follow nutrition news/blogs/pages on social media					
11	Without getting tired I buy/cook a food/dish that I see on social media					
12	I regulate my diet according to shared news/photos/videos about the foods/dishes I see on social media					
13	I am constantly snacking when surfing on social media, and I realise how much I’ve eaten later					
14	I am interested in foods/dishes shared by celebrities on social media and I consume that food/dish					

15	If I did not use social media, my time for eating would be reduced					
16	When surfing on social media, even though I am full I am snacking					
17	I consume foods/dishes shared by people who have a lot of followers on social media					
18	I think foods/dishes with more like/share on social media are healthier					
19	The foods/dishes that I see on social media arouse my desire to eat					
20	I consume foods/dishes with more news/photo/video likes on social media					
21	I think that foods/dishes with more like/share on social media are more reliable					
22	On the days I use social media for a long time, my desire to eat increases and I eat more					

APPENDIX 16 – Daily Food and Social Media Diary

Daily Food and Social Media Diary

Section 1

1. Welcome Note and Participation ID Request

Section 2

2. For the survey, you will be using your hand a portion measurement, please take a careful look at the photo and complete the measures quested accordingly in the next segments of the survey.

Hand Symbol	Equivalent	Foods	Calories
	**Fist** 1 cup	Rice, pasta Fruit Veggies	200 75 40
	**Palm** 3 ounces	Meat Fish Poultry	160 160 160
	**Handful** 1 ounce	Nuts Raisins	170 85
	**2 Handfuls** 1 ounce	Chips Popcorn Pretzels	150 120 100
	**Thumb** 1 ounce	Peanut butter Hard cheese	170 100
	**Thumb tip** 1 teaspoon	Cooking oil Mayonnaise, butter Sugar	40 35 15

Section 3

3. Did you have breakfast today?

Yes

No

4. Who prepared your breakfast?

Prepared by me

By other but homemade

Bought – Ready-To-Eat

Other, Specify

5. Did you have cereals for breakfast?

Yes

No

6. What cereals did you have? (choose as many options as applicable and indicate how much

you had based on your handful -half a handful,

one handful, one and a half handful, two hundfuls etc.)

High Fibre Cereals (such as Porridge, Muesli, Bran Flakes, All Bran)

Other Cold Breakfast

Cereal (such as Light 'n' Tasty, Special K, Weetbix)

Flavored

Sugar-coated

Other (Please, specify what, exactly and how much did you have)

7. Did you have any Bread and/or Savory/Sweet Biscuits (such as White bread, Brown bread, Scones, any kind of savoury biscuits).

Yes

No

8. What bread and/or savoury/sweet biscuits did you have for breakfast? (next to your answer you can write how much you had on each in normal slices or serving -for example, next to Wholemeal choice you can write 1 Tortilla and 2 slices of bread or whatever the case is, next to the Pancakes option you can write 2 servings of pancakes). You can also refer to brands if you had a branded item.

- White Bread including Sliced, Tortilla, Pita etc
- Wholemeal or multigrain bread including Sliced, Tortillas, Pita etc.
- Crackers, Crispbread
- Pancakes, Waffles, Sweet Buns, Scones
- Other (Please, specify what you had and indicate a portion size)

9. Did you have any carbohydrates for breakfast? (such as rice, pasta, noodles, quinoa, beans, couscous etc.)

- Yes
- No

10. What carbohydrates did you have? Please, in the box indicate how much you had based on the fist measurement -half a fist, one fist, one and a half fist, two fists etc.)

- Brown Rice/Wholemeal Pasta
- White pasta/rice/ Couscous

- Other Pasta (such as noodles, tinned)

11. Did you have any dairy products today (such as milk, cheese, butter cream, yogurt, ice cream)?

- Yes
- No

12. What dairy products did you have for breakfast? Please indicate at the box next to the choice how much did you have. (use your fist or thumb based on the measurement criteria of each type of food and indicate how much did you have to the following box, ex. 1/4 fist, 1/3 fist, 1/2 fist, 1 fist, 1,5 fist or half a thumb, one thumb, one and a half thumb, two thumbs etc.)

