Does color-product congruency effect the evaluation of banner advertisements?

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Does color-product congruency effect the evaluation of banner advertisements?

An eye-tracking experiment

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Abstract

In 1994 banner advertisements were introduced and since then the internet advertising industry and use of banner advertisements have exploded (Dahlen & Micael, 2001). In our experimental study we specifically aimed to explore how banner ads effect viewers when using colors on banner ads that are congruent or incongruent with the content of a website. We aimed to be able to contribute towards research that marketers can take into consideration when creating banner ads.

We investigated the variables time to first fixation, fixation duration (attention), fixation count, distraction of the ad, evaluation of the ad and purchase intention. Based on previous research, we expected that these variables would be significantly influenced by the congruence of banner ad colors and website content. We had a Functional (functional website content paired with a functional product banner ad) and Sensory-social condition (sensory-social website content paired with a sensory-social product banner ad) in our study. During our study we made use of an eye-tracker and questionnaire.

Results. We found that banner ads using both functional colours, which are colour-congruent to those of the webpage content, will lead to a more positive evaluation of the ad, whereas colour incongruence will lead to a negative evaluation of the ad. We found the opposite to be true for the sensory-social condition. Furthermore, we found that banner ads for only the functional condition (which are colour congruent with the webpage content), will lead to higher purchase intention, whereas colour incongruence will lead to a lower purchase intention. Lastly, results suggest that distraction levels of banner ads will be lower when color incongruence (for both functional and social-sensory colours) between webpage content and banner ad colors take place, whereas when colour congruence take place, it will be higher.

INTRODUCTION

The internet has become an important and unavoidable medium of advertising for many companies over the past decade. Digital marketing is the fastest growing and most exciting branch of marketing today. Web advertising can appear in many forms, including text links, sponsorships, classifieds, target sites and more, but banner advertisements have historically been the most predominant (Dahlen & Micael, 2001). Banner ads are a form of internet advertising and refer to advertisements that are displayed on a webpage which cover a portion of the screen (Lohtia, Donth & Hershberger, 2003). Banner ads generally display promotional messages at the top, bottom, or side of a webpage (Dahlen & Micael, 2001).

In 1994 banner advertisements were introduced and since then the internet advertising industry and use of banner advertisements have exploded. According to Dhalen and Micael (2001), when it comes to interactive marketing, brands spend more on banner ads than almost any other interactive marketing department. Banner advertisements are often used as a tool to build brands, develop brand awareness, create brand image, and increase intent to purchase (Lohtia, et al., 2003). Moreover, banner ads are used by brands to build brand loyalty, prompt sales, drive consumers to a website and collect personal data from users (Scott, 2006).

Despite the increase in popularity of the internet and banner advertising, some studies have raised doubts with regards to whether a banner ad is an effective medium of advertising (Hervet, Guerard, Tremblay & Chtourou, 2011). An internet user's disposition and contextual factors tend to influence evaluations of banner advertisements and may lead to advertisements being interpreted as distracting, annoying and other negative connotations (Hervet, et al., 2011). At first the click-through rate of banner ads was high but has decreased tremendously in the last couple of years. Benway (1998) found that internet users often attempt to avoid looking at banners, a concept referred to as banner blindness. Internet users are often unwilling to look at banner ads while engaging in online activities since it can divert internet users' cognitive resources from their main aim (Lang 2000). Marketers today need to be much more creative with their banner advertising to avoid banner blindness (Jones, Malczyk & Beneke, 2011).

In order to avoid banner blindness, annoyance levels caused by banner ads and the overall success of a banner ad, banner ad and website congruency can be used (Porta, Ravarelli & Spaghi, 2013). Congruency refers to the relationship between the nature of the content of an ad and its surrounding context, and to the association that the user can produce between them (Porta, et al., 2013). For a form of congruency to take place there needs to be a fit between the

content of an ad and its surroundings context (Zhang, Bao & Xiao, 2018). Such congruency leads to a positive effect on the evaluation of an ad (Zhang, et al., 2018) and purchase intention (Busen, Mustaffa & Bahtiar, 2016). There are various forms in which a websites content and banner ad congruency can take place, such as the design, colors used, text and so forth (Chiu, Lo & Hsieh, 2017). Color and text can be viewed as congruent when the content of the website text and the meaning conveyed by the color in a banner ad are matched (Zhang et al., 2018).

Specific colors can evoke certain associations towards a product, without any prior conditioning and can be a valuable tool in communicating a brand's desired image (Madden, Hewett & Roth 2000). Bottomley and Doyley (2006) found that it is more appropriate for functional products to be presented in functional colors and sensory-social products in sensory-social colors. Functional colors include colors such as black, blue and grey (Bottemley & Doyley, 2006). Dark blue is often associated with concepts such as sincere, dependable and trustworthy (Jacobs, Keown, Worthley, & Ghymn, 1991), which appear to be more salient for the fulfilment of functional rather than sensory-social needs. Social-sensory colors include red and purple. Red is often associated with concepts such as excitement, power and cheerfulness (Wexner, 1954), which appears to be more relevant to the fulfilment of sensory-social needs. When colors are selected appropriately it influences the effectiveness of the banner advertisement (Kohli and LaBahn, 1997).

Brands can represent functional sensory-social images (Park, Jaworski, & MacInnis, 1986). Functional brands and products entail brands and products, such as shampoo, that adhere to consumers' utilitarian needs for problem solving or problem prevention (Madden, et a 2000). Social-sensory brands and products entail the feelings of pleasure, affiliation and group membership. Such products are for instance perfumes and restaurants.

According to a previous study, when the color of a banner advertisement is congruent with the webpage content, consumers can organise these two blocks of information into a holistic element despite receiving visual cues from both blocks of information and therefore avoid initial banner blindness (Chiu, 2017). Color congruency can lead to more favourable attitudes towards a brand and advertisement (Moore, Stammerjohan & Coulter, 2005). A favourable attitude may be caused by various variables such as the ease of processing a stimulus due to color congruency (Winkielman, Schwarz & Fazendeiro, 2000). Color incongruence however entails other advantages such as a more favourable effect on recall and recognition (Moore, et al., 2005). It is therefore critical that marketers are aware of their primary goal when creating banner advertisements.

Despite the fact that spending time on the internet and banner advertising has increased (Bush and Bush 1998), there are still many questions that need to be addressed. As advertisers consider the value of investing in banner advertising, it would be helpful to understand how banner ad characteristics (Moore, et al, 2005) such as color congruency effect the success of a banner ad.

The current body of knowledge on banner ads provides insights on the impact of color congruence and incongruence on variables such as attention, attitudes, fixation, recall, recognition. Research however is not extensive (Poracaro, 2018) with a few inconsistences in findings and there is certainly space for further research into these and other relevant constructs.

In particular, it is not yet clear how functional colors and social-sensory colors used in banner ads on a functional or social-sensory product webpage will influence certain variables such as visual attention and processing of the ad, fixation duration, distraction by the ad, evaluation of the ad and so forth.

Fixation duration, fixation count and time to first fixation are the most used index measures of attention when using an eye-tracker (Jacob & Karn, 2003). Time to first fixation indicates how long it takes a banner ad to attract attention whereas fixation duration refers to the total amount of time the viewer fixated on the banner ad. Lastly fixation count refers to the number of times that a viewer was attracted to a specific area of interest.

Time to first fixation, fixation count and fixation duration are important seeing it provides a measure of the depth to which information within an ad is processed (Horstmann, Ahlgrimm & Glöckner, 2009). Generally, the longer the fixation duration and therefore the sooner first fixation takes place, indicates that more detailed processing has taken place (Horstmann, et al., 2009). According to recent studies this detailed processing leads to an increase in purchases (Venkatraman, Dimoka, Pavlou, Vo, Bollinger & Winer, 2015). These variables are furthermore important seeing that Zhang and Yuan (2018) found that individuals who gaze at the product element of an ad for a long duration of time are 2.97 times more likely to recall ad information than those with a shorter duration.

Time to first fixation and fixation duration will therefore influence the attitudes formed towards an ad and product (Thorson, Chi & Leavit, 1992). Attitudes that are shaped towards an ad and brand, are generally useful measures for evaluating the effectiveness of an advertisement. Individual's attitudes toward an ad and brand attitudes are strong predictors of purchase intentions (Law & Braun-LaTour, 2004). These are valuable attributes seeing that marketers want to attract as much attention and positive evaluation as possible to increase awareness and sales.

In the current study we were interested in measuring some of the relevant variables that may be influenced by color congruence/incongruence used on a banner ad with regards to website content. These variables include time to first fixation, fixation duration (attention), fixation count, distraction of the ad, evaluation of the ad and purchase intention. We expected that these variables would be significantly influenced by color congruence/incongruence and therefore we investigated and tested these variables using an eye-tracker.

We specifically aimed at exploring how banner ads effect viewers when using colors on banner ads that are congruent or incongruent with the website content. We aimed to do this to contribute towards research that marketers can take into consideration when creating banner ads.

THEORETICAL BACKGROUND AND CURRENT STUDY

Moore and colleagues (2005) found that color congruency leads to more favourable attitudes towards brands and advertisements whereas color incongruences leads to higher levels of recall and recognition. In order to obtain further knowledge on the findings of Moore and colleagues (2005) and to measure the relevant additional variables previously mentioned which may be influenced by color congruence/incongruence we tested six hypotheses.

Attention. Kahneman (1973) defines attention as the amount of cognitive capacity allocated to a stimulus. Attention refers to where individuals orient their focus. Attention was measured in the present study using an eye-tracker to measure fixation duration.

Chiu, Lo and Hsieh (2016) conducted a study also using an eye-tracking device to record and analyse participants' eye movement. Chiu and colleagues (2016) found that using banner advertisements with background colors which are similar to those of the web page content (color-congruence) increases the fixation duration and fixation count. They furthermore found that a longer fixation duration and fixation count leads to increased positive attitudes towards the brand advertised on a banner ad. On the other hand, it was found that color-incongruence leads to higher recall and recognition at a later stage (Moore et al., 2005). Based on these studies we can formulate the following hypothesis:

> H1: Banner ads for both functional and sensory-social colors, which are color congruent with the webpage content, will lead to a longer attention period (fixation duration), whereas banner ads which are color incongruent with the webpage content, will lead to a shorter attention period (fixation duration).

Time to first fixation. Fixation refers to the pause recorded by an eye-tracker to confirm that a viewer has fixated on an area of interest (Tangamanee, 2016). Time to first fixation refers to when this pause recorded by an eye-tracker takes place for the first time. In our study we measured how long it would take before first fixation takes place on the banner ads. Various factors such as color, size, brightness, relevance and so forth plays a role when considering how long it will take for a viewer to fixate on a banner ad. When looking specifically at color congruence, Mandler (1982) found that, when the colors used in a banner ad are not congruent with the content of the webpage it will attract attention. We therefore suspected that time to first fixation will be shorter when color incongruence takes place, whereas where color congruence takes place it will take longer.

H2: Time to first fixation will be shorter when color incongruence (for both functional and social-sensory colors) between the webpage content and banner ad colors takes place, whereas when color congruence takes place it will take longer.

Fixation count. Fixation count refers to the number of fixations located on the area of interest. The higher the fixation count and fixation time, the more attention is paid to an area of interest (Zhang et al., 2018). Studies have found that familiarity on banner ads such as a familiar face or location, attract fewer fixations compared to unfamiliar ones (Schwedes & Wentura, 2016). This factor should always be considered when designing banner ads for a study, in order to eliminate familiarity bias.

