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THE IMPACT OF THE MODEL`S GAZE DIRECTION ON THE USER EXPERIENCE

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Abstract: *The direction of a model's gaze in a photo can have varying effects on how users perceive an interface. The psychological state of the person in the image can be interpreted by viewers by focusing on the model's gaze. In advertising, however, gaze direction plays a different role, as it can guide the viewer's attention to specific elements as intended by the designer. This paper aims to explore whether the model's gaze direction influences user experience. For the research, a prototype of an online store was developed, featuring a model whose gaze is directed left, right, and straight ahead in different photos. An eye-tracking camera was used to monitor eye movement during the study. The results are displayed as heat maps, highlighting the areas of the interface that received the most attention and were viewed for the longest time.*

Key words: gaze direction, advertising, user experience, eye tracking

1. INTRODUCTION

Eye gaze direction is a crucial element in face processing and social communication, influencing how efficiently facial expressions of emotion are perceived and processed (Hu et al., 2017; Adams Jr & Kleck, 2003). Research has shown that direct eye gaze captures and retains attention to faces, suggesting its significance in human interaction and visual processing (Bindemann et al., 2005).

The direction of human gaze is a critical aspect of non-verbal communication, significantly influencing interpersonal interactions and emotional responses. When a person looks directly into another's eyes, it encourages feelings of trust, security, and positive feedback. Eye gaze serves multiple functions during social interactions, allowing individuals to effectively exchange social signals and comply with social norms, enhancing communication and connection.

Eye contact is crucial for establishing and maintaining interpersonal relationships, as it conveys attention and intent, and can influence emotional states such as trust and anxiety (Cañigueral & Hamilton, 2019; Davidhizar, 1992). Even in images with human faces research on eye gaze has indicated that, observers typically direct their attention quickly to the facial areas (Cerf, Frady & Koch, 2009).

In the context of advertising, studies have demonstrated that a model's gaze direction can significantly impact viewer attention and engagement. Hutton and Nolte investigated that participants looked longer at product in advertisements when the model's gaze was directed toward the product (Hutton & Nolte, 2011). This finding is particularly important in the digital advertising, where online users are more oriented on goals and critical of ads compared to print media (Deshwal, 2016), highlighting the potential impact of subtle design factors like gaze direction on advertising effectiveness.

Online shopping has become extremely popular in recent years, and there are various reasons why people prefer to shop online. Some of these reasons include: convenience, the ability to compare competitors and speed (Kavitha, 2017). Online shopping requires efficiency and respondents should enjoy the purchasing experience (Perea y Monsuwé, Dellaert & De Ruyter, 2004).

User Experience (UX) refers to the various perceptions that arise from using a specific product or system. This encompasses all physical and psychological reactions, as well as emotions that occur during and/or after its use. The experience results from the presentation of information, functionality, and performance provided by the system (Mirnig et al., 2015). A good interface is one that allows the user to focus on the information and their goals, rather than on how the interaction is executed (Galitz, 2007).

Furthermore, the results of the research in the paper "Effects of Model Eye Gaze Direction on Consumer Visual Processing" (Figure 1) show that direct and indirect gaze yield different outcomes in advertising. It has been demonstrated that direct gaze captures the viewer's attention and prompts them to fixate exclusively on the model's face in the image. If the model's eyes and head are directed at a specific part of the text or product, viewers will look at that point for a longer duration (Wang et al., 2018).

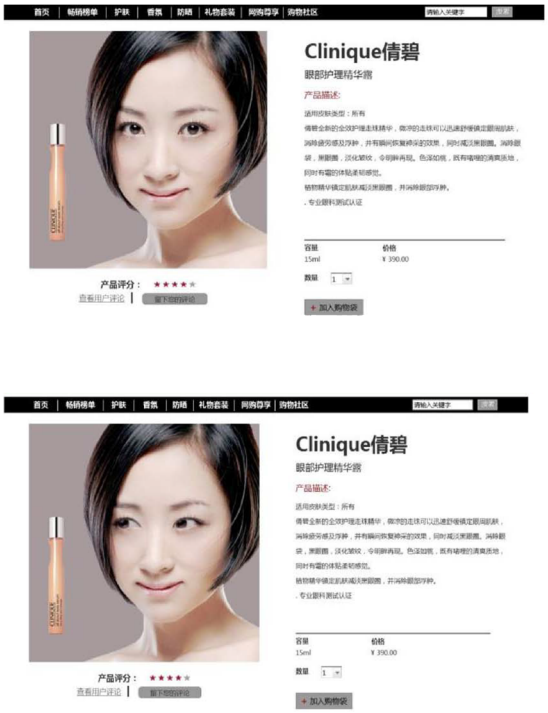

Figure 1: Examples in experiment of Wang et al., 2018
Direct gaze on the top picture and averted gaze on the bottom picture

