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"This Research Paper is Targeted to You!" A Factorial Survey Study on the Influence of Advertising Place and the Use of Personal Data on User Acceptance of Facebook Ads

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A Factorial Survey Study on the Influence of Advertising Place and the Use of Personal Data on User Acceptance of Facebook Ads

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Advertisements on social networking sites are typically unrequested messages placed in between the user-generated content. What makes users accept these ads (or not)? A factorial survey was conducted to uncover the impact of different factors related to the use of personal data (e.g. sensitivity of personal data) and advertising place (e.g. ad location) of Facebook ads on user acceptance (i.e. fairness and appropriateness) of the advertisement. Placement of the advertisement was the only factor to significantly impact user acceptance. Moreover, the effect of ad placement largely depended on the degree of involvement with the advertised product. Among low-involved subjects, sidebar ad placement was better accepted. The influence of ad placement on user acceptance was fully mediated by perceived intrusiveness of the ad. This indirect effect was not significant in the high-involved subgroup, where message stream placement was better accepted. Implications for targeting advertising on Facebook are discussed.

Keywords: acceptance; personalization; Facebook; social media advertising; ad placement

Introduction

Users' interactions on social networking sites (SNS) produce information about their preferences and relationships with people, organizations and brands. SNSs treat these data as business assets and use them for targeting and personalizing advertisements (Acquisti, Taylor, & Wagman, 2016; Facebook, 2015). This attribute has turned Facebook, the most popular SNS worldwide, into a highly successful advertising platform (eMarketer, 2015). Yet, advertising is not the main motivation for users to employ the platform (Wilson, Gosling, & Graham, 2012). Facebook ads are shown alongside the content people like and are motivated to process. Hence, users must tolerate and accept the existence of (personalized) advertising between or next to the principal SNS content, when using Facebook for one of their original goals such as

connecting with other users. User acceptance can be seen as a crucial prerequisite to advertising effectiveness (Kelly, Kerr, & Drennan, 2010). The internet has facilitated avoiding ads by providing mechanical means in the form of ad blockers. Therefore, ad avoidance should be considered together with studying the conditions under which users tolerate having advertising placed in between their search for online content. To conclude, in the long run, user acceptance thus is a crucial factor for both the advertiser and the social networking site.

User acceptance is defined as the assessment of fairness and appropriateness of the advertisement. The concept has a long research tradition in advertising effectiveness studies (Wright, 1973) and is a hot topic in the study of online advertising formats (Eisend & Tarrahi, 2016; Wu, 2016). Previous studies typically looked into the effects of a single dimension of an online ad on different types of advertising outcomes. Using a factorial survey method, we consider both the mutual and independent effects of six highly relevant dimensions related to advertisement place and the use of personal data on user acceptance of Facebook advertising. Based on theory, the role of product involvement as a moderator and perceived intrusiveness as a mediator will be considered. The central research question is: "When and how do different dimensions related to the place and the use of personal data of advertisements on Facebook determine the user acceptance of the ad?" [CRQ]

The six dimensions under study are based on theoretical considerations and practical relevance and can be divided in two groups: dimensions related to the *advertisement place* and dimensions related to *the use of personal data*. For each dimension, several possible outcomes are developed (e.g. for sensitivity of personal information used in the ad: 'no personal data used', 'low sensitive personal data used', 'high sensitive personal data used'). Facebook is continuously experimenting with new

advertising formats (Constine, 2016), locations and placements (e.g. carousel ads, ads in Facebook groups, ads in Facebook chats). We therefore added two interesting, non-existent outcomes to our research design, one for both the ad location and ad placement dimension (e.g. ads located on the user timeline). Thus, we gain insights into the underlying rationale in the user acceptance process and make our results relevant for future advertising formats.

Dimensions related to advertisement place

Ad placement in the page. The term "ad placement" is used by Facebook to indicate the different positions and the appearances of their ads on the social networking site (Facebook, s.d.). Although ad position has not often been the topic of research, it was found to be a main explaining variable in ad processing, attention, attitudes and nuisance (Lin & Chen, 2009; Smit, Neijens, & Heath, 2013). Even though pricing of advertising placements on Facebook differs and professionals report differences in effectiveness in terms of costs per conversion (Loomer, 2013), literature on the effectiveness of different types of ad placements on SNSs is lacking (Yu, 2014). Three ad placements will be implemented in our factorial survey: ads shown in the message stream and ads shown in either the right or the left sidebar. Message stream ads are a highly popular ad placement in social media. These in-stream served ads are also called 'sponsored stories' since they resemble the placement of stories from Facebook friends which are served to the users in the same manner (IAB, 2013). Studies on website ads have shown that advertisements central in the screen are perceived as intrusive, since they impede the goal for which users browse a website, negatively impacting tolerance towards the ad (Cho & Cheon, 2004; Goldfarb & Tucker, 2011b). Building on these findings, the following hypothesis is formulated: "User acceptance will be lower for ads

shown in the (central) message stream placement than for ads shown in the (peripheral) sidebar placement." (H1)

