



How smartphone advertising influences consumers' purchase intention

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ABSTRACT

In the last decade, the use of smartphones has grown steadily. The way consumers interact with brands has changed owing to the accessibility of internet connection on smartphones, and ubiquitous mobility. It is crucial to understand the factors that motivate consumers to interact with smartphone advertisements and therefore what stimulates their decision to purchase. To achieve this goal, we proposed a conceptual model that combines Ducoffe's web advertising model and flow experience theory. Based on the data collected from 303 Portuguese respondents we empirically tested the conceptual model using a partial least squares (PLS) estimation. The results showed that advertising value, flow experience, web design quality, and brand awareness explain purchase intention. The study provides results that allow marketers and advertisers to understand how smartphone advertisements contribute to consumer purchase intention.

1. Introduction

The number of smartphone users has been increasing significantly because of the growth of the smartphone industry, which develops new operating systems and a proliferation of applications. According to Gartner (2016) global sales of smartphones to end users totalled 349 million units in Q1 2016, a 3.9% increase over the same period in 2015. Moreover, smartphone sales represented 78% of total mobile phone sales in Q1 2016. Smartphones have been influencing the way people communicate with each other, becoming a near necessity in both private and professional lives (Derks, Bakker, Peters, & van Wingerden, 2016). The unprecedented growth of smartphones has attracted academic attention, hoping to determine the motivations that explain smartphone use (Park, Kim, Shon, & Shim, 2013; Yeh, Wang, & Yieh, 2016).

Earlier studies focused mainly on antecedents of advertising value and flow experience on mobile advertising, to study attitude toward mobile advertising or intention to read or click (Liu, Sinkovics, Pezderka, & Haghirian, 2012; Yang, Kim, & Yoo, 2013). There is little research about what leads to advertising value, flow experience, and purchase intention on smartphone advertising (Kim & Han, 2014). Therefore, the aim of this study is to analyse the factors that influence consumers' purchase intention after seeing smartphone advertisements. To do so, we developed a model that combines Ducoffe's web advertising model, flow experience theory and three additional variables

(emotional value, web design quality, and brand awareness) to understand the antecedents of purchase intention on smartphone advertising. The research questions (RQs) that emerged are as follows:

RQ1 – What are the factors that influence advertising value and flow experience?

RQ2 – Do emotions add significance to advertising value in smartphone advertisements?

RQ3 – Does web design quality influence flow experience in smartphone advertisements?

RQ4 – Does brand awareness play an important role in forming purchase intention in smartphone advertisements?

The contributions of this research are threefold. Firstly, it will be a guideline for marketers and advertisers to understand the factors that play an important role in smartphone advertising. Secondly, it provides valuable insights on how smartphone advertisements contribute to forming consumer purchase intention. Thirdly, we investigate the elements that influence best communication strategies for brands in the smartphone advertising market.

This article is structured as follows: Section 2 contains the theoretical background, i.e., the concept of mobile advertising, smartphone advertising and purchase intention, and theoretical foundation. Then, in Section 3 it presents the conceptual model, followed by Section 4 which covers the method used in the research. Sections 5 and 6 contain data analysis and discussion, respectively. Conclusions are in Section 7.

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2. Theoretical background

2.1. The concepts of mobile advertising, and smartphone advertising

Mobile advertising is defined by The Mobile Marketing Association as “a form of advertising that transmits advertisement messages to users via mobile phones or other wireless communication devices” (Chen & Hsieh, 2012). By incorporating mobile advertising techniques in their communication strategies, retailers, services providers and manufacturers can create more dynamic offers and campaigns. From a theoretical perspective, in order to understand how campaigns can reach successful levels, one must know how to ensure alignment between all context variables, the advertising goals, the stakeholders, market conditions, and the chosen mobile ad elements (Grewal, Bart, Spann, & Zubcsek, 2016).

Smartphones, different from standard mobile phones in terms of the operating system, have been attracting a substantial number of users and have become a perceived necessity in personal and work lives. People use them for social networking purposes, for features and functions like reading e-books, answering e-mails, sending messages, and playing games. The Smartphone is a quite new technology and it has received minor attention in academic research in terms of understanding users' mind-sets about the adoption of smartphones (Joo & Sang, 2013). Nevertheless, smartphone advertisements play an increasing role in the decision-making process in supporting consumer purchases (Kim & Han, 2014).

Advertisements on smartphones have become more sophisticated, adapting to device screens that are not suitable for showing traditional online advertising (pop up, pop under, video, and display ads).

2.2. The concept of purchase intention

Purchase intention indicates likelihood that consumers will plan or be willing to purchase a certain product or service in the future (Wu, Yeh, & Hsiao, 2011). Past research has demonstrated that an increase in purchase intention reflects an increase in the chance of purchasing. If consumers have a positive purchase intention, then a positive brand engagement will promote that purchase. Regarding the context of smartphones, one needs to consider purchase intention as the desire of consumers to make a purchase through the mobile application (Chen, Hsu, & Lin, 2010). Some of the most relevant research on mobile purchase intention is summarized in Table 1.

In their most recent research, Zubcsek, Katona, and Sarvary (2017) present several arguments supporting the assumption that consumers' movement patterns tend to represent their product preferences, which should be used by marketers to improve the provided commercial offer. In line with this, Shen (2015) argues that not only is mobile shopping increasing to the point of becoming part of many people's routine, but there is also a set of determinants, such as attitudes, subjective norms, and perceived behavioral control that tend to impact the customer intention to purchase. Hence, product information in mobile advertising

should take into consideration these determinants to be well accepted by customers and to have the desired trigger effect.

