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| Title | Influence of basketball shoe midsole inserts featuring different mechanical rebound properties on biomechanical loading and subjective perception during a side-cutting maneuver |
| Author(s) | Brendon Toh, Ho Keat Leng and Yi Xian Philip Phua |

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Abstract

As sports sponsorship is a common marketing tool among commercial organisations, there had been a large number of studies examining the effectiveness of sponsorship. The aim of this study is to examine whether colour affects sponsorship effectiveness on printed advertisements of sports events. This is an area that has received less research interest. 85 participants were randomly assigned to a Control group and three Experimental groups. In each of the groups, the participants viewed an advertisement of a sports event on a computer linked to an eye tracker. In the Control group, the logos of sponsors were in their original colours. In each of the three Experimental groups, the logos were manipulated and featured greyscale, blue or red backgrounds. The study found that sponsor recall and recognition rates were highest for the Control group. Visual attention was also the highest in the Control group. These suggest that manipulating colours of the sponsors' logos can negatively affect attention and sponsorship effectiveness.

Keywords: attention, sports sponsorship, advertisements, colour effect, eye-tracking

Effect of Colour on Sponsor Recall

Over the years, marketers have found it increasingly difficult to reach out to consumers through traditional marketing communication tools. As a result, they have attempted to embed themselves through sponsorships and product placements in computer games, sports events, television programmes and movies (Boronczyk, Rumpf, & Breuer, 2018; Cornwell, 2020; Rumpf, Boronczyk, & Breuer, 2020). While there are many different types of events for companies to sponsor including arts and music festivals, sponsorship in sports events remains popular among companies (Boronczyk et al., 2018; Meenaghan, 1991).

In sports sponsorship, companies can reach out to their target audience to create positive associations with the event and raise brand awareness (Meenaghan, 2001; Nufer & Bühler, 2010; Walliser, 2003). In addition, there is less risk of negative image transfer as compared to sponsoring other sporting entities (Nufer & Bühler, 2010). Consequently, many studies have been conducted on the effectiveness of sports events sponsorship including sponsor recall (Biscaia, Correia, Ross, & Rosado, 2014; Leng, 2017; Walliser, 2003). These studies have generally concluded that sports event sponsorship can be effective as participants are able to recall the sponsor and associate the sponsor with the event.

There are many factors affecting sponsor recall including duration of exposure and prominence of the sponsor (Leng, 2017; Walliser, 2003). However, one factor that has received less attention is the effect of colour on sponsor recall. Breuer and Rumpf (2015) in their study on sports telecasts found that a greater colour contrast between sponsor signages and its surroundings resulted in increased attention to sponsor signages. Yet, Park and Choi (2011) did not find sufficient empirical support that any one colour was more effective in sports sponsorship. Interestingly, despite the lack of research in this area, some commercial

organisations have embarked on marketing strategies that involve changing colours of their logos in sports sponsorship (Henderson, Mazodier, & Sundar, 2019).

The aim of this paper is to further examine the effect of colour on sponsor recall. Specifically, as earlier studies have examined sports telecast and live events, this study will examine how colour affects sponsor recall in printed advertisements of sports events. Printed advertisements on the sports event are part of sponsorship but to date, has not received much research interest (Alonso Dos Santos, Moreno, & Franco, 2019). Findings from this study can provide further insights on the effect of colour on sponsorship effectiveness.

Literature Review

Measuring Sponsorship Effectiveness

It is common for commercial organisations to use sports sponsorship as a marketing communication tool (Boronczyk et al., 2018). In sponsorship, the logos of sponsors appear in marketing collaterals and during the sports event. As sponsorships can involve monetary investments, companies are naturally interested in evaluating the returns from sponsorship. One of the key indicators of sponsorship effectiveness is sponsor awareness. As such, many studies have examined the rate of sponsor recall and recognition in sports events (Bennett, 1999; Biscaia et al., 2014; Breuer & Rumpf, 2011; Lardinoit & Derbaix, 2001; Leng, 2017; Meenaghan & O'Sullivan, 2013; Walliser, 2003).

