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CONSUMERS' RESPONSES TO FACEBOOK ADVERTISING

A Cross-Device Approach

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Social networking sites such as Facebook are an important and fast-growing advertising channel. Since access to social networking sites may happen through different devices, it is important to identify whether the drivers and mitigating factors affecting responses to social networking site advertising differ between those consumers who access Facebook primarily on PCs versus on mobile phones. The authors tested a model anchored in social exchange theory and drawing on uses and gratifications theory using data from a survey of Facebook users in France. Results show that the trade-off between the intrinsic and the social value Facebook advertisements bring, and their perceived intrusiveness and privacy invasiveness, drives consumers' approach and avoidance of Facebook advertising. Trust in Facebook also emerges as a key driver of advertisement acceptance.

Management Slant:

- Social networks must consider their users as social exchange partners.
- Users, especially mobile users, must be active in the control and diffusion of advertising.
- Advertisements must capitalize on the mobility functionality of mobile devices.
- On PCs, advertising sharing should be encouraged, as social value is a key factor in this environment.
- Given the central role of trust in the platform, social networks must offer a transparent policy with regards to the collection and usage of personal data.

INTRODUCTION

Advertising spending on social networking sites reached \$41 billion in 2017, with the bulk (67.9 percent) spent on Facebook (eMarketer, 2017). The value of social networking sites as an advertising channel is obvious; tracking users' data and behavior enables advertisers to target audiences more precisely and efficiently, to measure results immediately, and to correct actions almost instantaneously (Jeong and Coyle, 2014). Globally, Facebook is by far the most prominent social network, having reached 2.07 billion active users in August 2017 (Hootsuite, 2017). Although the mobile social networking site advertising industry is fast growing, literature on advertising effectiveness in this context is still nascent (Grewal *et al.*, 2016). A potentially impactful trend is that users are increasingly shifting access to these networks from personal computers (PCs) to mobile devices (Digital Report, 2016; eMarketer, 2017; Nielsen, 2017). Worldwide, more than 75 percent of active Facebook users are accessing it through a mobile phone (eMarketer, 2017; Statista, 2017).

Given that Facebook may be accessed from different devices, practitioners and advertising researchers alike must consider whether consumers respond to Facebook advertising differently if their Facebook experience is based primarily on accessing it through PCs or mobile phones. All technological devices afford similar analytic capabilities to yield insights on consumers' attitudes and behavior toward advertisements (Grewal *et al.*, 2016). But mobile phones' unique characteristics of convenience and more active user control signal that previously unexplored systematic differences in how consumers relate to the devices they use to access Facebook may impact the advertising outcomes. Some of these outcomes can be severe for advertisers, resulting for instance in the installation of adblockers if consumers react negatively to the presence of advertising messages on their Facebook feeds (Malloy *et al.*, 2016). Although the use of adblockers on smartphones is growing (eMarketer, 2017),

consumers are much less likely to use an adblocker on a mobile device than on personal computers (*e.g.* 5.9 percent versus 17.7 percent of U.S. consumers; Statista, 2016).

This research, grounded in social exchange theory, proposes and tests a model of how users perceive and react to advertising messages on their Facebook feeds. Drawing on uses and gratifications theory to account for differences in PCs versus mobile phones, the model also assesses whether the factors that shape consumers' responses to Facebook advertising vary as a function of the primary device used for accessing the social networking site.

THEORETICAL BACKGROUND

Social exchange theory proposes that social behavior is the result of an exchange process designed to maximize benefits and minimize costs of social relationships (Blau, 1964). The theory readily applies to the nature of relational exchanges on social networking sites as those sites are designed for social and commercial transactions among a network of "friends" (Surma, 2015). The authors follow a rich tradition of scholars who have used social exchange theory to explain how consumers weigh costs and benefits in their responses to online behavioral advertising (Boerman, Kruikemeier and Borgesius, 2017). This paper proposes and tests a framework of the drivers of consumers' responses to Facebook advertising that account for this inherent trade-off between the perceived intrusiveness and privacy invasiveness of advertisements posted on social networking sites and the value users see in them (Schumann *et al.*, 2014; Tucker, 2014).

Social and Commercial Exchanges within Facebook: A Turn to Social Exchange Theory

Through the social exchange theory lens, the reciprocal relationship between consumers and social networks / advertisers can be viewed as an implicit social contract whereby consumers provide personal data in exchange for personalized, geolocalized services that improve their

customer journeys while also respecting their privacy (Culnan, 1995; Okazaki, Li and Hirose, 2009). Reciprocity is a defining characteristic of bidirectional exchanges, whereby actions are “contingent upon the rewarding reactions of others” (Cropanzano and Mitchell, 2005, p. 890). In the online advertising context, reciprocity is an argument superior to relevance (Schumann *et al.*, 2014).

Social exchange theory can provide insights into the dynamics of approach / avoidance in the Facebook context: consumers must weigh the value offered by Facebook advertising against the disruption to the social environment in order to decide whether to approach it (clicking on it) or avoid it (not clicking and even installing an adblocker). Advertising messages would be unwelcome if they disrupt the genuine flow of exchanges by bringing in economic transaction. The rising use of adblockers reflects the increasing number of consumers who reject any kind of commercial message (as many as 25 percent of all Internet users in France; eMarketer, 2017). The personal data collected about the users to make those advertisements more customized and relevant may create another issue through reduced privacy. But if advertisers are not considered as commercial intruders but as trustworthy, useful and respectful social partners, their messages may be received more positively. In particular, the value consumers receive from Facebook should develop their trust in the platform. Then, due to reciprocal obligations (a key principle of social exchange theory), consumers who trust the platform more are more likely to see value in the advertisements conveyed through the platform and to think less about the potential intrusiveness and privacy invasiveness of those advertisements, which in turn may enhance acceptance and reduce avoidance. Understanding consumers’ responses to Facebook advertisements through the social exchange theory lens accounts for consumers’ often mixed responses toward online advertising and for the approach or avoidance behavioral strategies they may adopt as a result (Tang and Zhang, 2013).

Drivers of Advertising Approach: Advertising's Intrinsic and Social Value

Effective advertising is a function of its perceived value to consumers, a cognitive assessment of the extent to which advertising gives consumers what they want. Messages posted in a social network context are evaluated for their intrinsic utility but also for their image-related utility (Toubia and Stephen, 2013). This research thus recognizes that advertising messages encountered on Facebook may be valuable for their intrinsic value, such as their entertaining or informative function, as well as for their social value, factors that are usually included in classic frameworks of attitudes toward advertising (Pollay and Mittal, 1993). Even though some studies have found that online advertisements may not carry as much entertainment or information value as in other contexts (*e.g.* Ha, 2008), the positive inherent values of informativeness and entertainment are still applicable in the social network context as drivers of positive attitudes toward advertising (Taylor *et al.*, 2011).

Beyond their intrinsic value, advertisements may also be valued if users feel that members of their networks would appreciate the information or entertainment they convey. Some advertisements even go viral on Facebook as users pass them on to others as a way to disclose information about themselves (Chu, 2011). Given that sharing advertisements can be useful to one's social image within their communities, it is important to account for the social value of Facebook advertising as a driver of acceptance of advertising.

Drivers of Advertising Avoidance: Intrusiveness and Invasiveness

This research incorporates two important drivers of advertising avoidance: advertisement intrusiveness and privacy invasiveness. Although the first one, advertisement intrusiveness, has already been incorporated in previous models, the second, privacy invasiveness, has not been clearly addressed yet in the corresponding literature. Caution should be taken as some

models refer to invasiveness while using the intrusiveness scale created by Edwards *et al.* (2002) (*e.g.* Taylor *et al.*, 2011).

Advertising intrusiveness is defined as the disruption of consumers' train of thought and interruption of the experience, which creates irritation (McCoy *et al.*, 2008). Advertising messages perceived as intrusive impair task performance and cognitive processing (Edwards *et al.*, 2002; Cho and Cheon, 2004). Both advertising intrusiveness and the resulting irritation negatively affect attitudes toward the advertising medium (Morimoto and Chang, 2006; Edwards *et al.*, 2002). The hyper-targeted nature of many Facebook advertisements may be especially irritating and, as the sharp increase in the use of adblockers indicates, have direct behavioral consequences. In the realm of Facebook advertising, irritation is especially likely to lead to consumers' avoidance of advertising as those networks propose more technological tools to limit exposure (Yang *et al.*, 2013; Drèze and Hussherr, 2003).

