

# Impact of Digital Signage and Social Media Advertising on Consumer Buying Behavior: Mediating Role of Emotional Processes

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## Abstract

*Advertisement plays a major role in company products to attain a competitive edge. Now, companies are commercializing products using social media and digital signage. Over the past decade, social media and digital signage have become promising and greatly influence consumers' buying behavior. Consumers use social media to communicate with their peers and brands. This study is intended to investigate the role of digital signage and social media advertising on consumer buying behavior with the mediating role of emotional processes. Data was collected using a structured questionnaire and tested using SPSS and AMOS. The study showed a positive and significant relationship between digital signage, social media advertising, and consumer buying behavior. Emotions positively mediate digital signage, social media advertising, and consumer buying behavior relationships.*

**Keywords:** Digital Signage, Social Media, Emotions, Consumer Buying Behavior.

## Introduction

Advertisements influence customers' opinions about products, services, features, and quality. Advertisers extensively used indoor and outdoor sign campaigns to broadcast their messages, such as indoor signs in malls, retail stores, hotels, airports, and public places. In contrast, outdoor signs contain roadside billboards, cab advertising, and bus stops. As advertisements play a significant contribution to any company's product, companies now provide product ads through social media (SM) and digital signage (DS). Both companies and individuals share information about their consumption on social networks (Khan et al., 2011). Consumers can share their experiences with a particular product and brand, upload pictures of purchases, recommend products to others, and share their stories of shopping trips. Like consumers, firms also share their variety of offerings gradually and create a brand promotion in two ways: (1) through brand membership and page liking and (2) through comments and post liking (Wallace et al., 2014; Amir et al., 2023). Social media is an essential part of firms and individuals.

In marketing, Gaur et al. (2014) also pointed out the role of emotion in consumer choice-making and consumer behavior and consumption. However, past studies did not consider social media ads more compatible with DS ads. According to Chan et al. (2015), the role of emotional response as

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a mediator is vastly used in both affective and cognitive settings. In past studies, emotions' role as a mediator in different contexts, such as in services and shopping mall environments, has been explored. In the present study, the authors will examine the role of emotions related to DS and social media ads rather than just in a shopping mall or the atmospheric environment and how emotions influence consumer buying behavior (Khan et al., 2020). For instance, internet, social media, and other digital technologies usage increase daily worldwide and have become part of billions of people's daily lives (Khan et al., 2020).

Moreover, DS ads are also a trend; marketers have responded to DS displays to promote their brand products worldwide or in Pakistan (Khan et al., 2021). The present study is an effort to determine the impact of Media and Social Media ads on consumer buying behavior with the mediating role of emotions for the first time in Pakistani culture. This study proposes a theoretical framework supported by the evidence from past studies in the form of a literature review.

## Literature Review

This section provides a comprehensive approach to justifying the rationale for the current study. This section is divided into four sections to explain the existing trends about current research topics.

Existing literature presents numerous definitions of Digital signage. Digital signage can be defined as a flat monitor that may convey varying advertising content like news, local advertising, television advertising, brand offers, and entertainment content in public places (Newman et al., 2010; Akash et al., 2023; Khan et al., 2023). Similarly, Burke (2009) defines digital signage as LED screens that display endless and constant news material and fluctuating advertisements. These definitions describe the importance of digital signage advertising. DS systems are trending in trade settings, such as in shopping areas, roads, hypermarkets, department stores, and malls. Generally, DS contains LED or flat screens with digital Ads. DS system is used for countless purposes, including advertising, promotions, brand image enrichment, and news and community information. In outdoor places, LCD monitors can be huge, such as the giant billboards (Khan et al., 2023). According to Thorson and Moore (2013), cognitive response theory assumes individuals assign importance to numerous characteristics of goods, and cognitive advertisement has the ability to encourage comparative importance (Khan et al., 2023).

