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Article

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Asian Journal of Sustainability and Social Responsibility (AJSSR)

Provided in Cooperation with:

Sustainability Management Research Institute (SMRI), Inha University

Suggested Citation: Saeed, Muhammad Amad; Farooq, Ammara; Kersten, Wolfgang; Ben Abdelaziz, Semah Ibrahim (2019) : Sustainable product purchase: does information about product sustainability on social media affect purchase behavior?, Asian Journal of Sustainability and Social Responsibility (AJSSR), ISSN 2365-6417, Springer, Cham, Vol. 4, Iss. 9, pp. 1-18, <https://doi.org/10.1186/s41180-019-0029-3>

This Version is available at:

<https://hdl.handle.net/10419/217386>

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RESEARCH

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Sustainable product purchase: does information about product sustainability on social media affect purchase behavior?

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Abstract

Nowadays, consumer-to-consumer communication and its impact on purchase decisions have gained substantial consideration owing to digitalization and the emergence of internet-based social media platforms. Social media allows consumers to communicate with thousands of people well beyond their network. Consequently, the demand for transparency from industrial corporations has increased. It even becomes more important to understand how sustainability-related information on social media holds organizations accountable for their wrongdoings and reward them for taking sustainability-related initiatives. In this research work, the authors investigate how information that is available on social media influences consumers' purchase behavior with regard to sustainable products in the context of developing countries. Therefore, the authors surveyed social media users residing in Pakistan and used partial least squares structural equation modeling (PLS-SEM) to analyze the collected data. The results established that positive and negative sustainability-related information on social media significantly influences consumers' intention to purchase sustainable products. Furthermore, this study explains that consumers' willingness to seek sustainability-related information makes them dependent on social media and this dependency on social media affects their intention to purchase.

Keywords: Sustainable product development, Social media, Consumer purchase behavior, Sustainability risk, Sustainability trust, Media system dependency theory

Introduction

Digitalization and the transparency that new forms of media, such as the internet and social media, offer, revolutionize how consumers communicate with each other (Buz-zetto-More 2013; Men and Tsai 2013). This increased transparency grants consumers more access to information associated with product usage and spreads awareness relating to the conditions under which industrial corporations produce the products. This has not only resulted in an increase in the sales of sustainable products (Nielsen 2015), but also pressurizes organizations to address environmental, as well as social sustainability-related issues that their operations cause, and to adopt sustainability practices across their whole supply chain network.

According to Saeed and Kersten (2017), sustainability goals in the context of supply chain management are "to render maximum value to all stakeholders and fulfill customer requirements by achieving sustainable flows of products, services, information,

and capital as well as cooperation among supply chain participants.” The consumers’ and other stakeholders’ sustainability-related expectations require that organizations incorporate sustainability throughout their supply chain by shifting their focus from traditional profit-seeking toward addressing ecological and social sustainability-related issues (Carter and Easton 2011; Hervani et al. 2005; Saeed and Kersten 2017). Seuring and Müller (2008), however, defined sustainability in the product context as “a term used to comprehend all kinds of products that have or aim at an improved environmental and social quality (...). The ultimate aim is to satisfy customers and gain a competitive advantage in the market.” Therefore, to achieve improved environmental and social quality, organizations need to introduce sustainability during the product development stage in which all the product’s substantial features and properties are defined (Petersen 2017).

The significant rise in the number of internet users over the years causes a paradigm shift in consumers’ behavior all over the world and establishes a changing trend in the consumers’ readiness to seek information from new channels of mass communication, such as social media (Men and Tsai 2013). Consequently, the use of the internet and social media tends to influence consumers’ purchase behavior, as it allows consumers to interact with other consumers, and companies to interact with existing and potential customers. In developed countries like Germany, the 2014 survey results show that information on social media has already influenced the purchase decision of more than 6% of German customers (Berger 2014).

Despite social media’s growing importance, the scientific literature that investigates how information that is available on social media influences consumers’ purchase behavior with regard to sustainable products, is scant. Particularly in developing countries, scientific literature has not extensively addressed information seeking on social media pertaining to the sustainability of products, brands, or services, and how it affects consumer purchase decisions. Although sustainability has become a global issue of importance (Jaiswal and Kant 2018; Saeed and Kersten 2019), European companies are commonly assumed to be more keen to adopt sustainability practices and report their sustainability performance (KPMG 2015). Furthermore, the sustainability-related scientific literature focuses to a great extent on developed countries (Jaiswal and Kant 2018; Saeed and Kersten 2019); in developing countries, consumers are less aware of sustainability issues and sustainable products than consumers in developed countries (Altarawneh 2013; Butt 2017; Darley and Johnson 1993; Mohiuddin et al. 2018). Moreover, studies related to sustainable purchase behavior in developing countries are scarce (Jaiswal and Kant 2018; Joshi and Rahman 2019). This dearth of scientific literature and consumers’ awareness emphasize the importance to identify how, in developing countries, sustainability-related information on social media acts as the conscience of businesses and holds them responsible for their wrongdoings and reward them for doing things right. Hence, in order to broaden all perspectives, the authors developed a conceptual model to investigate how information available on social media influences consumers’ purchase behavior in Pakistan with regard to sustainable products. In light of media system dependency theory (MSD), this study investigates sustainability-related information seeking on social media and its effect on consumers’ intention to purchase, while considering the impact of perceived risk and trust on social media.