By contrast, invasiveness corresponds to intrusion into consumers' privacy (Milne, Rohm and Bahl, 2004; Sheehan and Hoy, 1999). For instance, consumers who perceive personalized advertisements as an invasion of their privacy acknowledge less freedom to control their private information (Baek and Morimoto, 2012). Privacy invasiveness thus concerns the extent to which advertisements invade privacy when they are customized using personal information. The tracking and potential use of consumer data in the social network context is likely to increase the degree to which advertising is perceived as an invasion into consumers' privacy (Sheehan and Hoy, 1999), resulting in more negative responses to Facebook advertising.

Antecedents of the Drivers of Facebook Advertising Acceptance/Avoidance: Trust, Privacy Concerns and Need for Control

Consumers' acceptance or avoidance of Facebook advertising may also be affected by other differences, particularly in terms of trust, privacy concerns and need for behavioral control.

Trust is a central driver of reciprocal exchanges within social exchange theory (Molm, Takahashi, and Peterson, 2000) and an important antecedent of perceived value and attitude toward advertising (Tsang *et al.*, 2004; Yang *et al.*, 2013). In a social network context, trust provides the foundation for the social exchanges therein (Blau, 1964). In exchange for relevant services, consumers implicitly expect that users of their data will respect their privacy (Okazaki, Li and Hirose, 2009). As social networking environments are social but private spaces, many users prefer trusted entities/parties (Schlosser *et al.*, 1999). A high trust in Facebook should therefore have a positive impact on consumers' responses to the advertisements it carries.

Privacy concerns, defined broadly as "individuals' subjective views of fairness within the context of information privacy" (Malhotra *et al.*, 2004), reflect an anticipation of potential future loss of privacy (Culnan and Armstrong, 1999; Milberg *et al.*, 1995). Research so far has mainly focused on privacy concerns that arise as a consequence of either excessive disclosures or the lack of protection strategies employed by Facebook users (*e.g.* Boyd and Ellison, 2007). Privacy concerns can be viewed as an individual trait (Doorn and Hoekstra, 2013); those with higher levels of privacy concerns are more likely to feel that advertisements are intrusive (Cortes and Vela, 2013) which can motivate protection behavior (Lancelot Miltgen and Smith, 2015).

Another individual difference likely to influence consumer responses to Facebook advertisements is the need for control, which reflects a fundamental difference between traditional and online advertising (Schlosser *et al.*, 1999). Need for control can be viewed as a stable trait reflecting the belief in one's ability to take actions in response to stimuli, such as online advertisements (Tang and Zhang, 2013). Although the evidence is mixed as to how need for control affects consumers' acceptance of mobile advertising (Merisavo *et al.*, 2007), in its most active form (Choi, Hwang, and McMillan, 2008), it is likely to influence what

consumers do to control exposure to advertisements (Ha *et al.*, 2014). In the context of Facebook, consumers are more receptive to the advertisements when they control their advertising settings (Tucker, 2014). Perceptual control over data use thus might affect privacy invasiveness and attitudinal and behavioral responses to advertising.

An Integrative Model of Consumers' Responses to Facebook Advertising

The theoretical model (depicted visually in Figure 1) integrates all above-reviewed constructs into a framework of antecedents of consumers' responses to Facebook advertising. Recognizing that approach / avoidance behavior are both potential outcomes of encountering Facebook advertisements, this research incorporates two main dependent variables: Facebook advertisement acceptance, an approach dependent variable, and privacy protective behavior, an avoidance dependent variable.

While most advertising models posit that consumers' perceptions of social networking site advertisements will have direct approach behavioral consequences in terms of accepting the advertisements, few study avoidance consequences. One such avoidance behavioral response to advertising lies in users' ability to control their exposure to those advertisements by changing their privacy settings. Given the rise of adblocking software (eMarketer, 2017; Malloy *et al.*, 2016), advertising research must account for privacy protection behavior. Consumers who perceive more disadvantages than benefits in exposure to advertisements will likely want to protect their privacy.

The first set of hypotheses (right side of the model) focuses on the social exchange inherent in Facebook advertisements: the trade-off between their perceived value (both intrinsic and social) and their perceived intrusiveness and invasiveness and the effect of such trade-off on the approach-avoidance behavioral set. Thus:

Hypothesis 1: The degree to which Facebook advertisements are perceived as providing intrinsic value should be related positively to consumers' overall acceptance of Facebook advertisements.

H2: The degree to which Facebook advertisements are perceived as providing social value should be related positively to consumers' overall acceptance of Facebook advertisements.

H3: Facebook advertisements' perceived intrusiveness should reduce consumers' acceptance of advertising (H3e) and increase tendencies to protect one's privacy (H3f).

H4: Facebook advertisements; perceived privacy invasiveness should reduce consumers' acceptance of advertising (H4e) and increase tendencies to protect one's privacy (H4f).

The second set of hypotheses focuses on the antecedents of the social exchange (left side of the model), with both users' relationship with Facebook, *i.e.* trust in Facebook, and individual characteristics, *i.e.* privacy concerns and need for control, acting as drivers of value as well as intrusiveness and privacy invasiveness. This is where the reciprocity principle inherent to social exchange theory will apply the most. The first antecedent to the value versus intrusiveness/invasiveness trade-off is trust in the network platform, *i.e.* Facebook. Thus:

H5a: Trust in Facebook is posited to increase intrinsic perceived advertising value.

H5b: Trust in Facebook would relate to increased social perceived advertising value.

H5c: Trust in Facebook would relate to reduced perceptions of advertisement intrusiveness.

H5d: Trust in Facebook would relate to reduced perceptions of privacy invasiveness.

H6a: Privacy concerns should be related to less perceived intrinsic advertising value.

H6b: Privacy concerns should be related to less perceived social advertising value.

H6c: Privacy concerns should be related to greater perceptions of advertisement intrusiveness.

H6d: Privacy concerns should be related to greater perceptions of privacy invasiveness.

H7a: Need for control is expected to reduce perceived intrinsic advertising value.

H7b: Need for control is expected to reduce social advertising value.

H7c: Need for control is expected to increase perceptions of advertisements' intrusiveness.

H7d: Need for control is expected to increase perceptions of advertisements' privacy invasiveness.

The model also controls for consumers' general attitudes toward advertising through direct links to advertisements' perceived intrinsic value and acceptance of Facebook advertising (Wolin *et al.*, 2002).

Differences in Key Dimensions of the Model: Users of PCs versus Mobile Phones

Regardless of the device used to access them, social networking sites primarily fulfill needs of social connection, such as relationship maintenance and sociability (Ku, Chu, and Tseng, 2013). But devices differ in several important ways that may affect responses to advertising messages based on whether users rely primarily on PCs or mobiles to access Facebook. Uses and gratifications theory, which posits that people actively seek and use media, including communication media, to fit their personal needs and goals (Cheung, Chiu, and Lee, 2011; Katz *et al.*, 1973), is useful in considering these differences.

By nature, mobile phones are primarily communication devices whereas PCs are used for data processing as well as transmission (Okazaki, 2009). Mobile devices' key defining

characteristic of portability accentuates their immediacy and instantaneity compared to PCs (Wang *et al.*, 2015). The absence of time and space constraints on mobiles enables consumers to initiate information exchange in any place at any time (Watson *et al.*, 2013).

Unlike PCs, used primarily in private, mobiles are used publicly to express personality, status and image (Nysveen *et al.*, 2005). Mobile devices fulfill a significant identity function, serving both self- and social expressiveness needs. The increasing role of mobile phones in how consumers construct and communicate their extended self-identity (Belk, 2016) may render the pressures created by social connections via those devices even more salient. In contrast, the more intimate and private PC setting may facilitate trust in the social network and facilitate social exchanges as a result.