Chen and Yu (2013) noted that on Facebook, brands create User Generated Content (UGC) to get aware of consumer experiences with the brand and realistic information. The positive and negative emotions significantly impact consumer satisfaction, happiness, and consumer loyalty (Pham et al., 2013; Akash et al., 2023). In addition, sensory incentives such as animated videos, pictures, and text information have a positive emotional response toward impulse buying (Adelaar et al., 2003). Cervone and Pervin (2016) found that the human personality refers to a continuing and persistent specific personality nature relating to intellectual, emotional, and behavioral reactions. Previously, Walsh et al. (2008) observed emotions as both moderator and mediator to study environment, atmosphere, consumption, and emotion–loyalty relationships mostly in service settings (Hansen et al., 2013; Akash et al., 2023). In the present study, emotions are used as a mediator in the Pakistani context to discover the influence of DS or SM ads on consumer behavior. Consumer buying behavior is a behavior that occurs in consumers after seeing the ads. Consumer purchase intention and buying decision all depend upon behavior. Both inside and outside factors influenced consumer choice-making practice. According to Kotler and Keller (2006), to study consumer buying behavior, it is essential to understand consumer way of buying and their consumption pattern. Schiffman and Kanuk (2010) revealed that consumer decisions to purchase

a good or service or purchase intention, considering alternative products, and assessing product information depend on consumer behavior (Karimi et al., 2015; Akash et al., 2023). According to the previous literature reasoning, in shopping task concerns, Digital signage should exert an extra optimistic and encouraging impact on shoppers' reactions than conventional Point of Sale incentives, irrespective of cognitive (helpful) or affective (sentimental) content. However, the emotions scale is large, so the magnitude of the positive response towards DS might be different based on the content (emotional vs. rational).

When consumers surf on social media systems like YouTube, flicker, and Facebook, where companies share product images and new offerings, and friends use these products or mention brands, they are in a reorganization stage. After realizing the need, they examine for information before purchasing. Parker et al. (2011) stated that when a shopper wants to buy something like a car, he is in the searching or education phase to determine where and how they have access, get customers' reviews and experiences with available brands to make a decision before buying.

## Theoretical Framework

The following theories have defined the theoretical justifications for building the current research rationale.

### Limited Capacity Model and Resource Matching Theory

According to Dennis et al. (2010), the Theory that deals with the influence of Social Media and Digital signage on shopper buying behavior is predominantly based on the Limited Capacity Model (LCM) in grouping with Resource Matching Theory (RMT) to explain when and why social media attracts more attention than mass media & why DS adds fascinates more than static, billboard or conventional banners or POS (point of sale) stimuli.

**Table 1: Limited Capacity Model and Resource Matching Theories Implication**

Theory	Researcher	Results
Limited Capacity Model (LCM)	Hoyer, (1984)	In utilitarian view consumer motivation is generally low to cognitively process the information rather than in affective shopping situation.
LCM	Reeves, et. al., 1986	They found the more complex message or Advertisement decrease recognition memory
LCM and RMT	(Keller & Block, (1997); Li & Bukovac, (1999)	LCM and RMT theory suggested in Affective (sentimental) shopping environment DS grab more attention of consumers.
LCM	Lang, (2006)	Reported using LCM perspective help in encoding, storing, and retrieval of both structural and content elements of advertisement.
RMT	Yim et al., (2014)	Reported positive result when advertisement matches to consumers Resource.

### Research Questions/ Hypotheses

Based on previous studies, DS advertising has a marvelous impact on consumer buying behavior. According to Newman et al. (2010), DS must be displayed where they capture more attention and have more time to see the content. Kwon et al. (2016) reported that it is essential to understand

consumer emotions to recognize the consumer's psyche. When consumers enter shopping malls, their emotions are influenced (Albrecht et al., 2017). Therefore, we can assume that:

**H1: Consumer emotion is significantly influenced by Digital signage advertisement.**

Based on the above discussion, social media advertising tremendously impacts consumer buying behavior in the present era. Consumer emotional reactions and feelings are essential in product selection and purchasing. Srinivasan et al. (2016) reported that on social media, consumers could respond positively and negatively to products and brands. Consumers may have positive and negative comments or like or dislike the product. Both types of positive and negative reactions from consumers can be lucrative or unprofitable for companies (Srinivasan et al., 2016). Thus, we can undertake that:

**H2: Social media advertisement has a direct impact on consumer emotions.**

Siemer et al. (2007) found that cognitive appraisal theory defined how emotional feelings and reactions proceed in different situations. Internal and external conditions determine an individual's assessment and evaluation of the problem. Internal conditions include an individual's personality, beliefs, thoughts, and aims, while external conditions contain an individual's experience with a particular product and other persons' reviews and responses. Therefore, we can assume that:

**H3: Consumer emotion has a direct impact on consumer buying behavior.**

According to Roggeveen et al. (2016), the DS display ads positively enhanced sales and purchases, time to stay in malls, visits for shopping trips, shopping time, and the number of products purchased in hypermarkets. Specifically, DS affects more when sales, discounts, and promotional advertisements are displayed manifestly. Likewise, the fluctuating and animated DS content can arouse emotions and shopping experiences Dennis et al. (2014). Thus, we can assume that:

**H4: Advertising via Digital signage has a significant impact on consumers buying behavior.**

Dehghani and Tumer (2015) stated that consumers' buying intentions are based on the brand image, comments, and recommendations shared by other consumers on social media. Consumer buying intentions depend on advertising value that leads towards social media advertising (Knight & Kim, 2007). Besides, people avoid social media advertisements because of vague information and irrelevant ads. Relating to social media like YouTube, several videos regarding other products and brands presenting their characteristics are effective for online consumers and more likely to comprehend the purchase intention. Therefore, we can assume that:

**H5: Advertisement via social media has a significant impact on consumers buying behavior.**

Based on the above discussion, social media advertising tremendously impacts consumer buying behavior in the present era. Chen and Yu (2013) reported that on Facebook, brands create User user-generated content to increase awareness of consumer involvement and familiarity with the realistic brand. Both informational and emotional messages shared through the brand UGC on Facebook by consumers make it possible to exemplify the anticipated responses (Smith et al., 2012). Therefore, we can assume that:

**H6: Consumer emotions significantly mediate between social media advertisement and consumer buying behavior.**

Based on previous studies, DS advertising has a marvelous impact on consumer buying behavior. Burke (2009) stated that the DS captured more consumers' attention and degree of engagement

when excellent content and context exposure were displayed. Similarly, Yim et al. (2014) mentioned that consumer buying decisions are influenced mainly by co-shoppers. Earlier studies reported that consumers' positive responses and reactions were primarily influenced by consumer emotions (Machleit & Eroglu., 2000; Koo & Ju, 2010). Dennis et al. (2010) described that effective DS enhances positive emotions in consumers, encouraging their behavior approaches like spending money and time and the frequency of visiting.

**H7: Consumer emotions significantly mediate between digital signage advertisement and consumer buying behavior.**

The Affective advertisement is the independent variable, and digital signage is the antecedent. Dennis et al. (2014) found that effective DS advertisement creates compelling consumer experiences. Affective DS are frequently used in ads, and their appearances, natural scenes, and stimulating incentives all arouse unconscious affective responses (Haws et al., 2012). Rapp et al. (2016) reported that DS generates satisfying and pleasing shopping experiences and likely increases spending. In affective DS content, motivational emotional theory suggests a theoretical understanding of consumers' responses (Ahmad et al., 2022). In the in-store environment, affective DS positively influences consumer preference and excitement, identifiable by consumers' expressions (Hung et al., 2011). Hence, we can commence that:

**H8: Affective digital signage advertisement has a significant impact on consumer emotions.**

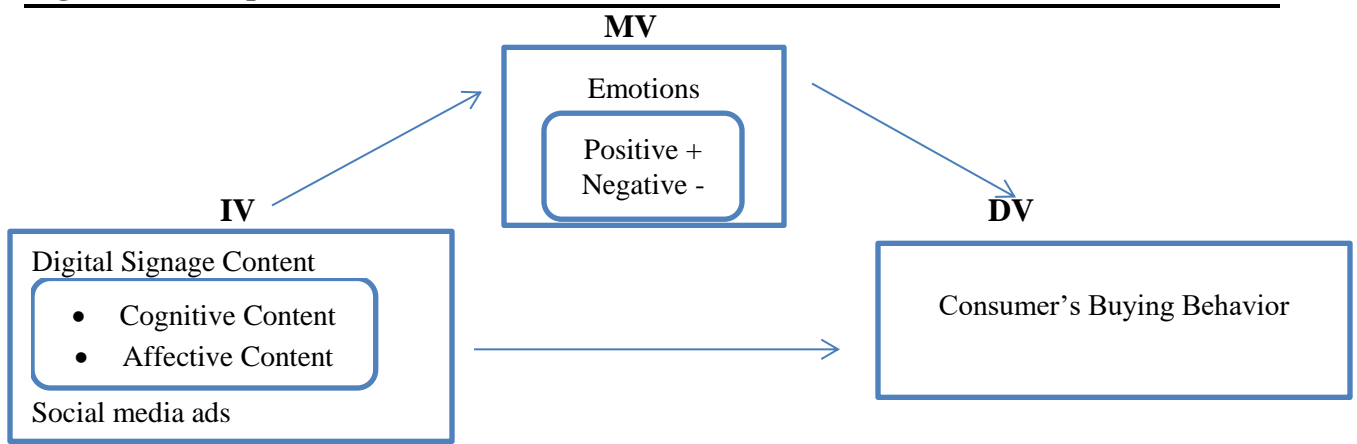
**H9: Affective digital signage advertisement significantly impacts consumer buying behavior.**

A Cognitive advertisement is an independent variable, and digital signage is taken as an antecedent. Napoli et al. (2014) reported that most shoppers are confused because of unsuitable, inappropriate, and mismatched store equipment, which creates cognitive misfits. Subsequently, when cognitive incentive processing resources were limited, affective stimuli strongly influenced emotions. Cognitive (information-based advertisement) is mainly used by brands and typically displayed in a manner that makes it doubtless, verifiable, and certifiable so that consumers have confidence relevant to purchased products (Creyer, 1997). Consequently, we can undertake that:

**H10: Cognitive digital signage advertisement has a significant impact on consumer emotions.**

**H11: Cognitive digital signage advertisement has a significant impact on consumer buying behavior.**

**Figure 1: Conceptual Framework**



## Research Methodology

The present study is quantitative in nature and continues towards quantitative data collection. The study is quantitative in nature because the authors are using five-point Likert scale questionnaire to determine the impact of Digital Signage and Social Media Advertising on consumers buying behavior with mediating role of emotions. In this study, customers who watched advertising before or during their shopping located in Lahore city are taken as target population. It has been quite difficult to determine the exact best-suited sample size for representatives in present research due to the time, and resources limitation. For this study Item-based theory was used to determine appropriate sample size.

To achieve these purposes, foremost data were collected by means of the survey tool questionnaire.

- 1) Social media variable consists of four items that adopted by (Ramanathan, 2017).
- 2) DS scale contained fifteen items from digital signage (cognitive and affective content) adopted and adapted by different researchers.
- 3) Emotions scale contained eight items of emotions (positive and negative) and scale developed by (Babin & Darden, 1996) Positive emotions include happy, pleased, satisfied and contented these are the terms which are used in measurement scale of positive emotions while Negative emotions include unhappy, despair, unsatisfied and annoyed these are the terms which are used in measurement scale of negative emotions.
- 4) Consumer's buying behavior scale contained four items.

Regression model will be used to analyze the independent and dependent variable relationship.

$$CBB = \alpha + \beta_1 DSC + \beta_2 SM + \beta_3 EM + \epsilon_0$$

## Data Analysis and Results

The analysis was obtained by applying AMOS technique. Table 2 shows the descriptive statistics of demographic characteristics and variables.

<b>Gender</b>		<b>Qualification</b>	
Female	60.1 %	Intermediate	13.9 %
Male	39.9 %	Graduation	42.6 %
<b>Age</b>		MS / MPhil	33.4 %
Less than 20 years	14.9 %	PhD	5.7 %
21-30	63.9 %	Others	4.4 %
31-40	16.2%	<b>Income</b>	
41-50	3.7 %	Below 10,000	27.4%
50 & Above	1.4 %	11,000-20,000	16.4%
<b>Marital status</b>		21,000-30,000	19.3%
Single	61.5 %	31,000-40,000	14.9%
Married	38.5 %	41,000 – 50,000	15.5%
		50,000 & Above	6.8%

In CFA, the factor loading is in the middle of 0.597 and 0.878, which is greater than .40. The composite reliability (CR) is amongst 0.821 and 0.910, greater than 0.70 and the AVE (Average Shared Variance) is 0.504 to 0.565, which is greater than .50. Therefore, the measurement used in this research is within the satisfactory level, supporting to the reliability and validity. In this study



discriminant validity was supported as all the correlations represented by R among each pair of constant variables, were less than AVE.