Ad location on Facebook. The extent to which users browse a SNS with the goal of gaining information on a specific topic varies (Jung, Shim, Jin, & Khang, 2015). Motivations for browsing the newsfeed, the starting page of Facebook, are not always specific, e.g. boredom relieve or keeping up to date with updates of friends and pages. Conversely, users deliberately navigate to a fan page or another user's timeline to gain certain information. In this case, ads can be perceived as irritating and impeding the user's goals and therefore have a negative effect on acceptance of the ad (Ajzen, 1991; Cho & Cheon, 2004; Jung et al., 2015). The following hypothesis is formulated: "User acceptance will be higher for advertisements located in the user's newsfeed, than for ads located on a fan page of an unrelated brand or on the user's own timeline." (H2)

Dimensions related to the use of personal data

Sensitivity of personal information used in the ad. Facebook offers advertisers a wide range of options to personalize the ads to the individual user. Not every type of personal data is considered equally sensitive for use in commercial messages (Sheehan & Hoy, 2000; van Doorn & Hoekstra, 2013; Walrave, Poels, Antheunis, Van den Broeck, & Van Noort, 2016). For example, a cell phone number is generally perceived as highly sensitive, whereas a user's gender is less sensitive to use in commercial communication (Walrave et al., 2016). The extent of use of personal information must be perceived as fair and well balanced. Research has found that tolerance of personalized communication might be reduced when perceived as unfair (Wathieu & Friedman, 2009). The following hypothesis was formulated: "User acceptance will be higher for advertisements using low sensitive personal information compared to advertisements using high sensitive personal information." (H3)

Perceived risk related to the advertiser. Eisend and Tahari (2016) found that the identity of the sender of persuasive communication is a main driver for making direct inferences about the ad's acceptability. Perceived risk is an important factor in explaining behavioral intentions (Malhotra, Kim, & Agarwal, 2004) and participation in e-commerce activities (Jarvenpaa, Tractinsky, & Saarinen, 1999). Perceived risk is influenced by the likelihood and the perception of the possible privacy damage stemming from the encounter (Krasnova, Kolesnikova, & Guenther, 2009). Data-intensive industries, e.g. the banking industry, tend to score higher on perceived risk as e.g. the clothing industry. Based on these findings, the following hypothesis was formulated: "User acceptance will be lower for advertisements by an industry high in perceived risk regarding the use of personal information for commercial purposes than advertisements by an industry low in perceived risk." (H4)

Social context. "Social context" is defined as "[…] a little snippet of text that shows which friends have "liked" the page, event, or application linked with an ad." (Y.-M. Li, Lin, & Chiu, 2014, p. 100). When a SNS user sends promotional messages, they are perceived as more acceptable and more persuasive because they are considered social proof (Y.-M. Li et al., 2014; Masłowska, 2013; Tucker, 2012; Wais & Clemons, 2008). The following hypothesis is constructed: "User acceptance of advertisements will be higher when the ad is accompanied by social context compared to when there is no social context information." (H5)

Transparency of personal data use. Disclosing and justifying the use of personal information in online offers can increase the perceived appropriateness by lowering attitudinal resistance (White, Zahay, Thorbjørnsen, & Shavitt, 2008). Understanding how a customized ad had been created can also have a comforting effect (Hastak & Culnan, 2010; Malheiros, Jennett, Patel, Brostoff, & Sasse, 2012).

Conversely, transparency about data use was also found to focus the user on the issue of privacy protection, increasing concerns and decreasing advertising effectiveness (Goldfarb & Tucker, 2011a; Stutzman, Capra, & Thompson, 2011; Van Noort, Kerkhof, & Fennis, 2008). Given inconsistency in previous research findings, the following research question is formulated: "What is the effect of transparency of personal data use on a user's acceptance of Facebook advertisements?" (RQ1)

Factors influencing user acceptance

Perceived intrusiveness and product involvement were included in the study as variables influencing the effect of the dimensions related to the place of the advertisement and the use of personal data on user acceptance (see Figure 1).