In [Literature review and hypotheses development](#) section, the authors explain the concepts of social media and media system dependency theory and, furthermore, give a detailed literature review of how the research hypotheses developed. In [Methodology and measurement](#) section, the authors describe the methodology along with the measurement of constructs, while [Findings and analysis](#) section presents the results of the research work, using PLS-SEM, followed by the conclusion in [Conclusions and outlook](#) section.

Literature review and hypotheses development

Social media

The continuous exponential increase in internet and social media usage has made them major sources of business-related information, particularly with regard to products and brands (Buzzetto-More 2013). According to the international telecommunication union (ITU), half of the world's entire population, i.e. 4.4 billion persons, use the internet, and of them, 3.5 billion persons are social media users (Statista 2019). However, the percentage of young people aged 15–24 using the internet (71%) is much higher than the percentage of the total population using the internet (48%) (ITU 2017). Although the percentage of the total number of active internet users in developed countries is higher than that of developing countries, the gap decreases rapidly, with a specific increase in the number of active internet users in developing countries like China and India. Similarly, in Pakistan, at the end of 2016, 16% of the population, i.e. 30 million persons, had access to the internet, which was almost double the total number of internet users in 2010, i.e. 16 million persons.

Internet and social media users can access product or brand-related sustainability information, which individuals, NGOs, and other consumer groups make available, in the form of blogs, discussion forums, cooperative projects (e.g., Wikipedia), content communities (e.g., YouTube), product rating or ranking websites (e.g., rankabrand.org), and other social networking websites (Kaplan and Haenlein 2010; Men and Tsai 2013; Reilly and Weirup 2012). Likewise, internet and social media offer organizations new opportunities to interact with a large pool of customers and influence consumers' purchase decisions (Buzzetto-More 2013; Dei Worldwide 2008). Kaplan and Haenlein (2010) defined social media as "a group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content."

Social media users create, share, and consume the product or brand-related content with the intention of educating each other about a company's sustainable practices and its supply chain (Ngai et al. 2015; Xiang and Gretzel 2010). These consumers' opinions, comments, and sharing of personal, product sustainability-related experiences on social media lead to an increase in the perceived word of mouth (WOM) (Buzzetto-More 2013; Xiang and Gretzel 2010). Consumers consider this WOM more trustworthy and reliable than information from traditional sources of mass communication, such as advertisements and company-initiated communications in newspapers and magazines (Brown et al. 2007). Due to these characteristics, social media-generated WOM has enormous potential to go viral and might influence many receivers (Brown et al. 2007; Buzzetto-More 2013). Satisfied customers may act as brand ambassadors and spread positive WOM, and unsatisfied customers may turn against a product or brand and spread negative WOM. Consequently, negative and positive social media-initiated

WOM can potentially impact the customers' intention with regard to purchasing products or brands (Buzzetto-More 2013; Gáti and Markos-Kujbus 2012; Grégoire et al. 2015) and holding businesses accountable for promises they made.

Media system dependency theory

Recent developments and outreach have introduced social media as an instance of mass media (Kheiravar 2018). In order to identify how the use of social media as an information medium can influence consumers' cognitive and affective beliefs pertaining to sustainable product purchase, the authors select the well-established media system dependency theory (MSD) as a theoretical framework in this research work. MSD builds on the distinguishing and pivotal conceptualization of media dependency relations, which provides a solid theoretical understanding of individuals' motivations for using media, and its consequences (Ben Abdelaziz et al. 2015; Kheiravar 2018). Ball-Rokeach and DeFleur (1976) defined dependency as "a relationship in which the satisfaction of needs or the attainment of goals by one party is contingent upon the resources of another party."

The core premise of MSD is that media can only exert powerful influence if consumers develop a dependency relationship to seek information through it (Jung and Moro 2012; Kheiravar 2018), whereas the amount of time the audience spends on the medium explains the audience dependency on the medium (Ball-Rokeach and DeFleur 1976). Higher dependency on the medium is also considered as a result of meeting an individual's needs via the medium (Kheiravar 2018). In the MSD view, media has two levels of dependency relations, i.e. with individuals (micro-level) and with other systems (macro-level), such as economic and political systems (Jung and Moro 2012). The micro-level dependency relations, also known as individual media system dependency, focus on the relationship between media and individuals (Kheiravar 2018). Micro-level dependency is the evaluation of the individuals' motivation to seek information via the media (Ben Abdelaziz et al. 2015), whereas the macro-level dependency explains the interdependencies among the audience, media, and society. At the macro-level, analyzing the macro origins of dependencies explains the effects of individual media dependency relations (Kheiravar 2018).

However, in the case of social media, its characteristics enable it to move across levels. At the micro-level, users generate content, which they can share publicly at the macro-level (Jung and Moro 2012). As MSD postulates that media may cause cognitive, affective, and behavioral changes in individuals who are exposed to them (Ball-Rokeach and DeFleur 1976), this research article investigates how a dependency on social media for sustainability-related information can influence consumers' purchase intention.