The convergence and integration of location-based services on mobile devices may also increase users' perceived vulnerability to the advertisers' greater tracking ability. As such the link between privacy concerns and privacy protection behavior may be especially strong when users consult Facebook on mobile devices (Tsang *et al.*, 2004).

In contrast, in the PC's more intimate environment, users may be less receptive to disturbances within the Facebook context, such as commercial intrusions. While trust in Facebook is expected to affect responses to advertising in both mobile and PC environments (Yang *et al.*, 2013), the greater interactivity and flexibility that characterize the mobile environment (Park and Yang, 2006) may make it more difficult to establish trust on mobile devices. Given that mobile phones are personal devices, perceptions of control over how advertisers may use information gathered through mobile advertising is likely to affect consumers' acceptance of advertising (Nysveen *et al.*, 2005).

PCs' easy navigational ability, compared to smaller screen mobile devices, may motivate online behavior, which can be positive for the advertisers, such as visiting an

advertised brand's website or looking for additional information (Ha *et al.*, 2014), but can also more easily trigger privacy protection behavior if advertisements are perceived as intrusive.

Given that the different uses and gratifications fulfilled by devices may influence the approach and avoidance processes identified in the model, a research proposition (RP) was posited to assess whether differences emerge when comparing Facebook users who access the platform primarily on their mobiles to users who access it primarily on a PC.

METHODOLOGY

Sample Selection

Facebook users were surveyed on their perceptions of and reactions to advertising messages posted therein. Participants were recruited via a professional marketing research company based in France and compensated €5 for answering the questionnaire. To ensure a sample representative of the French online population active on Facebook, a screening criterion was set that the participant use Facebook at least once a month and had noticed advertisements posted on his or her personal Facebook page. All participants received an e-mail with a link to the online survey.

Some 350 French residents of diverse ages and gender completed the study, of whom 53.1 percent reported accessing Facebook primarily on their personal computer and 28.9 percent via their mobile phone. Users accessing Facebook from other devices were excluded from the final sample as other devices carry different expectations in relation to advertising due to their shared use (*e.g.* family computers) or screen size (*e.g.* tablets) and also because they were too few (< 30) to enable statistical comparison. The final sample thus included 287 people, with an average age of 37. Respondents indicated having used Facebook for about four to five years on average and, at the time of the study, spent on average 6.5 hours a week on Facebook (See Table 1). Of the participants, 60.7 percent reported having from 20 to 200 friends.

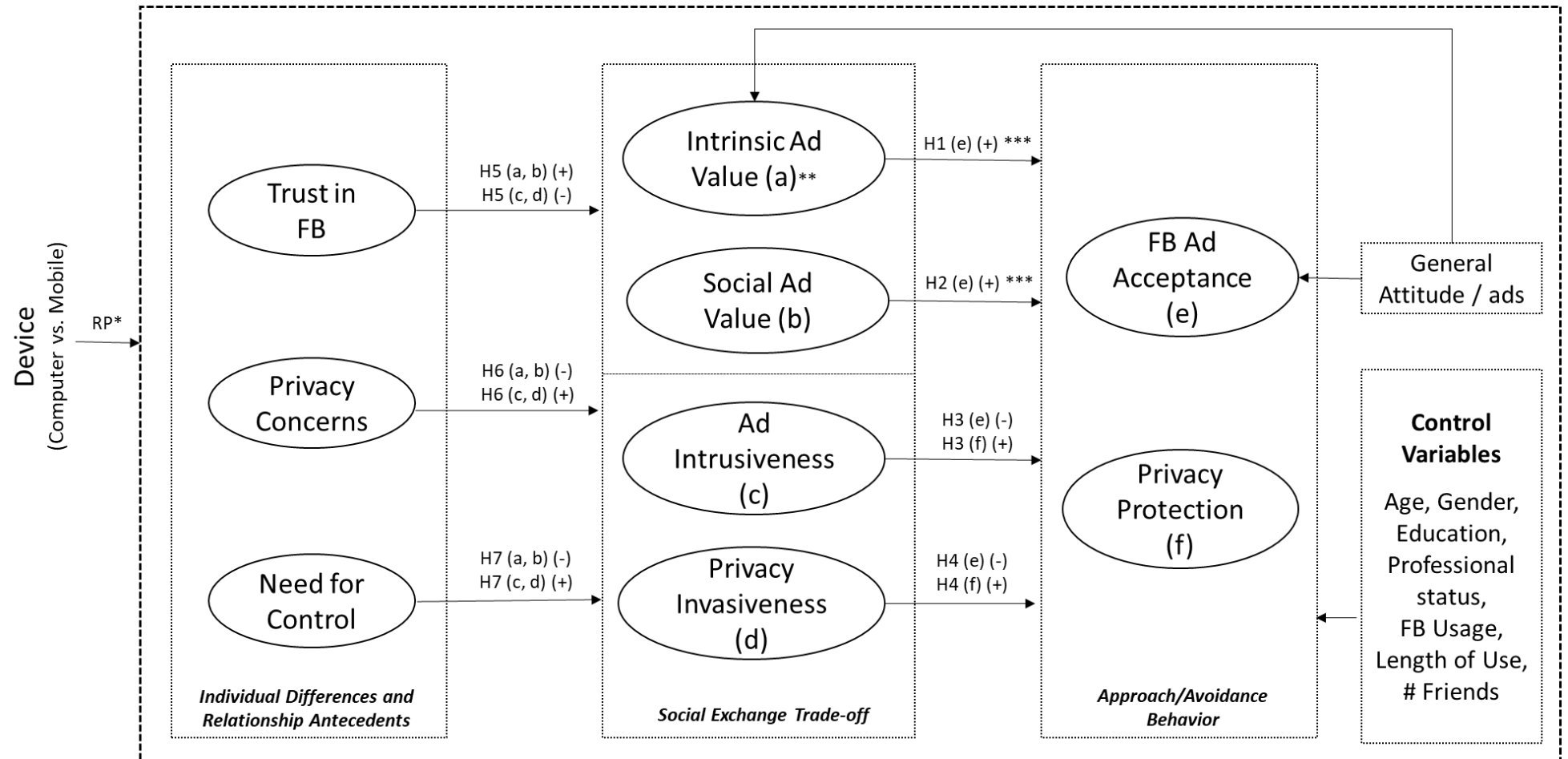
Comparisons of the PC and mobile user subsamples reported in Table 1 reveal differences in age ($p < 0.001$), professional status ($p = 0.017$) and number of friends ($p < 0.001$) but not in gender, educational level, or length of use and usage ($p > 0.05$). To control for possible effects of those differences, all demographic and usage variables were included in the analyses.

Measures and Measurement Validation Procedure

With the exception of Privacy invasiveness, all constructs were measured with previously validated and published scales or scales slightly modified to fit the current setting (Appendix 1). The reported behavior measure was developed based on prior literature and the authors' contribution. The Privacy invasiveness scale was self-developed albeit with inspiration from the items used to measure the Intrusiveness construct. Facebook intrinsic advertisement value was measured with a combination of items capturing advertising's informativeness and entertainment value. All items were measured on a 10-point Likert scale anchored by 1 = Strongly Disagree and 10 = Strongly Agree with the exception of reported behavior (social networking site advertisement acceptance and privacy protection) which used a 0 to 10 scale with 0 = Never and 10 = Always.

Since the research was based in France, the scales stemming from English literature were translated using a back-translation technique, then submitted to six marketing scholars to ensure content validity. The survey was pretested among 90 people from all age ranges who had experience in using Facebook. The feedback from the scholars and the pretest results were both incorporated in the final version of the questionnaire, thus ensuring its readability and logical flow.

Figure 1. An Integrative Model of Consumers' Responses to Facebook Advertising and Cross-Device Differences



* RP = Research Proposition

** We labelled the 4 mediating variables 'a, b, c and d' respectively and the two dependent variables 'e and f' respectively.

