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Social Media Drives Sustainable Food Consumption in Generation Z

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Abstract

This research investigates how social media marketing activities (SMMAs) influence sustainable food consumption behavior of consumers from Generation Z in restaurant industry. This research explores direct impact of SMMAs (i.e., customization, trendiness, informativeness, interaction, and word of mouth) on consumer sustainable consciousness and mediating role of consumer sustainability consciousness in fostering sustainable purchase intention which is based on Theory of Planned Behavior (TPB) and Stimulus Organism Response (SOR) framework. Data were collected from 633 Generation Z respondents through an online survey and analyzed using the PLS-SEM technique. The results reveal that all dimensions of SMMAs significantly influence consumer sustainability consciousness, which in turn positively influences sustainable purchase intention and subsequently drives sustainable food consumption behavior. By integrating S-O-R with TPB, this study extends prior research by explaining how social media stimuli shape sustainability consciousness and strengthen the attitude–intention–behavior link, offering deeper insights into sustainable consumption among young consumers.

Keywords: Social Media Marketing Activities, Consumer Sustainability Consciousness, Sustainable Purchase Intention, Sustainable Food Consumption Behavior

Introduction

The UN established the SDGs in 2015 as a worldwide roadmap for a more sustainable society by 2030. SDG 12, which addresses the growing environmental, social, and economic challenges of unsustainable lifestyles, is crucial among the 17 goals. SDG 12 emphasizes on sustainable consumption and production patterns. Sustainable consumption is the central objective of SDG 12 that focus on reduction in environmental pressure and responsible use of resources. Modern consuming habits cause about 40% of worldwide environmental degradation (Cheah & Aigbogun, 2022), highlighting the need for systemic reform. Food is one of the three most environmentally damaging sectors, along with mobility and clothes (Azzurra et al., 2019). The largest contributor to greenhouse gas emissions, food systems account for 30% of global emissions, and its effects

include ecological degradation, social inequality, and economic inefficiency. As per Sánchez-Fernández et al. (2021), this sector's significant contribution to climate change requires prompt and coordinated interventions to align consumption and production with sustainability (Panatsa & Malandrakis, 2024). Food and Agriculture Organization (2023) predicts an increasing global population. Thus, pollution, ecological imbalance, and public health issues will rise. Thus, the earth cannot meet such enormous demands without major consumption and production reforms. Responsible consumption and production (Kirmani et al., 2023), food waste reduction (Attiq et al., 2024), and agricultural yield technology investment (Lin & Luan, 2020) are examples. Global food waste in 2024 was 1.05 billion tons, including 60% in households, 28% in food services, and 12% in retail (United Nations Environment Programmes, 2024). However, one in eleven people worldwide are hungry, and 864 million went without food for a day or more (State of Food Security and Nutrition in the World, 2024). World Health Organization (2015) estimates that unhealthy food and drinking water cause over 200 diseases and two million deaths annually. The aforementioned background suggests that food products are acquired, utilized, and thrown carelessly, threatening humanity and sustainable development. Consumption patterns are evolving (Reisch et al., 2021), and sustainable consumption behavior is emerging as a primary area of research (Saulais & Espougne, 2024).

Food intake significantly impacts the ecosystem (Duchin, 2008). Sustainable food consumption is crucial for conserving natural resources for future generations (Kamenidou et al., 2019). Recent years have seen a focus on examining sustainable practices within the food production chain and methods for incorporating environmental consciousness into the food supply chain (Deprá et al., 2022). eating-related decisions are significantly influenced by contextual factors, with sustainability considerations contending against benefit uncertainty (Fennell & Bowyer, 2019), negative attitudes towards novel dietary options (Chan et al., 2014), and established eating habits (Flaherty et al., 2018). Consequently, it is not surprising that a considerable attitude-action disparity exists in sustainable food consumption (Arya et al., 2024). Therefore, it is essential to examine the elements that influence individuals' intentions and decision-making about sustainable food consumption (Arya et al., 2024; Attiq et al., 2024; Khan et al., 2024; Phan, 2024; Zhao et al., 2025).

Nonetheless, the escalation of food waste in restaurant poses an important threat to environmental sustainability. It is essential to investigate elements influencing users' sustainable food consumption behavior within food industry (Mensah et al., 2023). Moreover, it is essential to investigate impact of SMMAs on consumers' attitudes and actions regarding sustainable food purchases, specifically in relation to sustainable consumption (Chu et al., 2023). Therefore, we want to understand the perspectives linked to these restaurant client actions.

The current body of work on sustainable food consumption by consumers identifies several outstanding concerns. Most studies have pinpointed the factors and incentives for sustainable food consumption, commencing with qualitative research (Hajdari, 2023; Vargas et al., 2021). Secondly, investigations into strategies for promoting sustainable food consumption among consumers are scarce, underscoring the necessity for further research (Arya et al., 2024; Chu et al., 2023). Third, efforts to promote sustainable food consumption have been overlooked (Attiq et al., 2024). Fourth, it is essential to investigate sustainable food consumption behaviors and the distinct tendencies of young consumers (Doan et al., 2025; Kamenidou et al., 2019). Generation Z is the most significant consumer demographic, exhibiting heightened environmental awareness (Attiq et al., 2024; Sethuraman et al., 2023). Finally, food service firms have inadequately employed marketing tactics like SMMAs to enhance buyer knowledge and shape their intentions and behavioral tendencies concerning sustainable food consumption (Chamcham et al., 2024; Gulati, 2022). Moreover, in Pakistan, there is a necessity for study on sustainable food consumption due

to the nation's environmental challenges, food security issues, and evolving consumer lifestyles. Generation Z, a significant and impactful demographic, exhibits heightened social connectivity, environmental consciousness, and receptiveness to digital marketing (Attiq et al., 2024). Understanding sustainable consumption is crucial for promoting environmentally friendly eating practices, directing enterprises towards responsible strategies, and advancing national sustainability objectives.

The aim of current research is to investigate the impact of SMMAs on sustainable food consumption behavior. It aims to attain a thorough comprehension of behavior of Generation Z to improve sustainable food consumption by considering their distinct traits and viewpoints. The research seeks to enhance the understanding of sustainable food consumption and illuminate realistic solutions to this urgent issue.

Generation Z is a highly relevant cohort for studying sustainable consumption due to their strong digital nativity and intensive use of social media platforms for information, engagement, and decision-making (Djafarova & Bowes, 2021; Priporas et al., 2017). Compared to other generations, Gen Z is more exposed to social media marketing activities, which significantly shape their attitudes and consumption preferences (Lou & Yuan, 2019). Moreover, this generation shows increasing awareness of environmental issues and a stronger inclination toward sustainable and ethical consumption choices, making them an ideal group for examining sustainability consciousness and sustainable food consumption behavior (Wyrwa et al., 2023).