Theoretical relationships and hypotheses development

The global focus of manufacturing and service industries has shifted to devise strategies for reducing the undesirable environmental and societal impacts of these industries' product development processes (Ribeiro and Kruglianskas 2013). Organizations are considered to be more responsible and expected to go beyond the boundary of traditional profit-seeking thinking toward more ecological and socially responsible businesses. Furthermore, regulatory requirements and a multitude of stakeholder and

consumer expectations force companies to take sustainability initiatives in order to overcome the sustainability-related issues their operations cause (Carter and Easton 2011; Saeed and Kersten 2019). In their research, Chen and Chang (2012) identified that green sustainability-related performance leads to purchase intention.

Although previous research empirically supported the media dependency's positive effects on purchase intention, consumers are reluctant to buy products if they perceive themselves lacking sufficient information to make the right purchase decisions (Ben Abdelaziz et al. 2015). Traditional offline communication channels either do not offer such information or information retrieval is far more difficult, which leads to consumer confusion (Mitchell and Papavassiliou 1999). However, online social media platforms provide more enriched and easier to retrieve user-generated information, which can have a substantial impact on consumers' purchase behavior. In accordance with this article's research objective, i.e. to investigate how sustainability-related information on social media influences consumers' intention to purchase, the authors develop the following hypotheses.

Willingness to seek sustainability-related information and dependency on social media

The consumers' willingness to seek sustainability-related information depends on the consumers' willingness to change their state of sustainability knowledge. As stated, social media provides detailed and enriched sustainability-related information and it is very likely that consumers who are willing to seek this kind of information become dependent on social media. Owing to consumers' increased social media usage, marketers also expand their social media presence to attract users and to build long-term relationships with them through various channels (Jaiswal and Singh 2018).

Furthermore, social media users' interaction with other group members enables them to shape their perception of buying sustainable products. According to Ben Abdelaziz et al. (2015), motivated consumers who consider online resources (e.g., social media) useful, will very likely become dependent on them. The discussion on social media platforms allows consumers to inadvertently start approving, as well as disapproving, a product or a brand, which enables the consumers to trust the source of the information and make them dependent on social media for obtaining guidance with regard to their sustainable product purchase decisions (Ben Abdelaziz et al. 2015). Hence, the authors formulate the first hypothesis as follows –

H1: Willingness to seek sustainability-related information positively influences the dependency on social media for sustainability-related information.

Dependency on social media for sustainability-related information and intention to purchase

The consumers' lack of knowledge regarding a particular product in order to make the right purchase decision, prevents them from engaging in purchasing. This, in turn, might influence the consumers' product choice and result in postponing, as well as halting, the purchase in order to avoid cognitive strain (Mitchell and Papavassiliou 1999). Furthermore, according to the literature, detailed verbal information regarding environmentally friendly products helps educate consumers, which, in turn, positively

influences consumers' intention to purchase sustainable products (Gleim et al. 2013). The information usefulness of online user-generated content is considered to be more effective than traditional marketer-generated content (Buzzetto-More 2013).

Social media comprises communication websites that facilitate the development of relationships between internet users who have diverse backgrounds. The consumer-generated, product-related information on social media helps other potential consumers in their decisions to buy or not buy a product (Carillo et al. 2017). Ben Abdelaziz et al. (2015) defined dependency on social media for sustainability-related information as "individuals' contingency upon social media information resources in order to attain their objectives of making the right decisions when it comes to purchasing sustainable products or brands." Relating to the previous arguments, social media offer a favorable situation for consumers by providing comprehensive information from multiple sources, whereby consumers might very likely become reliant on social media (Wang et al. 2017). Hence, the authors formulate the second hypothesis as follows –

H2: Dependency on social media for sustainability-related information positively influences the intention to purchase sustainable products.

Social media information dependency and sustainability trust and risk on social media

Social media has become vital in today's business world, as it allows consumers more freedom in sharing their opinion regarding products. The construct of sustainability trust is the tendency for and inclination toward a product that presumably receives affirmative statements with respect to sustainability features from former, actual, or potential consumers via social media on the basis of a belief in or expectation of the product's sustainability-related performance (Ben Abdelaziz et al. 2015). On the other hand, Ben Abdelaziz et al. (2015) define the construct of sustainability risk on social media as "the expectation of negative consequences affecting sustainability as a result of purchasing products or brands that have been exposed to negative statements by former, actual, or potential consumers on social media, concerning their sustainability features."

Academicians emphasized that the trust antecedents vary according to the communication type that occurs on social media (Chang et al. 2013; Laroche et al. 2012). They have also suggested that perceived information usefulness and information credibility create a tendency in social media users to adopt both positive and negative WOM (Cheung and Thadani 2012). Hence, it is possible to postulate that consumers who are dependent on social media are very likely to adopt affirmations and build a higher perceived trust in products that other social media users mention or discuss as sustainable. Likewise, consumers who are dependent on social media are more prone to negative statements regarding a product's sustainability performance and very likely to perceive products that received negative comments on social media as risky and relatively less sustainable. Hence, the authors formulate the third and fourth hypotheses as follows –

H3: Dependency on social media for sustainability-related information positively influences sustainability trust on social media.

H4: Dependency on social media for sustainability-related information positively influences sustainability risk on social media.