A study conducted by Zhang and colleagues (2018) showed that congruence between color and text led to a higher fixation count than color and text incongruence. Their study showed that congruent banners captured more attention and were also rated more positively than incongruent banner ads. We therefore predicted that we would come to the same conclusion during our study.

H3: Fixation count will be higher when color congruence (for both functional and social-sensory colors) between the webpage content and banner ad colors takes place, whereas when incongruence color takes place it will be lower.

Evaluation of the advertisement. The attitudes that viewers form towards a banner ad, ultimately influence their overall evaluation of a banner ad. These attitudes can be defined as a consumer's response to an advertisement in a favourable or unfavourable manner during exposure (MacKenzie, Lutz, & Belch, 1986). Gaining favourable attitudes to obtain a positive evaluation of an ad should be a key objective for advertisers and marketers.

The ease with which viewers can process a stimulus influences people's liking of the stimulus (Winkielman, et al., 2000). This may be influenced by variables such as the colors used in a banner ad. A study conducted by Thorson and colleagues (1992), has also shown that the length of fixation time on a banner advertisement is associated with a more positive evaluation towards the brand advertised in the banner advertisement than a shorter fixation time.

H4: Banner ads using both functional and sensory-social colors, which are color-congruent to those of the webpage content, will lead to a more positive evaluation of the ad, whereas color incongruence will lead to lead to a more negative evaluation of the ad.

Purchase Intention. Online banner advertisements have been presented to successfully raise brand awareness, preference and purchase intention (Briggs & Hollis, 1997). Purchase intention can be defined as an individual's conscious plan to purchase a brand or product (Harshini, 2015). According to Raney, Arpan, Pashupati and Brill (2003), purchase intention is a key indicator of the success of online banner ads. Purchase intention has the ability to measure the possibility of a consumer to buy a product. The higher the purchase intention, the higher a consumer's willingness to buy a product (Raney, et al., 2003).

Research has found that the attitude and evaluation of an ad has a significant effect on consumer's purchase intention (Busen et al., 2016). A positive evaluation of an ad increases purchase intention (Homer & Yoon, 1992). Consumers are more likely to have a stronger intention to purchase a product when they react favourably towards an advertisement (Haley & Baldinger, 2000).

According to Kiang, Raghu & Shang (2000), web advertising is considered the primary marketing tool that influences the purchase decisions of consumers. The aspects of websites and banner ads such as suitable background colors are crucial in influencing consumers' purchase decisions (Shaouf, 2018). A recent study by Segev (2014) has also shown that a banner ad that has attributes consistent with the context can generate more positive attitudes toward the ad and the brand, as well as higher purchase intention. The dimensions and design of banner ads therefore has the potential to impact to consumer purchase intention (Busen et al., 2016).

H5: Banner ads for both functional and social-sensory colors, which are color congruent to those of the webpage content, will lead to a higher purchase intention, whereas color incongruence will lead to a lower purchase intention.

Distraction by the ad. Display ads vary in the extent to which they distract and annoy users (Goldstein, McAfee & Suri, 2013). Faraday (2000) identified six attributes that draws viewers toward a banner ad and therefore distracts them from their primary purpose for visiting a webpage. These attributes are motion, size, color, text-style, the presence of images and positioning.

When individuals are mentally set to carry out an internally driven task it is harder for viewers to get distracted by a banner ad (van der Lubbe & Postma, 2005). Individuals try to keep irrelevant stimuli's out of later processing in these cases and this modulation seem to act early in stimuli processing through the direct influence of gaze direction (Isaacowitz, 2006). Banner ads aim to distract and grab the attention of viewers but ads that are too distracting can lead to annoyed viewers and have a negative impact on a brand (Goldstein, et al.).

It has been shown that when color incongruity takes place, webpage viewers who receive incongruent cues from the content of a webpage and the colors of a banner ad, will be more distracted by the ad (Mandler, 1982). The level of distraction and annoyance caused by a banner ad can for instance be measured by asking relevant questions on a questionnaire after viewing a webpage. Questions like whether the banner ad distracted participants from reading the webpage article and whether they found the ad annoying are examples of questions that could be asked.

H6: Distraction of the banner ad will be lower when there is color congruence (for both functional and social-sensory colors) between webpage content and banner ad colors, whereas when color incongruence take place, it will be higher.

LABORATORY EXPERIMENT

We conducted a laboratory experiment using an eye-tracker and questionnaire in order to test our six hypotheses. This investigation had the primary aim of assessing how the congruence/incongruence of the color on banner ads and website content influences the variables namely, time to first fixation, fixation count, fixation duration, evaluation of the ad, purchase intention and distraction by the ad.

Three colors were used during the experiment to test the influence that color congruency and in congruency on banner ads might have on our variables. The colors we used were dark blue (the functional color), red (the sensory-social color) and white (the neutral color). We selected these three colors for the three conditions because we felt these colors best

represent our objective, seeing they have been well documented and researched in the past (as discussed above) (Bottemley & Doyley, 2006).

Red and dark blue furthermore have contrasting connotative meanings that have been based on evidence from different countries, collected at different points in time, and measured using different concepts and associations (Bottemley & Doyley, 2006).

Method

Participants and design. To test our six hypotheses a laboratory experiment took place. 101 participants from Leiden University (mostly from the faculty of Social and Behavioural Sciences) were invited to partake in our study in person or through the forum called "Sona", which is provided by Leiden University for psychology students. The study was designed to be a three-way mixed design experiment (product category: functional vs social-sensory) x (color: red vs dark blue vs white), with functional and sensory-social as between conditions and colors as within condition variables. We had 50/51 participants for each condition. Participants ranged between the ages 19 and 30 years old with 44 males and 57 females.

Materials, procedure, and measures. The materials that we used for the laboratory experiment included an eye-tracker, a laptop, a computer mouse, papers for the informed consent, the six banner ads/websites in Tobii Studio v3.0.2 and a Qualtrics questionnaire. Tobii Studio v3.0.2 and a 60 Hz eye-tracker system allowed a fast and automatic calibration procedure of the eyes for each participant. These devices were used to determine time to first fixation, fixation count and fixation duration on the banner ads.

To measure time to first fixation, fixation count and fixation duration, we selected the space on the screen occupied by each banner ad as the area of interest. The eye-tracker that we used did not require participants to wear any device and therefore the experimenters had to ask each participant to avoid rough movements when possible, to avoid measurement errors.

We only had access to one eye-tracker for our study which meant that participants were only able to attempt and complete the test one by one. The whole procedure took around 20 minutes per participant. We ran our study over a duration of two weeks.

The procedure started with participants entering the laboratory one by one where they were welcomed and asked to read and fill out the informed consent paper before commencing with the experiment. The participant was then accompanied to the room where the experiment took place. They were firstly asked to take a seat in front of the laptop. The participant was then randomly assigned to the functional or sensory-social condition.

Thereafter, the experimenter checked that the eye-tracker was set –up correctly and that the device was accurately detecting the eye movements of the person participating in the experiment. Before the experimenter left the room, to avoid any uncertainties about the task, the experimenter asked the participant to read the instructions displayed on the screen (which was programmed on Tobii) before starting. The instructions included informing participants that they will need to read articles on various webpages and thereafter answer questions regarding the content of the websites. These instructions were given to participants to prevent them from knowing the true objective of the study which could lead to bias answers provided by participants.

As previously mentioned, each participant was assigned to a functional or sensory-social condition. In both conditions, participants were exposed to nine articles displayed on a website. On each website, there was an article in the middle of the website with a banner ad on the right-hand side of the article, in the middle of the screen (see Appendix). The functional condition entailed articles on various power tools and how to use them, with banner ads about various hardware tools for sale. The sensory-social condition on the other hand entailed articles based on various things to do in Amsterdam as a tourist. The banner ads in this condition were about nightclubs and restaurants. In attempt to eliminate familiarity bias, all brands used in the banner ads of both conditions were fictional. We furthermore used the same format and fonts for all our banner ads to minimize any font effect confounding the impact of color (Klink, 2000).

The only colors that were used for the website and articles were black, white and grey in order to keep the website neutral. On the other hand, to manipulate congruence between the color of the banner ad and website content, we used three colors namely dark blue (functional color), red (sensory-social color) and white (neutral color) for the banner ads. These three colors were used to determine the effect of congruency/in congruency between the color of the banner ads and website content on various variables.

Each condition (the functional condition and sensory-social condition) had three banner ads of each color (three red banner ads, three dark blue and three white). In other words, in some situations color congruence took place between the banner ad and website content, where for instance a red banner ad about a restaurant was used on a website with sensory-social content. In other scenarios color incongruence took place where a dark blue banner ad was used on the website with sensory-social content. The same applied for the functional condition.

After reading through the website articles, participants were redirected to a Qualtrics questionnaire. The first three questions of the questionnaire were questions based on the articles that they read. This was done to determine how much attention they gave to the articles and to avoid immediately giving away the purpose of the study. Thereafter, the questionnaire contained questions that enabled us to measure the variables under investigation such as, purchase intention, distraction by the ad and the evaluation of the ad. Some of the questions were asked in the form of multiple-choice questions and other in the form of a five-point or seven-point Likert scale ranging from 1 to 5 or 1 to 7 (see Appendix).

The variable, evaluation of the ad, was measured by having participants answer questions on a seven-point Likert-scale, where 1 on the pole represented "strongly disagree" and 7 on the pole represented "strongly agree" with the statement given. The questionnaire included statements such as "I liked the ad" and "I think the ad was good". To measure purchase intention, participants had to answer the question, "What is the likelihood that you would purchase something here in the future?" The question was also answered using a seven-point Likert-scale, where 1 on the pole represented "extremely unlikely" and 7 represented "extremely likely". Lastly, to measure how distracting the ad was, the following two questions were answered: "Did you think the ad was annoying" and "Did the ad distract you from reading the text". These two questions were answered using a five-point Likert Scale, where 1 represented "definitely false" and 5 represented "definitely true." The same questions were asked for all nine banner ads that participants were exposed to.

After completing the questionnaire and study, the participants had the option to receive an explanation of the purpose of our study. Thereafter they were thanked for their participation and asked whether they suffer from any color-blindness/ deficiencies, to eliminate those with deficiencies from the study to obtain accurate results. Participants lastly received 1 credit or 3 euros for participating in the study.

Results

As mentioned in the previous section, the data of the study was gathered through means of a Tobii eye-tracker for the following variables: time to fixation, fixation duration (attention) and fixation count. Data for the other dependent variables namely: distraction of the ad, evaluation of the ad and purchase intention, were collected using a Qualtrics questionnaire.

To gather and organise the relevant data obtained through Tobii and Qualitrics, we used the SPSS data analyses program. SPSS was furthermore used to make the necessary analyses and interpretations in order to test the six hypotheses of the study.

We ran a mixed ANOVA for each dependent variable individually on SPSS, indicating our between (functional vs sensory-social) and within-variables (dark blue vs red vs white), to determine which of our hypotheses can be accepted.

Fixation Duration. No significant difference was found across the with-in conditions on fixation duration (congruence, incongruence, neutral), F (2, 198) = .50, p =.607. This means that there was no significant difference within-groups with regards to fixation duration. Furthermore, there was no significant effect between the two groups (functional and sensory-social) with regards to fixation duration, F (1, 99) = 3.21, p= .076 which was expected according to our hypotheses.