- Milk (include milk in hot or cold drinks, cereals, soups etc) such as whole milk, low-fat milk, plant-based milk etc. (quantity in fist)
- Flavored milk, evaporated milk, sweetened condensed milk (quantity in fist)
- Ice cream (quantity in fist)
- Cheese (such as Cheddar, Edam, Mozzarella, Brie, Camembert etc.) (quantity in thumb)
- Low-fat cheese (quantity in thumb)
- Cream based dairy such as cream, sour cream, cream cheese, curd etc. (quantity in fist)
- Other (Please, specify what exactly and how much did you have as appropriate)

13. Did you have any spreads/jams for breakfast?

- Yes

- No

14. What spreads/jams did you have? Indicate in the box next to you choice(s) how much did you have in teaspoons. For example, 1/2 teaspoon, 1 teaspoon, 1,5 teaspoons etc

- Jam, Marmalade, Honey
- Marmite, Bovril, Vegemite
- Peanut Butter (or similar nut butters)
- Chocolate Spread (e.g. Nutella or similar)
- Other (Please, specify what you had and indicate a portion size)

15. Did you have any fruits for breakfast?

- Yes
- No

16. What fruits did you have? In the box next to your choice indicate the portion you had as a whole pieces or in case it is a big fruit such as melon, watermelon, pineapple you can indicate how many slices you had.

- Banana
- Apples/Pears
- Citrus fruit: Oranges, Mandarins, Grapefruit, Lemons
- Stone fruit e.g. Apricots, Plums, Nectarines, Peaches
- Other fruit e.g. Kiwifruit, Grapes, Feijoa, Pineapple, Mango, Rhubarb, Tamarillos, Guava, Pawpaw, Melon

- Berries fresh, frozen or canned such as Strawberries, Blueberries etc. (use your fist as as an indicator for the portion you had -for example 1/4 first, 1/2 fist, 1 fist etc.)
- Dried fruit e.g. Raisins, Sultanas, Prunes (indicate in tablespoons the portion)
- Other (Please, specify what exactly and how much did you have)

17. Did you have any vegetables for breakfast?

- Yes
- No

18. What vegetables did you have? In the box next to your choice indicate the portion you had. (use your fist as as an indicator for the portion you had -for example 1/4 fist, 1/2 fist, 1 fist etc.)

- Tomatoes (fresh, canned or tomato sauce)
- Beans or legumes e.g. Green beans, Runner beans, Baked beans, Lentils, Chickpeas
- Salad Greens e.g. Lettuce, Cucumber, Celery, Rocket Other Greens: Broccoli, Cauliflower, Spinach, Silverbeet, Cabbage, Brussel Sprouts, Bok choy, Chinese cabbage, Watercress, Puha
- Onions, Leaks
- Potatoes, Kumara, Pumkin
- Other Root Vegetables e.g. Carrot, Beetroot, Parsnip, Turnips, Yams
- Other Vegetables e.g. Corn Mushrooms, Asparagus, Courgette, Eggplant, Capsicum, Peas, Coleslaw

- Other (Please, specify what and how much you had using the fist measurement)

19. Did you have any protein for breakfast? (such as eggs, meat, chicken, fish, meat alternatives etc.)

- Yes
- No

20. What did you have of protein? In the box next to your choice indicate the portion you had.

- Eggs (Indicate how many you had -1 egg, 2 eggs etc)
- Sausages, Hotdogs (Indicate how many you had - 1 sausage/hotdog, 2 sausages/hotdog)
- Salami, Ham, Bacon or other proceeded meat (indicate how much you had on the basis of the palm-1/2 palm of bacon, 1 palm of ham etc.)
- Beef, Pork or Lamb (indicate how much you had on the basis of the palm-1/2 palm of beef, 1 palm of pork etc.)
- Chicken and other poultry (e.g. turkey) (indicate how much you had on the basis of the palm-1 palm of chicken etc.)
- Tuna, Salmon, Sardins, Prawns and other fish and/or seafood (indicate how much you had on the basis of the palm-1 palm of Salmon, 2 palms of prawns etc.)

