Importance of Social Media in Online Marketing and Use of Eye-Tracking Methods in Online Shopping

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Foreword

Submitted in partial fulfilment of the requirements of the BSc Psychology degree, Reykjavik University, this thesis is presented in the style of an article for submission to a peer-reviewed journal.
Abstract - English

The main objective of this study is examining how different attributes, presented in Internet sales on Facebook, can influence a consumer’s behavior. The study was done in collaboration with a fashion store called Mania and a marketing and research company called MMR. An emphasis was imposed on five independent variables, the position of the price and size tags, whether the size and price were mentioned or not and the prevalence of a human model. In addition to that, the total fixation time was explored, in regards to a difference between men and women. Tobii’s 1750 eye scanner device was used in real life setting to measured how much the attributes affected the total fixation time participants had on the product. Participants in the study were students at Reykjavik University in the year 2014. A hierarchical multiple regression was done to test if the main attributes in the study significantly predicted the length of the total fixation time. The results showed that three out of five independent variables had a significant impact on the dependent variable or the total fixation time. The results also showed that there was a significant difference between male and female fixation duration, with male participants in general looking longer than female participants. Based on the results it can be concluded that the prevalence of the human model, and when size is not revealed, has a positive effect on the participant’s attention duration.

Abstract – Icelandic


Keywords: social media, online purchasing, eye-tracking, total fixation time
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The biggest change in marketing that has happened during the recent years is the scale of use of the Internet and web based social networks. The Internet and social media revolution has resulted in companies enhancing their presence online. Online shopping is increasingly popular and social networking sites like Facebook are growing at a steady pace (Lee, Kim, & Kim, 2012; Mangold & Faulds, 2009). The number of consumers who shop online increases continuously. Customers use the Internet as a platform for shopping for goods and services and for obtaining essential information about products (Demangeot & Broderick, 2007). Websites are platforms where consumers can form their opinions about the product and decide on future co-operation with sellers. Consumers gain power by sharing information about products and services on social media networks (Detmer, 2002; Wind & Mahajan, 2002). Therefore, an online shopping environment currently has a strong influence on the relationship between the marketers and their clients (Demangeot & Broderick, 2007; Detmer, 2002). More than 1.8 billion adults had access to online social networks in the beginning of 2014 (Statista, 2014c). The adaptation of social media for marketing purposes has turned them into a settled destination for companies around the world, with 90% of businesses reported to have utilized social media marketing in 2013 and 63% of advertisers reported that their online networking advertising plan would increase in 2013 (Statista, 2014c). Facebook is currently the greatest social network in the world, with more than 1.32 billion regular users worldwide (Statista, 2014b). Therefore, Facebook is the main platform for both social media and internet marketing (Statista, 2014a).

Various studies of online shopping environments have been researching the level of the individual stimulus or attributes that impact behavior (Dailey, 2004; Fortin & Dholakia,
Results from Degeratu, Rangaswamy, and Wu (2000), show that sensory hints, especially visual ones, will influence choices to a lesser degree online than they do offline. They demonstrated that there are systematically different impacts that brand name, price and various product features online compared to offline. Online pages are not the same as other visual stimuli, because they are the mixtures of textual, pictorial, and audio content. It is possible to see how this visual stimulus affects consumer’s behavior through their attention, which is reflected in their eye movements (Pieters, 2008). The eye movement behavior includes diverse levels of cognitive processes, including coulometer and semantic processes (Pan et al., 2004). Because of that, companies track what purchasers look at, keeping in mind the end goal to build up their visual marketing efforts more effectively (Pieters, 2008). The eye tracking is a research method when eye movement is tracked while participants are looking at the website page, providing evidence of what attracts their attention (Djamasbi, Siegel, & Tullis, 2010). Pieters (2008) reported in his study that eye movements under typical conditions are unequivocally and directly connected to high-order cognitive processes. Therefore, visual attention plays a substantially central role in the communication process (Pieters, 2008; Rayner, Rotello, Stewart, Keir, & Duffy, 2001). Eye-tracking can give a better understanding of how the purchaser disperses visual attention over diverse manifestations of online advertising (Salvucci & Goldberg, 2000). The eye-tracking research has shown that the total fixation time has a strong impact on customer’s behavior, as well as total fixation time on a product indicates likelihood of purchase in the future (van der Laan, Hooge, de Ridder, Viergever, & Smeets, 2015). Consequently, eye-tracking opens new possibilities to build up theories on how shoppers make their choices because it provides measurement of intentions (Pieters & Warlop, 1999).