2.3. Theoretical foundation

2.3.1. Ducoffe's web advertising model

Ducoffe (1995) developed an approach to study the effectiveness of attitude toward web advertising, focusing on advertising value. In order to understand what makes an advertisement valuable, Ducoffe (1995) found the antecedents (i.e., informativeness, irritation, and entertainment) of advertising value on the World Wide Web. Firstly, informativeness, described as the ability of advertising to inform consumers of product types. Secondly, irritation reflects the techniques employed by advertisers that annoy, offend, insult, or manipulate consumers. Consequently, techniques are perceived as unwanted, irritating consumers. Thirdly, entertainment is perceived as pleasant or likeable advertising and has a positive impact on brand attitudes. These three determinants were the starting point to justify how consumers evaluate the value of advertising. The addition of credibility by Brackett and Carr (2001) and incentives by Kim and Han (2014) as antecedents of advertising value came later. Varnali, Yilmaz, and Toker (2012) describe incentive as generic monetary gains (lotteries, discounts, prepaid credits, and gifts).

2.3.2. Flow experience theory

Csikszentmihalyi (1975) pioneered flow construct. Flow illustrates the best feelings and the most enjoyable experiences possible in human lives as “the bottom line of existence”. By definition, flow is a psychological state in which an individual feels cognitively efficient, motivated, and happy. Researchers have started to recognize the value of this theory in understanding people's behaviour while using the web (Hoffman & Novak, 2009; Novak, Hoffman, & Yung, 2000). The concept of flow was first applied to the experiences of web users by Hoffman and Novak (1996) in an examination of online marketing activities.

3. Conceptual model

3.1. The conceptual model

The conceptual model, as shown in Fig. 1, is based on Ducoffe's web advertising model and flow experience. The goal of this research is to determine how consumers perceive the antecedents of the interaction with smartphone advertisements, and consequently how this influences their purchase intention. The constructs, advertising value, and flow experience have five common variables: (1) informativeness; (2) credibility; (3) entertainment; (4) irritation; and (5) incentives. A new variable was added to advertising value, i.e., emotional value. Similarly, the web design quality variable was added to flow experience. We added brand awareness and the antecedent emotional value. Purchase intention is depicted as the consequence of advertising value, flow experience, web design quality, and brand awareness. Each of these constructs is discussed in the following sections.

Table 1
Earlier research studies on mobile purchase intention.

Topic	Research	References
Information credibility and purchase intention	Discuss how information credibility and user-generated content might impact the product quality and the customer purchase intention	Flanagin, Metzger, Pure, Markov, and Hartsell (2014)
Purchase intention in social network sites	Authors studied the relationship between eWOM, value co-creation, and purchase intention when customers are using SNS	See-To and Ho (2014)
Risk perceptions and online purchase intention	Research on the influence of online shopping experience on perception of risks associated with online shopping and how this influences online purchase intentions	Dai, Forsythe, and Kwon (2014)
Facebook advertising effect on purchase intention	Discuss how customer perception toward social media advertising impacts the relationship with brands, hence triggering the purchase intention.	Dehghani and Tumer (2015)
Mobile shopping	Authors present an extension to Technology Acceptance Model that included perceived enjoyment and satisfaction as the added constructs, aiming to explain customers' acceptance of m-shopping.	Agrebi and Jallais (2015)

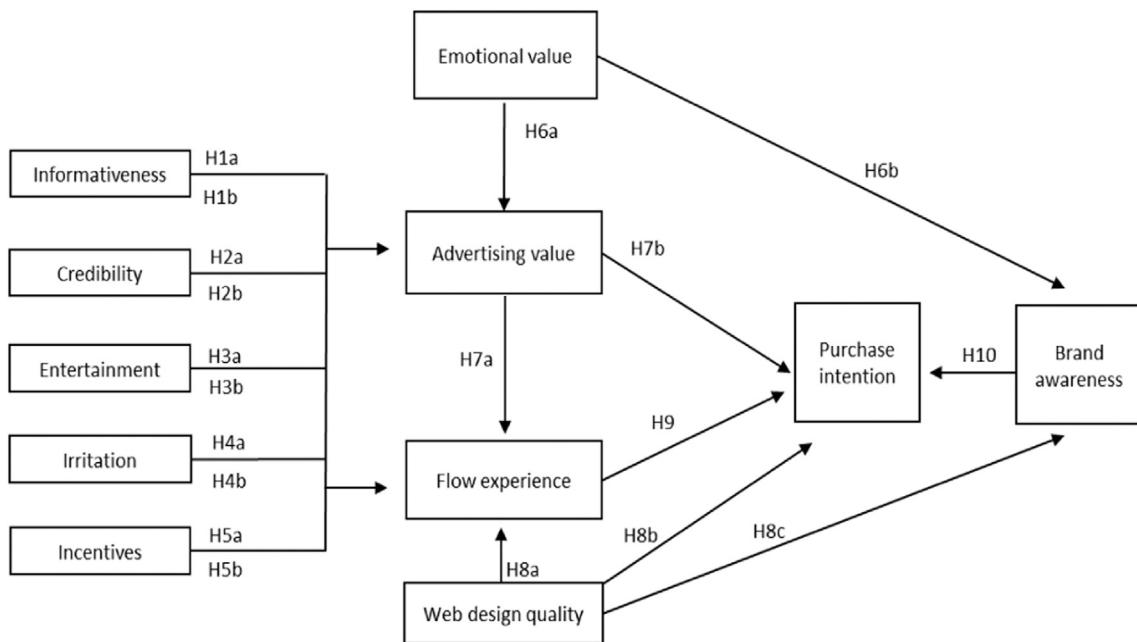


Fig. 1. - Conceptual model.