Sponsor recall requires respondents to correctly recall the sponsor without any aid. As such, it is sometimes termed unaided recall. Conversely, in sponsor recognition, respondents are presented with a list of brands from which they are to identify the sponsors. This list will contain both dummy and actual sponsors. As such, sponsor recognition is also termed as aided recall. Sponsor recall rates are usually lower compared to sponsor recognition rates as they require more

cognitive effort. However, sponsor recall is regarded as a more valid measure as it reflects the respondent's salient knowledge of the event or sponsor (Meenaghan & O'Sullivan, 2013).

Sponsor recall and recognition rates are affected by many different factors (Walliser, 2003). One of the factors is duration of exposure. When respondents are exposed to sponsors for a prolonged duration or repeatedly, they have more opportunities to process the visual stimuli (Bennett, 1999). Consequently, they are more likely to remember the sponsors (Breuer & Rumpf, 2011; Cornwell & Humphreys, 2013; Lardinois & Derbaix, 2001; Leng, 2017).

The prominence of the logos is another factor that can affect recall rates. Sponsor logos which are placed in a strategically prominent location, for example near scoreboards or on athletes, are more likely to be recalled by respondents (Biscaia et al., 2014; Breuer & Rumpf, 2012; J. N. Moore, Pickett, & Grove, 1999; Olson & Thjømøe, 2009; Park & Choi, 2011). This is because respondents are more likely to view the logos at such locations.

The sponsor recall rate is also dependent on the brand itself. Brands which have a dominant market share are more familiar to the general population. The recall of sponsors can involve a substantial degree of construction and cognitive effort (Johar & Pham, 1999). However, due to perceptual fluency, less cognitive resources are required to process familiar brands because they already exist in their minds (Acar, 2007; Lang, 2000). Familiar brands are also more likely to attract visual attention (Gunaratne et al., 2019). Consequently, familiar or dominant brands are more likely to be recalled (Breuer & Rumpf, 2011; Herrmann, Corneille, Derbaix, Kacha, & Walliser, 2014; Johar & Pham, 1999; Leng, Wu, & Zhong, 2019).

Effect of Colour on Sponsor Recall

Besides brand dominance and familiarity, other brand characteristics may lead to higher recall rates. Some brands may have logos that possess salient properties that attract visual

attention. These include properties such as brightness, contrast and colour (Itti & Koch, 2000; Leckner, 2012; Milosavljevic, Navalpakkam, Koch, & Rangel, 2012; Nothdurft, 2000; Schindler, 1986). Brighter logos are more prominent and thus more likely to attract attention (Breuer & Rumpf, 2015). Consequently, it is also more likely to be recalled by respondents (Park & Choi, 2011). Brighter visual cues may even positively affect purchase intention (Milosavljevic et al., 2012).

However, it is the contrast of the visual stimuli to its surroundings that is critical rather than just the brightness of the visual stimuli. The same visual stimuli may not attract attention when there is no contrast with its surroundings. Extending from this, even when brands possess the same level of brightness or colours, it does not mean that they will be recalled equally (Nothdurft, 2000).

The literature has also suggested that there might be differences between warm and cool colours in its effectiveness in marketing communications. Warm colours, such as red, generate higher levels of attention and arousal compared to cool colours such as blue (R. S. Moore, Stammerjohan, & Coulter, 2005; Park & Choi, 2011). In addition, warm colours appear to advance when compared to cool colours (Schindler, 1986). However, the few studies examining the effect of warm and cool colours on sponsorship effectiveness did not find any empirical support (Breuer & Rumpf, 2015; R. S. Moore et al., 2005; Park & Choi, 2011). Interestingly, a small number of studies found that colour contrast is effective in attracting attention (Boronczyk et al., 2018; Breuer & Rumpf, 2015). Again, it was not due to any specific colours but rather the contrast between the visual stimuli with its surroundings (Nothdurft, 2000).