Sustainability risk on social media and intention to purchase

The notion that perceived risk has a negative impact on the intention to purchase, is well established in the literature (Chang and Chen 2008; Grégoire et al. 2015; Kim et al. 2008; Mitchell and Papavassiliou 1999). Moreover, Chen and Chang (2012) showed that the perceived risk of harmful damage to the environment has a negative impact on the intention to purchase products. Social media users who perceive products with negative comments on social media as harmful, are presumably more aware of products or brands-related sustainability issues, and adopt other users' negative WOM about products' sustainability performance (Ben Abdelaziz et al. 2015).

Hence, it is possible to postulate that consumers are very likely to refrain from buying products or brands if they become aware of the product's or brand's negative sustainability performance; as a result, these consumers will rather purchase relatively more sustainable products or brands. Accordingly, the authors formulate the fifth hypothesis formulated as follows –

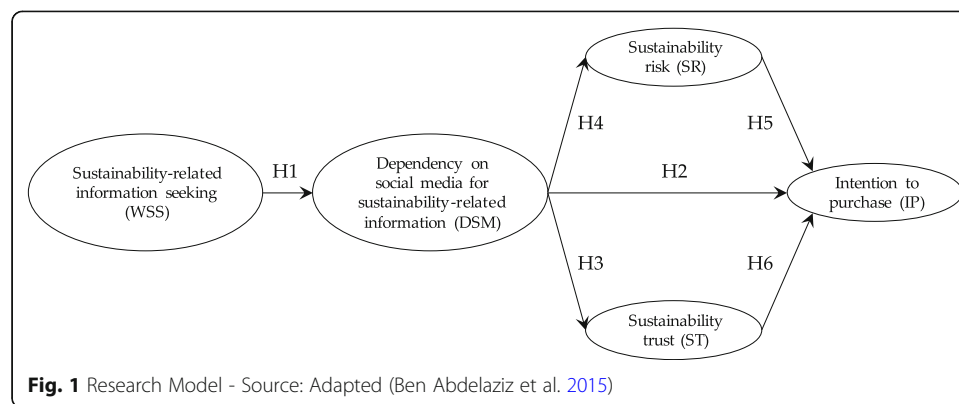
H5: Sustainability risk on social media positively influences the intention to purchase sustainable products.

Sustainability trust on social media and intention to purchase

In scientific literature, several authors think that perceived trust is a key driver of the intention to purchase (Chang and Chen 2008; Kim et al. 2008). Chen and Chang (2012) have also identified that perceived trust in better performing, environmentally sustainable products has a positive impact on the intention to purchase these products. Therefore, consumers are less likely to follow a product or brand when people do not predominantly like it, because consumers tend to follow a product or brand that is linked to positive WOM (Gáti and Markos-Kujbus 2012; Ladhari and Michaud 2015). Social media users who perceive products with positive recommendations on social media as sustainable, are presumably more aware of sustainability-related issues and adopt other users' positive WOM about the products' sustainability performance (Ben Abdelaziz et al. 2015). Hence, it is possible to postulate that consumers are very likely to buy products or brands if they become aware of the products' positive sustainability performance and that consumers will, in all likelihood, consider buying these products or brands to support sustainability practices. Hence, the authors formulate the sixth hypothesis as follows –

H6: Sustainability trust on social media positively influences the intention to purchase sustainable products.

Based on theoretical relationships and developed hypotheses, the theoretical framework shown in Fig. 1 consists of five constructs, i.e. sustainability-related information seeking (WSS), dependency on social media for sustainability-related



information (DSM), sustainability trust (ST), sustainability risk (SR), and intention to purchase (IP).

Methodology and measurement

Data collection and sample size

To the authors' best knowledge, this paper, which focuses on social media users residing in Pakistan, is one of the few empirical studies on consumers' purchase behavior in Pakistan that investigates the effects of sustainability-related information available on social media. In order to obtain data, the authors conducted an online survey, targeting the population aged between 18 and 55 years. Moreover, the authors offered complete anonymity to the survey participants. In order to complete the survey, it was mandatory for the participants to answer all the questions. Among 109 participants, the authors considered 91 responses for further analysis in which the participants answered all the survey questions.

Table 1 describes the sample's characteristics. The survey participants consisted of 49 (54%) males and 42 (46%) females. The majority of the survey respondents were highly educated with 49% having a bachelor's degree and 30% a postgraduate degree. Most of the respondents, i.e. 46%, were students by profession. Moreover, the vast majority of the survey participants (i.e. 89%) were younger than the age of 35 years.