The current study examined how the different components, present in the online shopping environment on Facebook, affect users attention and how companies can influence
the total fixation time of customers with these attributes by using them in their advertising. The study was conducted in collaboration with Mania, an Icelandic fashion store which sells their products through Facebook, and MMR, an Icelandic market research firm. It focuses on four main attributes (price, size, position of price and size and human model) and their impact on the total fixation time, as well as the difference between female and males total fixation duration. Some researchers have shown a significant difference between male and female fixation length (Jones, Stanaland, & Gelb, 1998; Pan et al., 2004). The study reported that males displayed a fundamentally longer mean fixation duration than females (Pan et al., 2004).

One of the main attributes that this study explores is price because previous studies has shown that price can be one of the most important attributes for online shopping (Djamasbi et al., 2010). According to Reibstein (2002), when shopping online for clothing, price was identified as the most important attribute. He also reported that price is an alternate stimulus that for most consumers has a high effect on the online buy. As indicated, price is an essential stimulus to pull in clients to online shopping platforms. The results from Fagerstrøm and Ghinea (2011) demonstrate that in relation to online proposals, price is the stimuli that most influences the consumer’s behavior online.

Menon and Sigurdsson (2015) examined the importance of the social media in regards to consumer purchasing, where attributes affect online purchase decisions of the customers. The results of the study showed that attributes of price and available size had high utility on the likelihood of purchasing. The study also indicated that gallery pictures of the product, the way the product is presented, had an impact on the customer’s decision. Research has also shown that using a famous human model in advertisements plays a main role in getting customers attention (van der Laan et al., 2015). In relation to that, this study examined how prevalence of a female model impacts the total fixation time of the customers in comparison
with how they react when the product it presented with the mannequin. The research question was how price, size, position of the prize and size, and female model and gender affects the total fixation time duration of participants on the product. The main goal of this study was to discover new information that is practical for the companies that use social media and would help them reach and influence their customers in the best way and increase the attention span to their products online.

Method

Participants

The participants were undergraduate and master students at Reykjavik University, comprising of both Icelandic and foreign nationals. The participants were volunteers, therefore, they were not paid in money for their participation but were compensated in the form of a participation grade. In total, the number of participants were 31 people both Icelandic and foreign, overall responses for all participants were 775. The participants were randomly divided into two groups. The final sample included 18 females and 13 males. The gender ratio and the number of participations was similar in both groups. In Group 1 were 7 males and 8 females. Group 2 consisted of 6 males and 10 females. Data from two Icelandic female from group 2 was missed and therefore it was not used. The participants in the age between 20 and 30 years old conceded 58,3%. In Group 1 bachelor students consisted 65% and in Group 2 90%.

Research design and data analysis

Computers and the Tobii eye scanner device was used to measure the response of the participants. Fixation time reflected the interest of the participants, eye scanner device gives us information about total fixation time and total fixation time for each part of the slide (Tobii Technology, 2008). Before the actual study took pace 4 participants were taken for trials in order to assure that instructions were clear enough and also to practice researchers.
There were six dependent variables in this study, the main dependent variable was total fixation time per slide. That variable was divided into five other dependent variables; fixation time for face, fixation time for body or dress, fixation time for price, fixation time for like and comments, and fixation time for ads. The independent variables of the study were gender (female, male), price (price mentioned, price not mentioned), size (size mentioned, size not mentioned), model (with or without model) and position of the price and size (on the left side of the slide or on the right side of the slide).

A hierarchical regression was done to check the effects of the five independent variables (gender, price, size, model and position of the price and size) on the main dependent variable (total fixation time). Subsequent hierarchical regressions were done for each dependent variable (total fixation time for face, body/dress, like and comments and ads) and how they are affected by three independent variable (gender, size and model).