2. METHODS

The aim of this research is to examine whether the gaze or direction of the model's look in a photograph affects the user's experience. For the purposes of the research, three examples of an online jewellery store were created. The photographs used for conducting the research are original, as are all the text and logo used in the research example. Model in the photograph is directed to a different side in each example (right, left, straight). The assumption is that the gaze of the model in the photograph will draw the respondent’s attention to a specific part of the website. On the first of the three examples, the model is wearing earrings and looking to the right. In the second example, the model looks to the left and is wearing sunglasses. The third example shows the same model wearing a necklace and looking straight ahead. The variable parameters are jewellery, price, title (name of the jewellery) and text (description). They contribute to the realism of the e-commerce itself and allow the user to remain interested and focused. However, the most important parameter that changes and is tested is the person's gaze in the picture. The basic design and elements of the e-commerce remain the same in each example.
79 students of the University North between the ages of 19 and 25 took part in the survey. Calibration could not be successfully completed for some participants, which is why the results of eight students were excluded from this analysis. The test was successfully completed by 40 male and 31 female participants.
Measurements were conducted using the Gazepoint GP3 Desktop eye-tracking device, with data processed by the Gazepoint Analysis 3.5.0 software. The eye-tracking device was recalibrated for each participant. Participants faced the screen directly, maintaining a distance of 60 to 80 cm from it. Each participant viewed three examples of a web store sequentially, with each example displayed for 10 seconds. The analysis of the research results was performed using heat maps.

3. RESULTS AND DISCUSSION

Heat maps are graphical representations of data that use cold and warm colours to indicate intensity of user interaction. When used with gaze tracking devices they indicate which areas are of most interest. High-intensity areas are coloured red, and low-intensity areas are indicated with blue. The colourless areas were either skimmed or not observed at all. For this reason, the results of this research are presented with the

help of heat maps. The results presented in this paper show the intensity of gaze for the 2nd second and for the complete duration of the observation.

3.1 Heat map analysis for 2nd second of viewing

From the display of the heat map for first example (Figure 2), it is clear that the respondents have an intense focus on the title. This focus aligns with the direction of the gaze of the person in the picture. To a lesser extent, they also look at the face and they ignore other elements of the online store. This is the 2nd second of viewing, so it can be concluded that the look of the model from the picture immediately at the beginning of viewing directed the subject's attention to the title itself.

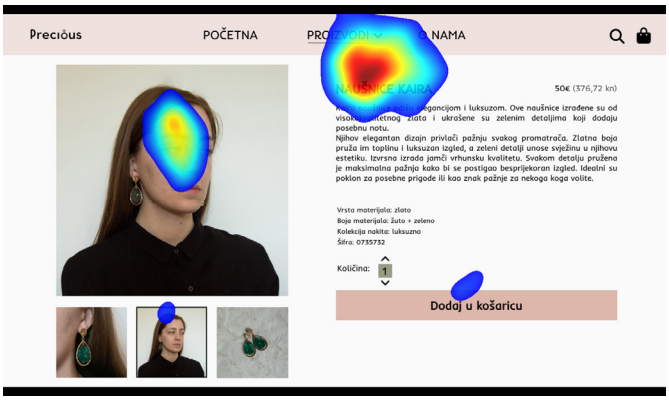

Figure 2: Heat map showing the intensity of gaze for the 2nd second of observation. Sample version is a right-facing model

Figure 3 shows the left-facing model and if compared with previous example (Figure 2) there is visible difference. In this example (Figure 3) direction of gaze is mostly focused on face of the model, title of product and a little bit on the smaller images. According to this it can be concluded that the participant's attention was dispersed and the model's orientation did not significantly influence the direction of their gaze.