The proliferation of information and communication technology globally has catalysed the emergence of social media marketing (SMM) in recent years (Mason et al., 2021; Sharma et al., 2022). Social media marketing (SMM) has emerged as a crucial marketing instrument for influencing potential consumers, particularly the younger generation, to acquire food goods (Wibowo et al., 2020). Social media has significantly captivated the younger generation, particularly Generation Z (Dubbelink et al., 2021). The posting maintains their engagement and has emerged as a reliable source of information for them (Magbanua et al., 2021; Sadom, 2022). Generation Z, also referred to as Zoomers or centennials, encompasses those born between 1997 and 2012. Similar to their global peers, Generation Z in Pakistan is proficient in digital technology, regularly engages with it, and possesses inherent abilities to interact on social media (Tjiptono et al., 2020).

Furthermore, the theory of planned behavior (TPB) and the stimulus–organism–response (S–O–R) framework are presented to enhance understanding. The Theory of Planned Behavior (TPB) is a recognized psychological framework that can be utilized to elucidate and predict human behavior, particularly with food consumption. The paradigm posits that an individual's mood, subjective norms, and perceived behavioral control all influence behavioral intention. In our study, we employed consumer sustainability consciousness as an attitude. Moreover, in the Theory of Planned Behavior, intention is the exclusive precursor of behavior. In this study, we utilized intention as a singular element directly influencing sustainable food consumption behavior (Arya et al., 2024). Likewise, the precursors of intention are external environmental influences, specifically SMMAs. The S–O–R theory, rooted in environmental psychology, elucidates the impact of external stimuli on consumer behavior. The S–O–R theory posits that an external stimulus (S) influences an organism (O), leading to a behavioral response (R) from the organism. For instance, SMMAs act as an external stimulus, modifying consumers' awareness of sustainability and thus influencing their intentions to shop sustainably and their sustainable food consumption behaviors within Generation Z (Khan et al., 2024; Phan, 2024).

In recent years, the restaurant industry has increasingly recognized the importance of addressing sustainability concerns, particularly concerning sustainable consumption in food and beverages. This study provides actionable insights on how social media marketing may successfully engage

Generation Z and promote sustainable food consumption in restaurants. Food enterprises can enhance sustainability awareness among young consumers by leveraging SMMAs: personalization, trendiness, informativeness, engagement, and word-of-mouth communication. Restaurants and hotels can develop digital advertising, sustainable menu selections, and interactive platforms that attract this demographic, so insuring enduring competitiveness and promoting sustainable food practices within Pakistan's food industry. Due to the study's possible impact, Generation Z will be compelled to re-evaluate their dietary habits.

Literature Review

Theoretical Background

Sustainable food refers to ecologically friendly food produced in a manner that safeguards the environment and natural resources, including air, water, and soil, while utilizing less energy (Chu et al., 2023). Understanding the elements that influence consumer behavior in sustainable food is essential, and there is an immediate necessity for comprehensive understanding in this area (Filimonau et al., 2023). Arya et al. (2024) employed the theory of planned behavior to forecast sustainable food consumption. The TPB is regarded as responsible for forecasting elements influencing sustainable food consumption (Arya et al., 2024; Chu et al., 2023; Gandhi et al., 2025; Zhao et al., 2025). The TPB was integrated with additional theories to elucidate consumer behaviors, aiming to uncover latent aspects of these behaviors from alternative viewpoints, such as the Stimulus-Organism-Response (S–O–R) framework (Attiq et al., 2024).

The integrative model put out in this work is theoretically based on the S–O–R model (Russell & Mehrabian, 1974), which was updated by Jacoby (2008). According to the S–O–R model, certain environmental features or stimuli (SMMAs) cause consumers to experience a cognitive and emotional state known as consumer sustainability consciousness. This leads to behavioral responses, such as purchase intention and sustainable food consumption behavior (Robert & John, 1982). For a number of reasons, the application of the S-O-R model as a comprehensive theory is relevant to the current study. Prior studies on consumer behavior in sustainable food consumption have mostly used the S-O-R model (Khan et al., 2024; Phan, 2024; Teangsompong & Sawangproh, 2024).

The S-O-R framework and TPB are particularly appropriate for this study as they provide a complementary explanation of sustainable consumption behavior in digital environments. S-O-R explains how social media marketing activities (stimuli) shape consumers' internal sustainability consciousness (organism), while TPB explains how this cognition translates into intention and actual sustainable food consumption behavior. Recent research highlights that Gen Z's eco-behavior is strongly influenced by algorithm-driven content exposure, influencer marketing, and interactive social media environments, making these theories more suitable than traditional behavioral models that do not capture digital stimulus effects.

Sustainable Food Consumption

The notion of consumption is predicated on the notion of property. Consumption typically refers to the utilization of both physical and intangible resources by the final consumer. The notion of sustainable consumer behavior was established at the Oslo Symposium in 1994 (Doan et al., 2025). Essentially, all consumption commences with a purchasing decision. The extended duration of product usage by the end consumer correlates with increased sustainability (Kropp, 2019). The ethical considerations of consumers are closely associated with sustainable consumption as they make purchasing decisions (Figueroa-García et al., 2018). Sustainable consumption encompasses both qualitative and quantitative alterations to the basic notion of consumption (Bulut et al., 2017).

The alteration pertains to the necessity for mankind to utilize natural resources judiciously, both presently and in the future, to acknowledge limitations (Vantamay, 2018). This indicates that the fulfillment of individual demands, encompassing the ecological and socio-economic circumstances of all current and future inhabitants, is unaffected (Geiger et al., 2017). To fulfill this criterion, individuals must balance self-sufficiency with constrained resources (Vantamay, 2018).

Sustainable consumer behavior is characterized by actions that fulfill fundamental requirements, such as shelter and nourishment, thereby enhancing overall quality of life. The conduct of mankind can be comprehended as the summation of the activities of every person (Geiger et al., 2017). The sustainability of consumption primarily considers the ecological system's sustainability (Vantamay, 2018). Product waste significantly contributes to the issue and should be eliminated to the greatest extent feasible (Bulut et al., 2017; Figueroa-García et al., 2018). Consumption encompasses three domains: the procurement, utilization, and disposal of products and services (Geiger et al., 2017).