**Table 3: Summary of Validity figures and Correlations**

	CR	AVE	MSV	ASV	EM	DSA	SMA	CBB
<b>EM</b>	0.885	0.565	0.293	0.222	0.752			
<b>DSA</b>	0.910	0.504	0.293	0.240	0.541	0.710		
<b>SMA</b>	0.821	0.536	0.210	0.195	0.443	0.458	0.732	
<b>CBB</b>	0.828	0.553	0.219	0.192	0.420	0.468	0.424	0.743

### Goodness of Fit

To measure the effect of DS and Social Media ads on consumer buying behavior there are two anticipated models. However, the proposed model of the present study describe the influence of DS and Social Media ads on consumer buying behavior with mediating role of emotions. The model fit of SEM anticipated in the present study was measured through a list resulted in AMOS output are shown below in table 4.

**Table 4: Summary of Goodness of Fit Indices of Measurement Model**

Fit Indices	Chi Square	P-Value	CMIN	GFI	AGFI	TLI	CFI
<b>RMSEA</b>							
<b>Value</b>	504.343	0.000	2.193	.879	.842	.918	.931
<b>Suggested</b>		<0.05	<0.03	>.80	>.80	>.90	>.90
<b>Values</b>							

### Hypotheses Testing

In research main step is to test the hypotheses specifically proposed for this study whereas, SEM helps to examine and check their usefulness. Table 5 Shows the standardized regression weights with values of standard error it also represents the significance of understudy variables.

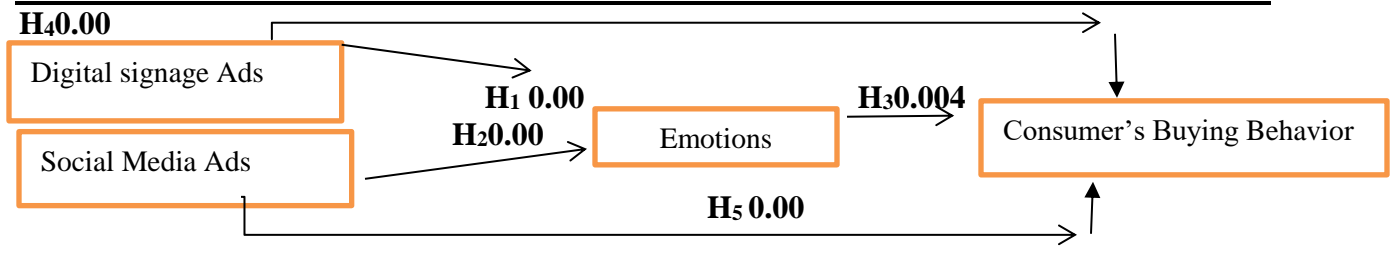
**Table 5: Estimates and Standardized Regression Weights of empirical model**

		$\beta$ -values	P-values	Decision
EM	<--- DSA	0.536	***	Accepted
EM	<--- SMA	0.333	***	Accepted
CBB	<--- EM	0.183	.004	Accepted
CBB	<--- DSA	0.359	***	Accepted
CBB	<--- SMA	0.327	***	Accepted
EM	<--- AA	.753	***	Accepted
EM	<--- CA	.290	.661	Rejected
CBB	<--- AA	.242	.016	Accepted
CBB	<--- CA	.263	***	Accepted