**Procedure**

The study took place in a closed environment at the Reykjavik University. Convenient sampling was used and participants were divided into two groups randomly. The main difference between Group 1 and Group 2 was where price signs on the pictures were located. Each group, received two packages, package 1 and package 2. Group 1 saw a price sign located in the left corner in bold black letters with a red box around. The package 1 for Group 1 was model Maria in full length portrayal in a dress that was advertised. The package 2 for Group 1 was mannequin showing the dress. Group 2 was shown a small price sign in the right corner with a normal letters above comments and ads. The package 1 for Group 2 was model Maria in depth while the package 2 for the same group was mannequin. The data for this study was received from a larger study where massive dataset was examined with eye scanner device in research setting environment.
At the beginning, the study was explained to participants and all details were carefully reviewed. The eye scanner measured an eye position for each participant and their names were recorded to the device. When the position of the eye was correct the device calibrated the eye movement. The participant was asked to follow several calibration points and the results were listed. If the results were not correct then the re-calibration was made. When calibration was as it should be and the correct responses were obtained then the session could start. An instruction slide was provided before the commencement of the experiment that explained the process.

**Results**

The hierarchical multiple regression was done to test if the attributes present in online shopping significantly predicted the length of the total fixation time. Preparatory analyses were made to guarantee no infringement of the assumptions of normality, linearity and homoscedasticity. The correlation between the independent variables (*gender, size, price, position of the size and price, model*). All correlations were weak, ranging between \( r = .023, p = .121 \) to \( r = .158, p < .001 \). This shows that multicollinearity was unlikely to be an issue (Field, 2009).

All independent variables, except *price*, were significantly correlated with total fixation time which shows that the data was appropriately correlated with the dependent variable to run though multiple linear regression. The correlations among the independent variables and the dependent variable (the fixation time) were all weak to rather strong, ranging from \( r = -.08, p < .05 \) to \( r = .30, p < .001 \).

In the first step of the hierarchical multiple regression, just gender was added to the model, dependent variable was total fixation time. This model was statistically significant, \( F(1, 742) = 69.69, p < .001 \) and it explained 8.6% of variance in total fixation time. In step 2 the four other variables were added; *price, position of the price and size, size* and *model*. The
model then explained 13.5% of the variance in total fixation time, which was significant
$F(5, 738) = 24.13, p < .001$. The introduction of price, position of the price/size, size and
model explained extra 5.5% in total fixation time after controlling for gender $R^2 \text{Change} = .055, F (4, 738) = 11.73, p < .001$. Three of five independent variables showed a significant
effect on the total fixation time, variables gender ($\beta = .285, p < .001$), size ($\beta = .216, p < .001$) and model ($\beta = -.117, p < .001$).

Other hierarchical multiple regression was done with the three significant variables
(Table 1). In first step gender explained 9.2% in total fixation time $F(1, 773) = 78.0, p < .001$.
In the second step, size and model explained extra 4.2%, $R^2 \text{Change} = .042, F(2, 771) = 18.5, p < .001$. The model then explained 13.3% $F (3, 771) = 39.57, p < .001$ in total of variance in the total fixation time each slide.

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of the Hierarchical Regression Analyses for Total Fixation Time</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Total fixation time</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>With/without model</td>
</tr>
<tr>
<td>$R^2$</td>
</tr>
<tr>
<td>$F$ for change $R^2$</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .001.

Gender had a highest Beta value ($\beta = .191, p < .001$), the men looked longer than the
women in total, then the size ($\beta = .134, p < .001$), the participants looked longer if the size
wasn’t mentioned and then the model ($\beta = -.06, p < .05$), the participants looked longer if the
female model was on the slide.

The main dependent variable (Total time $= 3113, M = 4.01$) was divided into five
other dependent variables; fixation time on face, fixation time on dress and body, fixation
time on price, fixation time on likes and comments. Descriptive statistics for dependent
variables are shown in table 2. The variable dress and body took most of the participants' attention (Total time = 1416, M = 1.82), second highest was fixation time on likes and comments (Total time = 578, M = 0.746) and the lowest one was fixation time on ads (Total time = 99, M = 0.128).