In recent years, significant alterations have occurred in human consumer behavior (Mainardes et al., 2021). Presently, individuals are not behaving as sustainably as required to safeguard our natural foundation of existence (Kropp, 2019). The demand for natural resources is escalating concurrently with population growth and consumption (Bulut et al., 2017). This results in the contamination of water, soil, and air with toxins, the destruction of rainforests, and the irreversible extinction of species (Kropp, 2019). There is an urgent necessity to establish alternative sources to alleviate the strain on the environment and to promote conscious consumption among individuals, specifically emphasizing avoidance of excess consumption, frugality, and understanding (Bulut et al., 2017; Figueroa-García et al., 2018). Challenges in the implementation of conscious consumption stem from a lack of requisite knowledge among individuals. Furthermore, there is an absence of accountability and the consequent expenses. It is important to note that individuals might engage in unsustainable lifestyles even when purchasing sustainable products. It primarily depends on the individual's lifestyle (Kropp, 2019).

The research on sustainable food consumption is young and presents a varied range of definitions. Sustainable Development Commission (2005, 2009) provides a comprehensive definition of sustainable food consumption, asserting that it must fulfill safety, political, and environmental criteria, including safe, healthy, and nutritious diets for all; sustainable livelihoods for producers, manufacturers, retailers; animal welfare; environmental protection; biodiversity preservation; energy conservation; and minimal waste generation.

Social Media Marketing Activities

Social media (SM) is a significant aspect of daily life for persons of many ages and countries worldwide. The utilization of social media is pervasive. Backlinko conducted a survey in 2021 and concluded that from its inception in 1996, the number of social media users had significantly increased. As of now, 63% of the worldwide population engages with social media (Backlinko, 2021). Social networking platforms, blogs, and virtual communities exemplify social media. The majority of these platforms are frequently utilized for social media marketing (SMM) due to their projected ability to enhance revenue. Social media marketing (SMM) is the process by which individuals are incentivized to establish their online presence through social media platforms to market their products and services, thereby attracting the attention of a global audience (Bushara et al., 2023).

SMMAs is an instrument for developing and interactive marketing tactics by cultivating relations in online environment (Ibrahim et al., 2021). The application of SMMAs provides very successful

communication platforms that can impact consumer intents and behaviors. Promoting sustainable food consumption and enhancing awareness is essential for community involvement. Consumers are urged to educate themselves on sustainability via social media, as it emphasizes personal environmental effect and fosters sustainable practices (Simões et al., 2023). SMMAs incorporates five dimensions such as customization, trendiness, informativeness, interaction, and word of mouth (Yadav & Rahman, 2018).

Consumer Sustainability Consciousness

Maidou et al. (2019) indicated that sustainability has three elements i.e., economic, social, and environmental views making it complicated. It is a multifaceted process that necessitates comprehensive understanding and analysis. Sustainability consciousness refers to an individual's understanding of environmental issues, encompassing their knowledge and experiences related to sustainability, including thoughts, emotions, and behaviors (Gericke et al., 2018). Long-term growth requires a robust basis in sustainability knowledge, which will shape individuals' attitudes and behaviors. Knowledge of sustainability enhances individuals' capacity to address environmental and developmental issues (Agbedahin, 2019). A comprehension of sustainability is inadequate; it must be manifested in attitude and behavior (Mihelcic et al., 2003). Sustainability consciousness is the amalgamation of information, attitudes, and behaviors pertaining to sustainability (Olsson et al., 2015).

de Carvalho et al. (2015) delineate five characteristics of consumer sustainability consciousness: sense of retribution, access to information, labeling and peer pressure, health, and crisis scenario. Sense of retribution means that after an awareness boom like the one offered by the book “An Inconvenient Truth” (Gore, 2006), many consumers began to look for alternative goods that would minimize their ecological footprints on people and the planet. A chemical-free product was “good-for-me” because it didn't harm the environment or test on animals. Access to information implies knowledge (e.g., environmental and social media information, internet, etc.): general people' lack of understanding would complicate sustainable product and consumption. Despite the Internet revolution changing how individuals acquire information, education was still necessary. Because of labelling and peer pressure, conscious consumers seek more information before buying, therefore peer advice is usually the first resource. However, labels were the most significant way to acquire information and build consumer trust because more information implies more transparency. Eco-labels help buyers choose low-quality, ecologically responsible products. It helps companies define, market, and promote their eco-friendly products (D’Souza, 2000). As for as health, increasing focus on wellness and healthy living signifies a shift towards greater awareness of purchasing decisions from a "beneficial for me" standpoint (e.g., safeguarding the body against chemicals). Crisis scenarios (e.g., need to avoid superficially wasting money and reorganize domestic expenditures): the belief that sustainable products are generally more expensive, typically linked with a price premium in the market, was not fair or transparent because it would lead to less consumption. Lack of product availability on shelves further showed that this segment's distribution networks are still underdeveloped. In one of Portugal's worst economic crises, the qualitative research showed how families were reevaluating consumption habits to save money and only buy what they needed. This study used de Carvalho et al. (2015)'s multidimensional consumer sustainability consciousness concept.

Hypothesis Development

SMMAs and Consumer Sustainability Consciousness

Digital footprints are pervasive in social media, and advancements in massive amounts of data have enabled the development of novel content customization methods that more accurately target messages. “Customization” denotes the modification of products or services to satisfy the distinct demands and preferences of individual consumers (Aggarwal & Mittal, 2022). The previous work indicates that social media technologies can customize experiences, resulting in favorable outcomes for particular customers and impacting overall efficacy of user-company relations (Bushara et al., 2023). Personalized adverts more effectively capture clients' attention and sustain their engagement, though they are not consciously acknowledged or accessed more frequently. Consequently, it is plausible to assert that personalization on social media significantly influences the sustainability awareness of Generation Z consumers, thereby promoting sustainable food consumption.

H1a: Customization positively influence consumer sustainability consciousness.

The term "trendiness" refers to the capacity to convey contemporary and current information regarding products, services, or subjects (Aggarwal & Mittal, 2022). The study acknowledges the significance of trendiness in providing consumers with up-to-date information, but it does not specifically show a link between trendiness and Generation Z consumers' sustainability awareness in promoting sustainable food consumption (Bushara et al., 2023). Other logics, however, can need for additional research or the collection of empirical evidence. By using social media channels to provide real-time information on products and services through suitable methods, businesses can effectively inform and sustain customer knowledge on food waste reduction. Businesses can increase awareness and spark interest in their goods and services by putting up pertinent ads that highlight the benefits of eating more sustainably. Consequently:

H1b: Trendiness positively influence consumer sustainability consciousness.