**Note** \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$

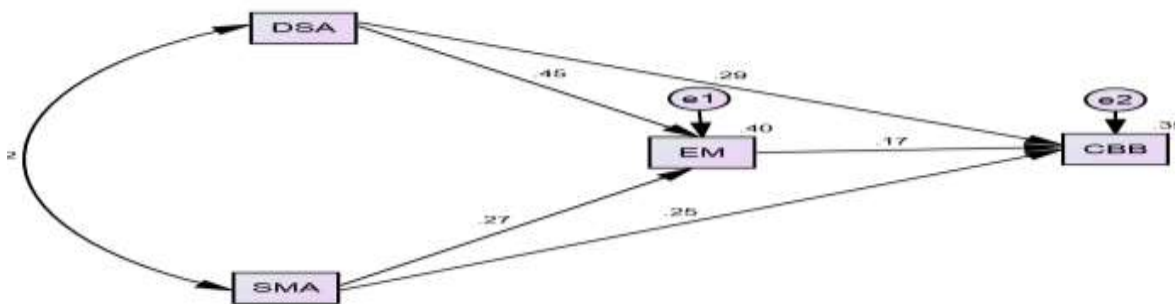
The regression model is as under:

**Figure 2: Regression Model**



H<sub>1</sub> predicted that Digital Signage Advertising (DSA) has a significant impact on (EM) consumer emotions. The proposed model relevant to first hypothesis showed a positive and significant effect on consumer's emotion. As shown in table 5, H<sub>1</sub> was accepted ((standardized  $\beta = 0.536$ ,  $p < 0.001$ ). Secondly, H<sub>2</sub> predicted that Social media (SMA) has a significant effect on Emotions (EM) with values (standardized  $\beta = 0.333$ ,  $p < 0.001$ ) that supports H<sub>2</sub> to be true. The results showed that Emotions (EM) has a significant effect on Consumer Buying Behavior (CBB) the proposed model relevant to third hypothesis indicates a positive and significant impact of Emotions on Consumer's Buying Behavior along with values (standardized  $\beta = 0.183$ ,  $p < 0.05$  (.004)) that supports H<sub>3</sub>.

**Figure 3: Standardized Regression Model performed in AMOS**



Furthermore, H<sub>4</sub> predicted that Digital Signage Ads (DSA) has significant effect on Consumer Buying Behavior (CBB) the model related to this hypothesis indicate a positive and significant impact on Consumer Buying Behavior (CBB) with values (standardized  $\beta = 0.359$ ,  $p < 0.001$ ) that supports H<sub>4</sub>. Social media and consumer buying behavior results show that Social Media Ads (SMA) has significant effect on consumer buying behavior (CBB) with values (standardized  $\beta = 0.327$ ,  $p < 0.001$ ) that supports H<sub>5</sub> as shown in table 5. Thus, hypotheses testing and its acceptance illustrates that variables of concern have positive and highly significantly affect each other.

### Measuring Emotions as a Mediating Role Between DSA, SMA and CBB

H<sub>6</sub> predicted that consumer emotions significantly mediate between social media advertisement and towards their buying behavior and finally, H<sub>7</sub> proposed that consumer emotions significantly mediate between digital signage advertisement and towards their buying behavior. To test the two hypotheses, this study conducted a bootstrapping procedure to test for mediation. According to



Preacher and Hayes (2008) bootstrapping has shown a good method for testing significance in models, since it does not make any assumption about the normality of the distribution of the tested variables. The results obtained through bootstrapping with bias corrected confidence estimates confirmed that emotions as mediator. Table 8 depicts the significant values of standardized direct effect and standardized indirect effect that express the occurrence of partial mediation between variables of current study. The indirect effect exists between DSA-SMA, EE and CBB significantly. According to Baron and Kenny, (1986) guidelines partial mediation was supported. Thus, emotions partially mediated between digital signage-social media Advertisements by using SEM and the paths proposed in the model results in statistically significant. Overall, findings showed that consumer's emotions mediated the hypothesized relationships, therefore H<sub>6</sub> and H<sub>7</sub> was supported. The results of Standardized Direct Effects and Standardized Indirect are shown in table 6:

**Table 6: Estimates of Standardized and Standardized Indirect Effects**

			Standardized Direct Effects	Standardized Indirect Effects
EM	<---	DSA	0.536	
EM	<---	SMA	0.333	
CBB	<---	EM	0.183	
CBB	<---	DSA	0.359	0.012*
CBB	<---	SMA	0.327	0.007**
EM	<---	AA	0.753	
EM	<---	CA	0.029	
CBB	<---	AA	0.242	0.002**
CBB	<---	CA	0.263	0.696

**Note** \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$

In the final step of the regression model, Digital Signage Advertisement revealed a significant positive predictor, as noted above. Concerning the other focal variables, i.e., Social Media advertisements are also significantly related to emotions. The results of the relative weights analysis demonstrated that all of the study variables explained a significant portion of the variance in emotions. However, the most dominant predictor of CBB was Social Media Advertisement. Digital signage (cognitive content & affective content) advertisement was the least dominant predictor on our criteria variable CBB. The last section was about results, with their description along with a discussion in which all the fundamental results were accounted for and reported alongside their tables, which represent the thought behind the entire research procedure and data collection for the research. Finally, the hypothesis status finishes the chapter.