To date, studies on the effectiveness of colour in sponsorship are conducted for visual stimuli within a sports event such as the signages surrounding the sporting venue (Breuer &

Rumpf, 2015; Park & Choi, 2011). However, sponsorship involves other marketing collaterals such as advertisements of the event on traditional printed media and posters (Alonso Dos Santos et al., 2019). Advertisements are an important part of marketing communications for the sports event as they can reach a large audience. More importantly, they can raise awareness for the sponsors beyond spectators at the event. Like other forms of marketing communications, there is a large amount of information in advertisements which might affect sponsorship effectiveness. As colour contrast can affect readability and legibility of print advertisements (Schindler, 1986), it suggests that there is a need to specifically examine the effect of colour in sports event advertisements and how it affects sponsorship effectiveness.

The purpose of this study is to investigate the effect of colour on sponsorship effectiveness in advertisements of sports events. Based on the above review of the literature, the study seeks to investigate the following research questions:

RQ1: What is the effect of colour on sponsor recall and recognition rate?

RQ2: What is the effect of colour on visual attention?

Method

Participants

With approval from the university's Institutional Review Board, students from a public university in Singapore were recruited through advertisements on social media. A convenience sample of 87 students between the ages of 19 and 29 ($M = 23.13$, $SD = 2.00$) were recruited. Of the participants, 50 (57.5%) were of female gender. Experiments involving the use of eye trackers generally have smaller sample sizes due to the nature of data collection which is both time-consuming and laborious (Gegenfurtner, Lehtinen, & Säljö, 2011; Leng & Phua, 2021; Vila & Gomez, 2016).

Research Procedure

Four advertisements on a sports event were created. The advertisements were based on the Standard Chartered Singapore Marathon held annually in Singapore. This event was selected due to its popularity and prestige both locally and regionally, with it being the only World Athletics Gold Label race in the region. The 2019 edition attracted over 50,000 participants from 133 countries, making it one of the most attractive running events globally.

The fictitious advertisements were designed to be similar to advertisements used by the Standard Chartered Singapore Marathon in previous editions of the event. This included a full description of the event, an event slogan, and details of the event including the date, time and venue. Logos of the sponsors were featured at the bottom of the advertisements which is a common practice. However, sponsors located in this area are also likely to receive less visual attention (Alonso Dos Santos et al., 2019). These sponsors were selected from real companies that have sponsored sports events in Singapore in the past. As such, they add realism to the advertisements.

The four advertisements were the same except for the background colour at the bottom of the advertisements featuring the sponsors. In the Control group, the original colours of the sponsors were retained against a white background. In the remaining three advertisements, the colours of the sponsors were manipulated to create three Experimental groups using Adobe Photoshop 2020 Version 21.2. In the first Experimental group, the logos were in greyscale with the logos in black on white background. In the second and third Experimental groups, the backgrounds were changed to blue and red respectively. Blue and red backgrounds were selected as background colours as they are cool and warm colours respectively (Park & Choi, 2011). The manipulation will allow for an investigation of the effect of cool and warm colours on sponsor

recall and visual attention. To ensure readability, the sponsor logos were also changed to white against the blue and red backgrounds (Schindler, 1986). In all the advertisements, sponsor logos were spaced equally from each other. In addition, the different logos were of the same size. This ensured that each sponsor logo had the same exposure. The advertisement for the Control group with the original colours is reproduced in Figure 1 below.

Insert Figure 1 here

Participants were randomly assigned to one of the four groups. The research procedure was the same for participants across the four groups. At the start of the experiment, participants were provided with information on the study and their consent to participate was sought. As the study involved sponsor recall and recognition, this specific aim of the study was not revealed to the participants to prevent the effect of priming. Instead, participants were informed of the general aim of the study, which was to investigate the effectiveness of sports event advertisements.

The study was conducted in a research laboratory in a public university in Singapore. Participants were asked to sit in front of a desktop computer with a 19-inch widescreen LCD monitor with an aspect ratio of 1440 x 900. A SensoMotoric Instruments Remote Eye-tracking Device 250mobile (SMI RED250m) was mounted on the monitor and used to track eye movements of participants. A five-point calibration and four-point validation process for the respondent's eye movements was conducted. This was similar to other studies using an eye tracker (Breuer & Rumpf, 2012; Leng & Phua, 2021; Scott, Zhang, Le, & Moyle, 2019; Vila & Gomez, 2016).