(Insert Figure 1 here)

Perceived intrusiveness. Perceived ad intrusiveness is defined as "the degree to which an unwanted marketing communication interferes with an individual's cognitive process" (H. Li, Edwards, & Lee, 2002, p. 39). Perceived intrusiveness was found to be an influential mediator in advertising research (Lee, Kim, & Sundar, 2015) and is related to user acceptance of social media advertising (Bond, Ferraro, Luxton, & Sands, 2010; Luna-Nevarez & Torres, 2015). Depending on its placement or location, the ad can be perceived as intrusive and interfering with the user's goals, experiences and online activities (Edwards, Li, & Lee, 2002; H. Li et al., 2002). Sidebar ads share characteristics with traditional banner ads and are shown in a space dedicated to advertisement. The centre of the screen is however usually dedicated to the website content. Advertising shown in this placement can be perceived as hindering the user when browsing the website content, thereby impeding their goals and leading to ad avoidance (Cho & Cheon, 2004; Goldfarb & Tucker, 2011b; H. Li et al., 2002). Therefore, the following hypothesis is constructed: "The effect of dimensions related to

the place of the ad on user acceptance will be mediated by perceived intrusiveness." (H6)

Product involvement. Product involvement is "a person's perceived relevance of the object based on inherent needs, values, and interests" (Zaichkowsky, 1985, p. 342). Product involvement can have a moderating influence on effects that are attributed to both advertising content and context (De Keyzer, Dens, & De Pelsmacker, 2015; Eisend, 2013; Petty, Cacioppo, & Schumann, 1983; Smit et al., 2013). Elaboration likelihood, a concept framed within the broader psychological framework of dual process theory, is higher for high-involvement products, whereas ads of low-involvement products have a higher chance of being evaluated on rather unrelated factors, transmitted by peripheral cues (De Keyzer et al., 2015; Kalyanaraman & Sundar, 2006; Noar, Harrington, & Aldrich, 2009; Petty et al., 1983). In terms of content, the factors related to the use of personal data in the advertisement require more cognitive efforts, and need processing within "system two"-thinking. System two thinking is characterized by high effort, conscious reasoning, linked to language and limited by working memory capacity (Kahneman, 2011). Whereas the assessment of advertisement place can be seen as a more peripheral process, anchored in "system one"-thinking (Smit et al., 2013). System one-thinking is characterized by low effort, unconscious reasoning, to a higher degree based on nonverbal cues and independent of working memory (Kahneman, 2011). Higher involvement with the product was found to limit perceptions of intrusiveness (Edwards et al., 2002; Lee et al., 2015). A simple moderation hypothesis and a moderated mediation research question were formulated: "Product involvement moderates the effects of the use of personal data on user acceptance meaning that when users are highly involved with the product, the direct effect of the use of personal data on user acceptance increases in significance." (H7)

“What is the relationship between the advertisement place and user acceptance, with product involvement as a moderator and perceived intrusiveness as a mediator?” (RQ2)

(Insert Figure 2 here)

Method

Participants & Procedure

A factorial survey was distributed to an online consumer panel of 25 to 55 years old Facebook users. This specific survey-experimental design allows us to measure the influence of each factor, while controlling for all other factors in the design (Auspurg & Hinz, 2014). Four hundred nine respondents (M_{age} = 40.18, *SD* = 8.9, 54.5% female) were included in the final sample. After recording demographic data, each respondent assessed five vignettes in terms of user acceptance and perceived intrusiveness. At the end of the survey, respondents’ product involvement was measured for the two products in the study, which differed in pretested perceived risk (i.e. an energy company and an entertainment company, see next paragraph). Vignettes consisted of a picture of a fictitious ad on a Facebook page, accompanied by a textual description of the ad (see Figure 2 for an example). Of the full 217 possible (3*3*3*2*2*2) factorial-combinations, an orthogonal and balanced d-efficient (98.46) sample of 100 vignettes was drawn (Auspurg & Hinz, 2014). The vignettes in this sample were divided over 20 different decks of which each respondent had to assess one. Each deck consisted of five advertisements and was evaluated between 16 and 26 times. The study took 5 to 10 minutes to complete. Because our observations are not independent, we accounted for this clustering by employing a multilevel analysis with vignette judgments nested in respondents (Auspurg & Hinz, 2014).

Operationalization of dimensions

The six dimensions that were studied each had two or three possible levels.

Ad placement in the page. Three outcomes were implemented: the "right sidebar" and "message stream" placements and the non-existent "left sidebar" placement. This dimension was developed both in the textual description of the vignette as in a graphical representation, by showing the ad on a fictitious Facebook page.

Ad location on Facebook. Three outcomes were implemented: the advertisement was shown either "in the newsfeed", "on a person's own timeline", or "on a fan page of an unrelated brand". This dimension was described in the accompanying text in this exact wording and was shown in the graphical representation of the vignette.

Sensitivity of personal information used in the ad. Three possible outcomes were implemented, which were only apparent in the textual description of the vignette: either "no personal information", pre-tested "low sensitive", and pre-tested "high sensitive" types of personal information were included in the vignette. A pretest indicated "fan page membership", "hobbies" and "events I attend" to be low-sensitive data and differ significantly from "browsing history", "family members" and "analysis of cursor movements and clicks", being high-sensitive personal data ($p < 0.001$). These results were controlled for age and gender.