*** We do not hypothesize effects on Privacy Protection in these cases

Table 1. Final Sample Characteristics

	Total	Mobile	PC	Chi ²	Sig.
Gender					
Male	52.6%	52.5%	52.7%	0.001	.972
Female	47.4%	47.5%	47.3%		
Age (years)					
18-24	26.8%	44.6%	17.2%	64.756	.000
25-34	21.3%	35.6%	13.4%		
35-45	24.0%	10.9%	31.2%		
46-64	24.4%	7.9%	33.3%		
65+	3.5%	1.0%	4.8%		
Education Level					
Middle/High School	6.3%	6.9%	5.9%	9.779	.134
High school - Professional track	16.4%	11.9%	18.8%		
High School Diploma	23.3%	27.7%	21.0%		
University degree (Undergraduate)	30.0%	31.7%	29.0%		
University degree (Graduate)	20.2%	14.9%	23.1%		
PhD	0.7%	1.0%	0.5%		
Other	3.1%	5.9%	1.6%		
Professional Status					
Artisan, trade, small business owner	3.1%	3.0%	3.2%	18.558	.017
Executive - upper level	8.0%	6.9%	8.6%		
Executive- mid Level	10.8%	9.9%	11.3%		
Middle Management	16.4%	9.9%	19.9%		
Employee	21.3%	24.8%	19.4%		
Tradesman	5.9%	5.0%	6.5%		
Retiree	6.3%	2.0%	8.6%		
Student	16.4%	25.7%	11.3%		
Unemployed	11.8%	12.9%	11.3%		
FB Participation (months)					
0-12	1.4%	1.0%	1.6%	8.564	.073
13-24	9.8%	6.9%	11.3%		
25-48	28.6%	21.8%	32.3%		
49-72	32.8%	42.6%	27.4%		
73+	27.5%	27.7%	27.4%		
FB Usage (hours per week)					
0-6	64.5%	63.4%	65.1%	1.88	.930
7-12	24.7%	26.7%	23.7%		
13-18	4.5%	4.0%	4.8%		
19-24	2.8%	2.0%	3.2%		
25-30	1.0%	1.0%	1.1%		
31-40	0.3%	0.0%	0.5%		
41+	2.1%	3.0%	1.6%		
# friends on FB					
<5	2.4%	0.0%	3.8%	25.533	.000
5-20	12.5%	4.0%	17.2%		
21-50	18.5%	14.9%	20.4%		
51-100	19.2%	18.8%	19.4%		
101-200	23.0%	24.8%	22.0%		
201-500	16.4%	25.7%	11.3%		
501+	8.0%	11.9%	5.9%		

The analysis employed the Partial Least Squares Structural Equation Modeling approach using the SmartPLS 3.1 software package (Ringle, Wende and Becker, 2015). This approach, known for its powerful predicting capability (Vinzi *et al.*, 2010), simultaneously estimates measurement and structural parameters, while also relaxing the demands regarding the data, the specification of the relationships and the distributional assumptions. This method is not constrained by identification issues even if the model becomes complex – as is the case here--with many constructs and relationships between them – a situation that typically restricts Covariance Based-Structural Equation Modeling use.

Before assessing the measurement and the structural models, the authors first ensured that there was no common method bias. To limit common method bias, the authors controlled *a priori* for item ambiguity through the feedback received from the pilot study and used a validated partial least squares-marker variable analysis *a posteriori* (Podsakoff *et al.*, 2012). Strict following of the six-steps approach proposed by Rönkkö and Ylitalo (2011) concluded that the data are not contaminated with method variance.

The proposed model first necessitates an analysis of measurement accuracy (reliability and validity) on the overall sample. All items compose a reflective measurement model which was analyzed to ensure internal consistency as well as the nomological, convergent, and discriminant validity of all construct measures. Table 2 provides these results.

The first criterion, internal consistency, can be assessed through Cronbach's alphas and the composite reliability which takes into account the different loadings of the indicator variables. Both criteria are largely above the recommended threshold of .70, therefore confirming the measures' internal consistency. Nomological validity was assessed by examining the correlations between each pair of constructs to ensure the relationships were consistent with extant literature. Except for a correlation with the privacy protection

dependent variable, all correlations were significant and in the expected direction (Table 2) confirming nomological validity (Hair *et al.*, 2012).

Convergent validity was assessed by examining the standardized factor loadings of each observed variable on its designated construct (indicator reliability) and the average variance extracted. All loadings were statistically significant (t-values from 13.09 to 204.29) and exceeded the recommended .708 threshold with all average variances extracted above the recommended .50 threshold (Fornell and Larcker, 1981).

Discriminant validity was assessed using the Fornell-Larcker criterion and the heterotrait-monotrait ratio of the correlations (Henseler *et al.*, 2015). Based on Table 2, discriminant validity is established using the Fornell-Larcker criterion: after removing some scale items that created confusion (*i.e.* intrusiveness 5 and invasiveness 2), all values of the heterotrait-monotrait matrix are below the recommended 0.90 threshold.

Overall Model Results

Collinearity among the predictor constructs is not a critical issue in this model as all variance inflating factor values are below 3.0. A first structural model was tested including all demographic (gender, age, education and professional status) and usage variables (length of use, Usage and # Friends) presented earlier (Figure 1). The professional status variable was coded as a nominal variable with three categories: 1 = upper professional status, including company owners, executives and middle management, 2 = lower professional status, including employees and tradesmen and 3 = inactive, including retirees, students and unemployed people. Treating professional status as a nominal variable aligns with France's socioeconomic composition as income levels align closely with these professional categories. Only three of these control variables (Professional Status, FB length of use and # friends) are related to one of the dependent variables, advertisement acceptance. Despite age differences in the PC versus mobile sub-samples, age had no significant effect on Facebook

advertisement acceptance nor on privacy protection. A second and final model was thus run including only these three significant control variables.

The R^2 of the endogenous constructs, which Partial Least Squares Structural Equation Modeling aims at maximizing, was assessed in this final model. While their interpretation depends on the particular model and discipline, one can consider the R^2 of intrinsic advertisement value (0.52), advertisement intrusiveness (0.447), privacy invasiveness (0.452) and Facebook advertisement acceptance (0.651) as being substantial while the R^2 of social advertisement value (0.097) and privacy protection (0.069) are weak. In general, this model thus explains Facebook advertisement acceptance quite well--more than 65 percent.

Using a bootstrapping procedure with 5,000 subsamples (as recommended by Ringle, Wende and Becker, 2015), the significance of the path coefficients in this final model was assessed to test hypotheses H1 to H7 (Figure 2). Most relationships are significant at a five percent level, supporting the majority of the hypotheses, in particular H1, H2, H3 (e), H4 (f), H5, H6 (a, c and d) and H7. But no support was found for H3 (f), H4 (e) and H6 (b). Globally, on the overall sample (people accessing Facebook either through PC or mobile), 15 out of the 18 sub hypotheses were validated, thus corroborating most parts of the model, which aimed at explaining both Facebook advertisement acceptance (approach) and willingness to further protect one's privacy (avoidance).

Facebook advertisement acceptance is positively influenced by the value advertisements bring to the user, be it the intrinsic value the advertisements confer or their social value (H1e and H2e) and negatively related to advertisements perceived as intrusive (H3e). Contrary to H4e, however, the privacy invasiveness of advertisements (*i.e.* personalized advertisements based on users' profiles or online activities) is not related to advertisement acceptance. Facebook advertisement acceptance is positively influenced by the attitude users have toward advertising in general and the number of friends in the social

network. Advertisement acceptance is lower for long time Facebook users and for inactive (*i.e.* unemployed) people.

The model also confirms that people take measures to protect their privacy in reaction to unwanted advertisement messages, especially when they perceived them as invading privacy (H4f). Contrary to H3f, however, this reaction does not happen when the advertisement is perceived as interrupting the user's activity. In addition, professional status is also related to privacy protection as users who are inactive (*i.e.* unemployed) protect their privacy less in reaction to advertisements.