3.2. Hypotheses

In a mobile devices context, information is considered as a valuable incentive because consumers react very positively to advertising (Aitken, Gray, & Lawson, 2008). Consumers do not feel annoyed if mobile advertisements provide appropriate information. Scharl, Dickinger, and Murphy (2005) concluded that consumers are likely to purchase advertised products if advertisers provide funny and entertaining SMS messages that are informative and relevant. Thus, informativeness is strongly related to perceived advertising value (Ducoffe, 1996). In addition, informativeness positively influences flow experience because it will affect consumer attention. The consumer focuses on product information messages, concentrating on their details, excluding irrelevant thoughts (Hoffman & Novak, 1996; Li & Browne, 2006). Thus:

H1. Perceived informativeness of smartphone advertisements is (H1a) positively associated with perceived advertising value and (H1b) positively associated with flow experience.

“The extent to which the consumer perceives claims made about the brand in ads to be truthful and believable”, defines credibility (Mackenzie & Lutz, 1989). Several empirical studies have demonstrated that advertisement credibility has a significant effect on attitudes toward advertising and behavioral intentions (Tsang, Ho, & Liang, 2004; Zhang & Mao, 2008). Advertising credibility is evaluated through the content of advertisements, being further influenced by a company’s credibility and the holder of the message (Balasubraman, Peterson, & Jarvenpaa, 2002). Thus, advertising credibility positively affects the perceived value of advertising. According to Yang et al. (2013) a consumer may avoid or not respond to advertising if they do not think mobile advertisements are trustworthy, not paying attention to the message. Therefore, the reliability of a mobile message is critical and consumers are able to experience flow state with a credible message (Choi, Hwang, & McMillan, 2008). Thus:

H2. Perceived credibility of smartphone advertisements is (H2a) positively associated with perceived advertising value and (H2b) positively associated with flow experience.

Ducoffe (1995) confirmed that entertainment of advertising information is positively related to advertising value. Entertainment is the

ability of an advertisement to promote enjoyment and create positive consumer attitudes by providing a form of escapism, diversion, aesthetic enjoyment, or emotional release (Elliott & Speck, 1998; Shavitt, Lowrey, & Haefner, 1998). In the advertising context, entertainment is pleasurable, enjoyable, and fun to watch (Schlinger, 1979). According to Sternthal and Craig (1973) entertaining advertisements attract consumers’ attention, consequently the effectiveness of the advertisement increases. Coulter, Zaltman, and Coulter (2001) found that entertainment is an important value that consumers look for in advertising. Moreover, entertainment has recently become a factor that consumers expect when they view advertising. Entertainment positively influences consumer flow experience. Hence:

H3. Perceived entertainment of smartphone advertisements is (H3a) positively associated with perceived advertising value and (H3b) positively associated with flow experience.

Irritation refers to the extent to which consumers perceive that mobile advertisements are irritating or annoying, involving negative feelings toward the advertisements (Yang et al., 2013). Past research examined irritation as being negatively related to advertising value, reducing advertising effectiveness and the value perceived by consumers (Korgaonkar & Wolin, 1999; Okazaki, 2004). Mobile advertising may provide information that is distracting and that overwhelms the consumer (Stewart & Pavlou, 2002) and this can be perceived as an intrusion into the mobile consumer’s privacy. According to Liu et al. (2012) consumers then feel confused about the advertising and react negatively to it, and irritation caused by incomprehensible or unwanted mobile advertising messages may reflect negatively on the perceived value of mobile advertising. Hence:

H4. Perceived irritation of smartphone advertisements is (H4a) negatively associated with perceived advertising value and (H4b) negatively associated with flow experience.

Incentives are major predictors of consumers’ responses and entail monetary benefits such as discounts, coupons, gifts, and non-monetary benefits (Varnali et al., 2012). Incentives are considered to have an impact on consumer intentions to receive mobile advertising and provide specific financial rewards to consumers who agree to receive an advertisement (Tsang et al., 2004). Y. Kim and Han (2014) introduced the incentives in the Ducoffe (1995) model. They suggest increasing

incentives for consumers receiving smartphone advertisements, affecting consumer flow experience. Their study reported that consumers are interested in tangible benefits and pay more attention to an advertising message for financial advantage. Thus, consumers perceive value in an advertisement with incentives. Consequently:

H5. Perceived incentives of smartphone advertisements is (H5a) positively associated with perceived advertising value and (H5b) positively associated with flow experience.

Past research studied emotion in the advertising field (Edell & Burke, 1987). The utility derived from the feelings or affective states (i.e. enjoyment or pleasure) that a product generates defines emotional value. Emotional value toward a brand relates to positive feelings upon using the brand, which increases consumer loyalty toward the brand (Sweeney & Soutar, 2001). When consumers view advertising, the information contained in it induces emotional responses and creates an attitude toward the brand. Hyun, Kim, and Lee (2011) defined emotional responses toward advertising as the set of emotional responses elicited during advertising viewing. We suggest the addition of emotional value to explain perceived advertising value and increasing brand awareness. Therefore:

H6. Perceived emotional value is (H6a) positively associated with advertising value and (H6b) positively associated with brand awareness.