Perceived risk related to the advertiser. A pretest assessing "perceived risk related to disclosing personal information to a specific industry" (scale based on Heirman, Walrave, Ponnet, & Van Gool, 2013) showed that, when controlled for gender and age the entertainment industry was evaluated significantly lower in perceived risk than the energy sector ($p < 0.001$). Consistent with recommendations in the literature (Geuens & Pelsmacker, 2017; Walrave et al., 2016), this study controlled for previous experiences with the brand by using two inexistent brands. As advised, the fictitious brands were

carefully pretested for similar logo appeal and brand involvement (Geuens & Pelsmacker, 2017). The two outcomes were implemented both in the textual description as in the graphical depiction of the vignette: “Amperus, an energy company” as a brand in an industry high in perceived risk, and “Millennium Studios, a movie company”, a brand in an industry low in perceived risk.

Social context. Two possible outcomes were implemented both in text as in the graphical depiction of the vignette. Either the ad included a message “Robbe Peeters likes [brand]” or not. “Robbe Peeters” is a common name in the country where the study was performed.

Transparency of personal data use. A message “click here for more information on how your personal data was used for this advertisement” was either included in the message or not. This manipulation was made apparent both in the textual description of the vignette as in the graphical representation.

(Insert Table 1 here)

Measures

User acceptance. To measure this construct, two aspects of the scale, ‘appropriateness’ and ‘fairness’, were adopted from Campbell (1995). Thus, the user acceptance scale consisted of 4 items, measured on a 7-point Likert scale ranging from ‘*strongly agree*’ to ‘*strongly disagree*’ (Cronbach's alpha = .939).

Perceived intrusiveness. A shortened 3-item scale, based on Li, Edwards and Lee (2002), was used. Participants had to rate the ad on being “distracting”, “forced” and “intrusive” on a 7-point Likert scale ranging from *‘strongly agree’* to *‘strongly disagree’* (Cronbach’s $\alpha = .983$).

Product involvement. The scale of Maheswaran and Meyers-Levy (1990), based on the involvement scale of Zaichkowsky (1985) was used. Three 7-point

semantic differentials measure how interesting, involving, and personally relevant the product was (Cronbach's $\alpha_{\text{Millennium Studios}}$ = .917, Cronbach's α_{Amperus}= .939).

Results

Multilevel analysis

After performing multicollinearity checks, a first multilevel analysis was conducted with the six dimensions as independent variables and user acceptance as the dependent variable. User acceptance was normally distributed (*range* = 1 - 7; M = 3.81, SD = 1.40). Results show that only ad placement in the page yielded significant results. The right sidebar placement was accepted significantly better than the message stream placement (p = 0.029) and the left sidebar placement (β = 0.15, SD = 0.06, p = 0.011). The latter two did not differ in terms of user acceptance (p = 0.764).

(Insert Table 2 here)

A second multilevel analysis was performed with product involvement as interaction term (Δdf = 9, $\Delta\chi^2$ = 54.76 > critical value 21.67, p = 0.01). The addition of product involvement as interaction term led to significant effects of the dimensions 'ad placement in the page', 'ad location on Facebook', 'sensitivity of personal data used in the ad', 'social context' and 'transparency of personal data use' on user acceptance. To break down the significant interaction of product involvement on the effect of our vignette dimensions on user acceptance, the dataset was split according to the median score (*Median* = 4) of product involvement, and the first multilevel analysis was replicated for both subgroups (see Table 2).

For the low-involved subgroup, user acceptance differed significantly according to the dimensions 'transparency', 'ad placement in the page' and 'ad location on Facebook'. In the high-involved subgroup, only 'ad placement in the page' predicted

user acceptance. The influence of ad placement in the page on user acceptance was different for both involvement groups. The respondents in the low-involved subgroup scored significantly higher on user acceptance for ads shown in the right sidebar placement ($p < 0.001$) and left sidebar placement ($p = 0.004$), when compared to the message stream placement. The right sidebar placement scored higher on user acceptance than the left sidebar placement ($p = 0.034$). Whereas among the group of high product involved respondents, both the right sidebar placement ($p = 0.066$) and the left sidebar placement ($p = 0.001$) were less accepted. Again, the right sidebar placement scored marginally higher on user acceptance than the left sidebar placement ($p = 0.088$). When the ad was accompanied by a message to increase transparency of data collection practices, the ad scored higher on acceptance for the low-involved subgroup ($p = 0.040$). Also in the low-involved subgroup, ads were less accepted when shown in the fan page location compared to the news feed ($p = 0.042$).