The utilization of social media marketing for information dissemination facilitates the effective transmission of hostile environmental influences and the promotion of sustainable practices, therefore aiding collaborative efforts to confrontation of social challenges like sustainable food consumption. In the context of SMMAs, "informativeness" refers to the extent to which advertising materials offer significant information, thus increasing understanding of products, services, and social issues (Aggarwal & Mittal, 2022). Social media capability to spread knowledge improves communication about adverse environmental effects and encourages sustainable behaviors, which supports group initiatives to address societal challenges such as sustainable food consumption (Bushara et al., 2023). It may infer that information disseminated on social media significantly influences the sustainability awareness of Generation Z consumers, hence promoting sustainable food consumption. We proposed;

H1c: Informativeness positively influence consumer sustainability consciousness

Users can choose how often they use the social media site and have real-time control over the style and content of their communications because to its interactive features. Consumers can interact with others who share their interests, exchange information, and have two-way conversations (Aggarwal & Mittal, 2022). Consumer behavior is significantly influenced by the degree of interaction on social media platforms, particularly when it comes to issues as waste of food (Sutinen & Närvänen, 2021). Users can engage with one another on social media by writing, sharing, and reading messages from others opposing food waste. The connection facilitates individuals in persuading others to adopt sustainable consumption and enables social groups to interact regarding this issue. It can be inferred that social media involvement significantly influences the sustainability awareness of Generation Z consumers, hence promoting sustainable food consumption.

H1d: Interaction positively influence consumer sustainability consciousness

Word of mouth is explained as how consumers utilize internet to instruct other consumers relating to products, services, or social concerns (Aggarwal & Mittal, 2022). Recent studies show a clear correlation amongst social media marketing campaigns and behavioral goals, such as reducing food wastage (Chuah et al., 2023). For instance, when patrons express their positive experiences with restaurants' efforts to enhance sustainable consumption of food, they may successfully promote and create a positive relationship with them. Therefore, it is reasonable to assume that social media word-of-mouth (WOM) has a significant influence on Generation Z consumers' sustainability consciousness.

H1e: Word of mouth positively influence consumer sustainability consciousness

Consumer Sustainability Consciousness and Sustainable Purchase Intention

Developing countries consumers are become more conscious of environment and willing to change their behavior to protect it (Greendex, 2012). Interestingly, developing nations customers are more conscious than those in the US, UK, Brazil, Russia, and other countries. Additionally, Raj et al. (2023) looked at how customers have become more conscious of sustainability and are more likely to make sustainable purchases since COVID-19. According to Danciu (2015), customers that are informed and conscious of sustainability modify their purchase habits appropriately. Additionally, Chang and Fong (2010) confirmed that consumers prefer sustainable goods. Sustainability consciousness increases purchase intentions for sustainable products in a positive way (Kumar et al., 2018). According to Chen and Chang (2012), customers who are concerned about sustainability are more likely to make sustainable purchases because they are aware of and knowledgeable about the environment than consumers who are not. Panda et al. (2020) showed that the intention for making sustainable purchases and sustainability awareness were positively correlated. Similarly, consumer sustainability awareness favorably affects sustainable purchasing intentions (Attiq et al., 2025; Tripathi & Kapoor, 2024). The aforementioned literature substantiates the association between sustainability awareness and the intention to purchase sustainably; however, it would be intriguing to explore this relationship within the unique cultural factors of Pakistan, which may significantly influence the intention to acquire sustainable food products in that context. Comprehending these fundamental factors could yield significant insights for enterprises and authorities seeking to foster sustainable consumption in Pakistan. In light of the preceding debates, we assert:

H2: Consumer sustainability consciousness positively influence sustainable purchase intention

Sustainable purchase intention and Sustainable Food Consumption

Researchers established a robust correlation between intention and actual behavior (Ajzen, 1980). This study regards intention as a characteristic that influences behavior. The theory of planned behavior posits that intention is the primary determinant of human behavior (Ajzen, 1991; Verbeke & Vackier, 2005). The intention is the factor that drives food consumption behavior. Researchers such as Kim and Hunter (1993) recognized intention as a behavioral predictor. Vermeir and Verbeke (2008) asserted in their study that a robust purpose can precipitate behavioral action. Persson (2013) contended that the "direct relation between intention and behavior" is far more robust than the associations of other variables with intention. Consequently, the subsequent hypothesis is posited:

H3: Sustainable purchase intention positively influence sustainable food consumption behavior

Consumer Sustainability Consciousness as Mediator

Previous literature suggested that SMMAs influence consumer perceptions by offering customized, trendy, and informative content with interaction and word of mouth that increase the

awareness of sustainability (Ilieva et al., 2024; Shao, 2024; Thomas et al., 2023). While, consumer sustainability consciousness is the individuals' awareness and concerns for social and environmental perspectives of consumption that play significant role in transforming external marketing stimuli (SMMAs) into buying decisions. Hence, consumer sustainability consciousness can mediate relations between SMMAs and sustainable purchase intention. Thus, we proposed following hypotheses.

H4a: Consumer sustainability consciousness mediate relation between customization and sustainable purchase intention

H4b: Consumer sustainability consciousness mediate relation between trendiness and sustainable purchase intention

H4c: Consumer sustainability consciousness mediate relation between informativeness and sustainable purchase intention

H4d: Consumer sustainability consciousness mediate relation between interaction and sustainable purchase intention

H4e: Consumer sustainability consciousness mediate relation between word of mouth and sustainable purchase intention

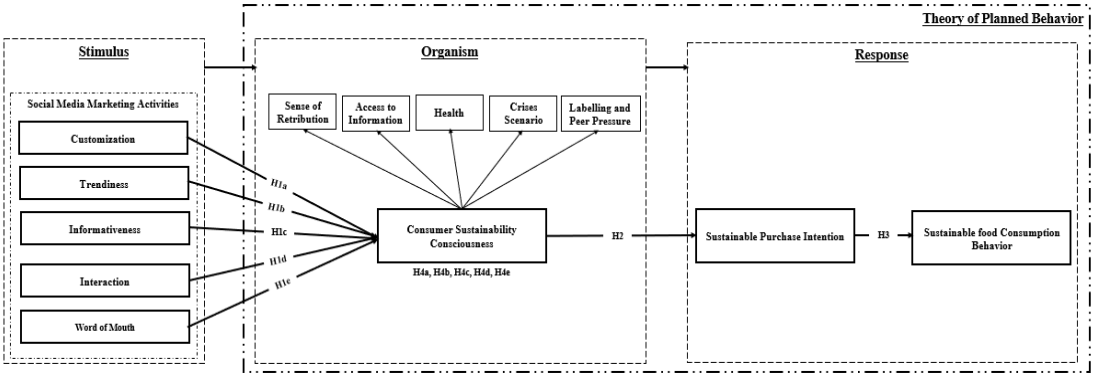


Figure 1: Theoretical Framework

Research Methodology

Data Collection Procedures

For this quantitative research, a non-probability sampling technique i.e., convenience sampling is adopted to collect data (Attiq et al., 2023). This sampling technique helps to target the Generation-Z and is cost effective. Convenience sampling was adopted due to the absence of a comprehensive sampling frame for Gen Z social media users, making probability sampling impractical in this context. Given the study's focus on digitally active consumers engaged in online platforms, convenience sampling is widely considered appropriate in social media and consumer behavior research to ensure timely and relevant data collection. Moreover, prior studies in digital marketing and sustainability domains have similarly employed convenience sampling when targeting hard-to-reach, dispersed online populations. Pakistan has substantial number of social media users and grow annually. Generation-Z (age of 28 years) is suitable cohort for assessing sustainable food consumption due to their considerable use of social media. Before data collection, verbal consent was obtained from all participants. For respondents aged 13–16, verbal assent was obtained from the participants, and verbal approval was additionally obtained from a parent or guardian to ensure ethical compliance. Future studies should apply stricter age screening and quota sampling to

improve representativeness. This generation have begun to use social media in early age and interact daily on social media platforms and online communities (Mumtaz et al., 2024). Consumers from different universities in major cities of Pakistan were targeted for data collection about their sustainable food consumption through social media apps i.e., WhatsApp and Facebook. A link was generated to get the final questionnaire. In total, 633 forms were considered for data analysis.