The interaction-effect between the within-conditions and the two groups were also non-significant, F (2, 198) = 2.45, p = .089. This indicates that the fixation duration period across the three conditions (congruence, incongruence, neutral) were not significantly different between the two between-groups (functional and sensory-social groups).

As can be seen in *figure 1*, the means within the two conditions do differ in terms of congruence, incongruence and neutral, but not significantly. We can therefore not accept H1 stating that banner ads with both functional and sensory-social colors, which are color congruent to those of the webpage content, will not lead to a longer attention period and incongruence to a shorter attention period.

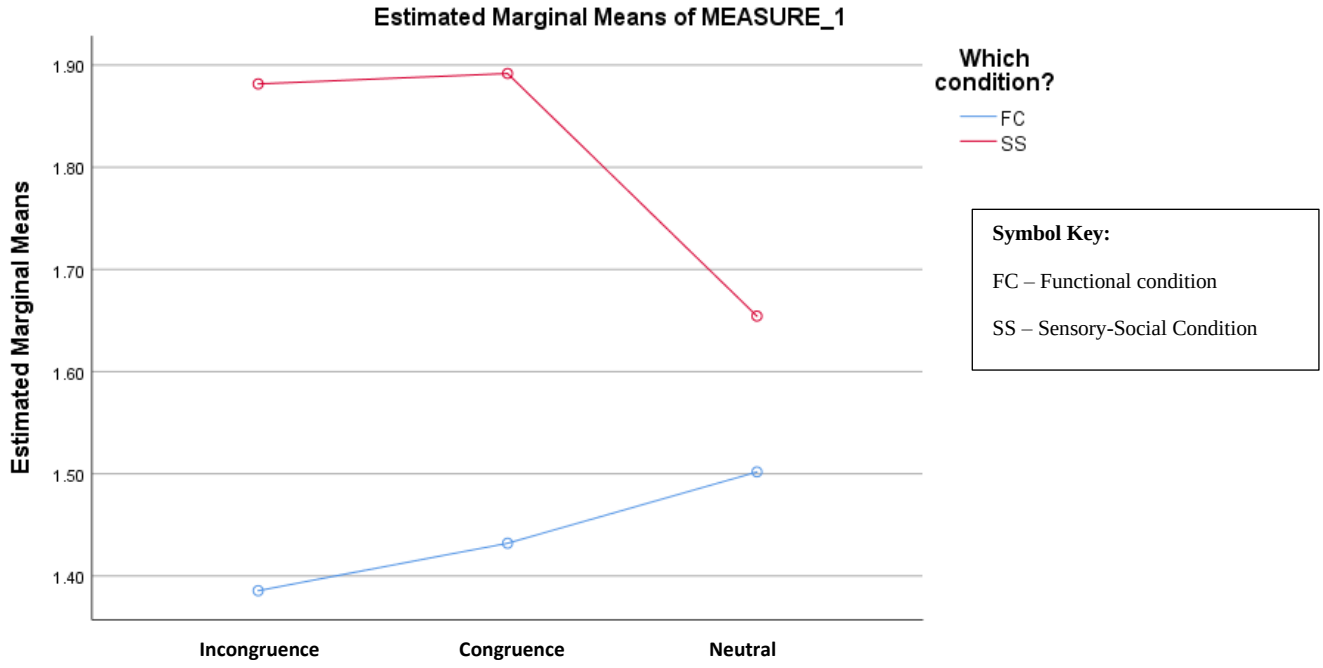


Fig. 1. Estimated marginal means for the main effect between the Functional and Sensory-social condition and within the conditions (congruent, incongruent and neutral) for the variable, fixation duration.

Time to First Fixation. After running a mixed ANOVA on SPSS for the variable, time to first fixation, it was found that there was a non-significant difference across the main-effect within groups (congruence, incongruence, neutral), F (2, 198) = .85, p = .429. This indicates that there is no significant difference within-groups with regards to time to first fixation. There was also a non-significant effect between the two groups (functional and sensory-social) with regards to time to first fixation, F (1, 99) = .78, p = .380.

The interaction-effect between the within-conditions and the two groups were also found to be non-significant, F (2, 198) = 1.25, p = .289. This indicates that time to first fixation across the three conditions (congruent, incongruent and neutral) were not significantly different between the two between-groups (functional and sensory-social groups).

As can be seen in *figure 2,* the means differ between subjects as well as within-subjects but non-significantly so. Time to first fixation in fact takes longer in the neutral banner ad in the Sensory-Social condition. Moreover, time to first fixation takes longer in the congruent banner ad in the Functional condition. As mentioned though, these findings were non-significant. We can therefore also not accept H2, stating that time to first fixation will be shorter when color incongruence (for both functional and social-sensory products) between the webpage content and banner ad colors takes place, whereas when color congruence takes place it will take longer.

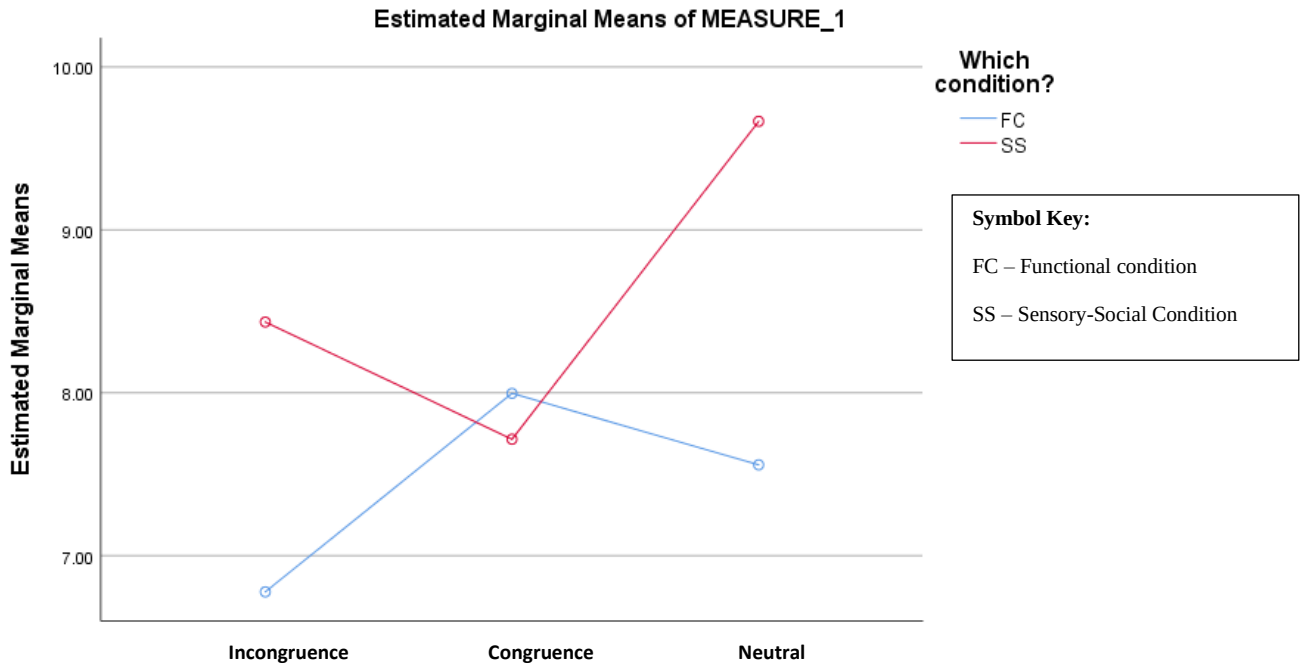


Fig. 2. Estimated marginal means for the main effect between the Functional and Sensory-social condition and within the conditions (congruent, incongruent and neutral) for the variable, time to first fixation.

Fixation count. There was no significant difference across the main effect within (congruence, incongruence, neutral), F (2, 198) = .57, p = .567, regarding fixation count. There was also a non-significant effect between the two groups (functional and sensory-social) with regards to fixation count, F (1, 99) = 3.78, p= .055.

The interaction-effect between the within-conditions and the two groups were found to be non-significant as well, F (2, 198) = 2.80, p = .063. This indicates that the fixation count across the three conditions (congruence, incongruence, neutral) were not significantly different between the two between-groups (functional and sensory-social groups).

As can be seen in *figure 3* below, the means differ between subjects as well as within-subjects, but they do not differ significantly. We can therefore also not accept H3, stating that fixation count will be higher when color congruence (for both functional and social-sensory colors) between the webpage content and banner ad colors takes place, whereas when incongruence color takes place it will be significantly shorter.

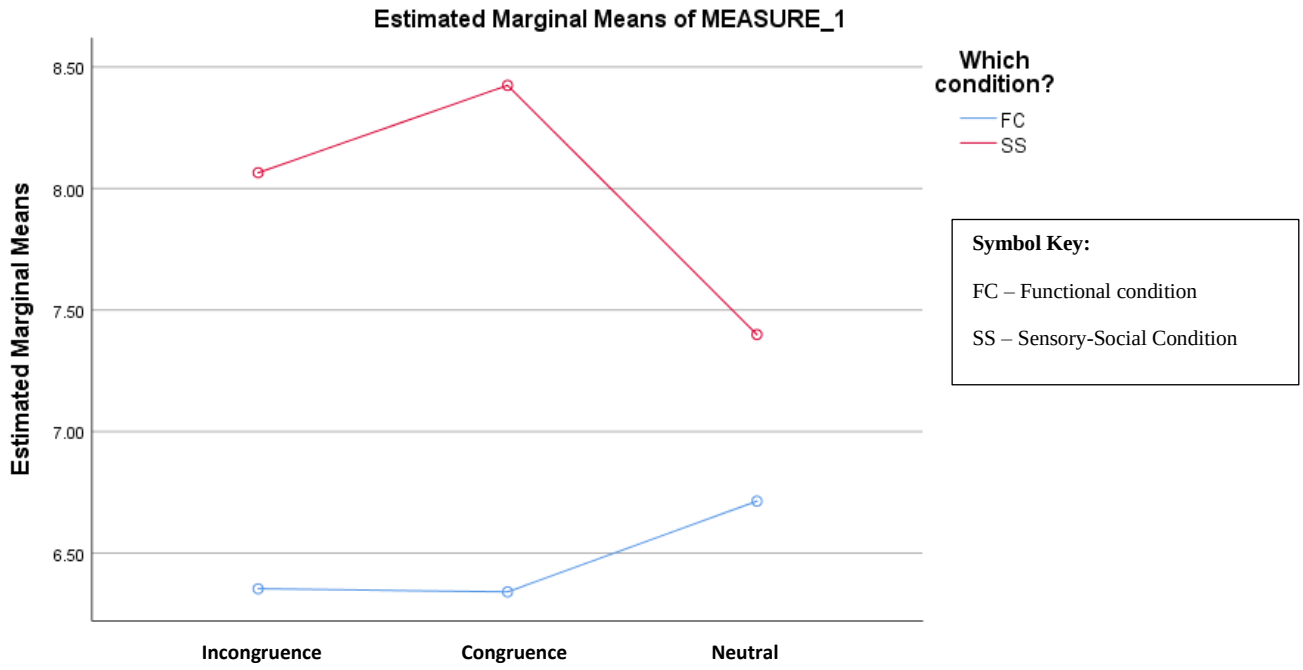


Fig. 3. Estimated marginal means for the main effect between the Functional and Sensory-social condition and within the conditions (congruent, incongruent and neutral) for the variable, fixation count.