Table 2. Summary Statistics and Correlations among Study Variables

Study Variables	AVE	CR	Alpha	Rho	R ²	1	2	3	4	5	6	7	8	9	10
1. Trust in FB	0.864	0.950	0.922	0.923		<i>0.930 *</i>									
2. Privacy Concerns	0.677	0.926	0.904	0.920		-0.219	<i>0.823</i>								
3. Need for Control	0.807	0.944	0.920	0.927		-0.107	0.543	<i>0.899</i>							
4. Intrinsic Ad Value	0.802	0.960	0.951	0.952	0.524	0.452	-0.309	-0.330	<i>0.896</i>						
5. Social Ad Value	0.886	0.959	0.936	0.941	0.097	0.285	-0.106	-0.151	0.609	<i>0.941</i>					
6. Ad Intrusiveness	0.815	0.956	0.943	0.948	0.447	-0.268	0.620	0.510	-0.554	-0.309	<i>0.903</i>				
7. Privacy Invasiveness	0.802	0.924	0.876	0.889	0.452	-0.276	0.644	0.461	-0.426	-0.193	0.817	<i>0.895</i>			
8. FB Ad Acceptance	0.819	0.932	0.890	0.890	0.651	0.415	-0.312	-0.316	0.748	0.556	-0.516	-0.377	<i>0.905</i>		
9. Privacy Protection	0.672	0.860	0.761	0.805	0.069	-0.010	0.141	0.063	0.182	0.255	0.098	0.197	0.332	<i>0.820</i>	
10. General Attitude / ads (control)	0.873	0.976	0.971	0.972		0.457	-0.139	-0.202	0.670	0.466	-0.420	-0.273	0.661	0.164	<i>0.934</i>

* Square root of the AVE in italics in the diagonal.

As hypothesized, trust in the social platform is related significantly to all mediating variables. In particular, the more trustful the user is, the more he/she will consider the advertisements as having both an intrinsic and a social value (H5a,b) and the less he/she will perceive advertisements to be intrusive or invasive from a privacy perspective (H5c,d). Privacy concerns also have a significant and negative impact on advertisements' intrinsic value and a significant and positive influence on perceptions of advertisement intrusiveness and privacy invasiveness (H 6a, c and d). Privacy concerns, however, are not related to advertisements' social value, so H6b is rejected. Finally, need for control is also related to all mediating variables (H7): users with higher need for control see less intrinsic and social value in Facebook advertisements (H7a,b) and tend to find them more intrusive both because they tend to interrupt their activities and because they invade their privacy (H7c,d).

Exploration of the relative importance of antecedents of Facebook advertisement acceptance reveals that intrinsic advertisement value is the most important driver (0.410) followed by advertisement intrusiveness (- 0.158, mitigating effect). Privacy protection is in turn mostly and, even, uniquely driven by privacy invasiveness (along with an influence of users' professional status as a control variable). Intrinsic advertisement value is primarily driven by trust in Facebook (0.157, positive influence) followed by need for control (- 0.133, mitigating effect). Social value is by and large determined by the trust users have in the network. Perceptions of advertisement intrusiveness and privacy invasiveness are both predominantly guided by privacy concerns (resp. 0.455 and 0.525) and need for control (resp. 0.248 and 0.161).

Globally, these results corroborate that people are more accepting of Facebook advertising when they feel it is useful to them, especially if it brings enough intrinsic and social value. But this is no longer the case if the advertisement is perceived as interrupting their digital activities. Trust in how the social network is using their personal data can

enhance the perception of usefulness/value and reduce the negative perceptions of intrusiveness and privacy invasiveness. Individual characteristics such as privacy concerns and need for control also appear to be strong antecedents to intrinsic and social advertisement value, on one hand, and to perceived intrusiveness and privacy invasiveness, on the other hand.

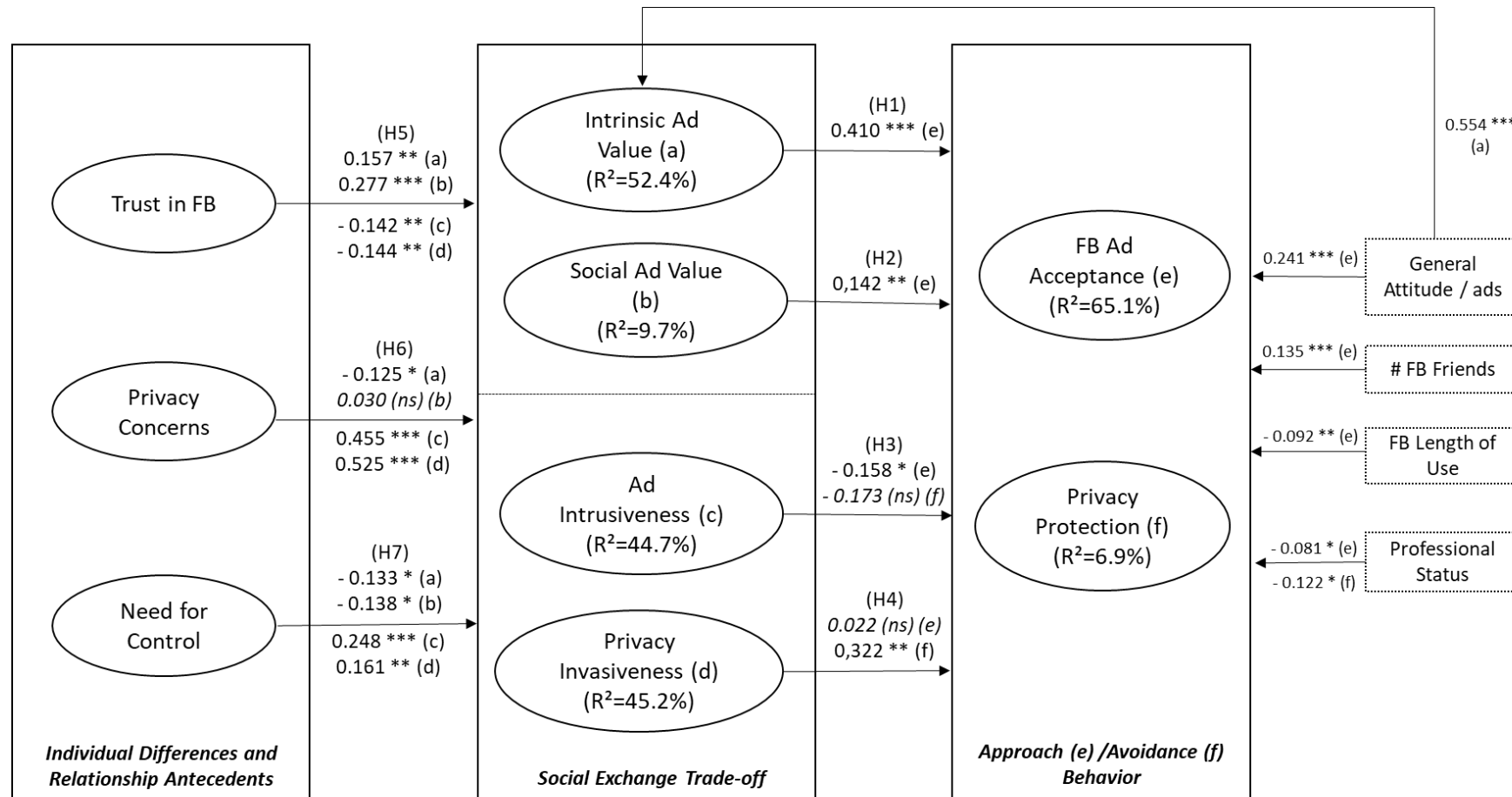
Mediation Analysis

The model includes four potential mediators--intrinsic advertisement value, social value, advertisement intrusiveness and privacy invasiveness--that could govern the relationships between the three independent variables--trust in Facebook, privacy concerns and need for control and the two approach-avoidance dependent variables, advertisement acceptance and privacy protection. To understand the cause-effect relationships hypothesized and test for possible mediation, the authors refer to Zhao *et al.* (2010) and Hair *et al.* (2017). The approach consists in bootstrapping the sampling distribution of the indirect effects while considering all mediators simultaneously to gain a more accurate picture of all the mechanisms through which the exogenous constructs affect the endogenous constructs. The procedure is based on testing the significance of each specific indirect effect and the corresponding direct effect.

The model involves six direct effects and 18 indirect effects (Table 3). Assessment of the indirect effects (done by manually computing each effect's standard error and corresponding 95 percent confidence interval, t and p values) reveals five significant ones whose 95 percent confidence intervals do not include zero. The empirical t-values of those five indirect effects are > 1.96 with a corresponding p-value < 0.05 . Assessment of the corresponding direct effects reveals, as shown in Table 3, that all direct relationships are weak and statistically non-significant ($p > 0.05$), thus concluding that all significant indirect effects correspond to full mediation.