Figure 3: Heat map showing the intensity of viewing for the 2nd second of observation. Sample version is a left-facing model

In Figure 4, it is evident that the respondent's attention was mostly focused on the model's face. However, they also looked with great interest at the first item in the small picture gallery, namely the necklace.
From the three displayed images (Figure 2, Figure 3, Figure 4), it can be seen that the gaze of the model in the photograph significantly influenced the respondents' attention within the 2nd second of viewing.

Figure 4: Heat map showing the intensity of viewing for the 2nd second of observation. Sample version is a front-facing model

3.2 Heat maps analysis for all ten seconds – average

When taking the average of all 10 seconds of viewing, the results in Figure 5 show that the respondent's primarily focus on the direction of the gaze of the person in the image, while almost ignoring all other elements and the remaining text. There are hardly any areas, except for the title and the model's face, where the heat map is yellow.

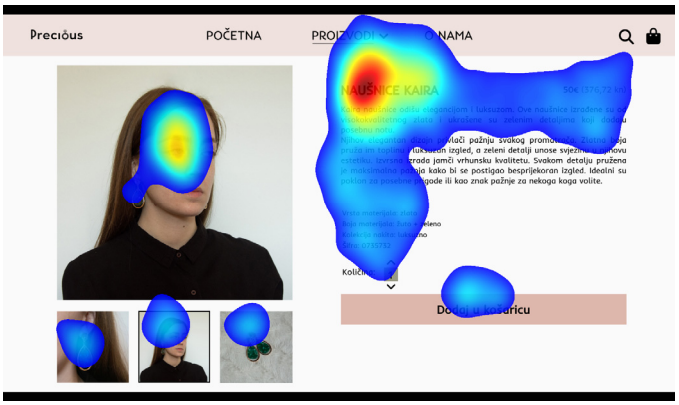

Figure 5: Heat map showing the overall results, right-facing model

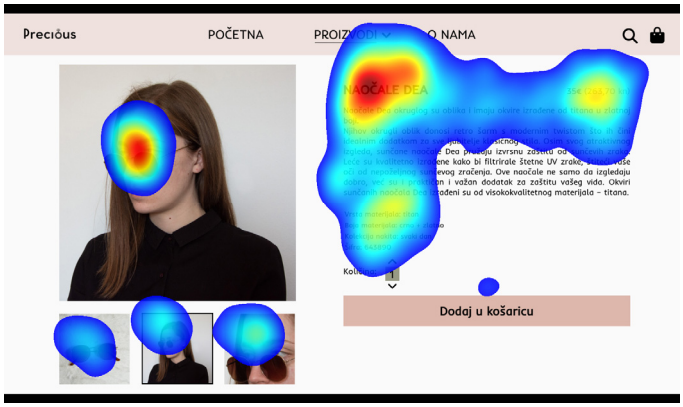

Figure 6: Heat map showing the overall results, left-facing model

Figure 6 showing the overall results for left-facing model, indicates that the entire text is viewed with slight emphasis on the title. The heat map in Figure 7 is very similar to Figure 6, but much more attention is focused on the text as well as the small images that provide more detailed views of the product being purchased.

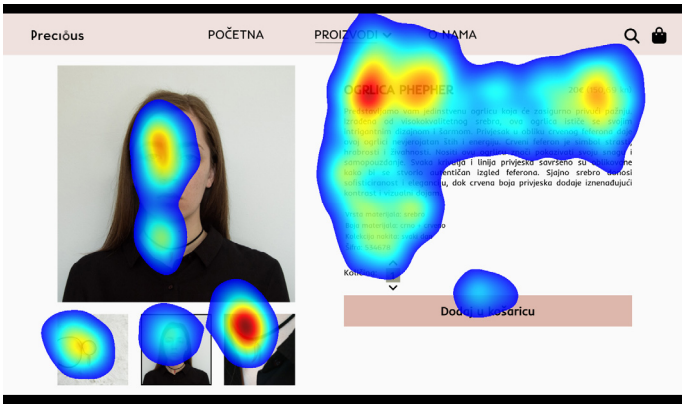

Figure 7: Heat map showing the overall results, front-facing model

From these three photographs (Figures 5-7), it can be concluded that the gaze of the model in the image significantly influences the respondent. If the model is looking straight ahead, the respondent's attention is scattered across the entire interface of the online store. However, if it is necessary for respondents to focus on a specific part of the online store, this is achieved by directing the model's gaze directly at that point.