Ad evaluation. After performing a Mixed Anova, the study showed that there was a non-significant effect of with-in subjects (congruence, incongruence, neutral), F (2, 198) = 1.93, p = .148, regarding ad evaluation. There was also a non-significant effect between the two groups (functional and sensory-social) in terms of ad evaluation, F (1, 99) = .229, p= .633.

The interaction-effect between the within-conditions and the two between-groups were however found to be significant, F (2, 198) = 4.52, p = .012. This indicates that the ad evaluation across the three conditions (congruent, incongruent and neutral) were significantly different between the two between-groups (functional and sensory-social groups). This means that ad evaluation in the functional and sensory-social condition was influenced by whether the color of the ads were congruent, incongruent or neutral with the content of the website.

According to the H4, banner ads using both functional and sensory-social colors, which are color-congruent to those of the webpage content, will lead to a more positive evaluation of the ad, whereas color incongruence will lead to a more negative evaluation of the ad. In *Figure 4* it is shown that ad evaluation was most positive in the Functional condition when congruence took place whereas for the Sensory-Social condition it was when incongruence took place. The

hypothesis can therefore only be accepted for the Functional condition, but not for the Sensory-Social condition.

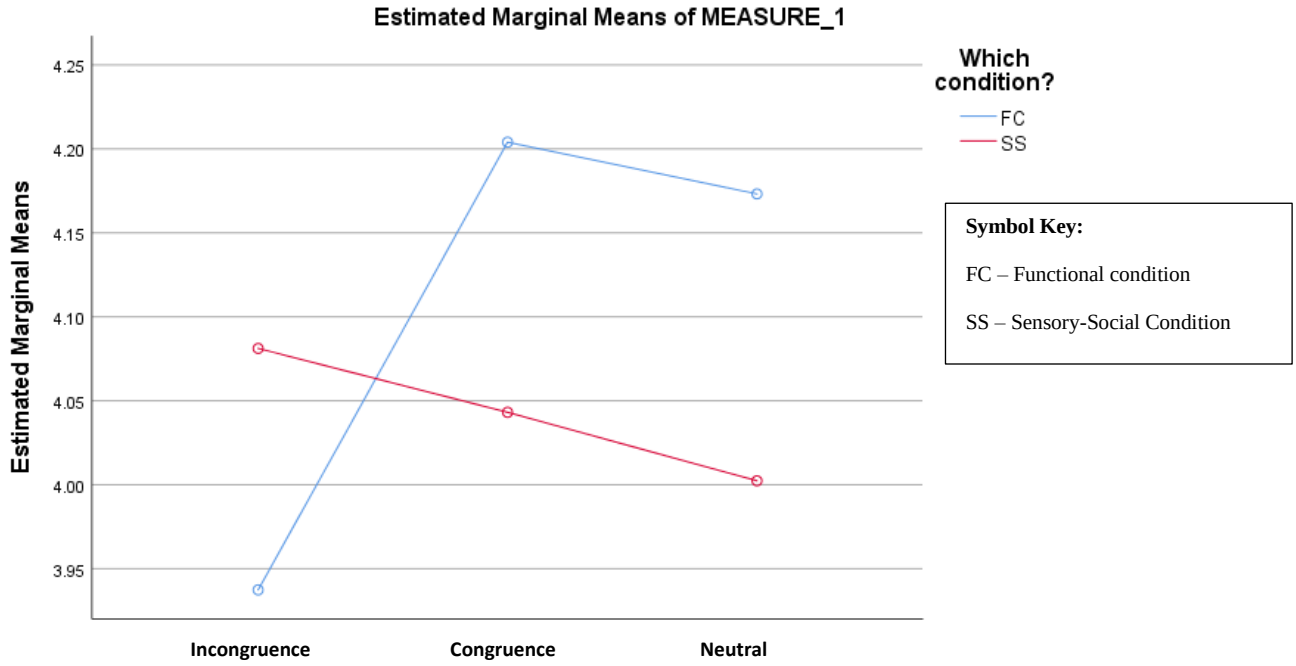


Fig. 4. Estimated marginal means for the main effect between the Functional and Sensory-social condition and within the conditions (congruent, incongruent, and neutral) for the variable, ad evaluation.

Purchase Intention. Our study showed that there was a significant difference across the main effect within subjects (congruence, incongruence, neutral), F (2, 198) = 5.28, p = .006, regarding purchase intention. There was however a non-significant difference between the two groups (functional and sensory-social), as expected, in terms of purchase, F (1, 99) = .54, p= .465.

Furthermore, the interaction-effect between the within-conditions and the two groups were also found to be significant, F (2, 198) = 3.83, p = .023. This indicates that purchase intention across the three conditions (congruent, incongruent, and neutral/dark blue, red and white) were significantly different between the two between-groups (functional and sensory-social groups) with regards to purchase intention. These findings indicate that purchase intention in both the functional and sensory-social condition is significantly influenced by whether the colors of the ad were congruent, incongruent, or neutral with the content of the website.

The findings in the Pairwise Comparisons test show that there is a significant difference between the congruent and incongruent condition (p = .012) regarding purchase intention. There was also a significant difference between the congruent and neutral condition (p = .032).

As shown in *Figure 5* below, the means for all three within conditions (congruent, incongruent and neutral) for the Sensory-Social condition were similar, whereas for the Functional condition they varied with the congruent condition having a far higher mean than the neutral and incongruent condition.

After taking all this information into consideration it was found that banner ads for only the functional condition (which are color congruent to those of the webpage content), will lead to a higher purchase intention, whereas color incongruence will lead to a lower purchase intention. This means that hypothesis 5 can only partially be accepted.

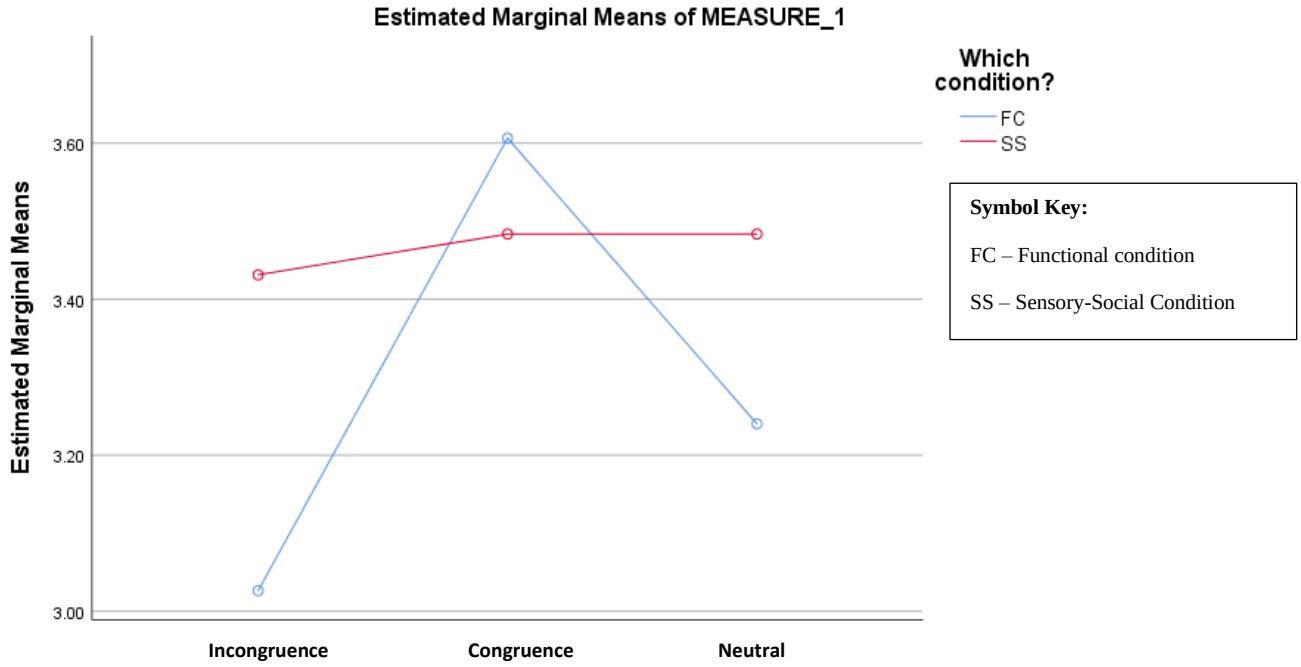


Fig. 5. Estimated marginal means for the main effect between the Functional and Sensory-social condition and within the conditions (congruent, incongruent, and neutral) for the variable, ad evaluation.

Distracting by the Ad. The data analysis showed that there was indeed a significant difference across the main effect within subjects (congruent, incongruent and neutral), F (2,

198) = 5.28, p = .003 when considering distraction levels of the banner ad. There was furthermore also a significant difference between the two groups (functional and sensory-social) with regards to distracting ads, F (1, 99) = 21.22, p<.001, which is not in line with H6.

The interaction-effect between the within-conditions and the two groups were found to be non-significant, F (2, 198) = 1.87, p = .157. This indicates that the distraction of the ads across the three conditions (congruent, incongruent, and neutral/dark blue, red, and white) were not significantly different between the two between-groups (functional and sensory-social groups) with regards to distraction levels when considering the interaction effect.

These findings indicate that the distraction levels of the ad significantly differed between the two groups and within the groups. Specifically, the Pairwise Comparisons test showed that the incongruent condition significantly differed from the congruent condition (p = .025), as well as the incongruent from the neutral condition (p =.007).

When observing *figure 6*, the difference between-subjects are clearly visible and in both conditions the distraction levels of the ads were lower in the incongruent condition and higher in the congruent condition. We can therefore not accept H6 stating that distraction of the banner ad will be lower when there is color congruence (for both functional and social-sensory colors) between webpage content and banner ad colors, whereas when color incongruence take place, it will be higher. We can also see in *figure 6* that there is indeed a significant difference between the functional condition and sensory-social condition which was also not predicted in our hypothesis. The functional condition had significantly higher means in all three conditions (incongruence, congruence and neutral) than in the sensory social condition which means in general participants found the banner ads in the functional condition more annoying.