## Conclusion

Previously, lots of studies have been done on consumer behavior and paid contributions to existing knowledge. The author moves this literature forward to get a broader understanding of rapidly moving digital and social media advertising. The research inspects critical phenomena with developed theories to get a most valuable theoretical base. This study examines the impact of DS and SM ads on consumer emotions and buying behavior. Moreover, this study is conducted on digital techniques and social media marketing to attract more consumers because companies face intense competition nowadays. Companies and marketers worldwide are involved in social media and digital signage. Advertisers promote their brands, get consumers' active responses, grab more

attention, and cost-effectively profit their business. The existing research emphasizes the impact of DS and SM ads on consumer emotions and their buying behavior. Previous studies examined consumers' positive responses toward DS ads in shopping malls or retail stores.

Moreover, most of the research concentrated on investigating DS ads' impact on consumer responses only in a particular setting. Subsequently, DS has the potential to create positive emotions and feelings. Previous research indicated that DS generates positive responses and avoids negative emotions, specifically in task-oriented shopping settings such as grocery shops and shopping malls. The present study is conducted in diverse places to get consumer responses about DSA and SMA rather than just in shopping malls.

This research study contributes to a new research paradigm. Before this research, no study was done on the relationship between DS/ SM Ads and CBB in Pakistan. DS advertising is a new concept in Pakistani culture and has a tremendous impact on consumer emotions. Additionally, the current study confirms the mediating role of emotions in the relationship between social media & digital signage ads and consumer buying behavior. The animated/ sentimental DS content and effective SM ads create positive emotions in consumers, increasing their buying behavior. Ultimately, the study concluded that digital signage and social media advertising significantly and positively impact consumers' buying behavior.

Further, results show that positive emotions positively enhance consumer buying behavior in terms of more money spending, etc. Despite all the productive contributions in the theoretical and practical aspects of the current study, specific limitations exist in terms of the sampled data and the generalizability of the research. However, this research is insufficient to justify the impact of DS and SM ads as it doesn't close the door to insights into consumer buying behavior relationships. The present study is only a minor contribution to the research paradigm.

- The present study is a questionnaire survey-based study that was ensured within a limited period. Moreover, the external validity of cross-sectional studies is limited compared to experimental studies.
- The present study has been done for the first time in Pakistani culture to determine the impact of DS and SM ads on consumer emotions and buying behavior. The studies on digital signage ads have been more focused on explaining its determinants from the shopping environment and indicating varying results depending upon different nations and cultures. Thus, the study needs to be done in a diverse climate rather than just in the shopping environment to determine digital signage's impact.
- This study considered the general population. It can be done on the specific target population, including different demographic variables, as the population can be divided and compared based on gender, age, marital status, and income basis.
- Furthermore, a smaller number of variables has been considered in the present study; for instance, no moderating variable has been adopted. Moreover, psychological effects such as confusion and irritation have not been adopted as mediators. Thus, it calls for a study with other varying but associated moderating and mediating variables.

The present study has proved an essential avenue for literature. Besides all these limitations, though, the results of the present study are based on the proposed hypotheses. However, there are still certain limitations that lead to future research recommendations. The present study allows the researcher to conduct research in the following directions. The study indicated the limitation of the cross-sectional approach; thus, it calls for future research conducted by incorporating a longitudinal time approach by utilizing specific manipulations regarding variables. The study is preliminary in Pakistani culture and was conducted in a real-world

setting to get responses from the general public so replications could be done in diverse environmental settings. In the current study, the impact of general DS content on consumers has been tested. Thus, future research would be worthwhile, and the findings could be validated if tested with one product category.

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