4. CONCLUSIONS

The success and functionality of an online store depends on numerous factors, and there are often debates about whether the most important element on a website, or in this case an online store, is the text, the headline, or the photograph. It often turns out that the most important factor is the photograph itself, or more specifically, its content.

In this paper, the focus was on the photograph itself, particularly the gaze direction of the model in the image. The influence of gaze direction on the viewer is certainly an interesting area, and based on the conducted research, it can be concluded that proper positioning of the model in the photograph can have a positive effect on the effectiveness of the online store.

The results of this research were presented for the 2nd second of viewing the online store and the average of all ten seconds of viewing. The reason for focusing on the 2nd second of viewing is to allow designers to see what respondents notice first and how long they stay on that part of the web page. Often, this initial glance is crucial for the purchasing decision.

Analysing the research results, it can be concluded that the direction of the model's gaze in the image significantly influences users. If the goal is for viewers to focus their attention on the model, the model's gaze should be directed straight at the user. However, if a specific part needs to be highlighted, the model's gaze should be directed towards that point. This way, users will pay more attention to the desired area. A direct gaze and a gaze directed outside the frame can be beneficial if the aim is for respondents to view all interface elements evenly. Through this method, designers can influence users and guide them to notice specific areas of the design.

5. REFERENCES

Adams Jr, R. B. & Kleck, R. E. (2003) Perceived gaze direction and the processing of facial displays of emotion. *Psychological Science*. 14 (6), 644-647. Available from: doi: 10.1046/j.0956-7976.2003.psci_1473.x

Bindemann, M., Burton, A. M., Hooge, I. T., Jenkins, R. & De Haan, E. H. (2005) Faces retain attention. *Psychonomic Bulletin & Review*. 12 (6), 1048-1053. Available from: doi: 10.3758/bf03206442

Cañigueral, R. & Hamilton, A. F. D. C. (2019) The role of eye gaze during natural social interactions in typical and autistic people. *Frontiers in Psychology*. 10, 560. Available from: doi: 10.3389/fpsyg.2019.00560

Cerf, M., Frady, E. P. & Koch, C. (2009) Faces and text attract gaze independent of the task: Experimental data and computer model. *Journal of Vision*. 9 (12), 10-10. Available from: doi: 10.1167/9.12.10

Davidhizar, R. (1992) Interpersonal communication: a review of eye contact. *Infection Control & Hospital Epidemiology*. 13 (4), 222-225. Available from: doi: 10.1086/646513

Deshwal, P. (2016) Online advertising and its impact on consumer behavior. *International Journal of Applied Research*. 2 (2), 200-204.

Galitz, W. O. (2007) *The essential guide to user interface design: an introduction to GUI design principles and techniques*. Indianapolis, Wiley Publishing, Inc.

Hu, Z., Gendron, M., Liu, Q., Zhao, G. & Li, H. (2017) Trait anxiety impacts the perceived gaze direction of fearful but not angry faces. *Frontiers in Psychology*. 8, 1186. Available from: doi: 10.3389/fpsyg.2017.01186

Hutton, S. B. & Nolte, S. (2011) The effect of gaze cues on attention to print advertisements. *Applied Cognitive Psychology*. 25 (6), 887-892. Available from: doi: 10.1002/acp.1763

Kavitha, T. (2017) Consumer buying behavior of online shopping—A study. *International Journal of Research in Management & Business Studies*. 4 (3), 38-41.

Mirnig, A.G., Meschtscherjakov, A., Wurhofer, D., Meneweger, T. & Tscheligi, M. (2015) A formal analysis of the ISO 9241-210 definition of user experience. In: Begole, B. & Kim, J. (eds.) *HI EA '15: Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing*

Systems, 18-23 April 2015, Seoul, Republic of Korea. New York, Association for Computing Machinery. pp. 437-450.

Wang, Q., Wedel, M., Huang, L. & Liu, X. (2018) Effects of model eye gaze direction on consumer visual processing: Evidence from China and America. *Information & Management*. 55 (5), 588-597. Available from: doi: 10.1016/j.im.2017.12.003

Perea y Monsuwé, T., Dellaert, B. G. C. & De Ruyter, K. (2004) What drives consumers to shop online? A literature review. *International Journal of Service Industry Management*. 15 (1), 102-121. Available from: doi: 10.1108/09564230410523358