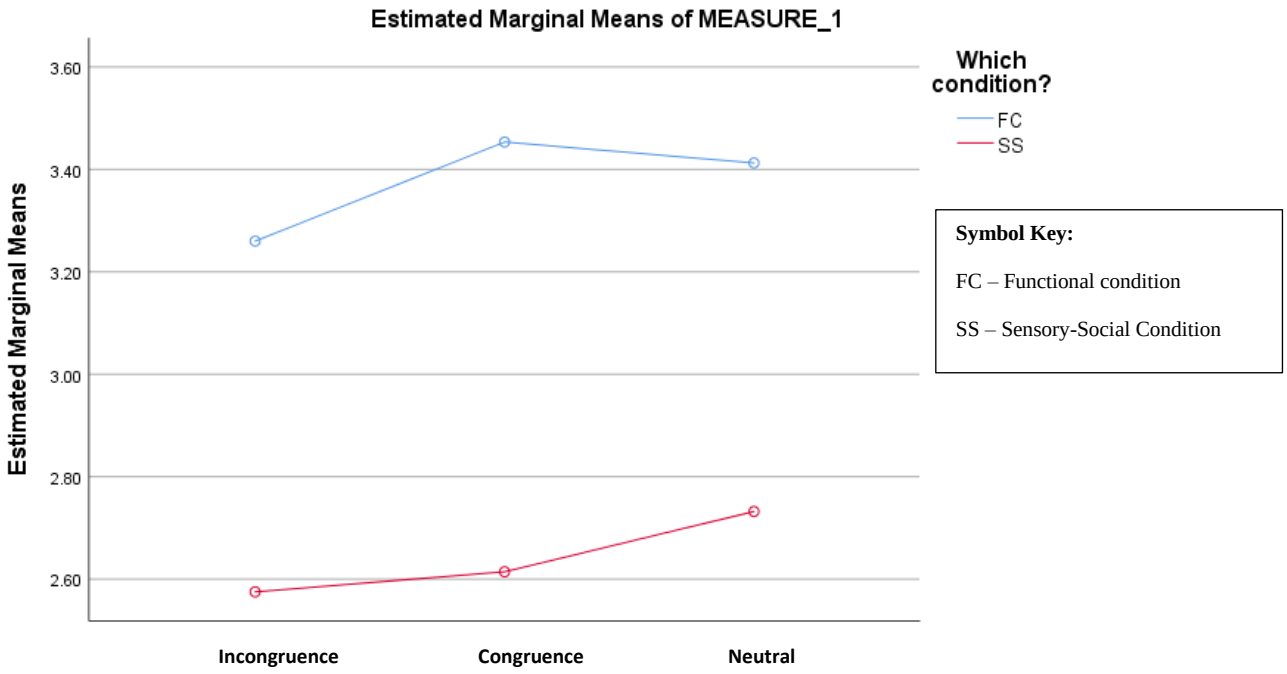


Fig. 6. Estimated marginal means for the main effect between the Functional and Sensory-social condition and within the conditions (congruent, incongruent and neutral) for the variable, distracting ad.

Discussion

The results obtained from the eye-tracking laboratory experiment did not uphold the first hypothesis of the study on attention/fixation duration. There was no significant finding that banner ads with both functional and sensory-social colors, which are color congruent to those of the webpage content, will essentially lead to a longer attention period and incongruence to a shorter attention period. Our study does not seem to verify the findings of Chiu and colleagues' study who found that banner advertisements with background colors which are color congruent to the web page content will increase fixation duration.

Furthermore, the second hypothesis and third hypothesis of the study were also not met. The second hypothesis which stated that that time to first fixation will be shorter when color incongruence (for both functional and social-sensory products) between the webpage content and banner ad colors takes place, whereas when color congruence takes place it will take longer, was not significantly met in our study. It was the same case for the third hypothesis which stated that fixation count will be higher when color congruence (for both functional and

social-sensory colors) between the webpage content and banner ad colors takes place, whereas when incongruence color takes place it will be significantly shorter.

Our findings regarding the second and third hypotheses showed that fixation count and time to first fixation did not as expected significantly differ between the sensory social conditions and functional condition. Fixation count and time to first fixation also did not significantly differ across the three conditions which is not in line with our predictions. Our findings seem to contradict our hypotheses as well as some previous studies and literature regarding the variables time to first fixation and fixation count. For instance, our study does not seem to uphold Zang and colleagues (2018) findings regarding fixation count or Mandler's (1982) study regarding time to first fixation.

Furthermore, our fourth hypothesis was only partially met. According to our hypothesis, banner ads using both functional and sensory-social colors, which are color-congruent to those of the webpage content, will lead to a more positive evaluation of the ad, whereas color incongruence will lead to lead to a more negative evaluation of the ad. We found that ad evaluation across the three conditions were significantly different between the two between-groups. Ad evaluation was significantly more positive in the Functional condition when congruence took place whereas for the Sensory-Social condition it was when incongruence took place. The hypotheses can therefore only be accepted for the Functional condition, but not for the Sensory-Social condition.

Moreover, our fifth hypothesis was also partially met. Our hypothesis stated that banner ads for both functional and social-sensory colors, which are color congruent to those of the webpage content, will lead to a higher purchase intention, whereas color incongruence will lead to a lower purchase intention. Our hypothesis was in line with various studies such as a study performed by Segev (2014) and Shaouf (2018) who found that a banner ad that has attributes consistent with the context, will lead to higher purchase intention. After performing our study regarding purchase intention, our hypothesis and previous studies can only be partially upheld. We found that only the Functional conditions varied with the congruent condition having a significantly higher mean than the neutral and incongruent condition with regards to purchase intention. This was however not the case for the Sensory-Social condition.

Finally, our last hypothesis stating that the distraction of the banner ad will be lower when there is color congruence (for both functional and social-sensory colors) between webpage content and banner ad colors, whereas when color incongruence take place, it will be

higher, was not met. This indicates that our findings do not confirm the findings by Mandler (1982).

With regards to distraction of banner ads, we found that there was a significant difference between the two conditions (functional and sensory-social). Moreover, there was a significant difference between congruence and incongruence, which indicate that our findings were the opposite of our hypothesis. It was found that on the contrary, the distraction of the banner ad will be higher when there is color congruence between webpage content and banner ad colors, whereas when color incongruence take place, it will be lower.

GENERAL DISCUSSION

Marketers tend to enjoy using banner ads as they are easy to set up and can require minimal expenses (Preston, 2017). Banner ads usually display promotional messages in order to attract viewer's attention to the banner ad, which will hopefully lead to viewers visiting the advertiser's website (Siegel, Braun & Sena, 2008). As with all forms of advertising, exposure to a banner ad is compulsory for a banner ad to be effective, but it however does not guarantee a user's attention. This issue for marketers is especially relevant for internet banner ads, seeing that ad avoidance on the internet tends to happen often (Lee & Ahn, 2012). There has been evidence in previous studies that heavy internet users tend to ignore or avoid internet banner ads altogether (Cho, 2003).

Regardless of the mixed opinions and study results on whether banner ads are truly effective, the use of banner ads have clearly increased in recent years and it is still often used as a marketing tool. It is therefore crucial for organisations to do thorough research on what would make their banner ad most effective and reach their specific objectives before developing and launching their banner ads. Effective banner ads are important because it may be a way to increase and build brand loyalty, to influence purchase behaviour, to influence attitudes, to prompt a sale, drive consumers to a website, collect personal data and so forth (Scott, 2006).

There has been earlier research on what makes a banner ad the most valuable and effective, but the research on color congruity and incongruity and how it contributes to developing and designing effective banner ads has not been extensive and at times contradicting. An exception is given by Moorre and colleagues (2005) who investigated color congruence and incongruence of banner ads and website content. They specifically focused on recall and recognition as well as attitudes during their study. Our study focused on some of these variables, as well as additional variables. We also measured variables that required the

use of an eye-tracker. They also did not differentiate between functional and sensory-social colors. Another exception is Zang and colleagues (2018) who also made use of an eye-tracker and subjective ratings similar to our study, but they mainly focused on capturing attention and attitudes during their study.

It is important to investigate valid and reliable research and findings on banner ads regarding the specific variables that we measured during our study, seeing that it influences the strategy followed to develop one's banner ad. This ultimately influence various aspects of your brand or product. It is important to measure time to first fixation, fixation duration and fixation count of a banner ad seeing that it provides a clear indication of which elements on the screen were attended to and to determine whether time was spent, and attention was given to the banner ad (Kiili, Ketamo, & Kickmeier-Rust, 2014). Fixation duration is also important to determine whether adequate depth of processing of information on the banner ad took place (Blignaut, Matthew, Botha-Ravyse, 2015). When time to first fixation, fixation count and duration is low, it means that there were certain flaws in the banner ad which should be improved to reach certain objectives.

We furthermore consider the other variables that we measured during our study (such as ad evaluation) to be important and valuable information for marketers regarding banner ads, seeing that how viewers evaluate your ad can affect their entire perception of the brand. Opinions of individuals viewing banners ads should be analysed, questioned, and tested to make decisions on how to improve a banner ad and to increase positive evaluations by viewers. The overall ad evaluation of a banner could influence sales, market share and consumer preferences.

Banner ads also aim to distract and grab the attention of viewers, but it may happen that when banner ads are too distracting, it may lead to annoyed individuals and negative associations towards a brand (Goldstein, et al.). It appears that even small details, such as which colors used or size of a banner ad can influence how distracting a banner ad is. It is furthermore essential to measure individuals purchase intention after viewing a banner ad, seeing that purchase intention often correlates with future sales (Morwitz, 2014). In other words, when purchase intention is high, it is likely that future sales will also increase. This provides a good indication on whether a banner ad was successful. According to Jamieson and Bass (1989), between 70 and 90 percent of clients of market research suppliers indicated in a study that they regularly measure and use purchase-intentions to predict sales. Marketing managers also use purchase intention as a leading indicator of future demand for their products and to evaluate how their marketing actions will affect those future sales (Jamieson & Bass, 1989).

It is clear that we considered and researched the importance of every variable measured during this study. Based on previous studies, such as the studies conducted by Moorre and colleagues (2005) and Zang and colleagues (2018), as well as other thorough research conducted, we expected that certain variables such time to first fixation, fixation count, attention, distraction of the ad, evaluation of the ad and purchase intention would be influenced by the congruency of banner ad colors and website content. Based on previous research we developed hypotheses on these variables and explored how banner ads effect viewers when using congruent and incongruent colors on banner ads, which matches or mismatches the website content. To explore these variables and test our hypotheses we made use of a Tobii eye-tracker and Qualtrics questionnaire. When analysing the findings of our study, the expected and hypothesised results were not found for many of the variables investigated. A non-significant difference for these variables may be due to previous research being flawed, that our research had certain limitations, or it may be that the congruency of banner ad colors and content of websites indeed has a non-significant effect on certain variables that we tested. There were however a few hypotheses where the expected results were fully or partly found, and hypotheses were met.

Our overall findings during our study makes it clear that there are certainly contradictions with regards to previous studies and our study. To shortly summarize our findings, we had non-significant findings for *H1, H2 and H3.* According to our findings, banner ads that use functional and sensory-social colors which are congruent with the website content, will not necessarily lead to a longer attention period, longer fixation period or fixation count on the banner ad. The time to first fixation will also not necessarily be shorter when color incongruence between the webpage content and banner ad colors takes place or when color congruence takes place it will take longer.

It was also not the case that the distraction of the banner ad will significantly be lower when there is color and website congruence for both conditions *(H6).* Results showed that the opposite was true for this hypothesis during this specific study (distraction will in fact be higher when there is color and website congruence). Distraction levels were also significantly higher in the functional condition compared to the sensory-social condition in the congruent, incongruent, and neutral condition.

With regards to *H4,* we did however find that ad evaluation was significantly more positive in the functional conditions when color and website content congruence took place. On the other hand, ad evaluation was significantly more positive in the sensory-social conditions where color and website incongruence took place. This means our hypothesis was

met for the functional condition, but that the opposite was found to be true for the sensory-social condition. We lastly also found that functional colors that were congruent with the website content led to significantly higher purchase intention levels and incongruence to lower levels of purchase intention. The finding only partially agrees with *H5,* seeing no significant difference was found for the sensory-social condition.

Overall, when taking all our hypotheses and findings into consideration it is clear that most of the variables we tested needs further investigation. It is clear that literature and previous studies which we based our hypotheses on contradicts our findings in many aspects which may be due to various research limitations on either/both sides. For instance, the use of colors in marketing can be culturally contextualized (Zang, et al., 2018). The taboos, meanings and preferences of colours vary across countries and findings cannot be generalized across cultures (cultural bias). Zang and colleagues mentioned that this may have been a limitation of their study. Brand familiarity on banner ads also could have taken place in the Moore and colleagues (2005) which may have influenced results found and assumptions made from this study.