Moderated mediation analysis

The influence of perceived intrusiveness as a mediator in the relationship between ad placement in the page and user acceptance was calculated through mediation analysis (Figure 3). The standardized regression coefficients between ad placement in the page and perceived intrusiveness were significant, as was the coefficient between perceived intrusiveness and user acceptance. The direct and indirect effects were both significant for the message stream placement and the right sidebar placement.

(Insert Figure 3 here)

When repeating the mediation model with product involvement as a moderator, we get a more nuanced view (Figure 4 and Figure 5). The effect of ad placement in the page on user acceptance was fully mediated by perceived intrusiveness when product involvement was low, both for the sidebar as the message stream placement. However,

when product involvement was high, the mediation through perceived intrusiveness was not significant, yet the direct effect of ad placement on user acceptance achieved significance.

(Insert Figure 4 here)

(Insert Figure 5 here)

Discussion & conclusion

The use of a factorial survey design allowed us to provide a unique look at both the individual influence of six highly relevant dimensions of Facebook advertising on user acceptance as their relative effects. Our results comparing the six dimensions and their interactions with product involvement revealed the important influence that ad placement has on the user acceptance of Facebook advertising. In general, placement of the ad in the sidebar led to better user acceptance in comparison to the message stream placement. As expected, also ads in the user's news feed generated higher user acceptance scores than ads in the timeline and fan page. These results lead to the acceptance of hypotheses H1 and H2. Surprisingly, hypotheses H3, H4, H5 and H7 are rejected. The role of the use of personal data in Facebook ads in the process of determining user acceptance was, contrary to our expectations, found to be marginal. Mediation analysis showed that perceived intrusiveness is one of the key explaining factors of the effects of different types of ad placement in the page on user acceptance, leading to the acceptance of hypothesis H6.

We found that the effect that ad placement in the page had on user acceptance among high-involved people was different from the effect of ad placement in the page on user acceptance in the low-involved subgroup. When respondents indicated to be highly involved with the shown product, user acceptance was highest for ads placed in

the message stream. However, when respondents were low involved with the shown product, user acceptance was highest for ads placed in the sidebar.

As expected, product involvement further proved to be an important moderator in our model. The degree to which a person perceives the relevance of the shown product (based on the person's specific needs, values and interests) determines to a large degree the process through which user acceptance of Facebook advertising is evaluated and the attributes that are deemed important in this evaluation. The mediation and moderated mediation analysis showed that the effect of ad placement in the page was fully mediated by perceived intrusiveness when product involvement was low. However, when product involvement was high, only a significant direct effect of ad placement in the page on user acceptance was found. Product involvement thus moderates the effects of advertisement place on user acceptance and the mediation via perceived intrusiveness, meaning that when users are highly involved with the product, the direct effect of advertisement place on user acceptance turns significant and the mediation through perceived intrusiveness turns insignificant (RQ2). Moreover, a difference between low- and high involved people was observed in terms of the specific dimensions that had a significant effect on user acceptance. When respondents indicated to be low involved with the product, user acceptance was driven by ad placement in the page, transparency and the location of the ad on Facebook. Transparency of the use of personal data in a Facebook advertisement had a positive effect on user acceptance under the condition that product involvement is relatively low (RQ1). Also, ads located on a fan page of an unrelated brand were less accepted under low involvement. For high-involved respondents, only ad placement in the page proved to be a significant predictor of user acceptance.

The managerial value of our findings can be found in the Facebook ad formats. Message stream ads, or sponsored stories, are labeled as ‘native advertising’, since they are consistent with the experience on the Facebook website (C. Campbell & Marks, 2015). This consistency, and Facebook’s capabilities to target advertisements to interested / involved audiences, makes message stream ads a popular advertising format on Facebook. Our findings prove the effectiveness of the ‘native’ message stream ads, yet only when product involvement is high. Becker-Olsen (2003) argues that a greater cognitive elaboration is needed for in-stream ads in comparison to banner ads. Moreover, she states that the chance that users think about concepts as usefulness and sincerity are higher when cognitive elaboration increases. Moreover, when involved with a product, user acceptance of the ad is possibly also determined by the ease of reading the content. Message stream ads are bigger and easier to read, as they appear central on screen. This can explain the direct effect between ad placement in the page and user acceptance in the high-involved subgroup. The finding confirms the basic principles of the dual process theory and elaboration likelihood model. When involved with the product, the user will be motivated to process the information (conscious, “system two”-thinking) and will accept the message better (Kahneman, 2011; Petty et al., 1983). In banner ads, less cognitive elaboration is needed and a good product fit is less important. Moreover, our findings proved that, as product involvement is low, elaboration in terms of user acceptance happens through a mental ‘shortcut’: perceived intrusiveness. The process of using a shortcut when elaboration motivation is low, is typical for “system one”-thinking and consistent with the findings of Petty and Cacioppo (1983). Sidebar ads are less intrusive because they are easier to avoid, that way not hindering users’ goals and thus are better accepted than message stream ads in

that case (Cho & Cheon, 2004). A good fit between product and user, indicated through product involvement, is thus more important for ads served in the message stream.