Table 2
Descriptive Statistics for Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total time</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fixation time</td>
<td>775</td>
<td>3113</td>
<td>4.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Fixation time on face</td>
<td>775</td>
<td>301</td>
<td>.39</td>
<td>0.7</td>
</tr>
<tr>
<td>Fixation time on dress/body</td>
<td>775</td>
<td>1416</td>
<td>1.82</td>
<td>1.3</td>
</tr>
<tr>
<td>Fixation time on price</td>
<td>775</td>
<td>218</td>
<td>0.28</td>
<td>0.4</td>
</tr>
<tr>
<td>Fixation time likes/comments</td>
<td>775</td>
<td>578</td>
<td>.75</td>
<td>1.2</td>
</tr>
<tr>
<td>Fixation time on ads</td>
<td>775</td>
<td>99</td>
<td>0.13</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Five other hierarchical multiple regressions were done to explore how independent variables affect five dependent variables, listed in table 2. First hierarchical multiple regression was done to examine how gender, size and model affect the fixation time on body and dress. Gender was the only variable that had a significant effect on fixation length on body and dress. Men looked statistically significant longer on body and dress on the slide than women, the result is presented in table 3. This model was statistically significant, $F(1, 768) = 51.917, p < .001$ in step 1 and explained 6.3% of variance in fixation time on dress and body. After entry of size and model the number increase only to 6.7%, $F(3, 766) = 18.47, p < .001$.

Second of five hierarchical multiple regression examined the effect of the three independent variables on fixation time on face. The result showed that gender was again the only variable that had a significant effect on fixation length on face, men looked longer on face of the model than women. In step 1 the model was statistically significant, $F(1, 317) = 74.7, p < .001$ and explained 19.1% of variance in fixation time on face. After entry of size and model the number increase only by 0.01% or to 19.2%, $F(2, 316) = 37.5, p < .001$. 
Table 3

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
<th></th>
<th></th>
<th>Step 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>β</td>
<td>R²</td>
<td>B</td>
<td>β</td>
<td>R²</td>
</tr>
<tr>
<td>TFT on face</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.401</td>
<td>.437*</td>
<td>.191*</td>
<td>.493*</td>
<td>.439**</td>
<td>.192**</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td>.04</td>
<td>.038</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With/without model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TFT on dress and body</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.178</td>
<td>.252**</td>
<td>.062**</td>
<td>.18</td>
<td>.255**</td>
<td>.067**</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td>-.023</td>
<td>-.031</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With/without model</td>
<td></td>
<td>.042</td>
<td>.060</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TFT on price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.005</td>
<td>.025</td>
<td>.001</td>
<td>.006</td>
<td>.26</td>
<td>.037**</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td>.044</td>
<td>.186**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With/without model</td>
<td></td>
<td>.006</td>
<td>.028</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TFT on likes and comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.06</td>
<td>.053</td>
<td>.003</td>
<td>.08</td>
<td>.066</td>
<td>.155**</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td>.454</td>
<td>.371</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With/without model</td>
<td></td>
<td>.096</td>
<td>.079</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TFT ads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.414</td>
<td>.342</td>
<td>.117**</td>
<td>.413</td>
<td>.341**</td>
<td>.161**</td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td>.239</td>
<td>.200*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With/without model</td>
<td></td>
<td>-.177</td>
<td>-.149</td>
<td></td>
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</tr>
</tbody>
</table>

Note. *p < .05. **p < .001. TFT = Total fixation time.

Third hierarchical multiple regression analyzed the effect of three independent variables on the fixation time on price. Size was the only independent variable that had statistically significant effect on fixation time on price (Table 3). In the first step the model just explained 0.1% and wasn’t significant. The model showed significant result after step 2, $F(3, 771) = 9.98$ $p < .001$ and explained 3.7% of fixation time on price. If the size wasn’t mentioned on the slide participants looked longer on the price. The same result showed hierarchical multiple regression which explored relationship between independent variables.
and the fixation time on likes and comments. The model was significant after step 2, $F(3, 500) = 30.65, p < .001$ and explained 15.5% of the fixation time on like and comments.