This analysis shows that there is no direct effect of trust in Facebook, privacy concerns and need for control on Facebook advertisement acceptance nor on privacy protection. The findings provide empirical support for the mediating role of intrinsic advertisement value in the approach-avoidance model: intrinsic advertisement value fully mediates all three paths: trust in Facebook --> advertisement acceptance, privacy concerns --> advertisement acceptance and need for control --> advertisement acceptance. Social value is also full mediator of trust in Facebook --> advertisement acceptance and privacy invasiveness is full mediator of privacy concerns --> privacy protection. Advertisement intrusiveness does not have a mediating role in this model.

Figure 2. Consumers' Responses to Facebook Advertising (whole sample)



* $p < 0.05$ Hypothesis sig. at 5%
 ** $p < 0.01$ Hypothesis sig. at 1%
 *** $p < 0.001$ Hypothesis sig. at 1/00
 ns $p > 0.05$ Hypothesis rejected

Additional Analysis: Differences in terms of Primary Device

To address the Research Proposition (Figure 1), the authors compared the model relationships between users accessing Facebook primarily from their PC to those accessing it on their mobile. Although exploratory, the cross-device comparisons revealed interesting findings.

Differences were first assessed at the latent variable level using ANOVAs (Table 4). As can be seen, advertising in general triggers more positive attitudes for people who access Facebook primarily on their PC (3.88 versus 3.00 on mobile, $p = 0.001$). In addition, people accessing Facebook primarily through their PC report a higher perceived social value of Facebook advertisements (3.77 versus 3.07 on mobile, $p = 0.014$) and a higher trust in Facebook (4.26 versus 3.68 on mobile, $p = 0.016$). Using the Bonferroni correction, only the attitude toward advertising in general is significantly different between people using primarily PCs versus those using mobiles.

The authors also conducted a multi-group analysis to assess how the relationships in the model hold between the two subsamples (Table 5). Two noteworthy significant differences emerged when comparing the two groups. First, the relationship between privacy invasiveness and privacy protection holds in the PC environment but not in the mobile environment and this difference is significant at a five percent level. Perceiving advertisements as invasive does make users who access Facebook primarily through their PC more likely to enhance the protection of their privacy (0.422, $p = 0.001$), which is not the case for users accessing Facebook through their mobile (-0.052, $p = 0.811$). Second, the relationship between need for control and perceived intrusiveness only holds for mobile users. For them, a higher need for control is related to Facebook advertisements being perceived as more intrusive (0.412, $p = 0.000$), the difference between devices being significant at a five percent level. The number of friends on the platform also seems to make a difference (at a five percent level) based on the device primarily used. While the number of friends has a

positive influence on advertisement acceptance and privacy protection for PC users, the relationship is negative among mobile users.

Table 3. Multiple Mediation Test: Significance Analysis of the Direct and Indirect Effects

Paths	Direct Effect	2.5%	97.5%	t Value	p Value	Sig (p < 0,05) ?	Mediator	Indirect Effect	2.5%	97.5%	t Value	p Value	Sig (p < 0,05) ?	Type of Mediation
Trust in FB -> Ad Acceptance	0,064	-0,029	0,158	1,332	0,183	No	Intrinsic Ad Value	0,060	0,007	0,111	2,265	0,024	Yes	Full
							Social Value	0,041	0,008	0,074	2,406	0,016	Yes	Full
							Ad Intrusiveness	0,019	-0,007	0,046	1,437	0,151	No	
							Privacy Invasiveness	-0,010	-0,029	0,012	0,907	0,364	No	
Trust in FB -> Privacy Protection	0,053	-0,104	0,200	0,678	0,498	No	Ad Intrusiveness	0,026	-0,006	0,064	1,478	0,140	No	
							Privacy Invasiveness	-0,044	-0,089	0,004	1,855	0,064	No	
Privacy Concerns -> Ad Acceptance	-0,061	-0,160	0,033	1,213	0,225	No	Intrinsic Ad Value	-0,048	-0,092	-0,002	2,091	0,037	Yes	Full
							Social Value	0,004	-0,021	0,029	0,340	0,734	No	
							Ad Intrusiveness	-0,063	-0,139	0,017	1,567	0,117	No	
							Privacy Invasiveness	0,035	-0,036	0,101	0,999	0,318	No	
Privacy Concerns -> Privacy Protection	0,077	-0,143	0,272	0,713	0,476	No	Ad Intrusiveness	-0,084	-0,200	0,032	1,430	0,153	No	
							Privacy Invasiveness	0,161	0,018	0,290	2,326	0,020	Yes	Full
Need for control -> Ad Acceptance	-0,036	-0,138	0,065	0,686	0,493	No	Intrinsic Ad Value	-0,051	-0,098	-0,003	2,113	0,035	Yes	Full
							Social Value	-0,020	-0,044	0,004	1,660	0,097	No	
							Ad Intrusiveness	-0,034	-0,078	0,012	1,481	0,139	No	
							Privacy Invasiveness	0,011	-0,013	0,033	0,904	0,366	No	
Need for control -> Privacy Protection	-0,019	-0,180	0,133	0,240	0,811	No	Ad Intrusiveness	-0,046	-0,112	0,020	1,360	0,174	No	
							Privacy Invasiveness	0,049	-0,005	0,101	1,813	0,070	No	

Table 4. Cross-Device (Mobile vs. PC) Differences in Latent Variables Scores

Latent Variables	Mean Mobile (n = 101)	St. dev.	Mean PC (n = 186)	St. dev.	<i>F</i>	Sig. (at 5%)	Sig. (with Bonferroni adjustment) ¹
Privacy Concerns	6.65	2.097	6.84	1.919	0.653	.420	No
Need for control	7.55	2.350	7.56	2.217	0.000	.990	No
Trust in FB	3.68	1.983	4.26	1.917	5.866	.016	No
Intrusiveness	6.79	2.694	7.14	2.353	1.301	.255	No
Privacy Invasiveness	6.38	2.589	6.64	2.431	.715	.399	No
Social Value	3.07	2.024	3.77	2.415	6.158	.014	No
FB Ad Value	3.16	1.892	3.65	2.116	3.678	.056	No
G^{al} Attitude / ads	3.00	1.966	3.88	2.261	10.988	.001	Yes
Ad acceptance	2.66	1.772	3.04	2.248	2.188	.140	No
Privacy Protection	3.61	1.926	4.04	2.182	2.763	.098	No

¹ If multiple hypotheses are tested at the same time, the chance of a rare event increases, and therefore, the likelihood of incorrectly rejecting a null hypothesis increases. The Bonferroni correction compensates for this increase by testing each individual hypothesis at a significance level of α / m where α is the desired overall alpha level and m is the number of hypotheses (here the number of latent variables). In our case, as we are testing $m = 8$ hypotheses with a desired $\alpha = 0.05$, the Bonferroni correction would test each individual hypothesis at $\alpha = 0.05 / 8 = 0.00625$.

More exploration of the differences across both subsamples reveals other interesting disparities. In general, four hypotheses--H1e, H5d, H7c and H7d--are validated for both devices whereas four other hypotheses--H3e, H4e, H7a and H7b--are rejected for both devices. For all remaining cases, the hypothesis is validated in one subsample, but not the other. In particular, the outcome side of the model (H1 to H4) holds better for people using PCs for Facebook access, such as social advertisement value having a significant effect on advertisement acceptance while advertisement intrusiveness and privacy invasiveness are significantly influencing privacy protection decision-making. The relationship between advertisement intrusiveness and privacy protection is surprisingly negative for PC users. Given that PC users consider Facebook advertisements as an interruption of what they are

doing, it is possible that changing settings is perceived as yet another burden or cost in addition to the already costly effect of the interruption.