Familiarity with the ad placement in the page can explain the differences in user acceptance between the left and right sidebar. Left sidebar ads are not (yet) existent on Facebook. This could have led to lower user acceptance in comparison to right sidebar ads. It is striking that the dimensions related to the use of personal data, when studied in combination with the ad place dimensions are not determining user acceptance of the advertisement. This finding could point to the, much debated, possible shift in stance towards the use of personal data in SNS (Van den Broeck et al., 2015) and the idea of privacy in commercial settings as contingent and context-dependent (Rainie & Duggan, 2016). The conclusion of Smit and colleagues (2013) in relation to newspaper advertising are found to be also applicable for Facebook advertising: the place of the ad is the first and most important factor to consider if advertisers want to reach their audience.

Limitations

Limitations in the research design could explain the non-acceptance of hypotheses H4 and H5. Social context had the opposite effect on user acceptance than hypothesized. This could be attributed to the fact that the 'friend' in our vignettes was not a real person known by the respondent. It could have been a too difficult task for the respondents to try to imagine that 'Robbe Peeters' was someone from their Facebook friends list. In this case, the results could be explained by the finding that tie strength is an important requisite for social context to be effective in influencing attitudes and effectiveness (Bakshy, Eckles, Yan, & Rosenn, 2012; van Noort, Antheunis, & van Reijmersdal, 2012).

Recommendations for future research

Mediation analysis showed that perceived intrusiveness was the principal explaining factor in the relationship between ad placement in the page and user acceptance for the low product involvement subgroup. Yet, the mediating effect of perceived intrusiveness was not significant for highly involved respondents. Further research is needed to uncover the explaining factor for the found direct effect between ad placement in the page and user acceptance in the high involvement subgroup. Possible explaining variables that could be further investigated are perceived goal impediment, amount of cognitive elaboration and motivations for Facebook use (Becker-Olsen, 2003; Cho & Cheon, 2004; H. Li et al., 2002; Taylor, Lewin, & Strutton, 2011; Zhang & Mao, 2016). Moreover, surprisingly, our hypotheses on the influence of ad personalization on user acceptance were not confirmed. This study is one of the first studies that looked into the mutual influences of both personalization factors and more directly observable factors as ad place on user acceptance. More research could be dedicated to this relationship to complement or nuance our findings.

Managerial implications

Consumers nowadays use technology that enables them to avoid both content and advertising messages that do not interest them. To avoid that advertising is not being seen, advertisers should adapt ad placement according to the involvement of their audience with a product and the confidence they have in predicting this involvement. If advertisers are not sure their audience is involved with their product, as can be the case with a new product or a new target market, they could better spend their advertising budget on the sidebar ads. This is not only often less expensive, it also counteracts a lack of user acceptance and subsequent rise of ad avoidance among social networking site users.

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Appendices

Figure 1. Hypothesised Model

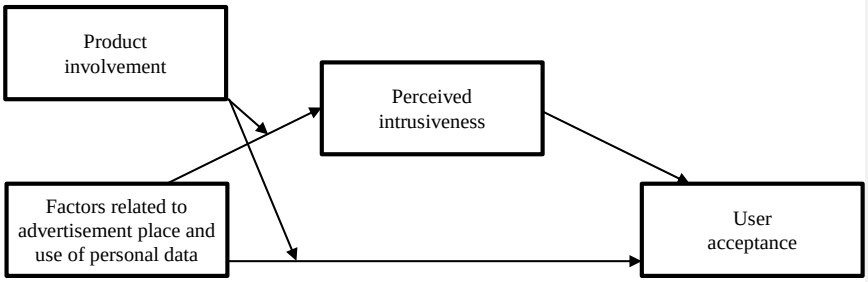


Figure 2. Example of a vignette (originally written in Dutch)

You are browsing Facebook and you see an advertising message **in the right sidebar** on your **news feed**.
The advertising message is about **Millennium Studios, an entertainment company,** and consists of an advertising image and a description “Have you already discovered our new offerings?”
To serve you this advertisement, **no personal data were analyzed and processed**.
At the top of the message, you see that a **Facebook friend is fan of the brand**.
Below the message, you have **the possibility to request more information on how Facebook used your data in this advertisement**.