Demographic Profile

Males and females from a variety of age groups and educational levels made up the respondents who took part in the data gathering. Table 1 presents complete details:

Table 1: Demographic Statistics

Demographic	Category	Percentage (Frequency)
Gender	Male	44 (279)
	Female	56 (354)
Age (In years)	13-16	10.60 (67)
	17-20 years	45.65 (289)
	21-24 years	21.64 (137)
	25-28 years	22.11 (140)
Education	High School	9.95 (63)
	Professional degree/vocational school	14.69 (93)
	Bachelors	49.13 (311)
	Masters	21.81 (138)
	Doctorate	4.42 (28)

Measures

All measuring items were evaluated using a five-point Likert scale, with 1 = strongly disagree and 5 = strongly agree. The measuring items were adapted from earlier research. Social media marketing activities (i.e., customization, trendiness, informativeness, interaction, and word of mouth) are measured using scale of fifteen items by Yadav and Rahman (2018). Nineteen items are borrowed from de Carvalho et al. (2015) for evaluating consumer sustainable consciousness with five dimensions. Four items from the work of Matharu et al. (2020) were used to gauge sustainable purchase intention. Four items have taken from Matharu et al. (2020) to quantify sustainable food consumption behavior. Before moving towards final data collection, a pilot study is conducted to ensure understanding of questions and cultural adaptation of measures.

Data Analysis Procedure

We employed PLS-SEM for the analysis. Partial Least Squares Structural Equation Modelling (PLS-SEM) is a statistical method used to model complex relationships among latent and observable variables (Purwanto & Sudargini, 2021). Utilizing PLS-SEM in this context is both prudent and judicious. This study examines innovative or relatively underexplored relationships within the context of sustainable food. PLS-SEM is ideal for exploratory research when the theoretical model is in development or subject to modification. This study employed PLS-SEM because to the model's multi-path complexity, the research's predictive focus, and the exploratory aim of understanding the psychological mechanisms driving sustainable food consumption behavior. Its flexibility to non-normative data and limited sample numbers further justified its application. The two stages of PLS-SEM involve the examination of outer model (measurement model) and an evaluation of inner model (structural model).

Results

Common Method Bias Test

In cross-sectional researches, it is critical to examine common method bias (CMB). The findings of Harman-Single Factor test demonstrated that maximum explained variance was 33.64% which is less than threshold of 40% (Hair et al., 2017). These findings revealed that there is no significant issue of CMB.

Measurement Model

Cheah et al. (2018) suggested that the measurement model assessment have three significant components i.e., discriminant validity, convergent validity, and reliability. The composite reliability (CR), Cronbach's alpha (α), and Dijkstra Henseler (rho_A) values are consistent as in Table 2, as scores are above 0.70 (Hair et al., 2017). These results demonstrate that all variables have good reliability and consistently measured. Further, outer loading scores are above the recommended criterion i.e., 0.70, indicator reliability values are also above the threshold i.e., 0.50 (Hair et al., 2017), and average variance extracted (AVE) values are also exceed the recommended threshold i.e., > 0.50 that confirms the convergent validity (Fornell & Larcker, 1981). Convergent validity values indicated that all constructs are correlated and share a reasonable amount of variance. The fit indices are also tested i.e., SRMR and NFI. The SRMR value is 0.07 which is below the recommended threshold i.e., < 0.08, and NFI values is 0.91 which is above the threshold i.e., > 0.90 (Hair et al., 2017).

Table 2: Measurement Model Evaluation

Construct	**Dimensions**	**Code**	**Loadings** > 0.708	**Indicator Reliability** > 0.50	**α** > 0.70	**CR (rho_a)** > 0.70	**CR (rho_c)** > 0.70	**AVE** > 0.50
Social Media Marketing Activities (Yadav & Rahman, 2018)								
	Customization	CTM1	0.881	0.776	0.885	0.890	0.929	0.813
		CTM2	0.918	0.843				
		CTM3	0.904	0.817				
	Trendiness	TDS1	0.906	0.821	0.878	0.878	0.925	0.804
		TDS2	0.883	0.780				
		TDS3	0.901	0.812				
	Informativeness	IFT1	0.917	0.841	0.869	0.870	0.920	0.793
		IFT2	0.878	0.771				
		IFT3	0.877	0.769				
	Interaction	ITS	0.893	0.797	0.883	0.883	0.928	0.810
		ITS	0.898	0.806				
		ITS	0.909	0.826				
	Word of Mouth	WDM1	0.900	0.810	0.877	0.878	0.924	0.803
		WDM2	0.881	0.776				
		WDM3	0.906	0.821				
Consumer Sustainable Consciousness					0.961	0.962	0.964	0.589

(de Carvalho et al., 2015)	Sense of Retribution	SRB1	0.826	0.682	0.891	0.893	0.917	0.648
		SRB2	0.854	0.729				
		SRB3	0.740	0.548				
		SRB4	0.819	0.671				
		SRB5	0.785	0.616				
		SRB6	0.801	0.642				
	Access to information	ACF1	0.770	0.593	0.822	0.834	0.883	0.654
		ACF2	0.743	0.552				
		ACF3	0.865	0.748				
		ACF4	0.851	0.724				
	Labelling and Peer Pressure	LPP1	0.847	0.717	0.867	0.869	0.909	0.715
		LPP2	0.831	0.691				
		LPP3	0.879	0.773				
		LPP4	0.824	0.679				
	Crises Scenario	CSN1	0.911	0.830	0.802	0.802	0.910	0.835
		CSN3	0.916	0.839				
	Health	HLT1	0.857	0.734	0.832	0.832	0.899	0.749
		HLT2	0.870	0.757				
		HLT3	0.869	0.755				
Sustainable Purchase Intention (Matharu et al., 2020)		SPN1	0.783	0.613	0.854	0.854	0.902	0.697
		SPN2	0.864	0.746				
		SPN3	0.825	0.681				
		SPN4	0.864	0.746				
Sustainable Food Consumption Behavior (Matharu et al., 2020)		SFC1	0.781	0.610	0.792	0.802	0.864	0.615
		SFC2	0.812	0.659				
		SFC3	0.783	0.613				
		SFC4	0.740	0.548				

Note: α- Cronbach's Alpha, CR- Composite Reliability, AVE- Average Variance Extracted

The study assesses discriminant validity using the heterotrait-monotrait (HTMT) ratio. Interestingly, all of the constructs (Table 3) show high discriminant validity because their values remain below 0.90 (Kline, 2023).