Advertising value is a measure of advertising effectiveness, being defined as a “subjective evaluation of the relative worth or utility of advertising to consumers” (Ducoffe, 1995, p. 1). Perceived advertising value contributes to the growth of flow experience because consumers focus totally on the messages received, eliminating irrelevant thoughts (Hoffman & Novak, 1996). Consumers evaluate the received messages as being worthy if they match their needs or include valuable information to purchase. Past research studied the relationship between advertising attitude and purchase intention (Tsang et al., 2004). However, there are few studies investigating the relationship between advertising value and purchase intention. Consumers show a favorable attitude to products or services when purchase intention increases (Ko, Cho, & Roberts, 2005). Thus:

H7. Perceived advertising value is (H7a) positively associated with flow experience and (H7b) positively associated with purchase intention.

Web design is the set of elements that a consumer experiences on a web site - information search, product selection (Ha & Stoel, 2009). Design factors - size of the advertisement, use of colour, music effects, presence of animation, and the length of the commercial are related to how effectively the advertisement is designed. Web site design affects online purchase intention. A poorly designed interface can disrupt a flow experience by demanding an excessive amount of attention, or contrarily, distracting the users. H. Kim and Niehm (2009) reported that web design quality positively influences consumer perception regarding the quality of information shown on the web site, and consequently affects brand perception as reliable. We include web design quality due to the lack of study about designing mobile advertisements. Accordingly:

H8. Perceived web design quality is (H8a) positively associated with flow experience, (H8b) positively associated with purchase intention, and (H8c) positively associated with brand awareness.

The concept of flow refers to optimal and enjoyable experiences when an individual engages in an activity with total involvement, concentration, and enjoyment. When consumers become absorbed in their activities, irrelevant thoughts and perceptions are filtered out. Researchers concluded that surfing the web is an activity that can facilitate the occurrence of flow (Chen, Wigand, & Nilan, 1998; Hoffman & Novak, 1996). The decision to interact with smartphone advertisements and whether to purchase advertised products or services or not is

crucial for flow experience (Kim & Han, 2014). Thus, consumers' flow experience positively influences purchase intention. Hence:

H9. Flow experience is positively associated with purchase intention.

Brand awareness is related to the strength of the brand node or trace in memory as reflected by consumers' ability to recall or recognize the brand under different conditions. Hence, only brands that consumers recognize can be identified, categorized, and ultimately purchased. The importance of brand awareness resides in the fact that consumers include it in their decision to purchase and evaluate the product. Regarding purchase intention, consumers' choice of a more familiar brand is usually higher than that of a less familiar brand (Hoyer & Brown, 1990). We add brand awareness because past research has demonstrated that raising it increases the chance of the brand being considered for purchase (Washburn & Plank, 2002). Thus:

H10. Brand awareness is positively associated with purchase intention.

4. Methods

4.1. Measurement

All constructs were adapted, with slight modifications, from the literature (see Appendix A). All the constructs were measured by using seven-point range scales in each item, ranging from “strongly disagree” (1) to “strongly agree” (7). The language of the constructs was modified to be suitable in the smartphone ad context. We also included four demographic questions relating to age, gender, education, and job. The questionnaire was uploaded to the web, to be divulged online, through surveymonkey.com.

4.2. Data

In July 2016 a pilot survey was conducted with 44 responses to refine the questions, obtain additional comments on the content and structure in order to decide which would be the final items to analyse. Respondents of the pilot test were asked to provide feedback and suggestions for improvement when instructions or questions were not clear. Respondents also answered all questions by following the instructions. The most important changes were in the items of emotion value (EV), web design quality (WDQ), incentives (INC), and purchase intention (PI), as they generated misunderstandings and users did not clearly understand the questions. For this reason and regarding the smartphone context, the items were modified by many suggestions about the phrasing and the overall structure of the questionnaire. The data from the pilot survey was not included in the main survey.

A survey was conducted to examine the hypotheses in this study. Respondents were those who have a smartphone and have had an experience viewing smartphone advertisements. The data were collected from smartphone consumers who had experienced SMS, MMS, keyword search, display, and rich media advertising. We carefully scrutinized the responses for each question. Improper responses such as having the same answers to all questions and incomplete responses were excluded from our sample. In total, 303 respondents successfully completed the questionnaire, which can be considered an adequate sample for a research of this kind (Baptista & Oliveira, 2015; Hossein, 2015; Hsia, Chang, & Tseng, 2014; Zhu, Chang, & Luo, 2016). These valid responses were analysed to assess reliability, validity, and appropriateness for hypotheses testing.

We administered the questionnaires to people residing in Portugal, the 18th country in the World regarding smartphone penetration rate (Newzoo, 2017). The final sample comprised 303 individuals (see Table 2), in which 49% (151) are male and 51% (152) are female. The average age is 33, the youngest respondent being 15 and the oldest 63.

Table 2
Survey respondent profile (n = 303).

Measure	Item	N	Percentage (%)	Measure	Item	N	Percentage (%)
Gender	Male	151	49.8	Daily Internet usage time (using a smartphone)	Seldom	13	4.3
	Female	152	50.2		Under 1 h	51	16.8
Age	Under 20	10	3.3		1 h – 2 h	73	24.1
	20–29	133	43.9		2 h – 3 h	61	20.1
	30–39	82	27.1		Over 3 h	105	34.7
	40–49	52	17.2	Frequency of reading or viewing of an advertisement on a smartphone	Seldom	103	34.0
	50–59	24	7.9		1–3 per day	80	26.4
60–69	2	0.7	> 3 per day		80	26.4	
Education	Junior high school	6	2.0		1 per 2–3 days	21	6.9
	High school	28	9.2		1 per 4–5 days	7	2.3
	Graduate	135	44.6	1 per week	12	4.0	
	Postgraduate	59	19.5	Last purchase of a smartphone	Under 6 months	71	23.4
	Master	70	23.1		6 months – 1 year	76	25.1
Job	Doctorate	5	1.7		1 year – 2 years	92	30.4
	Unemployed	6	2.0		2 years – 3 years	38	12.5
	Student	39	12.9		Over 3 years	26	8.6
	Freelancer	5	1.7	How long respondent has used a smartphone	Under 6 months	7	2.3
	Self-employed	25	8.3		6 months – 1 year	17	5.6
	Internet usage period (using a smartphone)	Employed	228		75.2	1 year – 2 years	29
No use		2	0.7		2 years – 3 years	59	19.5
Under 6 months		8	2.6		Over 3 years	191	63.0
6 months – 1 year		15	5.0				
1 year – 2 years		50	16.5				
2 years – 3 years		61	20.1				
	Over 3 years	167	55.1				