By contrast, the antecedent side of the model holds better for mobile users. Specifically, trust in Facebook influences advertisement intrusiveness among mobile users while such trust in Facebook influences intrinsic and social advertisement value for PC users. For mobile users, need for control appears to influence intrinsic advertisement value, advertisement intrusiveness and privacy invasiveness while it influences social advertisement value for PC users. No such cross-device differences emerge when looking at privacy concerns, which seem to have no influence on value (whether intrinsic or social) but a strong influence on intrusiveness and invasiveness, regardless of the device.

DISCUSSION

Globally, the analyses provide empirical support for the proposed drivers of consumers' acceptance and rejection of Facebook advertisements. On the overall sample, all but three relationships are supported. The absence of significant relationships between advertisement intrusiveness and privacy protection and between privacy invasiveness and advertisement acceptance probably reflects the closer conceptual correspondence between elements related to the interruption of the experience (more perceived advertisement intrusion leading to less acceptance) and between elements related to privacy *per se* (more perceived invasion of privacy leading to more privacy protective behavior). This finding thus confirms the importance of distinguishing the advertisement intrusiveness and the privacy invasiveness variables. The mediation analysis confirms that three out of the four mediating variables play a significant role in this acceptance/avoidance decision-making process: intrinsic advertisement value as a full mediator of all paths to Facebook advertisement acceptance; social value as a full mediator of trust in Facebook --> advertisement acceptance; and privacy invasiveness as a full mediator of privacy concerns --> privacy protection.

This research, anchored in social exchange theory, shows that Facebook users can find value in advertising, and this value is an essential element in the acceptance of advertising. Distinguishing between advertising's intrinsic value and its social value reveals differences in how value emerges as a function of the primary device used to access Facebook. The finding that advertisements' intrinsic value surfaces as a central driver in the mobile world reaffirms mobility as the defining characteristic of mobile technology. In order to be valuable to mobile users, an advertisement must provide a real service in facilitating ease of localization and access. A more surprising finding, given the value expressiveness function of mobile devices is that Facebook advertisements have greater social value for those users who consult the network on their PCs, signaling that, in the PC world, both intrinsic and social value of advertisements are important to overall Facebook advertisement acceptance. Access to the social media environment is more private on a PC, and thus more prone to sharing (including advertising messages) within the space. Users may have smaller social networks (fewer friends) in the more intimate PC world as is the case in the authors' sample (Table 1), but paradoxically, those friends' influence is greater, most probably because a smaller number of friends correspond to closer friends whom you know better and trust more.

A key finding is that trust in Facebook is a major driver of advertisement acceptance overall and an important protective element in terms of reducing advertisements' perceived intrusiveness on mobile devices, despite trust in Facebook being generally lower on mobile devices than on PCs. On mobile devices, privacy concerns and need for control are linked to perceptions of advertisements as more intrusive and invasive of privacy, but these do not materialize in terms of the general outcomes of advertisement acceptance or privacy protection.

Evidence of avoidance behavior in terms of privacy protection is stronger among PC users, a finding that aligns with the navigational functionality of PCs (paths from

advertisement intrusiveness and privacy invasiveness to privacy protection are significant for PC users but not mobile users).

MANAGERIAL IMPLICATIONS

These findings carry clear managerial implications. Social networks and brand managers alike must recognize that users respond to advertising using both approach and avoidance strategies, depending on their perceived values and risks. The continuing value of social networks must

Table 5. Cross-Device (Mobile vs. PC) Differences between Model Relationships through MGA

Hypotheses		β (Mobile)	t (Mobile)	Sig. (p)	Hyp. validated?	β (PC)	t (PC)	Sig. (p)	Hyp. validated?	Diff (PC / Mobile)	Sig. of the Difference
H1e	Intrinsic Ad Value -> FB Ad Acceptance	0,431	3,980	***	Yes	0,397	4,711	***	Yes	0,034	
H2e	Social Ad Value -> FB Ad Acceptance	0,082	1,267			0,171	2,814	**	Yes	0,089	
H3e	Ad Intrusiveness -> FB Ad Acceptance	-0,211	1,297			-0,116	1,328			0,096	
H3f	Ad Intrusiveness -> Privacy Protection	0,036	0,605			-0,181	2,387	**	Yes	0,217	
H4e	Privacy Invasiveness -> FB Ad Acceptance	-0,052	0,395			0,043	0,572			0,096	
H4f	Privacy Invasiveness -> Privacy Protection	0,051	0,240			0,422	3,430	***	Yes	0,372	Yes
H5a	Trust in FB -> Intrinsic Ad Value	0,112	1,430			0,185	2,333	*	Yes	0,073	
H5b	Trust in FB -> Social Ad Value	0,157	1,406			0,340	4,110	***	Yes	0,183	
H5c	Trust in FB -> Ad Intrusiveness	-0,197	2,327	*	Yes	-0,101	1,608			0,096	
H5d	Trust in FB -> Privacy Invasiveness	-0,166	2,280	*	Yes	-0,129	2,077	*	Yes	0,037	
H6a	Need for Control -> Intrinsic Ad Value	-0,230	1,977	*	Yes	-0,092	1,296			0,139	
H6b	Need for Control -> Social Ad Value	-0,083	0,648			-0,175	2,083	*	Yes	0,092	
H6c	Need for Control -> Ad Intrusiveness	0,412	3,794	***	Yes	0,146	1,926			0,266	Yes
H6d	Need for Control -> Privacy Invasiveness	0,273	2,430	*	Yes	0,093	1,307			0,180	
H7a	Privacy Concerns -> Social Ad Value	-0,150	1,559			-0,098	1,376			0,053	
H7b	Privacy Concerns -> Intrinsic Ad Value	-0,130	0,791			0,121	1,325			0,251	
H7c	Privacy Concerns -> Ad Intrusiveness	0,352	3,276	**	Yes	0,525	7,385	***	Yes	0,173	
H7d	Privacy Concerns -> Privacy Invasiveness	0,495	4,497	***	Yes	0,541	7,823	***	Yes	0,046	
CONTROL	General Attitude / ads -> Intrinsic Ad Value	0,508	5,644	***	Yes	0,572	9,272	***	Yes	0,064	
	General Attitude / ads -> FB Ad Acceptance	0,158	1,679			0,254	3,426	***	Yes	0,096	
	# Friends -> Privacy Protection	-0,293	2,928	**	Yes	0,181	2,287	*	Yes	0,474	Yes
	# Friends -> FB Ad Acceptance	-0,041	0,521			0,187	3,869	***	Yes	0,228	Yes
	FB length of Use -> Privacy Protection	0,028	0,247			-0,128	1,768			0,155	
	FB length of Use -> FB Ad Acceptance	-0,039	0,564			-0,116	2,404	*	Yes	0,077	
	Prof. Status -> Privacy Protection	-0,043	0,414			-0,098	1,291			0,055	
	Prof. Status -> FB Ad Acceptance	-0,080	1,144			-0,046	1,067			0,033	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Light grey shading indicates hypotheses validated on one device but not the other. Dark grey shading signals significant differences between the two devices.

account for the paradoxical nature of consumers' relationships with this technology (Mick and Fournier, 1998). Consumers want to preserve their experience navigating the social network, free of intrusions, yet they may be receptive to advertising messages within these networks if those messages add value to their customer journeys--*e.g.* personalized recommendations, useful and valuable promotions. Given these paradoxes, advertisers and brand managers alike must ensure that their messages provide intrinsic value, especially given more negative views of advertising on mobiles. Capitalizing on the mobility element, advertisements must be delivered at the most opportune time, place and to the most relevant receiver, in order to optimize their value to enhance mobility.

Advertisers should continue to ensure that the content of their advertisements is entertaining and informative, regardless of the device on which they are viewed. Advertising formats must take into account the navigational experience but also the proper timing for diffusing advertisements that minimize disruption to the navigational flow. But given the simultaneous desire to protect from unwanted messages, advertisers must also ensure that consumers are active with their settings for controlling the timing, size, modalities, and perhaps content of the messages they accept to receive. In the PC environment, users are especially reactant to the collection of personal data. But since advertisements' social value is particularly important to PC users, formats and tools that promote social sharing should be facilitated.