Construct measurement

The authors developed the survey based on previous scientific literature. In order to ensure a consistent understanding of the survey, the authors illustrated the meaning of sustainability in the social media context and they also illustrated sustainable product purchase in the survey's preface. In Table 2, the authors list survey items to measure each variable. The authors adopted a seven-point Likert scale to measure all questionnaire items ranging from *strongly disagree* (1) to *strongly agree* (7). However, the authors measured the sustainability risk and sustainability trust constructs using a seven-point Likert scale ranging from *very unlikely* (1) to *very likely* (7). In order to measure sustainability-related information seeking, the authors adapted five items from Borah (2014). Furthermore, they adapted seven items of dependency on social media for sustainability-related information from Grant (1996). Moreover, they adapted five items of sustainability risk on

Table 1 The sample's characteristics

Characteristics	<i>n</i> = 91	%
Gender		
Male	49	54%
Female	42	46%
Profession		
Student	42	46%
Homemaker	1	1%
Employed for wages	31	34%
Self-employed	8	9%
Out of work and looking for work	3	3.3%
Out of work but not currently looking for work	2	2.2%
Others	4	4.5%
Age		
18–24 years	38	42%
25–30 years	30	33%
30 years and above	23	25%
Education		
Some high school	4	4.5%
High school degree	11	12%
Some university course	4	4.5%
University degree	45	49%
Postgraduate degree	27	30%

social media, five items of sustainability trust on social media, and six items of intention to purchase from Chen and Chang (2012).

Methodology

After completing the data collection procedure to ensure data absoluteness, the authors cleaned the raw data. The data cleaning procedure ensures, for instance, that the collected data have no omissions, are consistent in classification, and are legible. The authors adopted the PLS-SEM approach for the data analysis and used *SmartPLS 3 Professional* software to analyze the data from 91 respondents. Scholars consider the PLS-SEM approach to analyze data, especially when dealing with a small sample size (Gefen and Boudreau 2000; Hair et al. 2017), such as the sample size in the current research work. The PLS-SEM approach regrouped into two steps: During the first step, the researchers examined the measurement (outer) model's reliability and validity, and during the second step, they assessed the significance of path relationships and R^2 values in the structural (inner) model.

Findings and analysis

Measurement model assessment

In assessing the measurement model, all the items were loaded into their respective variables. According to Chin (1998), the loadings are significant when the value is at least 0.6 and ideally at least 0.70 or more. A loading value of 0.70 means that the

Table 2 Items for measuring each variable

Construct	Measurement item	Reference
Sustainability-related information seeking (WSS)	WS1: Regarding sustainability issues, I seek more information supporting my opinions. WS2: Regarding sustainability issues, I seek more information supporting the other opinions WS3: Regarding sustainability issues, I seek more information that offers a balanced view. WS4: Regarding sustainability issues, I seek more opinions supporting my point of view. WS5: Regarding sustainability issues, I seek more opinions supporting the other points of view.	Borah (2014)
Dependency on social media for sustainability-related information (DSM)	Information available on social media helps me – DSM1: decide whether to buy sustainable products/brands or not. DSM2: decide which products/brands are sustainable and which are not. DSM3: decide whether to buy a certain sustainable product/brand or not. DSM4: know what sustainable products/brands make good impressions on others. DSM5: decide what sustainable products/brands to buy. DSM6: decide between different sustainable products/brands alternatives. DSM7: choose the right sustainable product/brand.	Grant (1996)
Sustainability risk (SR)	When I read negative statements by other users on social media about a certain product/brand with respect to its sustainability characteristics, I would likely suspect that – SR1: the product/brand will not meet the desired sustainability criteria. SR2: the product/ brand will not work properly with respect to sustainability requirements. SR3: I would face negative consequences if I use this product/brand, because of social or environmental harm. SR4: using the product/brand will negatively affect sustainability aspects (e.g., environment, work conditions, etc.) SR5: using the product/brand would damage my reputation or image as a person who cares about sustainability.	Chen and Chang (2012)
Sustainability trust (ST)	When I read positive statements by other users on social media about a certain product/brand with respect to its sustainability characteristics, I would likely think that – ST1: the product/brand's sustainability reputation is generally reliable. ST2: the product/brand will work properly with respect to sustainability requirements. ST3: the product/brand's claims regarding sustainability are generally trustworthy. ST4: the product/brand's concerns about sustainability meet my expectations. ST5: the product/brand keeps promises and commitments regarding sustainability.	Chen and Chang (2012)
Intention to purchase (IP)	IP1: I intend to purchase sustainable products/brands, because of their sustainability concerns. IP2: I expect to purchase sustainable products/brands in the near future. IP3: I avoid buying products/brands that are potentially unsustainable. IP4: Overall, I am glad to purchase sustainable products/brands, because they are sustainable. IP5: When I have to choose between two similar products/brands, I choose the one that is more sustainable. IP6: I will not consider sustainability-related issues when making a purchase.	Chen and Chang (2012)

variable explains at least 50% of its related indicator's variance. The results in Table 3 show that, for the larger part, the items' loadings were satisfactory. However, the loading values of the third item of sustainability-related information seeking (WS3), the fourth item of dependency on social media for sustainability-related information (DSM4), the third item of sustainability risk (SR3), and the sixth item of intention to purchase (IP6) showed that these items were not loaded into their respective constructs. In other words, these items did not represent their respective constructs. Hence, the authors deleted these items, owing to low factor loadings. However, following the recommendations of Hair et al. (2017), the authors retained five items, – i.e. IP1, IP3, DSM1, DSM5, and SR1, – although their boasting outer loadings were below 0.70. The authors included these items in the analysis, particularly in order to avoid the loss of content that would have resulted from their deletion.