5. Results

To examine the causal relationships and estimate the conceptual model, we used structured equation modeling (SEM). SEM has changed the nature of research in international marketing and management. It is a statistical technique for testing and estimating causal relationships using a combination of statistical data and qualitative causal assumptions (Henseler, Ringle, & Sinkovics, 2009). The use of Partial Least Squares (PLS) is suitable and was considered the most appropriate method due to: (a) the early stage of theoretical development; (b) this conceptual model has not been tested in the literature and; (c) the conceptual model is considered to be complex. In the next two subsections we firstly examine the measurement model in order to assess indicator reliability, construct reliability, convergent validity, and discriminant validity. Secondly, we test the structural model. The software used for applying the method was PLS Smart 3.0 Software (Ringle, Wende, & Will, 2005).

5.1. Measurement model

Firstly, in order to analyse the indicator reliability, the loadings should be higher than 0.7 (Chin, 1998; Hair & Anderson, 2010; Henseler et al., 2009). All the items have loadings > 0.7 (Table 3), confirming that the indicator reliability is achieved. Secondly, two criteria were used to examine the construct's reliability – Cronbach's alpha (CA) and composite reliability (CR). As seen in Table 3, all constructs have CR and CA > 0.7, approving construct reliability (J. Henseler et al., 2009). Thirdly, in order to assess convergent validity, the average variance extracted (AVE) should be at least 0.5 to be considered sufficient and explain more than half of the variance of its indicators on average (Hair & Anderson, 2010; Henseler et al., 2009). As seen in Table 3, AVE for all the constructs are above 0.5, guaranteeing convergent validity.

Finally, the discriminant validity has three criteria. The first criterion is the Fornell-Larcker criterion, which demands that the root square of AVE (Table 4 in bold) for each latent variable should be greater than the correlation with any other latent variable (Fornell & Larcker, 1981). In Table 4, we see that these criteria are achieved. The

second criterion, the loading of each indicator is expected to be greater than all of its cross-loadings (Chin, 1998). This was also analysed and each construct has loadings with higher values than their cross loadings (Hair & Anderson, 2010); this result is available from the author upon request. The Hetrotrait-Monotrait ratio (HTMT) table is available upon request, and all values are below the threshold of 0.9 (Jörg Henseler, Ringle, & Sarstedt, 2015).

Therefore, all the measures satisfy the discriminant validity of the constructs. The assessment of the construct reliability, convergent validity and indicator reliability, produce satisfactory results, indicating that the constructs can be used to test the conceptual model.

5.2. Structural model

We demonstrated above that the measurement model is satisfactory. Now, it is possible to test the structural model. This article used a bootstrapping of 5000 resamples to estimate the statistical significance of path coefficients (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). According to Chin (1998), the crucial criterion for assessing the structural model is the coefficient of determination (R²) of the endogenous latent variables. R² should be above 0.2 to be considered moderate. The results of the hypotheses of structural model are illustrated in Fig. 2.

First, the research explains 71.7% of variation in advertising value in the conceptual model. The hypotheses of informativeness ($\hat{\beta} = 0.133$; $p < 0.05$), credibility ($\hat{\beta} = 0.334$; $p < 0.01$), entertainment ($\hat{\beta} = 0.205$; $p < 0.01$), irritation ($\hat{\beta} = -0.071$; $p < 0.10$), and incentives ($\hat{\beta} = 0.260$; $p < 0.01$) are statistically significant. However, emotional value ($\hat{\beta} = 0.011$; $p > 0.10$) is not statistically significant. Therefore, hypotheses H1a, H2a, H3a, H4a, and H5a are supported, but H6a is not supported to explain advertising value.

Second, flow experience is explained by 67.4% of the variation in the conceptual model. The hypotheses that are statistically significant to explain flow experience are credibility ($\hat{\beta} = 0.208$; $p < 0.01$), entertainment ($\hat{\beta} = 0.164$; $p < 0.05$), irritation ($\hat{\beta} = -0.084$; $p < 0.10$), incentives ($\hat{\beta} = 0.321$; $p < 0.01$), and advertising value ($\hat{\beta} = 0.288$; $p < 0.01$). However, informativeness ($\hat{\beta} = -0.156$;

Table 3
Factor loading, composite reliabilities, Cronbach alpha and average variance extracted (n = 303).