Table 3: HTMT Analysis

Constructs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Customization								
2. Trendiness	0.890							
3. Informativeness	0.883	0.883						
4. Interaction	0.897	0.891	0.865					
5. Word of Mouth	0.816	0.867	0.871	0.868				
6. Consumer Sustainable Consciousness	0.783	0.818	0.823	0.812	0.841			
7. Sustainable Purchase Intention	0.805	0.846	0.839	0.835	0.848	0.820		

8. Sustainable Food Consumption Behavior	0.858	0.870	0.836	0.844	0.840	0.871	0.881

Structural Model

Following the examination of the measurement model that confirms validity and reliability, the structural model utilizes the five-step process. To deal with the problem of collinearity, variance inflation factor (VIF) analysis is performed. Table 4 shows that the VIF values are still significantly below 5 (Hair et al., 2017). We conclude from this result that there are no multicollinearity issues with the model.

The hypothesis results are subsequently assessed utilizing the bootstrapping approach with 5000 resamples. From Table 4, we can see that customization (H1a: $\beta = 0.12$, $p < 0.00$) positively affect consumer sustainable consciousness; this indicates if companies use customized social media content for Generation-Z, users probably more conscious about sustainability food's issues and they will start to think positively about what they consume. Trendiness (H1b: $\beta = 0.13$, $p < 0.00$) positively affect consumer sustainable consciousness; this conveys if content related to food become popular and trendy, this will encourage youngsters to think about sustainability when they consume food items. In-formativeness (H1c: $\beta = 0.17$, $p < 0.00$) positively affect consumer sustainable consciousness; this means if companies share valuable and educational content on social media, there are more chances to develop favorable attitude towards choosing sustainable food products. Interaction (H1d: $\beta = 0.13$, $p < 0.00$) positively affect consumer sustainable consciousness; this reveal engaging the generation-Z with social media campaign relating to sustainable food make youngsters more conscious while opting food. Word of mouth (H1e: $\beta = 0.30$, $p < 0.00$) positively affect consumer sustainable consciousness; this denotes if users talk more about sustainable food on social media, youngsters will begin to care about sustainability of food they consume. More, consumer sustainable consciousness (H2: $\beta = 0.83$, $p < 0.00$) positively affect sustainable purchase intention; this reveal user who are more concerned about sustainability have more to intend to shop sustainable food items. Sustainable purchase intention (H3: $\beta = 0.82$, $p < 0.00$) positively affect sustainable food consumption behavior; this denotes users who intend to shop sustainable food items have chances to indulged in sustainable food consumption behavior (also see Figure 2). Table 4 shows that each predictor explained variance (R^2) is 65%, 69%, and 68% in consumer sustainability consciousness, sustainable purchase intention, and sustainable food consumption behavior, respectively.

Table 4: Structural Model Evaluation

Hypothesis	**Path**	**Beta**	**t value**	**p-value**	**R^2**	**VIF**	**f^2**	**Q^2**
Stimulus → *Organism* Consciousness			Consumer Sustainable		0.65			0.38
H1a	CTM → CSC	0.12	3.13	0.00		4.54	0.02	
H1b	TDS → CSC	0.13	3.04	0.00		4.62	0.03	
H1c	IFT → CSC	0.17	4.10	0.00		4.07	0.01	
H1d	ITS → CSC	0.13	3.21	0.00		4.50	0.01	
H1e	WDM → CSC	0.30	8.70	0.00		3.81	0.07	

Organism → Response Intention				Sustainable Purchase	0.69		0.48
H2	CSC → SPN	0.83	48.32	0.00		1.00	2.29
Response → Response Consumption				Sustainable Food	0.68		0.41
H3	SPN → SFC	0.82	48.40	0.00		1.00	2.18

Mediation Analysis

Stimulus → Organism → Response		**Beta**	**t value**	**p-value**	**LCL (5%)**	**UCL (95%)**
H4a	CTM → CSC → SPN	0.10	3.12	0.00	0.04	0.15
H4b	TDS → CSC → SPN	0.11	3.00	0.00	0.05	0.17
H4c	IFT → CSC → SPN	0.14	4.08	0.00	0.08	0.20
H4d	ITS → CSC → SPN	0.11	3.18	0.00	0.05	0.16
H4e	WDM → CSC → SPN	0.25	8.57	0.00	0.20	0.30

CTM- Customization, TDS- Trendiness, IFT- Informativeness, ITS- Interaction, WDM- Word of Mouth, CSC- Consumer Sustainability Consciousness, SPN- Sustainable Purchase Intention, SFC- Sustainable Food Consumption Behavior, LCL- Lower Confidence Limit, UCL- Upper Confidence Limit

The mediation analysis further performed to test the mediation paths. From Table 4, we can observe that consumer sustainability consciousness (H4a: $\beta = 0.10$, $p < 0.00$, LCL = 0.04, UCL = 0.15) mediate the relationship between customization and sustainable purchase intention, this finding indicates that customization enhances Gen Z consumers' awareness and concern for sustainability, which in turn increases their intention to purchase sustainable food products. Further, consumer sustainability consciousness (H4b: $\beta = 0.11$, $p < 0.00$, LCL = 0.05, UCL = 0.17) mediate the relationship between trendiness and sustainable purchase intention, when sustainable food is perceived as trendy, it strengthens consumers' awareness and concern for sustainability, thereby indirectly influencing their sustainable purchase intention. In the same way, consumer sustainability consciousness (H4c: $\beta = 0.14$, $p < 0.00$, LCL = 0.08, UCL = 0.20) mediate the relationship between informativeness and sustainable purchase intention, this finding shows that providing informative content about sustainable food enhances Gen Z consumers' sustainability consciousness, which in turn increases their intention to purchase sustainable food products. Moreover, consumer sustainability consciousness (H4d: $\beta = 0.11$, $p < 0.00$, LCL = 0.05, UCL = 0.16) mediate the relationship between interaction and sustainable purchase intention, this result suggests that interactive features related to sustainable food products enhance Gen-Z consumers' sustainability consciousness, which subsequently increases their intention to purchase sustainable food products. Finally, consumer sustainability consciousness (H4e: $\beta = 0.25$, $p < 0.00$, LCL = 0.20, UCL = 0.30) mediate the relationship between word of mouth and sustainable purchase intention, this result indicates that positive word of mouth about sustainable food products significantly enhances Gen Z consumers' sustainability consciousness, which in turn strengthens their intention to purchase sustainable food products.