Further investigation should take place to contribute to valuable research and to guarantee that banner ads are designed in the best possible way with regards to color congruence and incongruence for successful marketing purposes.

Limitations and suggestions for future research. After thorough considerations and investigation there are several limitations in this study that should be considered when generalizing its results and analysing the results of the study. These limitations should be considered when choosing the direction for future research in this field. Firstly, all the participants that took part in this study were university students from Leiden University, in particular the Psychology department (specially a lot from our specialization) which means there is a likelihood that participants may have figured out that they were supposed to look at the banner ads which may have influenced our eye-tracking findings. It would be interesting for future research on this topic to investigate whether findings would be different with a sample group from a wider age and profession range.

During our study we used red in our banner ads to represent the sensory-social condition and dark blue to represent in our functional condition. There may however be other colors that represent the functional and sensory-social conditions better. For instance, Bottomley and Doyle (2006) found that grey and black better represents functional conditions than dark blue. They also found that violet, pink and yellow better represent a sensory-social condition than

red. These findings by Bottemley and Doyle (2006) indicates that we could have used other colors that better represent the conditions we were researching.

Another limitation in our study is the fact that it may be that certain participants have an interest in nightclubs, restaurants or power tools which attracted them to the banner ad which could have led to biased findings. There is a possibility that some participants evaluated banner ads more positively or fixated more on them not due to the congruence or incongruence of the colors used on the banner ad, but merely since they are interested in the product on the banner ad. These types of biases should be taken into consideration when making conclusions on some of the found results. Future research could implement pre-test determining participants interests to eliminate this type of bias.

Moreover, our hypotheses assumed that functional and sensory-social conditions would have the same outcome with regards to the variables measured. The results found during the study however showed that in some of our hypotheses the opposite results were found for the functional and sensory-social conditions. For instance, we predicted that banner ads using both functional and sensory-social colours, which are colour- congruent to those of the webpage content, will lead to a more positive evaluation of the ad. We found that this was true for the functional condition, but for the sensory-social condition we found that incongruence in fact leads to more positive evaluations of the ad.

This shows that it should not be assumed that functional and sensory-social banner ads are most effective using the same strategy with regards to color congruence and should at times rather be investigated separately. Future research should consider treating the functional and sensory-social conditions as separate hypothesis for each variable.

During our study we furthermore found that the distraction of the banner ad will be higher when there is color congruence between webpage content and banner ad colors, whereas when color incongruence take place, it will be lower. Our findings proved to be the opposite of our hypothesis. It is possible to have conflicting results from conducting a similar experiment, seeing that although colour congruence with regards to banner ads and website contact have been researched in the past, research is still limited and not many studies have been conducted on this specific topic. It may be that different methodology should be used or different questions should be asked during a questionnaire to measure the effect of colour congruence on distraction levels of a banner ad. Studies should be conducted multiple times in order to obtain the most accurate findings and additional studies should be conducted to identify why these different findings arose.

Moreover, while managers very often use purchase intention measures as a tool for decision-making, it has been found in previous research that purchase intention may not necessarily leady to increased sales. It is often believed that purchase intention is a good proxy for what consumers will do in the marketplace. At times purchase intentions are however imperfect predictors of future consumer behaviour (Namias, 1959). Given the fact that purchase intention is correlated but an imperfect measure of consumers' subsequent purchase behaviour, it might not be a true reflection on future sales in real life situations.

Lastly it would be interesting to measure a variable such as recall in a future study. This could be done in a follow-up study a few days later. Such a study would require extra resources and time, but it may be valuable to see if levels of recall differ when using congruent or incongruent colors on banner ads. Recall may influence purchase behaviour seeing that when consumers are for instance looking for a power-tool they may recall a specific brand that they saw in a banner ad. They may be more likely to purchase the item they recall rather than the one that they cannot remember being exposed to and which may appear unfamiliar. It has been shown by a study conducted by Park and Stoel (2005), that brand familiarity leads to consumer decision bias.

CONCLUSION

Despite the increase in popularity of the internet and banner advertising, previous studies have raised doubts with regards to whether a banner ad is an effective medium of advertising (Hervet, Guerard, Tremblay & Chtourou, 2011). It has become clear that marketers today need to use clever tactics and be more creative to avoid irritation and banner blindness when it comes to banner advertising (Jones, Malczyk & Beneke, 2011). There has been earlier research on what makes a banner ad the most effective, but the research thus far on color congruity and incongruity and how it contributes to developing and designing effective banner ads has not been extensive and at times contradicting.

We explored and tested how banner ads effect viewers when using colors on banner ads that congruent or incongruent with website content. To summarize, the result obtained from the eye-tracking laboratory experiment did not uphold our hypothesis on fixation count, fixation duration and time to first fixation. We found that when using congruent, incongruent, or neutral colors in banner ads for both the functional and sensory-social conditions, did not to significantly influence these three variables.

We did however find that ad evaluation is significantly more positive in the functional condition when banner ad color and website congruency takes place, whereas in the sensory-

social condition a more positive ad evaluation takes place with incongruency. We also found that purchase intention is only higher when there is colour congruence in the functional condition.

With regards to our hypothesis on distracting advertisement, we found the opposite of our hypothesis to be true. We found that the distraction of the banner ad will be higher when there is color congruence between webpage content and banner ad colors, whereas when color incongruence take place, it will be lower for both conditions.

Our overall findings during our study makes it clear that there are certain contradictions with regards to previous studies and the results that we found. Some of our findings however have confirmed and strengthened the findings of previous research done on this topic. Research is yet not extensive on the effect of color congruency and it is clear that some of the variables explored need further investigation.

It is important that future research is done in order to improve the effectiveness of banner ads. The limitations and flaws of previous studies as well as the limitations of our study should be addressed and removed in future studies to contribute towards the developing of effective banner advertisement.

Appendix

As mentioned, participants were randomly divided into a functional or sensory-social condition. They were asked to read through websites while we measured fixation duration, fixation count and time to first fixation using a Tobii eye-tracker.

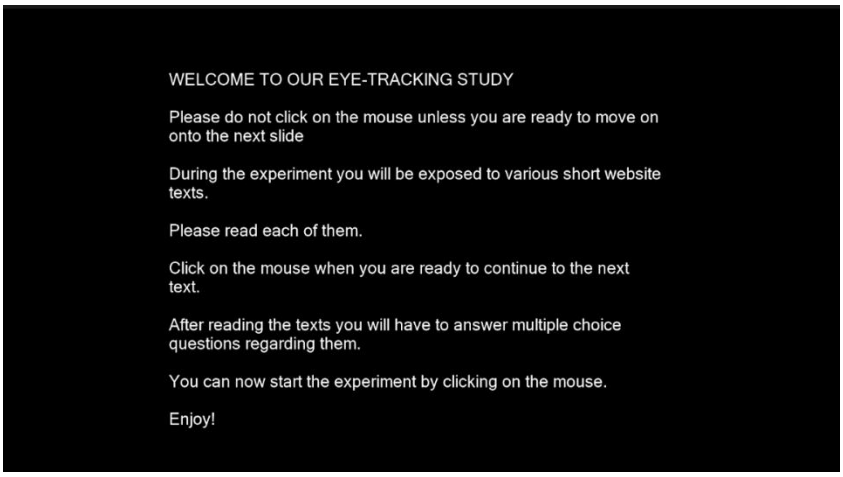


Fig.7. Before being introduced to the website articles participants first read the above on the screen before starting the study.