The results also carry implications for social networks. Social networking sites play an integral role in connecting consumers and advertisers and, as such, must solidify their role as the channel of communications between these exchange partners. To manage the tensions created by advertisement invasiveness (on any device) and privacy intrusiveness (especially on mobiles), social networking sites should work on establishing and sustaining trust in their network. Social networks must consider their users as social exchange partners and embrace a

policy of transparency regarding the collection and usage of personal data. The continuing growth of social commerce (for instance through Shoppable posts on Instagram or Snapchat's Snap to Store) will require even more access to data from social networks to generate traffic toward stores, redirect consumers toward sales-related posts, and ultimately encourage sales. Hence, social networks must legitimize their intermediary role by explicitly conveying a policy of confidentiality (Aguirre *et al.*, 2016) in order to induce trust, a major lever of acceptance of targeted advertising (Bleier and Eisenbeiss, 2015a). This research signals that trust plays slightly different roles as a function of the device used: in the PC environment, trust in the network enhances acceptance of advertising, by increasing users' perceived value, and in the mobile environment, trust in the network reduces perceptions of invasiveness and intrusiveness.

In addition to trust, social networks must acknowledge consumers' increasing need for control and its consequences in terms of advertising value (intrinsic value for mobile, social value for PC) and perceptions of advertisements as intrusive and interruptive (in the mobile context only). Aligning with previous recommendations that adding privacy control options on social networking sites actually makes personalized advertisements more effective (Tucker, 2014), this research advocates for offering users more choices in terms of control and use of private data as to promote a relational approach between the social networks and their users. The economic model of social networks rests on the delicate balance between disseminating personal data to optimize advertising targeting and the need for users to retain control over how these data are used. In the light of controversies over personal data dissemination, social networks must not only encourage their users to update their advertising preferences but also find ways for users to control their interactions with brands to sustain trust in the network and preempt complete advertisement blocking (Brettel *et al.*, 2015).

LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

Notwithstanding the novel insights, several limitations should be noted. First, only two individual differences--privacy concerns and need for control--were considered in this study. Just as the need for control over one's private data plays an important role in the acceptance of advertising on social networks, variables such as the feeling of being manipulated (Tucker, 2014) or general trait reactance may also be incorporated in future research. Second, as social networks enable their users to modify and control their private data in order to regulate which advertisements they receive, future research should pinpoint how receptiveness to advertisements may differ based on the specific type of advertising, whether the advertisement is "pushed" (Taylor *et al.* 2011) on consumers (such as banner advertisements) versus initiated by other consumers.

Moving from responses to advertising in general to specific reactions toward particular messages, future research also could assess whether the context and timing of advertisement delivery affect their acceptability differently by device. Given that Internet browsing behavior and purposes differ on a mobile versus a PC (Ghose *et al.*, 2012), it is likely that the advertisements' perceived value and their perceived intrusiveness would also vary as a result. Careful integration of the advertisement within the temporal dynamics of the choice task should reflect device-specific purposes to ensure its optimal utility in the browsing and buying process (Grewal *et al.*, 2016).

Future research could also assess whether advertisement acceptance differs as a function of where and how commercial messages appear, and whether framing communications as banner advertisements or suggested posts affects consumer responses (Morris *et al.*, 2016). The role of advertisements' social value suggests that responses would vary as a function of the message source (user- versus marketer- promoted) and encourage future research on the role of social norms in how users respond to messages from these different sources.

Finally, this study could only compare consumers who primarily use one device or the other to access the social network, although the authors recognize that many may in fact use both. To compare differences specific to the device (PC versus mobile) with a stronger internal validity, a controlled experimental design could be set up in which respondents are randomly assigned to one group (PC or mobile).

CONCLUSION

The increasing use of adblockers and the ethical issues linked with data collection and data access, as highlighted in the 2018 Facebook-Cambridge Analytica scandal, all point to the need for developing a new mode of advertising on social networks, one that is more acceptable to and more respectful of consumers' experience (Boyle, 2017). Even though users leave numerous traces of their online behavior within social networks, they do not necessarily welcome or accept their use for advertising purposes. There indeed lies the delicate balance inherent to the social media business model and its reliance on advertising revenues.

The integrative theoretical framework proposed here shows that, in order for social network sites to be considered as valuable communication channels, advertisers and social networks alike must treat their users as social exchange partners. As advertising messages are increasingly personalized and given the availability of more targeted user data today (Doorn and Hoekstra, 2013), privacy concerns are likely to become more and more salient to consumers. Social networks and advertisers must maximize the benefits users perceive in the advertisements, by providing both intrinsic and social value, with advertising content and delivery formats that account for device-specific navigational experiences so as to minimize disruption and the potential for outright rejection of commercial messages in an environment designed for social exchanges. As users increasingly move to mobile devices, where geo-location and geo-targeting capabilities accentuate perceptions of vulnerability, ensuring trust and respecting users' desire to protect and take control of their own data will be all the more salient to sustain the viability of advertising on social networks (Bleier and Eisenbeiss, 2015b; Goldfarb and Tucker, 2011).

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APPENDIX 1. Final items used in the analyses

Trust in Facebook

Source: Fogel and Nehmad (2009)

1. Facebook can be relied on to keep its promises.
2. I can count on Facebook to protect my privacy.
3. Facebook is a trustworthy social network

Privacy Concerns

Source : Malhotra et al. (2004)

1. All things considered, the Internet causes serious privacy problems.
2. Compared to others, I am more sensitive about the way online companies handle my personal information.
3. To me, it is very important to keep my privacy intact from online companies.
4. I believe other people are not concerned enough with online privacy issues.
5. Compared to other subjects on my mind, personal privacy is very important.
6. I am concerned about the threat to my personal privacy today.

Need for Control

Source: Merisavo et al. (2007)

1. It is important to me that I can only receive ads on my Facebook page if I have previously provided permission.
2. It is important to me that I can control the permission to receive ads I receive on my Facebook page.
3. It is important to me that I can refuse to receive advertising on my Facebook page.
4. It is important to me that I can filter advertising on my Facebook page to match my needs.

Intrinsic Ad Value (composed of Ad Informativeness and Entertainment)

Source: Pollay and Mittal (1993)

1. In general, advertising on Facebook is a valuable source of information.
2. In general, advertising on Facebook helps me keep up to date with available products/services.
3. In general, advertising on Facebook tells me which brands have the features I am looking for.
4. In general, advertising on Facebook is often entertaining.
5. In general, advertising on Facebook are more enjoyable than ads in other media.
6. In general, advertising on Facebook sometimes causes me to take pleasure in thinking about what I saw or heard in an advertisement on Facebook.

Social Ad Value

Source: Bauer et al. (2005)

If I opt into Facebook ads (e.g. like, share, comment or re-post), most of my Facebook friends ...

1. will regard me as clever
2. will regard my 'opt in' as useful
3. will regard my 'opt in' as valuable

Ad Intrusiveness

Source: Edwards et al. (2002)

1. I find advertisements on my Facebook page distracting.
2. I find advertisements on my Facebook page disturbing.
3. I find advertisements on my Facebook page forced upon me.
4. I find advertisements on my Facebook page interfering.

Privacy Invasiveness

Self-developed

1. I find advertisements on my Facebook page invading my privacy.
2. I find advertisements on my Facebook page intruding on my privacy.
3. I find advertisements on my Facebook page compromising my privacy.

Facebook Ad Acceptance

Source: Wollin et al. (2002) and own contribution

1. When I see an advertisement on my Facebook page, I click on the ad to find more information.
2. When I see an advertisement on my Facebook page, I 'like' or 'comment' on the ad.
3. When I see an advertisement on my Facebook page, I delete or hide the ad (rev).

Privacy Protection

Source: Roberts (2010) and own contribution

1. When I see an advertisement on my Facebook page, I change my privacy settings.
2. When I see an advertisement on my Facebook page, I consider deleting my Facebook profile.
3. When I see an advertisement on my Facebook page, I remove some personal/contact details from my Facebook profile.

General attitude towards advertising (control)

Source: Pollay and Mittal, 1993

1. I consider advertising in general a good thing.
2. I like advertising in general.
3. I consider advertising in general essential.
4. Having advertisements in general are important to me.
5. Advertisements in general are interesting to me.
6. I would describe my overall attitude towards advertising in general as favorable