The variance inflation factor (VIF) test measures the value of excessive multicollinearity among the constructs and examines the level of collinearity. In the PLS-SEM context, a VIF value of 5.0 or higher indicates a potential collinearity issue (Hair et al. 2017). Table 3 shows that all the VIF values for the current model are below 5.0, ranging from 1.2 to 2.8, which indicates that the model satisfied Hair et al. (2017)'s recommendation regarding collinearity.

Table 3 Loadings and variance inflation factor (VIF)

	DSM	IP	SR	ST	WSS	VIF
DSM1	0.633					1.286
DSM2	0.769					2.240
DSM3	0.705					2.063
DSM5	0.695					1.619
DSM6	0.720					1.712
DSM7	0.755					1.781
IP1		0.660				1.342
IP2		0.805				1.619
IP3		0.686				1.412
IP4		0.827				2.789
IP5		0.764				2.453
SR1			0.646			1.468
SR2			0.765			1.521
SR4			0.837			1.721
SR5			0.796			1.427
ST1				0.730		1.557
ST2				0.833		1.983
ST3				0.807		2.403
ST4				0.793		1.884
ST5				0.817		2.401
WS1					0.754	1.739
WS2					0.761	1.929
WS4					0.767	1.407
WS5					0.791	1.651

In accordance with Hair et al. (2017), Table 4 presents the measures of internal consistency reliability (Cronbach's alpha and Composite reliability) and convergent validity (AVE values). The composite reliability values for the current model ranged from 0.848 to 0.897 and Cronbach's values ranged from 0.773 to 0.856, which are higher than the minimum acceptable limit of 0.70 to establish the model's reliability. In order to assess the convergent validity, the authors used the average variance extracted (AVE). An AVE value of 0.50 or more indicates that, on average, the construct explains more than half of the variance of its indicators (Hair et al. 2017). In the current model, the authors noted that all AVE values were higher than the acceptable range of 0.50.

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards (Hair et al. 2017). To assess the discriminant validity, the authors used the Fornell-Larcker (see Table 5) and Heterotrait-Monotrait Ratio of Correlations (HTMT) (see Table 6) criteria. The Fornell-Larcker criterion compares the square root of the AVE values with the latent variable correlations. It suggests that the square root of each construct's AVE should be greater than its highest correlation with any other construct, such that a construct shares more variance with its indicators than with the ones of any other construct in the model (Hair et al. 2017). The results in Table 5 asserts the discriminant validity as the square root of AVE for each latent variable (diagonal values) is higher than the other correlation values among the latent variables.

Furthermore, the results indicate that all HTMT values were below Hair et al. (2017)'s recommended value of 0.90, which satisfied the condition of the constructs' discriminant validity. Moreover, none of the values demonstrated a negative relationship between the respective variables.

Structural model assessment (path analysis)

The authors assessed the structural model using the coefficient of determination (R^2) and path coefficients. Based on the six direct relationship hypotheses, they analyzed the current model using PLS-SEM. Figure 2 presents the R^2 values for each exogenous variable. Academics consider an R^2 value of 0.20 high in the consumer behavior discipline (Hair et al. 2017). The authors estimated the highest R^2 for IP, i.e. 0.483, followed by ST, i.e. 0.249, DSM, i.e. 0.185, and SR, i.e. 0.028. The R^2 values for two out of the four endogenous variables show that these variables were well explained by their relationships. The R^2 values for DSM were near the acceptable range. However, the R^2 values for SR showed that SR is not well explained by their relationships.

Table 7 presents the results of the effect sizes (f^2 statistic). The results of the direct relation hypotheses in the current study show that the strongest effect size ($f^2 = 0.331$)

Table 4 Reliability and validity coefficients

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
DSM	0.807	0.862	0.510
IP	0.806	0.865	0.564
SR	0.775	0.848	0.585
ST	0.856	0.897	0.635
WSS	0.773	0.852	0.590

Table 5 Discriminant validity assessment (Fornell-Larcker criterion)

	DSM	IP	SR	ST	WSS
DSM	0.714				
IP	0.590	0.751			
SR	0.166	0.305	0.765		
ST	0.499	0.566	0.135	0.797	
WSS	0.430	0.363	0.254	0.416	0.768