- Veggie/Soy/Nuts/Beans based burgers or sausages (ex. Beyond Meat, Quorn) (indicate how much you had on the basis of the palm-1 palm of beef, 2 palms of pork etc.)
- Other (Please, specify what and how much you had using the fist measurement)

21. Did you have any fast-food for breakfast?

- Yes
- No

22. What kind of fast-food did you have?

- Hot chips/French fries (indicate how much you had on the basis of your handful - 1 handful of french fries, 1,5 handfuls of french fries etc.)
- Potato chips/Crisps or Corn Chips (indicate how much you had on the basis of your handful - 1 handful of crisps, 2 handfuls of chips etc.)
- Pizza (Indicate how much typical size slices you had)
- Hamburgers (indicate how many medium size hamburgers you had)
- International Takeaway such as Chinese, Thai, Greek, Turkish, Indian etc.. (indicate how many servings you had – 1 serving of Thai food)
- Other (Please, specify what exactly and portion as appropriate)

23. Did you have any sweets/snack foods (such as chocolate bars, biscuits, brownies, nuts) for breakfast?

- Yes
- No

24. What kind of sweet/snack foods did you have?

- Chocolate / Chocolate bars (indicate how many squares you had or use your palm as a measurement)
- Sweets, Lollies (indicate how much you had on the basis of your handful -half a handful sweets, 1/3 of a handful lollie etc.)
- Biscuits (indicate how many you had - 2 biscuits, 3 biscuits etc.)
- Cake, Brownie, Croissant, Pie, Brioche, Pudding. Fudge (indicate how much you had in servings - 1 serving of brioche, 2 servings of brownies etc.)
- Nuts, seeds (indicate how much you had on the basis of your handful - 1 handful of cashews, 1,5 handful of almonds etc.)
- Other (Please, specify what exactly and how much did you have)

25. Did you use any oils or/and seasoning for your breakfast? Even for the making processing.

- Yes
- No

26. What kind of oils or/and seasoning did you have?

- Fats such as butter or margarine. (indicate how much you had in tablespoons - such as 1/3 Tbsp of butter, 1/2 Tbsp of margarine etc.)
- Oils such as olive oil, vegetable oil, mayonnaise, salad dressing (indicate how much you had in tablespoons -such as 1 Tbsp of olive oil, 1/2 Tbsp of mayonnaise etc.)
- Iodized salt (indicate how much you had in pinches -1 pinch of salt etc.)
- Other (Please, specify what exactly and how much did you have)

27. Did you have any beverage for breakfast? (Indicate how many cups did you have)

- Tea
- Coffee
- Soft Drink (Coca-Cola, Pepsi, Diet Coke, Dr Pepper, Sprite, Coke Zero, Fanta, Lipton etc.)
- Fruit Based juice -No added sugar (for example, squished oranges)
- Wine
- Beer
- Other alcoholic drink (Please, specify)
- Water
- Other beverage (Please, specify)
- I did not have any beverage

28. Summarize in your own words what you had for breakfast.

Section 4

29. Did you have lunch today? (Including beverages)

Section 5

30. Did you have dinner today? (Including beverages)

Section 6

31. Did you have any in-between-meals today? Such as snacks.

32. What kind of snacks/food did you have? Here you can list all the foods you had in between meals such as fruits, vegetables, chocolate bars, cereal bars, fastfoods etc. For each entry, specify portion as appropriate.