Fig.8. An example of banner ad congruency in the sensory-social condition

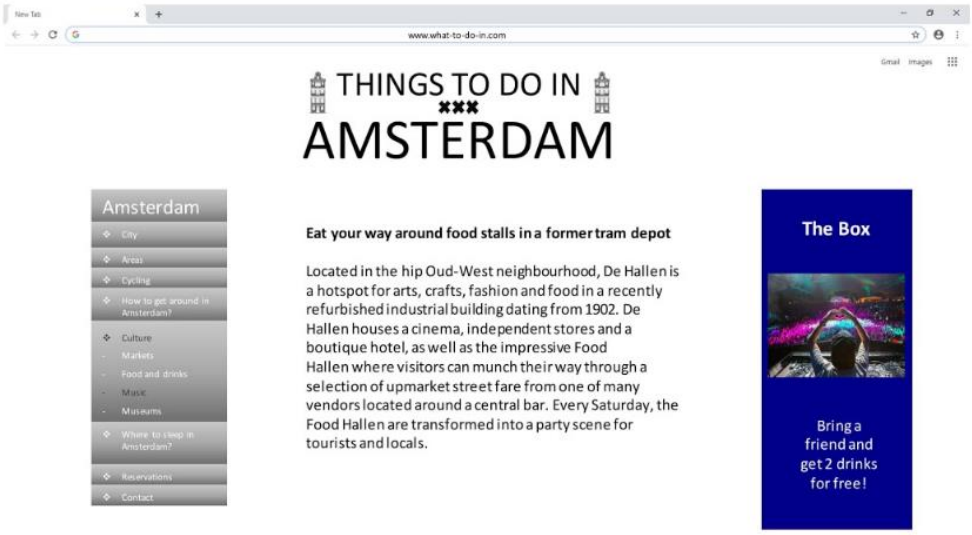


Fig.9. An example of banner ad incongruency in the sensory-social condition

Fig.10. An example of a neutral banner ad in the sensory-social condition

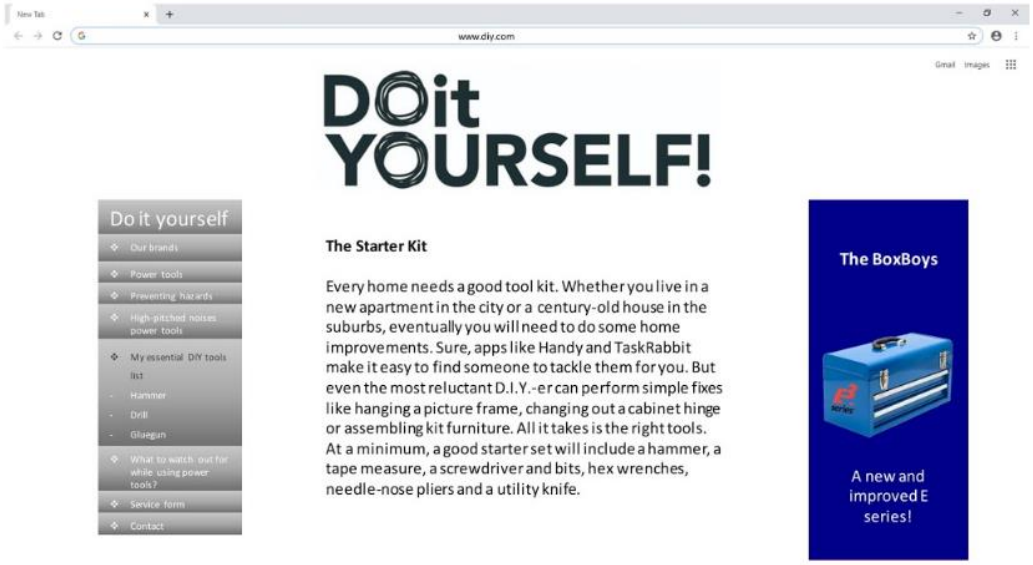


Fig.11. An example of banner ad congruency in the functional condition

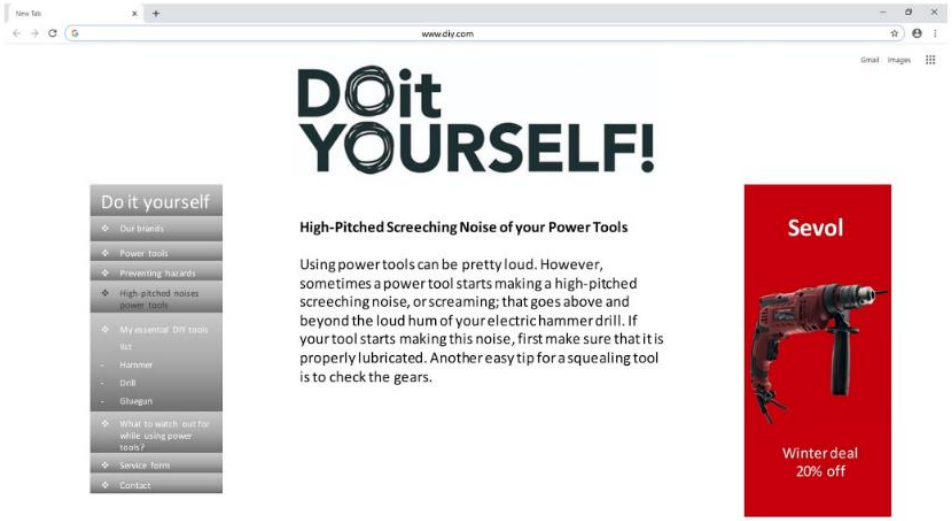


Fig.12. An example of banner ad incongruency in the functional condition

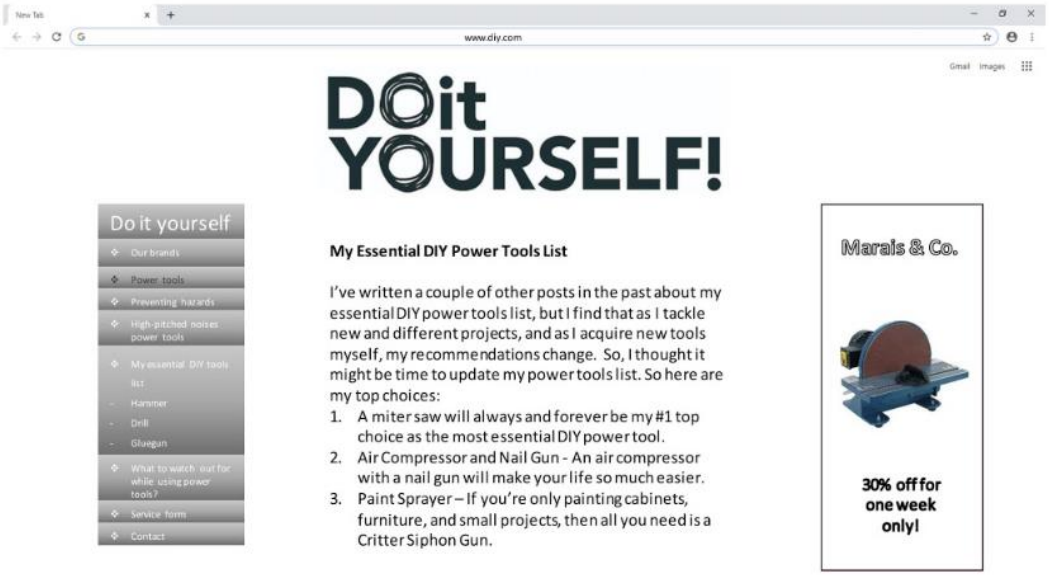
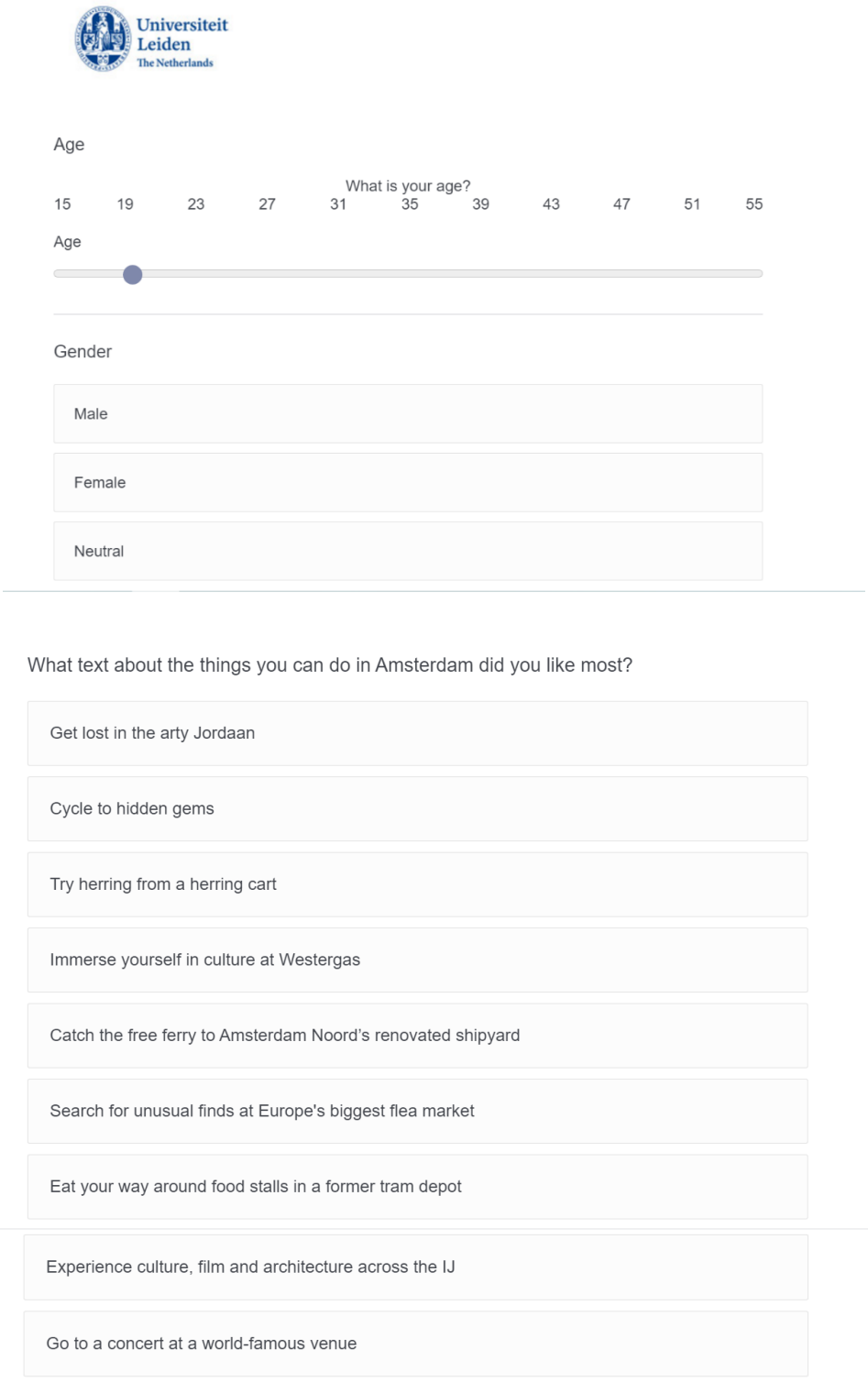


Fig.13. An example of a neutral banner ad in the functional condition

After being exposed to the functional or sensory-social condition participants were directed to a Qualtrics questionnaire. The questionnaire looked as follow for the sensory social condition:



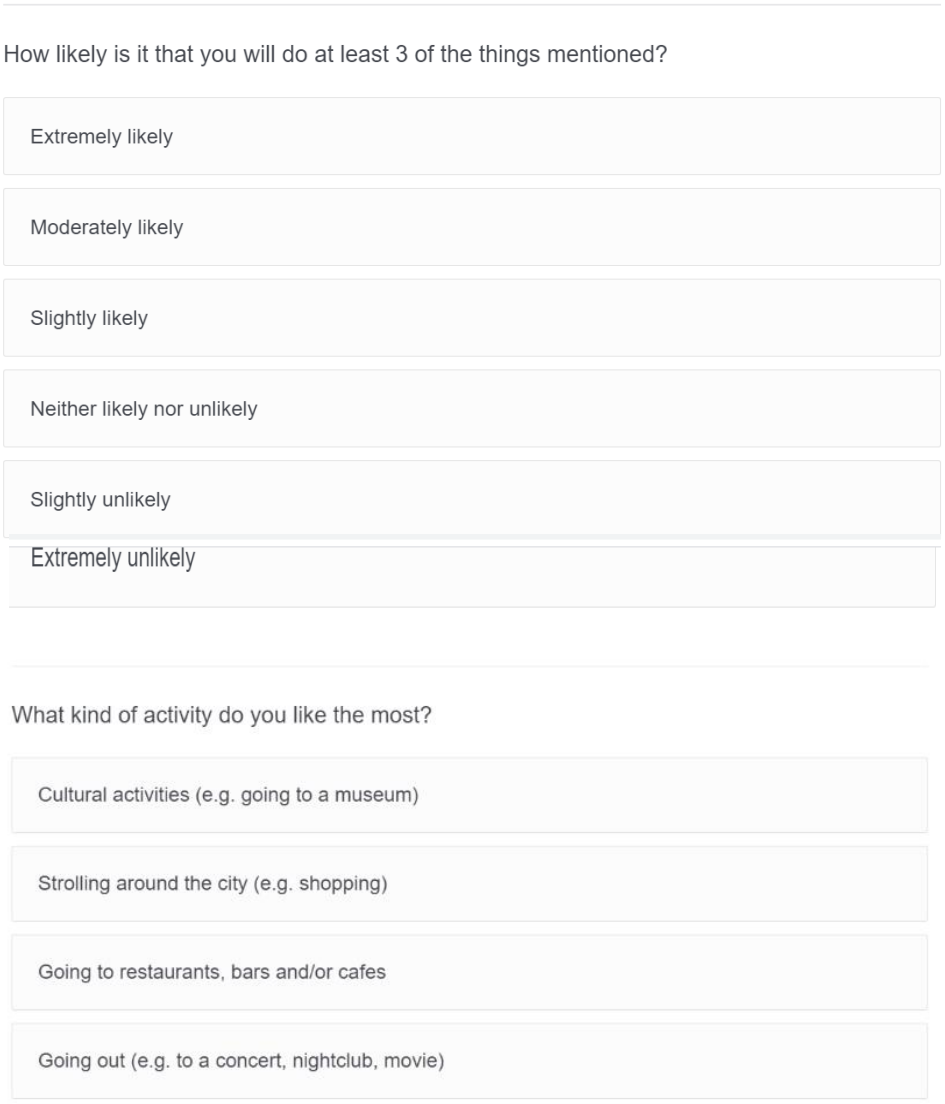


Fig.14. For the sensory-social condition the questionnaire started with general questions regarding the content of the articles on the website. The questionnaire started with these questions to minimise the likelihood that participants know the true objectives of the study.

Do you remember the following banner ads?