After the calibration exercise, participants were asked to view the advertisement shown on the computer monitor and complete an online questionnaire on Google Forms. Respondents

were given a S\$5 voucher as a token of appreciation at the end of the study. In addition, they were debriefed on the true purpose of the study. As deception was involved in this study, participants were given the opportunity to opt out of the study at this stage. None of the participants did so.

Measures

The online questionnaire collected demographic information from the respondents and measures of sponsor recall and recognition. In addition, visual attention data were collected by the eye tracker. These are detailed below.

Sponsor Recall and Recognition Recall and recognition measures are commonly employed in sports sponsorship studies to evaluate sponsorship awareness (Cornwell & Humphreys, 2013; Meenaghan & O'Sullivan, 2013; Walliser, 2003). In this study, participants were first tasked to recall the sponsors that appeared in the advertisement. The number of correctly recalled brands is the measure for sponsor recall.

Following this, respondents were presented with a list of 14 brands which contained the 7 sponsors and another 7 dummy sponsors. Dummy sponsors were included to mitigate the effect of participants getting the correct answers through guesswork. The dummy sponsors were selected on the basis that they offered similar products or services to the brands that were featured (Pitts, 1998). This is presented in Table 1 below. Participants were tasked to identify the sponsors that appeared in the advertisement. To further reduce the possibility of guesswork, participants were given the option to indicate that they did not know whether the presented sponsor appeared in the advertisement. The measure for sponsor recognition is calculated as the number of correctly recognised brands.

Insert Table 1 here

Visual Attention Eye trackers have been used in earlier research to measure visual attention and sponsorship effectiveness (Breuer & Rumpf, 2012, 2015; Leng & Phua, 2021). They provide insights into the visual behaviours of consumers which could be useful in studies examining attention to different visual stimuli (Leckner, 2012; Scott, Green, & Fairley, 2016). Physiological measures are also considered more reliable measures of visual attention than self-reports or memory scores (Higgins, Leinenger, & Rayner, 2014; Krugman, 1965; Rosbergen, Pieters, & Wedel, 1997; Scott et al., 2019). As such, using an eye tracker to measure visual attention across the groups with different background colour manipulation in this study could provide reliable physiological data and marketing insights.

The eye tracker used in this study is the SMI RED250m with a frequency of 250Hz and a gaze position accuracy of 0.4 degrees. Eye movements can be classified into saccades and fixations. Saccades are rapid and sharp eye movements that last around 20-40 milliseconds (Wedel & Pieters, 2007). Fixations on the other hand is when the eye is relatively still between 200-500 milliseconds (Rayner, 1998). For this study, fixations were set at 200 milliseconds in line with earlier studies (Scott et al., 2019).

Area of interest (AOI) was marked out for the logos of the sponsors at the bottom of the advertisement. The proprietary software SMI BeGaze (Version 3,5) was used to match participants' gaze coordinates with the AOI to calculate the glance duration, fixation count, average fixation duration and first fixation duration. These are common measures in eye-tracking studies (Scott et al., 2019). Glance duration is the sum of the initial saccade into the AOI, combined with the duration of all saccades and fixations within the AOI (Leng & Phua, 2021). Fixation count is the number of fixations within the AOI. The data collected from glance

duration and number of fixations can reveal consumer's preference among the different stimulus shown in the advertisement (Gunaratne et al., 2019; Simola, Kivikangas, Kuisma, & Krause, 2013; Wedel & Pieters, 2007). A longer glance duration and a higher number of fixations suggest higher levels of visual attention.

Findings

During a preliminary check on the data, two invalid responses were found. These were removed from the analysis. The final sample size was 85 participants (97.7%). There were 23 participants in the Control group with the original colours. There were 19 participants in Experimental group 1 with the greyscale background, 21 participants in Experimental group 2 with the blue background and 22 participants in Experiment group 3 with the red background. Data was analysed using the IBM Statistical Package for the Social Sciences (SPSS) Statistics (Version 23) predictive analytics software. This is detailed below.

Sponsor Recall and Recognition

A one-way between-groups analysis of variance with planned contrasts was conducted to investigate the effect of colour on sponsor recall rates. It was found that respondents in the Control group with the original colours had significantly higher sponsor recall rate compared to any of the respondents in Experimental groups with manipulated background colours, $t(81) = 2.74, p = .01$.