The last hierarchical multiple regression explored the effect of the gender, size and model on the fixation time on ads. Only gender had a significant effect on fixation time on ads and the men looked longer on ads than the women. The regression model was statistically significant, $F(1, 143) = 9.01, p < .001$ after step 1 and explained 11.7% of variance in fixation time on price (Table 3). After introduction of size and model the number increased to 16.1% $F(3, 141) = 9.02 p < .001$.

On the figure 1, it is possible to see the interaction between the two dependent variables, mean fixation time on the price and total fixation on the likes and comments and independent variable sizes. It shows how the total fixation time increase both for likes and comments and price when size is not mentioned.

![Figure 1](image1.png)

*Figure 1.* Size mentioned and size not mentioned and two dependent variables.

Figure 2 indicate how gender affects two dependent variables, total fixation time and on the face and total fixation time on the dress and body. Total fixation time on the face, and dress and body increased when the participants were males.
Discussion

The attributes mentioned in the study were all important for gaining the attention of the participants. Three out of five attributes showed significant effect on the total fixation time on the product. Surprisingly, price did not have a significant impact as the positioning of the price and size. This result is not in accordance with previous studies which have shown that price is one of the main attributes that controls customer’s behavioral, (Djamasbi, Siegel, & Tullis, 2010; Fagerstrøm & Ghinea, 2011; Reibstein, 2002). Furthermore, the total fixation time on the price was not a big part of the total fixation time, which means that participants did not spent much time observing the price. The reason for this may be that the price is important factor when it comes to decision-making about whether the customer intend to purchase the product or not, but has no major impact on the total attention of the consumers. The presence of the model had also a significant impact on the total fixation duration of the participants, a previous study supports these findings (van der Laan et al., 2015).

The results of this study showed a great difference between male and female fixation duration, with the male participants looking longer than the female participants. This result is in accordance with previous studies which have shown that the total fixation duration is

Figure 2. Difference between females and males fixation time on two independent variables.
longer for males then for females (Pan et al., 2004). This gives a reason to believe that companies have male’s attention longer than females and might therefore mean that it is more challenging to reach and increase the attention of females. The gender most affected the total fixation time, in the second place was prevalence of the size and the last one was the prevalence of the model.

The total fixation time was divided into five other dependent variables to see the profound impact of the three independent variable (price, size and model) on the perception of the customers. The fixation time on the dress and body took most of the total attention time of the participants. Gender had effect on the total fixation time on dress and body as well as on the total fixation time on face. The total fixation time on the face was the third longest time of total fixation time. That is another indication that the prevalence of models affects the length of attention because there was no head nor face on the mannequin. The total fixation time on the likes and comments posted on the product’s photo on the Facebook took second longest time from the total fixation time. When size was not mentioned, participants looked at the likes and comments for longer. Size was only independent variable that had significant impact on the total fixation time on price. This indicates that if companies want to increase time that customers spent looking on the likes and comments they should not mention the size of the product and conversely, however, it would most likely depend on how positive the likes and comments are. When size was not mention total fixation time on price increased. Therefore, if companies want to draw attention away from the price, one of their option is to mentioned size and if they want to increase attention on the price they should not mention the size.

One of the problem with the eye-tracking incorporates light changes, head movements and eye flickering, all of them can result in abruptly vanishing fixation of eyes (Hansen & Hammoud, 2007). Another limitation is that researchers can record eyes’ fixation and movements and look at the measurements, yet there are not any certainty of the cognitive
The main research question was to observe how, with different attributes in online shopping, can increase the customer’s attention. From the results it can be concluded that the greatest customer attention can be gained by having a human model and not mentioning the size. As well as, males are more likely to give their attention to human models, body or dress and face of the model, than the females. When the size is mentioned it seems to take attention away from the price, likes and comments, therefore total fixation time increases when size is not given.

The regression model in this study only explained 13.3% of the total fixation time of the participants. It indicates that the independent variables in this study explain small part of what affects the perception of the participants. Future research may explore in more detail what attributes present in online shopping influence the behavior of purchasers. This research did not reach the all attributes that affect attention online, so more researches are needed in this field.
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