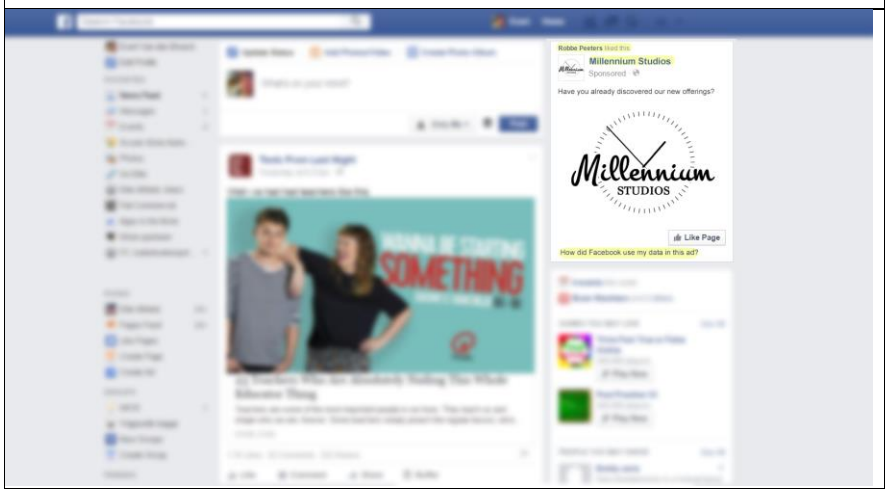
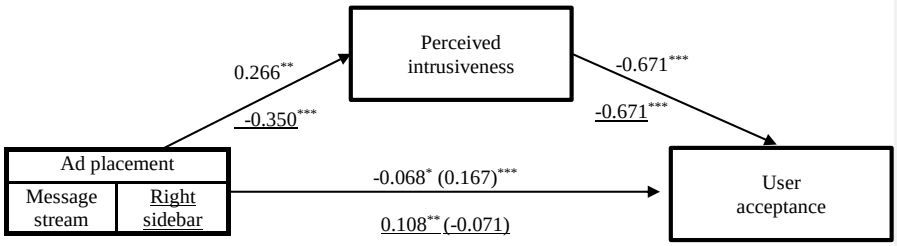


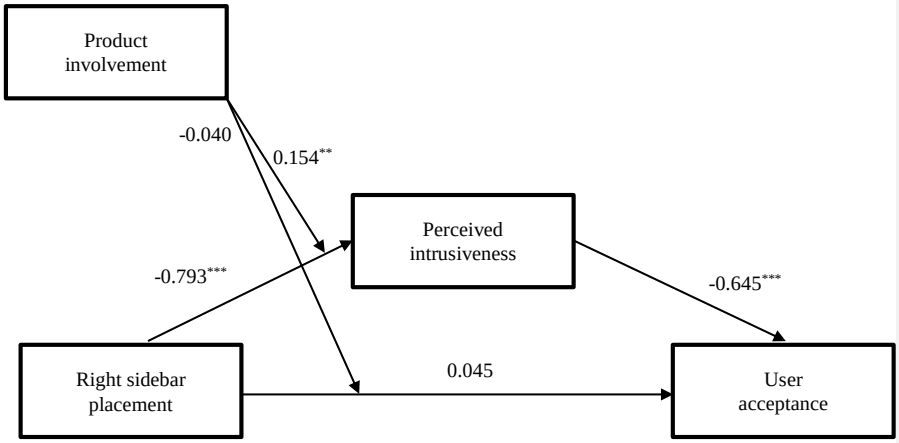
Figure 3. Mediation model 1a & 1b



Message Stream I.E. ab = -0.179, SE = 0.055, 95% CI [-0.279, -0.071]
Right Sidebar I.E. ab = 0.235, SE = 0.055, 95% CI [0.131, 0.339]

Note: ** $p < 0.05$, *** $p < 0.001$

Figure 4. Moderated mediation model 2a



<u>Conditional direct effect</u>

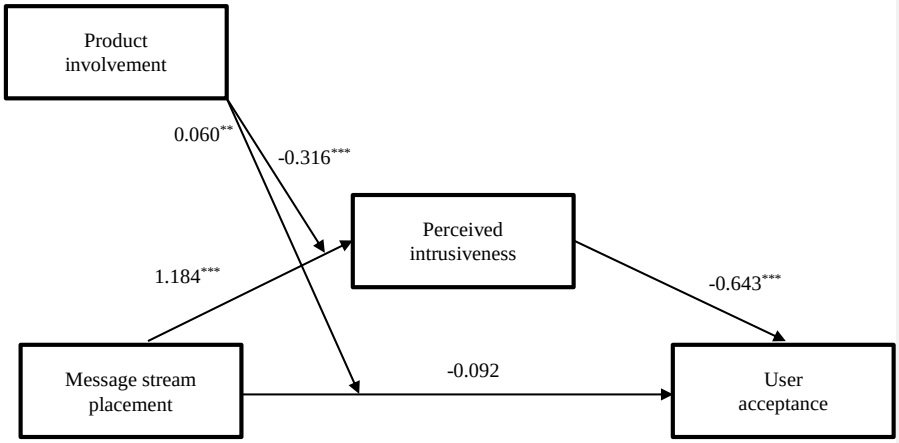
Product Involvement = 1.52	*c'* = -0.016, *SE* = 0.052, *p* = 0.762
Product Involvement = 2.88	*c'* = -0.070, *SE* = 0.037, *p* = 0.058
Product Involvement = 4.24	*c'* = -0.124, *SE* = 0.052, *p* = 0.017