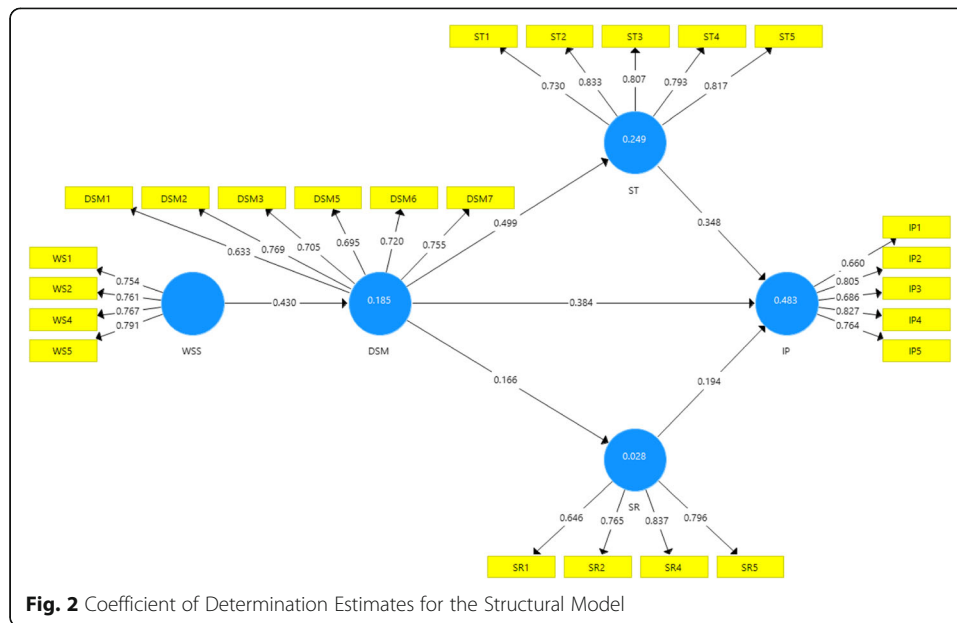
with a t-value (5.653) was for dependency on social media for sustainability-related information on sustainability trust on social media, whereas, the authors considered the effect size ($f^2 = 0.028$) with a t-value (1.179) for dependency on social media for sustainability-related information on sustainability risk on social media too small and therefore deemed it insignificant. Furthermore, the authors considered the following significant: the effect size ($f^2 = 0.212$) and t-value (4.752) for dependency on social media for sustainability-related information on the intention to purchase, the effect size ($f^2 = 0.227$) and t-value (6.189) for a willingness to seek sustainability-related information on dependency on social media for sustainability-related information, the effect size ($f^2 = 0.071$) and t-value (2.677) for sustainability risk on social media on the intention to purchase, and the effect size ($f^2 = 0.175$) and t-value (4.117) for sustainability trust on social media on the intention to purchase.

The authors present the estimated values for the path coefficients in the structural model in Table 7. The result of *H1* ($WSS \rightarrow DSM$) shows that the hypothesis is accepted at the value of 0.430 for the path coefficient with a *p*-value of 0.000 and t-value of 6.189. Since the path coefficient is above the threshold value of 0.20 suggested by Hair et al. (2017), the results of *H2* ($DSM \rightarrow IP$) likewise shows that *H2* is accepted at the value of 0.384 for the path coefficient with a *p*-value of 0.000 and t-value of 4.752. The result of *H3* ($DSM \rightarrow ST$) shows that it is accepted at the value of 0.499 for the path coefficient with a *p*-value of 0.000 and t-value of 5.653. The result of *H4* ($DSM \rightarrow SR$) shows that it is rejected at the value of 0.166 for the path coefficient with a *p*-value of 0.239 and t-value of 1.179. The result of *H5* ($SR \rightarrow IP$) shows that it is accepted at the value of 0.194 for the path coefficient with a *p*-value of 0.008 and t-value of 2.677. Similarly, the result of *H6* ($ST \rightarrow IP$) shows that it is accepted at the value of 0.348 for the path coefficient with a *p*-value of 0.000 and t-value of 4.117.

To conclude, the hypotheses resulting from a t-value higher than 1.96 and *p*-value less than 0.05 lead to the acceptance of hypotheses. All the hypotheses (*H1*, *H2*, *H3*, *H5*, and *H6*) are accepted, except *H4*.

Table 6 Discriminant validity assessment (HTMT criterion)

	DSM	IP	SR	ST	WSS
DSM					
IP	0.703				
SR	0.230	0.362			
ST	0.584	0.662	0.160		
WSS	0.528	0.450	0.330	0.488	



Conclusions and outlook

This article's main objective was to examine how sustainability-related information available on social media affects consumers' purchase behavior. To address the research question, the authors conducted an online survey of social media users residing in Pakistan and analyzed the collected data using PLS-SEM. The research results indicate that social media developed as an anchor point on the internet (Wang et al. 2016) for sustainability-related information sharing and, in turn, have the ability to influence consumers' intention to purchase. The integrated model's analyses with regard to social media dependency of consumers from a developing country, i.e. Pakistan in this research paper, help researchers understand the purchase intention behaviors, considering the trend of increased sustainability-related information acquisition via social media. This kind of social influence plays a vital role in shaping consumer behavior

Table 7 Results of direct relationship hypotheses

Hypothesis	Path	Path coefficient	t-Value	p-Value	Finding
H1: Willingness to seek sustainability-related information positively influences the dependency on social media for sustainability-related information.	WSS→DSM	0.430	6.189	0.000	Accepted
H2: Dependency on social media for sustainability-related information positively influences the intention to purchase sustainable products.	DSM→IP	0.384	4.752	0.000	Accepted
H3: Dependency on social media for sustainability-related information positively influences sustainability trust on social media.	DSM→ST	0.499	5.653	0.000	Accepted
H4: Dependency on social media for sustainability-related information positively influences sustainability risk on social media.	DSM→SR	0.166	1.179	0.239	Rejected
H5: Sustainability risk on social media positively influences the intention to purchase sustainable products.	SR→IP	0.194	2.677	0.008	Accepted
H6: Sustainability trust on social media positively influences the intention to purchase sustainable products.	ST→IP	0.348	4.117	0.000	Accepted

(Ronald et al. 2019) with regard to a preference for purchasing sustainable products. Moreover, this article distinguishes between the product sustainability trust and product sustainability risk associated with the intention to purchase.