Constructs	Loadings	CR	CA	AVE	Constructs	Loadings	CR	CA	AVE
Informativeness		0.957	0.941	0.849	Flow experience		0.941	0.915	0.799
INF1	0.888				FE1	0.837			
INF2	0.930				FE2	0.904			
INF3	0.932				FE3	0.932			
INF4	0.935				FE4	0.899			
Credibility		0.967	0.955	0.882	Emotional value		0.904	0.865	0.654
CRED1	0.919				EV1	0.852			
CRED2	0.952				EV2	0.719			
CRED3	0.951				EV3	0.702			
CRED4	0.934				EV4	0.901			
Entertainment		0.978	0.971	0.919	EV5	0.851			
ENT1	0.945				Web design quality		0.954	0.936	0.839
ENT2	0.971				WDQ1	0.906			
ENT3	0.962				WDQ2	0.917			
ENT4	0.956				WDQ3	0.935			
Irritation		0.961	0.939	0.892	WDQ4	0.905			
IRR1	0.947				Brand awareness		0.916	0.878	0.734
IRR2	0.949				BA1	0.770			
IRR3	0.938				BA2	0.861			
Incentives		0.929	0.885	0.814	BA3	0.917			
INC1	0.850				BA4	0.871			
INC2	0.929				Purchase intention		0.957	0.932	0.881
INC3	0.925				PI1	0.913			
Advertising value		0.981	0.971	0.945	PI2	0.958			
AV1	0.967				PI3	0.945			
AV2	0.976								
AV3	0.973								

$p < 0.01$) and web design quality ($\hat{\beta} = 0.035$; $p > 0.10$) are not statistically significant. Therefore, hypotheses H2b, H3b, H4b, H5b, and H7a are supported, while hypotheses H1b, and H8a are not supported.

Third, brand awareness is not explained by 26% of the variation in the conceptual model. The hypotheses emotional value ($\hat{\beta} = 0.231$; $p < 0.01$) and web design quality ($\hat{\beta} = 0.362$; $p < 0.01$) are positively and statistically significant. Therefore, hypotheses H6b and H8c are supported.

Finally, the model explains 68.3% of variance in purchase intention. The hypotheses of advertising value ($\hat{\beta} = 0.228$; $p < 0.01$), web design quality ($\hat{\beta} = 0.099$; $p < 0.05$), flow experience ($\hat{\beta} = 0.516$; $p < 0.01$), and brand awareness ($\hat{\beta} = 0.109$; $p < 0.01$) are statistically significant to explain the purchase intention. Therefore, H7b, H8b, H9 and H10 and are supported.

In summary, out of a total of 19 hypotheses in the model, 16 are supported and 3 are not.

6. Discussion

6.1. Theoretical implications

This research has three theoretical implications. First, advertising value was positively influenced by informativeness, credibility, entertainment,

and incentives, which is consistent with previous findings (Ducoffe, 1995; Kim & Han, 2014; Liu et al., 2012). Credibility was the strongest positive factor, followed by entertainment and informativeness. These results show that consumers perceive smartphone advertisements as a good source of product information and tend to consider it as being somewhat useful and enjoyable. In contrast, irritation negatively influences advertising value, meaning that consumers avoid irritating or annoying smartphone advertisements (Kim & Han, 2014). In addition, this research failed to predict the effect of emotional value. That is, consumers do not have positive feelings about the brand advertised, and do not derive any benefit from the experience of smartphone advertisements.

Second, flow experience is positively influenced by credibility, entertainment, incentives, and advertising value. Informativeness and irritation had a negative influence, which is consistent with earlier research (Kim & Han, 2014). Incentives are the strongest factor, followed by credibility and entertainment. To the contrary, the addition of web design quality did not have a significant impact, the effect of web design experience is not relevant for consumers while they are interacting with smartphone advertisements.

Third, the addition of emotional value and web design quality was revealed to explain brand awareness. These results show the importance of consumers developing an emotional bond with the brand they recognize in smartphone advertisements, and web design plays a crucial role in the perception of brand to consumers, a feeling that is reliable.

Table 4
AVE and correlations.

	INF	CRED	ENT	IRR	INC	AV	FE	EV	WDQ	BA	PI
Informativeness (INF)	0.921										
Credibility (CRED)	0.790	0.939									
Entertainment (ENT)	0.725	0.814	0.959								
Irritation (IRR)	- 0.402	- 0.477	- 0.550	0.944							
Incentives (INC)	0.415	0.539	0.581	- 0.382	0.902						
Advertising value (AV)	0.687	0.784	0.767	- 0.497	0.646	0.972					
Flow experience (FE)	0.518	0.682	0.699	- 0.491	0.698	0.741	0.894				
Emotional value (EV)	0.458	0.372	0.351	- 0.084	0.387	0.375	0.358	0.809			
Web design quality (WDQ)	0.737	0.711	0.713	- 0.418	0.463	0.633	0.551	0.448	0.916		
Brand awareness (BA)	0.495	0.519	0.457	- 0.165	0.381	0.552	0.412	0.394	0.466	0.856	
Purchase intention (PI)	0.578	0.668	0.658	- 0.452	0.642	0.733	0.785	0.360	0.579	0.493	0.939