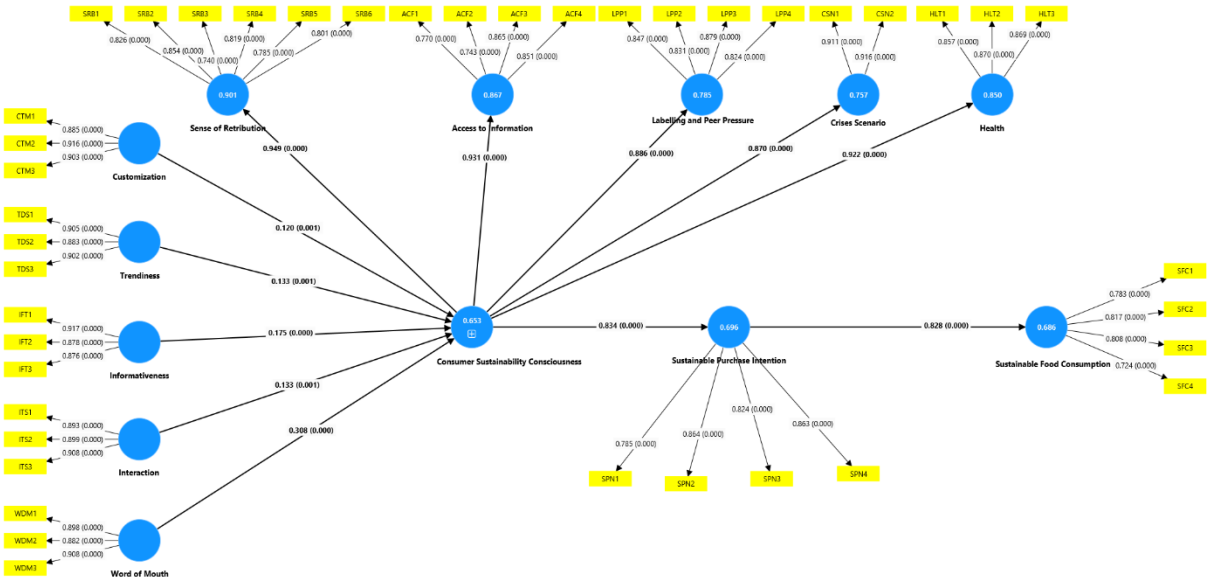


Figure 2: Structural Model Evaluation

Subsequently, the effect size (f^2) was computed to ascertain the relative significance of each pathway (Sullivan & Feinn, 2012). Effect size can be categorized into three classifications: large (0.35), medium (0.15), and small (0.02). Table 4 presents the results of the effect size (f^2). A blindfolding technique is employed to assess the model's predictive relevance (Q^2). The endogenous constructs exhibit Q^2 values exceeding zero, ranging from 0.38 to 0.54, indicating the model's predictive capability (Hair et al., 2017).

Discussion

This research is conducted to investigate how SMMAs shape sustainable consumption patterns of Generation-Z with the lens of TPB and SOR. The study findings provide valuable insights how customization, trendiness, informativeness, interaction, and word of mouth enhance consumer sustainability consciousness, which after drives sustainable purchase intention and sustainable food consumption behavior.

As H1a result revealed that customization enhance the consumer sustainability consciousness. This suggest that consumers feel more engaged and become more aware with sustainability as they are offered more customized marketing contents, products and services. This means customization allows brands to adapt messages and offerings to consumer needs. So, customized contents shape positive attitude towards sustainable practices as recommended by TPB (Khan, 2022; Wolf & Zhang, 2016). Further, customization as stimulus in SOR that evokes mental engagement that help in greater sustainability awareness. Customized offerings increase sustainability consciousness in Generation-Z that motivate them in responsible decision making i.e., sustainable purchase intention and sustainable food consumption. H1b result showed that trendiness favourably influences consumer sustainability consciousness. These finding emphasized that when sustainable products and practices framed as fashionable and modern, the users may internalize sustainability in their lifestyle. On social media, trendiness assists to highlight trendy, up-to-date, and socially relevant information regarding sustainable products. As TPB recommended that trending content can help to shape favorable attitude (Khan, 2022) and SOR perspective, it works as stimulus that trigger enhanced sustainability consciousness as Generation-Z that is highly influenced by trends. H1c result demonstrate that informativeness has positive impact on consumer sustainability consciousness. In social media marketing, when informativeness offers credible and

detailed information about sustainable products to the consumers i.e., Generation-Z, this may make consumers more aware and clearly understand the sustainability. This information minimize uncertainty in consumers and help to form attitudes towards sustainable consumption (Khan, 2022; Ummar et al., 2023). H1d finding revealed that interaction significantly strengthens consumer sustainability consciousness. On social media, interaction provides two-way communication between consumers and brands, facilitate feedback and discussion, and community engagement sustainability. Interaction fosters cognitive and emotional involvement (Khan, 2022) and establishing strong sustainability consciousness in Generation-Z. H1e result indicated that word of mouth positively exerts influence on consumer sustainability consciousness. On social media, word of mouth denotes peer to peer conversation and recommendation about sustainable products. Word of mouth strongly shapes consumers attitudes as Generation-Z is more influenced by their peers. Word of mouth trigger social trust (An & Ngo, 2025) and enhance sustainability consciousness in Generation-Z.

H2 findings confirmed that consumer sustainability consciousness positively drives sustainable purchase intention. This suggests that when consumers are aware with sustainability and environmental issues, they are more motivated to decode this awareness into concrete buying decisions which are align with sustainable values. As consumer sustainability consciousness reflect awareness regarding social and environmental impacts of consumption and favorable attitude (i.e., consumer sustainability consciousness) make sustainable purchase intention in Generation-Z. As Generation-Z which is more eco-aware that deliberately translate sustainability consciousness into sustainable purchase intention (Ilieva et al., 2024; Tripathi & Kapoor, 2024).

H3 results showed that sustainable purchase intention significantly drives sustainable food consumption behavior. TPB predicts behavior when favorable attitudes promote sustainable buying intention, which is the propensity to acquire eco-friendly products. Purchase intention represents response that leads to sustainable consumption behavior. Generation-Z views buying sustainable food as a lifestyle choice based on social and environmental concerns. Thus, higher sustainable buying intention automatically increases sustainable food consumption behavior (Prakash et al., 2024), ensuring consistency between intention and eco-friendly consumption.