The results of this research paper reveal that consumers' willingness to seek sustainability-related information lead them to consider social media platforms as a key source of sustainability-related information. Besides, the authors found that the consumers' intention to purchase was subject to their dependency on social media for sustainability-related information. This means that consumers who depend on social media are more likely to purchase sustainable products. This proves that social media users are a relevant customer segment and that social media is a good place to target potential consumers of sustainable products. The results also show that social media dependency has a positive effect on perceived trust, i.e. positive sustainability-related information about products. This means that consumers who depend on social media for sustainability-related information are more likely to adopt positive WOM on social media with regard to product sustainability, which positively influences consumers' intention to purchase. However, consumers' dependency on social media for sustainability-related information does not make them more prone to negative WOM on social media. Nonetheless, susceptibility to negative WOM on social media has a positive effect on the intention to purchase sustainable products. Hence, it is possible to interpret users' proneness to negative and positive WOM on social media as exhibiting a stronger commitment to sustainability and, therefore, a higher likelihood to purchase sustainable products.

In accordance with these research results, the authors can propose that businesses should also start focusing on the content that is available on social media platforms regarding their products, and that they should acquaint themselves with electronic word of mouth (eWOM). It has become essential to comprehend different factors that act as antecedents and that can affect human behaviors, such as purchase behavior, as a result of social media usage (Wang et al. 2016). In this context, this article recommends that businesses should pay more attention to developing their brands on social media and establishing their relationships with individual users and potential consumers, such that they can remain in contact with their customers in order to fulfill their needs.

Furthermore, consumers' dependency on social media for seeking sustainability-related information about products has no effect in the case of negative WOM or perceived sustainability risk, i.e. consumers' social media dependency does not increase their sensitivity to negative WOM on social media. However, consumers in Pakistan are prone to negative statements on social media regarding a product's sustainability performance, i.e. negative WOM on social media has a negative effect on their intention to purchase. Interestingly, in the case of developed countries, such as Germany, the observations were rather different. In their study, Ben Abdelaziz et al. (2015) noticed that consumers in Germany depend on social media when it comes to sustainability-related information seeking, and consumers' sensitivity to negative, as well as positive, WOM on social media increased according to their social media dependency. However, Ben Abdelaziz et al. (2015)'s study noted that, in Germany, the effect of negative sustainability-related information or perceived sustainability risk on the intention to purchase was insignificant.

To conclude, it is possible to argue in this article that sustainability-related information on social media has the potential to influence consumers' intention to purchase sustainable products or brands in developing countries like Pakistan. Furthermore, social media has emerged as an essential platform for seeking sustainability-related information in developed (e.g., Germany) (Ben Abdelaziz et al. 2015) and developing (e.g., Pakistan) countries, and positive WOM on social media regarding products' or brands' sustainability performance positively influences consumers' intention to purchase.

Moreover, to a great extent, managers might find sustainable trust and sustainable risk on social media interrelated in the context where a decrease in customers' perceived risk with regard to sustainable products can help ease customers' perception to raise product sustainability trust. Based on this study's findings, the authors can conclude that firms should put more emphasis on producing sustainable products, considering that sustainable trust and sustainable risk on social media impact consumers' intention to purchase. Practitioners and policymakers should also focus on communicating their products' sustainability features effectively to shape the customers' attitude and behaviors, which can help organizations create a positive image of their products and brands (Joshi and Rahman 2015). Consequently, the authors postulate that companies can produce customers' trust and intention to purchase sustainable products by increasing their companies' presence on social media platforms to provide more awareness of their products' sustainability and communicate more about their sustainability-related efforts and achievements (e.g., certifications awarded) (Rahbar and Abdul Wahid 2011). Furthermore, industrial corporations and brands can build more customers' trust by providing reliable, sustainability-related information about their products in a simple and user-friendly manner (Joshi and Rahman 2015). Moreover, the presence of companies on social media platforms, building direct relationships with consumers, and handling consumers' queries on social media are also considered helpful to gain customers' trust (Goh et al. 2013) and increase their intention to purchase.

Academics can conduct further research to understand the factors and mechanisms that influence individuals' purchase behavior based on their dependency on social media platforms for seeking sustainability-related information in developed and developing countries. Furthermore, academics can conduct an in-depth study of the framework that the authors propose in this research paper by including other related factors, such as sustainability-related confusion and sustainability involvement from the perspective of developed and developing countries. Moreover, scholars can also expand future research via a longitudinal research methodology in order to investigate the value of sustainability-related information on social media about a product or brand over a relatively long period of time.

Acknowledgments

Not applicable.

Authors' contributions

Conceptualization, MAS, WK, and SIBA; methodology, MAS, AF; software, MAS and AF; validation, MAS, AF, and SIBA; formal analysis, MAS and AF; investigation, MAS and AF; resources, WK; data curation, MAS and AF; writing—original draft preparation, MAS and AF; writing—review and editing, MAS, AF, WK and SIBA; project administration, MAS and WK. All authors read and approved the final manuscript.

Funding

This research received no external funding.

Availability of data and materials

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Received: 21 June 2019 Accepted: 21 September 2019

Published online: 17 October 2019

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