	Yes	Maybe	No
The Box (nightclub)	◯	◯	◯
Xolam (nightclub)	◯	◯	◯
Le balony (restaurant)	◯	◯	◯
Mario's (restaurant)	◯	◯	◯
De Lapa (nightclub)	◯	◯	◯
Aikeysaw (restaurant)	◯	◯	◯
Bunx (nightclub)	◯	◯	◯
CityAsian (restaurant)	◯	◯	◯
Hussar & Grill (restaurant)	◯	◯	◯

Answer the following questions below, regarding Mario's, a restaurant banner ad:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think the ad is good	◯	◯	◯	◯	◯	◯	◯
I think that the ad is of high quality	◯	◯	◯	◯	◯	◯	◯
I like the ad	◯	◯	◯	◯	◯	◯	◯
I think the ad is pleasant	◯	◯	◯	◯	◯	◯	◯
I think the ad is favourable	◯	◯	◯	◯	◯	◯	◯

Answer the following question below, regarding Mario's, a restaurant banner ad:

	Extremely unlikely	Moderately unlikely	Slightly unlikely	Neither likely nor unlikely	Slightly likely	Moderately likely	Extremely likely
What is the likelihood that you would purchase something here in the future?	◯	◯	◯	◯	◯	◯	◯

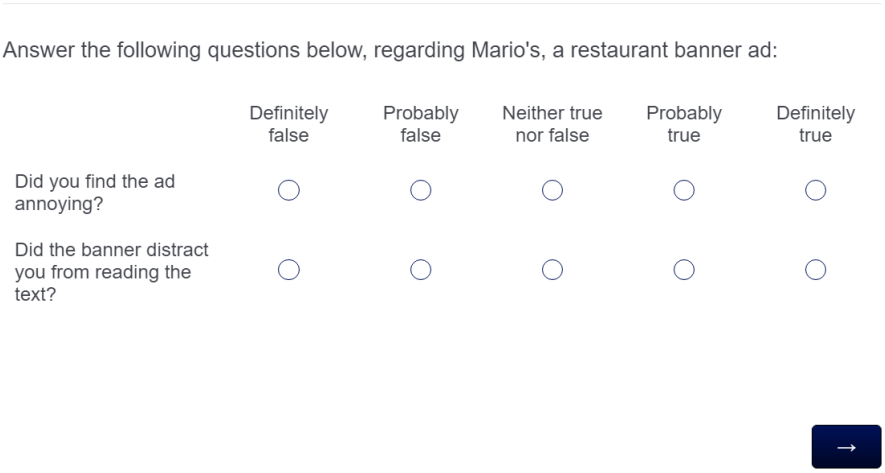
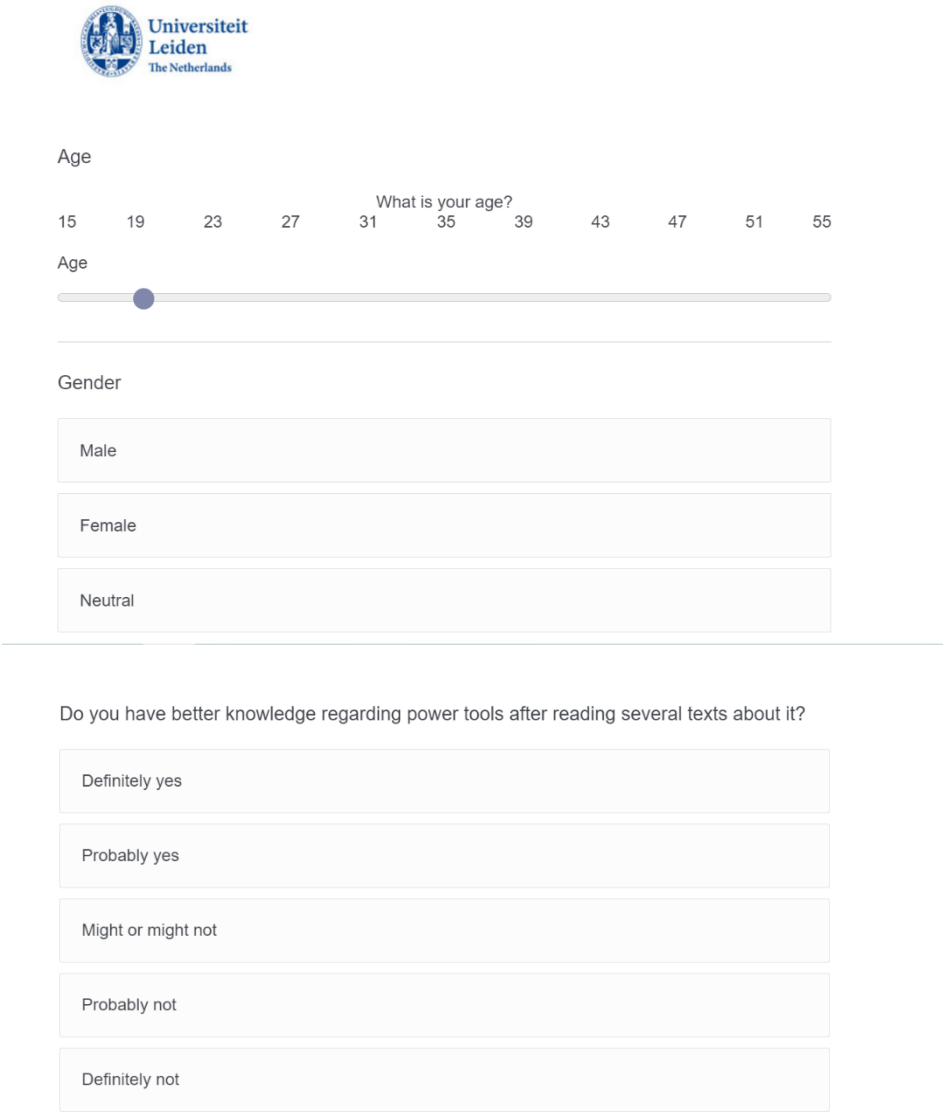


Fig.15. Example of questions that were asked for each of the sensory-social banner ads seen by participants in order to measure how colour congruency influences the evaluation of the banner ad, purchase intension and the distraction of the banner ads.



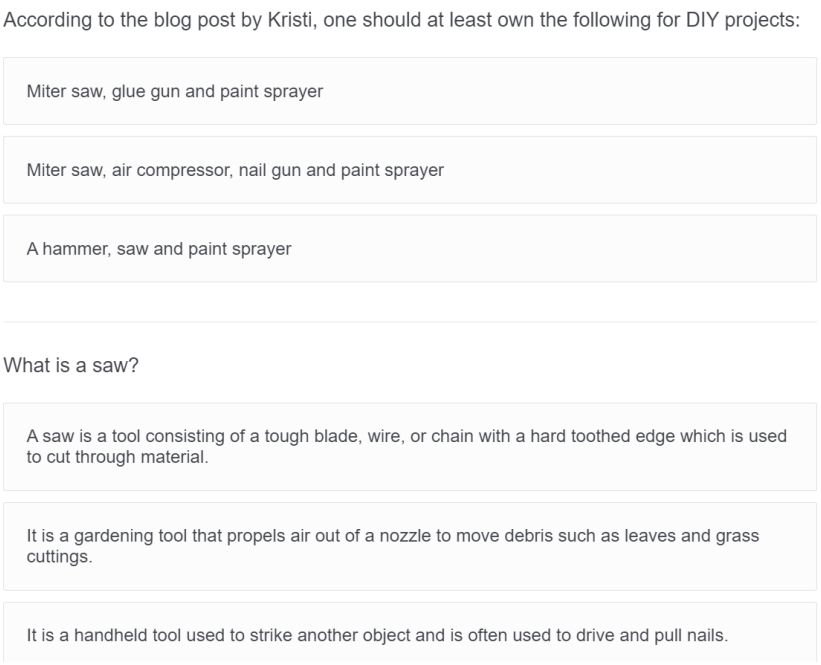


Fig.16. For the sensory-social condition the questionnaire started with general questions regarding the content of the articles on the website. The questionnaire started with these questions to minimise the likelihood that participants know the true objectives of the study.

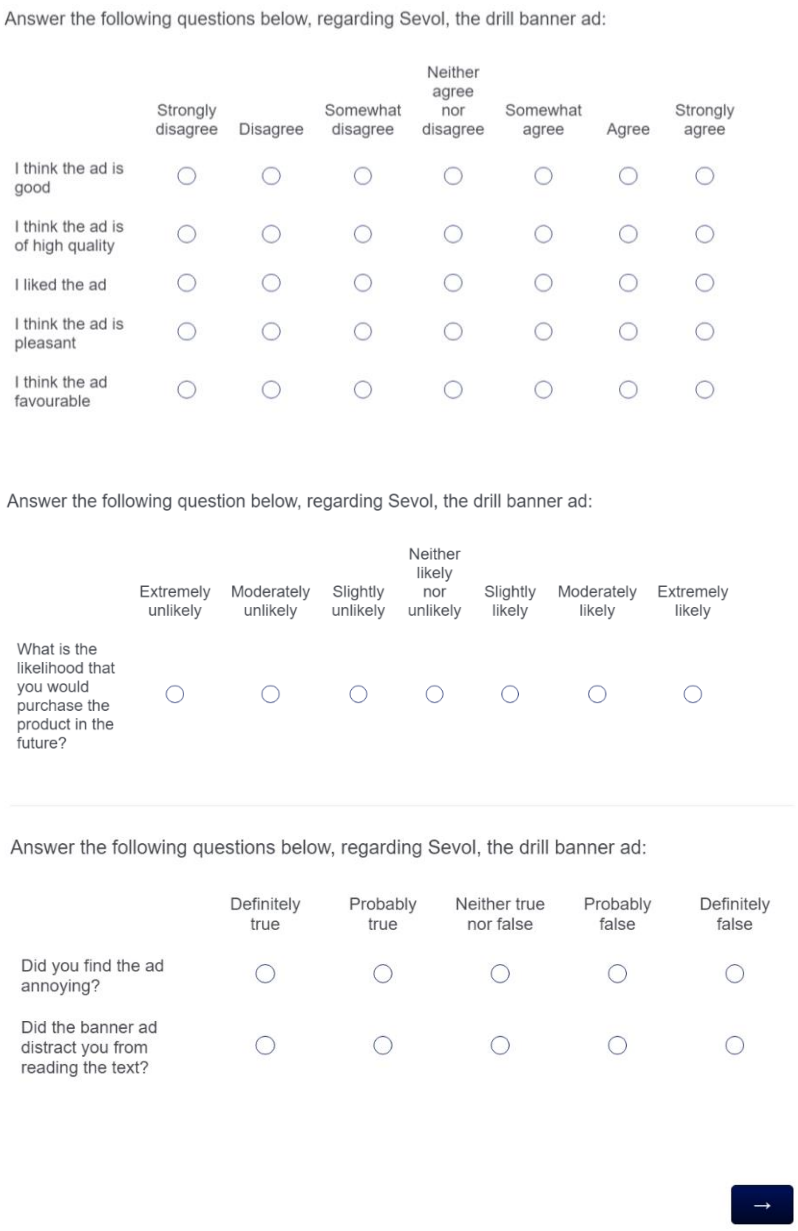


Fig.17. Example of questions that were asked for each the functional banner ads seen by participants in order to measure how colour congruency influences the evaluation of the banner ad, purchase intension and the distraction of the banner ads.

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