<u>Conditional indirect effect</u>

Product Involvement = 1.52	*ab* = 0.361, *SE* = 0.075, 95% CI [0.216, 0.506]
Product Involvement = 2.88	*ab* = 0.226, *SE* = 0.053, 95% CI [0.126, 0.330]
Product Involvement = 4.24	*ab* = 0.091, *SE* = 0.078, 95% CI [-0.049, 0.259]

Note: ** $p < 0.05$, *** $p < 0.001$

Figure 5. Moderated mediation model 2b



Conditional direct effect

Product Involvement = 1.52	*c'* = -0.001, *SE* = 0.054, *p* = 0.991
Product Involvement = 2.88	*c'* = 0.081, *SE* = 0.038, *p* = 0.032
Product Involvement = 4.24	*c'* = 0.163, *SE* = 0.053, *p* = 0.002

Conditional indirect effect

Product Involvement = 1.52	*ab* = -0.453, *SE* = 0.072, 95% CI [-0.586, -0.304]
Product Involvement = 2.88	*ab* = -0.176, *SE* = 0.051, 95% CI [-0.265, -0.074]
Product Involvement = 4.24	*ab* = 0.101, *SE* = 0.077, 95% CI [-0.054, 0.250]

Note: ** $p < 0.05$, *** $p < 0.001$

Table 1. Operationalization of dimension in vignettes

Dimension	*Levels*
Ad placement in the page	Message stream (*) – left sidebar – right sidebar
Ad location on Facebook	Newsfeed (*) – timeline – fanpage
Sensitivity of personal information that was used for customizing the ad	No personal data (*) – low-sensitive personal data – high-sensitive personal data
Perceived risk related to the advertiser	Low perceived risk (*) – high perceived risk
Social context	No social context added (*) – social context added
Transparency of personal data use	No transparency (*) – transparency

Note: (*) is chosen as baseline for multilevel analysis

Table 2. Multilevel analysis of vignette dimensions

	(1) Baseline model	(2) Cov. Product involvement	(3) RI for PI low	(4) RI for PI high
Model 1				
Placement right sidebar	0.13 (0.06)**	0.81 (0.13)***	0.48 (0.10)***	-0.14 (0.08)*
Placement left sidebar	-0.02 (0.06)	0.57 (0.14)***	0.28 (0.10)**	-0.27 (0.08)**
Location timeline	-0.04 (0.06)	-0.30 (0.14)**	-0.09 (0.10)	-0.02 (0.08)
Location fan page	-0.08 (0.06)	-0.51 (0.13)***	-0.19 (0.09)**	-0.00 (0.08)
Low sensitive	0.06 (0.06)	-0.24 (0.14)*	0.02 (0.10)	0.08 (0.08)
High sensitive	0.03 (0.06)	-0.03 (0.13)	0.11 (0.09)	-0.06 (0.08)
High risk	0.05 (0.05)	0.06 (0.11)	0.10 (0.08)	0.015 (0.06)
Social context	< 0.01 (0.05)	-0.19 (0.11)*	-0.05 (0.08)	0.02 (0.06)
Transparency	0.03 (0.05)	0.24 (0.11)**	0.16 (0.08)**	-0.07 (0.06)
Model 2				
Placement right sidebar * PI		-0.23 (0.04)***		
Placement left sidebar * PI		-0.20 (0.04)***		
Location timeline * PI		0.09 (0.04)**		
Location fan page * PI		0.15 (0.04)***		
Low sensitive * PI		0.10 (0.04)**		
High sensitive * PI		0.01 (0.04)		
High risk* PI		< 0.001 (0.04)		
Social context * PI		0.06 (0.03)*		
Transparency * PI		-0.07 (0.04)**		
Intercept	3.73 (0.09)***	3.73 (0.09) ***	3.38 (0.14)***	4.06 (0.12)***
Number of vignettes	2045	2045	930	1115
Number of respondents	409	409	214	250
Residual variance	1.21	1.16	1.32	1.04
Log likelihood χ^2	6759.75	6705.00	3142.23	3570.02
Intraclass correlation ρ	0.38	0.39	0.34	0.43

Note: Standard errors in parentheses. Product involvement (PI) 0 = *low involved*, 1 = *high involved*.
*p < .01. **p < .05. ***p < .01