Section 7

33. Have you checked your Instagram account today?

- Yes
- No

34. How much time did you spend on Instagram today?

- Less than 30 minutes
- 30-60 minutes
- 1-2 hours
- More than 2 hours

35. Have you seen any food-related post in your feed today?

- Yes
- No

35. What kind of food/snacks were they? (From 0 -Mostly Healthy to 5 -Mostly Unhealthy)

0 1 2 3 4 5

36. How much do you think the food related content you saw online influence your daily food consumption? (From 0 -Not at all to 5 -Very much)

0 1 2 3 4 5

37. How much the food related content you saw on Instagram affected your emotional state? (From 0 -Not at all to 5 -Very much)

0 1 2 3 4 5

38. The food content on Instagram gave me enjoyment feelings today (From 0 -Not at all to 5 -Very much)

0 1 2 3 4 5

39. The food content on Instagram gave me feelings of dissatisfaction today (From 0 -Not at all to 5 -Very much)

0 1 2 3 4 5

40. How much do you have desire to eat something delicious after seeing something delicious on your Instagram feed today? (From 0 -Not at all to 5 -Very much)

0 1 2 3 4 5

41. The food content I saw on Instagram today made me want to eat more (From 0 -Not at all to 5 -Very much)

0 1 2 3 4 5

42. I feel proud of myself resisting to temptation on Instagram today (From 0 -Not at all to 5 -Very much)

0 1 2 3 5

43. Did you upload or repost any food related content on Instagram today?

- Yes
- No

44. How likely do you think it is that if you have not been exposed to food related content you would have healthier food choices for your meals? (From 0 -Very unlikely to 5 -Very likely)

0 1 2 3 5

45. How much of food related content on your Instagram feed today comes from your friends? (Move the slider to the approximate percentage)

0 10 20 30 40 (…) 80 90 100

45. How much of food related content on your Instagram feed today comes from food related accounts? (Move the slider to the approximate percentage)

0 10 20 30 40 (…) 80 90 100

46. Did you perform any mindfulness exercise today?

- Yes
- No

47. How much time did you spend on the mindfulness exercise?

- 5-15 minutes
- 15-30 minutes
- More than 30 minutes

APPENDIX 17 – Foods Accounts Followed by Participants

Food Accounts participants reported

Proper_Tasty	Blondiebakes_	DessertBae
Tasty	Ldnibbles	Foodslut
Ektorasbotrini	Cznburak	RestaurantCravings
BuzzFeedTasty	Sabrina Ghayour	MrChef
Bingingwithbabish	Sunday Brunch	The_bare_scientist
Emmymade	Knackeredmother	Bakemanbegins
Pleasurewithoutmeasure	Accidentally Vegan	Migratefuluk
RealFooding	MyVegan	Thekoreanvegan
YorkOnaFork	FoodyEating	Thefoodietakesflight
Bread_Pitt_Foodie	Foodaddict1._	York_vegan
Leedsgems	Twisted	Theveggiefeed

Oxclub	Hungry Twins	Nigella Lawson
Veeb_eats	Soyummy	Britishbakeoff
The food medic	Myfoodcraving	Doe bakehouse
Vegdeats	MassiveCravings	Outofofficebaker
avoiceofvegan	Vegan card	Remembermetearooms
TasteMadeUk	Sussex ranger	Markwiens_thefoodblogger_fp
Gurmefoodreal	Helenarosecope	Migrationology
Akispetretzikis	Foodbible	Minimalistbaker
Madamegingercom	Healthbytss	Thevegankindsupermarket
My.Food.Craving	Katalyshealth	Vegan_edi
Smoothie.simple	Londonfoodbabes	Goodoldvegan
Not_bad_scran	London.mouthful	Dailyhealthysalads
The gareden	Foodporn	Stamfeast and foodie

Yorkfoodanddrink	Missminifier	Juicygrill_athens
Yorkshirefoodguide	Bbcfood	Samseats
Nutritionsupport	Foodnetwork	Onlyscrans
Wine & Taste	Cucinabotanica	sinosfavorites
Keto Diet & recipes	Cooker.girl	Benandjerrysuk
Keto_personal_diet	Samhollandfood	Perfectlyaveragebaker
Female6packguide	Gordongram	
Amator.gurmelique	Sparkyork	