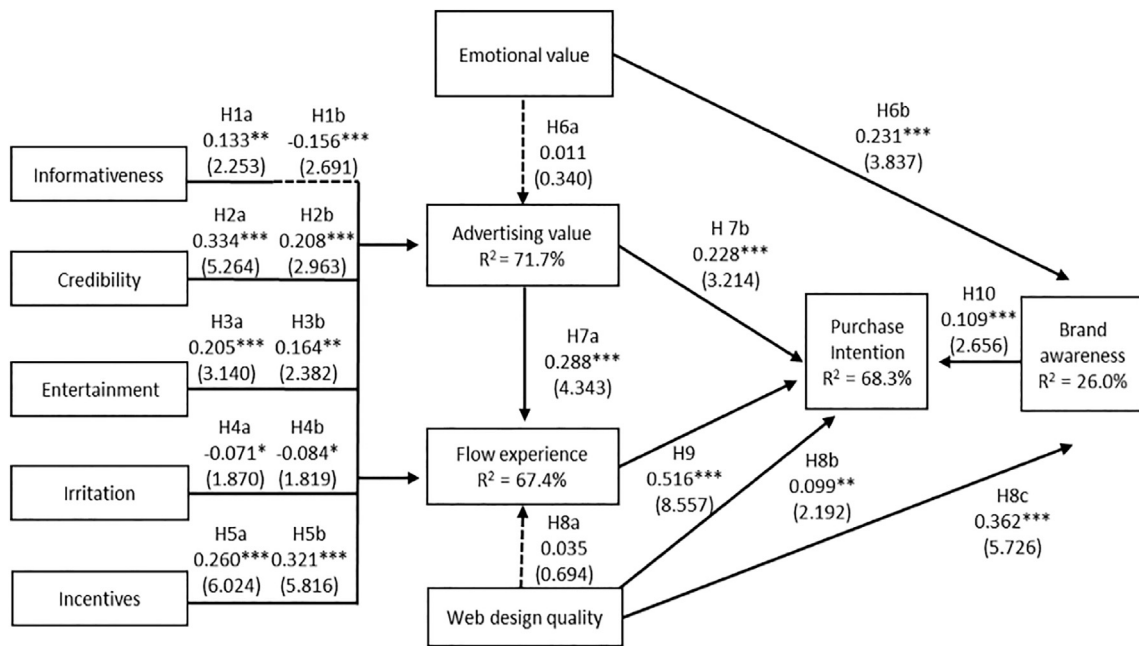


Fig. 2. - Structural model results.

Finally, results indicate that advertising value, flow experience, web design quality, and brand awareness are key factors to explain purchase intention in the context of smartphone advertisements. Table 5 illustrates the results demonstrated in this section.

6.2. Practical implications

Several practical implications can be drawn. First, while consumers view and engage with smartphone advertisements, valuable information that fulfils consumer needs should be delivered. Consumers enjoy focusing on the details of the product or service advertised. Marketers

and advertisers can provide advertisements that meet consumer needs, and ensure they are part of the target communication.

Second, irritation is recognized by consumers as being annoying and intrusive with advertisements. Marketers and advertisers should consider if consumers are receptive to advertisements on smartphones, and allow the option for consumers to choose whether they want to receive them or not. This would contribute to making consumers feel less irritated, impatient, and advertisements being less intrusive.

Third, regarding the importance of emotional value on brand awareness, consumers become more engaged with the brand the more they are familiar with it. Advertisers should consider creating advertisements that

Table 5 Hypotheses conclusions.

Hypo-theses	Independent variables	Dependent variables	Findings	Results
H1a	Informativeness	→ Advertising value	Positive and statistically significant ($\hat{\beta} = 0.133$; $p < 0.05$)	Supported
H1b	Informativeness	→ Flow experience	Negative and statistically significant ($\hat{\beta} = -0.156$; $p < 0.01$)	Not supported
H2a	Credibility	→ Advertising value	Positive and statistically significant ($\hat{\beta} = .334$; $p < 0.01$)	Supported
H2b	Credibility	→ Flow experience	Positive and statistically significant ($\hat{\beta} = 0.208$; $p < 0.01$)	Supported
H3a	Entertainment	→ Advertising value	Positive and statistically significant ($\hat{\beta} = 0.205$; $p < 0.01$)	Supported
H3b	Entertainment	→ Flow experience	Positive and statistically significant ($\hat{\beta} = 0.164$; $p < 0.05$)	Supported
H4a	Irritation	→ Advertising value	Negative and statistically significant ($\hat{\beta} = -0.071$; $p < 0.10$)	Supported
H4b	Irritation	→ Flow experience	Negative and statistically significant ($\hat{\beta} = -0.084$; $p < 0.10$)	Supported
H5a	Incentives	→ Advertising value	Positive and statistically significant ($\hat{\beta} = 0.260$; $p < 0.01$)	Supported
H5b	Incentives	→ Flow experience	Positive and statistically significant ($\hat{\beta} = 0.321$; $p < 0.01$)	Supported
H6a	Emotional value	→ Advertising value	Positive and statistically significant ($\hat{\beta} = 0.011$; $p > 0.10$)	Not supported
H6b	Emotional value	→ Brand awareness	Positive and statistically significant ($\hat{\beta} = 0.231$; $p < 0.01$)	Supported
H7a	Advertising value	→ Flow experience	Positive and statistically significant ($\hat{\beta} = 0.288$; $p < 0.01$)	Supported
H7b	Advertising value	→ Purchase intention	Positive and statistically significant ($\hat{\beta} = 0.228$; $p < 0.01$)	Supported
H8a	Web design quality	→ Flow experience	Non-significant effect ($\hat{\beta} = 0.035$; $p > 0.10$)	Not supported
H8b	Web design quality	→ Purchase intention	Positive and statistically significant ($\hat{\beta} = 0.099$; $p < 0.05$)	Supported
H8c	Web design quality	→ Brand awareness	Positive and statistically significant ($\hat{\beta} = 0.362$; $p < 0.01$)	Supported
H9	Flow experience	→ Purchase intention	Positive and statistically significant ($\hat{\beta} = 0.516$; $p < 0.01$)	Supported
H10	Brand awareness	→ Purchase intention	Positive and statistically significant ($\hat{\beta} = 0.109$; $p < 0.01$)	Supported

arouse emotions. Emotions are representative of consumers' feelings and the way they interact with the brand relies on the basis that smartphone advertisements' connection with consumers arouse emotions, allowing for positive brand recognition, perceiving it as relevant and valuable.