Further, H4a-H4e demonstrated that consumer sustainability consciousness mediates relationship between SMMAs and sustainable purchase intention. This means consumer sustainability consciousness plays important role in translating social media marketing activities into sustainable purchase intentions. As per TPB, customization, trendiness, informativeness, interaction, and word of mouth work as antecedents that cultivate attitude i.e., heighten sustainability consciousness. Sustainability consciousness for Generation-Z, helps as a bridge by confirming that engagement with SMMAs not only increases awareness but also translate this awareness into actionable sustainable purchase intention (Attiq et al., 2024; Khan et al., 2024).

Theoretical and Practical Implications

This research has several theoretical implications. First, by investigating the SMMAs i.e., customization, trendiness, informativeness, interaction, and word of mouth on consumer sustainability consciousness (H1a–H1e), it extends the S-O-R framework and TPB in the context of sustainable food consumption. These are novel relationships and past researches majorly focused on purchase intention instead of psychological pathway of sustainability consciousness. Second, the research augments sustainability literature by examining the less studied relation between consumer sustainability consciousness and sustainable purchase intention (H2) (Tripathi & Kapoor, 2024). This study highlights sustainability consciousness as an essential attitudinal variable within TPB that enhance its explanatory power in the domain of sustainable food consumption. Third, by linking sustainable purchase intention to sustainable food consumption

behavior (H3), this research empirically validate intention behavior connection of TPB in the context of sustainable food consumption in Pakistan. Finally, this research advances literature by presenting consumer sustainability consciousness as mediating construct between SMMAs and sustainable purchase intention (H4a–H4e). These mediating relations are novel and offer a sophisticated understanding of how external marketing stimuli are cognitively processed into pro-environmental intentions.

Social media campaigns showcasing the restaurant's sustainable food consumption efforts and raising customer awareness of the implications of neglecting this issue may provoke emotional reactions, increase awareness, and modify behavior. Restaurant publicity materials should highlight sustainable food consumption practices. It is crucial to educate Generation Z customers about food security and its potential implications, including starvation, pain, and environmental destruction. Social media promotions and sustainable food consumption tactics help engage Generation Z shoppers in sustainable consumption. Social media marketing can persuade people to eat sustainably. This raises food awareness in the community. The collective repercussions above help explain how sustainable food consumption becomes more popular. Thus, plans and activities should target customers and the food industry. The research found that restaurants can use SMM to raise awareness, educate, and set social norms to promote sustainable food consumption. Social media allows consumers to share personal experiences and discuss restaurant practices like sustainable food consumption because it is interactive. This communication happens among friends, relatives, and coworkers. Sustainable food consumption practices in restaurants boost WOM. Restaurants use social media to encourage sustainable food consumption and educate customers.

Social Implications

This study examines Generation Z consumers' efforts to improve sustainable food consumption during the stage of food supply chain that involves consumption, which has major social implications. To shape these behaviors, SMMA attributes including information delivery, content customization to personal preferences, interaction enhancement, WOM communication facilitation, and trend reflection are essential. The study explores how SMMA affects Generation Z and underlines the necessity for social media marketing to promote sustainable food consumption. The findings demonstrate that social media may spread knowledge and shape food consumption norms. The study shows that SMMA traits, interactivity, and personalization influence Generation Z's desire to eat more sustainably. Consumers make informed choices based on social media, which influences their sustainable food consumption. Positive WOM and trendy information on social media influence food intake habits and intentions. According to the report, restaurants can use social media to promote sustainable food consumption and attract Generation Z customers. The study emphasizes social media's participatory nature, facilitating customer-restaurant interaction. Using social media marketing, restaurants may improve sustainable food consumption and customer habits and attitudes. In conclusion, social media actively raises consumer awareness, promotes food industry-consumer cooperation, and promotes sustainable food consumption.

Limitations and Future Directions

It is important to note study limitations and topics for further research, notwithstanding the consequences. Due to their age range of 18 to 25 and proficiency with technology, university students constitute the most relevant representation of Generation Z in this study. Technology and social media enthusiasts may also like management and information systems schools and courses.

However, since it targets a demographic section with greater education opportunities, this image may not cover the majority of Generation Z. Thus, future research should examine Generation Z's generational traits outside of academia, using a larger, more heterogeneous sample, to better understand their technological preferences. Researching Generation Z's technology and social media use by socioeconomic group may reveal inconsistencies and tendencies.

This study also ignored hotel and restaurant staff and owners in favor of consumers. Considerations from numerous stakeholders can help reduce hotel food waste. This study also assessed sustainable food intake by relying on participants' dining memories. Future sustainable food consumption studies should use more objective methods like direct observation or monitoring technologies to improve data dependability. This study also focused on sustainable food consumption and SMMA, ignoring emotional factors like regret and guilt. Thus, to properly grasp sustainable food consumption psychology, more emotional components must be considered. Online trends make it necessary to study consumer behaviours related to sustainable food consumption in diverse scenarios. Future research should examine two consumer segments: those who buy meals for their households and those who buy meals in institutional settings like businesses, hospitals, and schools. Income, age, and urban/rural location comparisons may reveal population attitudes toward sustainable food consumption. The current study focused on food consumption, but future research may include packaged goods, perishable edibles, branded goods, and expired food. A larger view would reveal dynamic sustainable food consumption challenges. This study utilized customer sustainability consciousness as a mediator, but future research may consider alternative mediators such as consumer green attitude and consumer self-congruity. Conversely, in conjunction with SMMAs, social media influencers may also be examined as predictors of sustainable food consumption.

Conclusion

This research is carried out to study the impact of SMMAs on sustainable food consumption behavior among Generation Z consumers in Pakistan by integrating TPB and SOR theory. Results revealed that all SMMAs i.e., customization, trendiness, informativeness, interaction, and word of mouth significantly strengthen consumer sustainability consciousness that in turn positively impacts sustainable purchase intention which eventually influence sustainable food consumption behavior. Additionally, results indicate that consumer sustainable consciousness is a key mediator that translate marketing stimuli into rational buying decisions. These findings identify importance of informative, trendy, personalized and interactive social media campaigns in cultivating sustainable attitude and behavior amongst young customers. Theoretically, this study extends SOR and TPB by considering consumer sustainability consciousness as vital psychological construct. On other side, this research practically provides actionable insights for digital marketers and restaurants to involve young consumers in adopting sustainable food consumption practices. Overall, the theoretical insights derived from this study offer practical guidance for marketers and policymakers to design targeted social media strategies that enhance sustainability consciousness and encourage responsible consumption behavior. By leveraging these insights, stakeholders can more effectively promote sustainable food choices among Gen Z consumers in digitally driven markets.

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