Fourth, advertisers should develop smartphone advertisements that easily engage consumers' attention. Brands should consider investing in better designed advertisements that make the experience of viewing advertisements more attractive. Web design makes a difference in consumer perception about the content and product or service information. Improving web design quality in smartphone advertisements should induce pleasure and satisfaction among consumers.

6.3. Limitations and future research

Our study has several limitations. First, the study was conducted with consumers of only one European country. Therefore, in order to overcome cultural and economic disparities, it would be interesting to implement it in other countries, and compare the findings. Second, brand awareness confirmed the influence on purchase intention and is one of the dimensions of brand equity. Thus, more effort is required to theoretically and empirically test the antecedents of brand equity that influences purchase intention. Third, web design quality was unsupported to explain flow experience and future studies should investigate the antecedents such as interactivity. Fourth, further research to understand the effect of emotional value on purchase intention would be welcome.

7. Conclusions

The contribution of this research was to identify the strongest

factors influencing consumers' willingness to purchase products or services, after viewing advertisements on smartphones. For this purpose, we developed a model based on Ducoffe's web advertising model and flow experience theory. This study was the first to include emotional value, web design quality, and brand awareness. Based on a sample of 303 Portuguese respondents we empirically confirmed that for advertising value the facilitators were informativeness, credibility, entertainment, and incentives, while irritation and emotional value were inhibitors. These findings revealed that consumers consider smartphone advertising as being credible, enjoyable, a good reference of information for purchasing products, and offers the chance of obtain rewards. However, they may also perceive smartphone advertising as unwanted, intrusive, and annoying, and as a result, negative feelings arise toward the brand advertised. Flow experience was positively influenced by credibility, entertainment, incentives, and advertising value. Informativeness and irritation negatively influenced flow experience. These results may be driven by the fact that, as argued in the literature, consumers are starting to develop positive attitudes toward smartphone advertisements, as they are useful, valuable, believable, entertaining, and correctly deliver the details of the products. Nevertheless, when consumers do not obtain proper information, they recognize smartphone advertisements as irritating. Brand awareness was successfully explained by emotional value and web design quality. Brand awareness was confirmed to be crucial for consumers to recognize the brand, and consider purchasing of a brand's products or services. Finally, we concluded that purchase intention was successfully explained by advertising value, flow experience, web design quality, and brand awareness.

Appendix A

Constructs	Items	Measurement items	References
Informativeness (INF)	INF1	Smartphone advertising provides timely information on products or services.	(Ducoffe, 1995; Liu et al., 2012; Wang & Sun, 2010)
	INF2	Smartphone advertising supplies relevant information on products or services.	
	INF3	Smartphone advertising is a good source of information.	
	INF4	Smartphone advertising is a good source of up to date products or services information.	
Credibility (CRED)	CRED1	I feel that smartphone advertising is convincing.	(Liu et al., 2012; Yang et al., 2013)
	CRED2	I feel that smartphone advertising is believable.	
	CRED3	I feel that smartphone advertising is credible.	
	CRED4	I believe that smartphone advertising is a good reference for purchasing products.	
Entertainment (ENT)	ENT1	I feel that smartphone advertising is interesting.	(Ducoffe, 1995; Liu et al., 2012; Yang et al., 2013)
	ENT2	I feel that smartphone advertising is enjoyable.	
	ENT3	I feel that smartphone advertising is entertaining.	
	ENT4	I feel that smartphone advertising is pleasing.	
Irritation (IRR)	IRR1	I feel that smartphone advertising is irritating.	(Ducoffe, 1995; Liu et al., 2012)
	IRR2	I feel that smartphone advertising is annoying.	
	IRR3	I feel that smartphone advertising is intrusive.	
Incentives (INC)	INC1	I am satisfied to get smartphone advertisements that offer rewards.	(Kim & Han, 2014)
	INC2	I take action to get smartphone advertisements that offer rewards.	
	INC3	I respond to smartphone advertising to obtain incentives.	
Advertising value (AV)	AV1	I feel that smartphone advertising is useful.	(Ducoffe, 1995; Liu et al., 2012)
	AV2	I feel that smartphone advertising is valuable.	
	AV3	I feel that smartphone advertising is important.	
Flow experience (FE)	FE1	Smartphone advertising allows me to control my own purchase intention.	(Ho & Kuo, 2010)
	FE2	I am not distracted by other online activities, and stay focused on smartphone advertising.	
	FE3	I find myself eager to press on advertising content or activity displayed on my smartphone.	
	FE4	I like to pay attention to smartphone advertising.	

Purchase intention (PI)	PI1	I find purchasing product/service advertised to be worthwhile.	(Hsu & Lin, 2015; Kumar, Lee, & Kim, 2009)
	PI2	I will frequently purchase product/service advertised in the future.	
	PI3	I will strongly recommend others to purchase product/service advertised.	
Emotional value (EV)	EV1	Using smartphones makes me feel relaxed.	(Hsu & Lin, 2015; Kumar et al., 2009)
	EV2	I enjoy using smartphones.	
	EV3	The use of smartphones makes me want to use them.	
	EV4	Using smartphones makes me feel good.	
	EV5	Using smartphones gives me pleasure.	
Web design quality (WDQ)	WDQ1	The web site looks attractive.	(Ha & Im, 2012)
	WDQ2	The web site uses fonts properly.	
	WDQ3	The web site uses colours properly.	
	WDQ4	The web site uses multimedia features properly.	
Brand awareness (BA)	BA1	I have heard of this brand.	(Wu & Ho, 2014)
	BA2	This brand is what I first thought of.	
	BA3	This brand is very famous.	
	BA4	Most people know this brand.	

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