Further analysis with a one-way between-groups analysis of variance with all groups was conducted. There was a statistically significant difference at $\alpha < .10$ level for sponsor recall between the groups ($F(3, 81) = 2.55, p = .06$), and a medium effect size ($\eta^2 = .09$). Post-hoc comparisons using the Tukey HSD test indicated that sponsor recall rate for the Control group with the original colours ($M = 2.35, SD = 1.72$) was the highest and differed significantly from

Experimental Group 3 with the red background ($M = 1.36$, $SD = 1.50$). However, sponsor recall rates from Experimental Group 1 with the greyscale background ($M = 1.47$, $SD = .96$) and Experimental Group 2 with the blue background ($M = 1.38$, $SD = 1.24$) did not differ significantly from either the Control or other Experimental groups. This is detailed in Table 2.

Insert Table 2 here

A one-way between-group analysis of variance was also conducted to analyse sponsor recognition rates between the groups. The sponsor recognition rates were higher than the sponsor recall rates in all groups, concurring with earlier studies that due to the lower cognitive effort required, recognition rates were usually higher than recall rates (Meenaghan & O'Sullivan, 2013). More importantly, the findings for sponsor recognition were similar to the findings for sponsor recall, demonstrating that the findings were consistent across different measures. Planned contrasts revealed that respondents in the Control group with the original colours had significantly higher sponsor recognition rate compared to respondents in any of the Experimental groups with manipulated background colours, $t(81) = 2.31$, $p = .02$. However, when further analysis was conducted with all groups, there was no significant differences between the groups ($F(3, 81) = 1.88$, $p = .14$). The Control group with the original colours ($M = 3.83$, $SD = 1.61$) had the highest recognition rate compared to the experimental groups ($M_{\text{Greyscale}} = 2.79$, $SD_{\text{Greyscale}} = 1.62$; $M_{\text{Red}} = 2.95$, $SD_{\text{Red}} = 1.56$; $M_{\text{Blue}} = 3.10$, $SD_{\text{Blue}} = 1.45$) but this did not reach statistical significance.

Physiological Data from Eye Tracker

Heat maps were generated to visualise stimuli in the advertisements that participants attended to (Scott et al., 2019; Vila & Gomez, 2016). They display the aggregated fixation duration data, where areas that are red and opaque represent high values, while clear areas with

no colours represent no gaze recorded. This is shown in Figure 1 below. The generated heat maps suggested that the original background in the Control Group attracted more attention from respondents.

Insert Figure 2 here

Further investigation was conducted with statistical analysis. A one-way between-groups analysis of variance was conducted to examine the effect of colours on visual attention using glance duration, fixation count, average fixation duration and first fixation duration as measures. This is detailed in Table 3.

Insert Table 3 here

Planned contrasts revealed that respondents in the Control group with the original colours had significantly longer glance duration ($t(28) = 1.78, p = .09$) and higher number of fixation counts ($t(81) = 2.52, p = .01$) compared to respondents in any of the Experimental groups with manipulated background colours. However, there was no significant difference between respondents in the Control group and Experimental groups in terms of average fixation duration and first fixation duration.

Further analysis with all groups found no significant difference between the groups in all four measures. Respondents in the Control group with the original colours spent the longest time looking at the sponsors ($M = 3247.53, SD = 3491.90$) when compared to the other groups but this did not reach statistical significance. Respondents in the Control group with the original colours also had the highest number of fixation counts ($M = 6.48, SD = 6.08$), longest average fixation duration ($M = 321.75, SD = 152.94$) and longest first fixation ($M = 276.34, SD = 128.70$) compared to the other groups but these did not reach statistical significance.

Discussion

Sponsorship effectiveness can be measured through sponsor recall and recognition measures. In addition, visual attention data can also provide important information as they are considered to be more valid when compared to self-reports of memory. This study contributes to the existing literature by examining both memory and visual attention as it investigates the effect of colour on sponsorship effectiveness in printed advertisements.

The results from this study found that the sponsor recall and recognition rates were the highest in the group where the original colours of the sponsors were used. Planned contrasts between the control group exposed to the original colours of the sponsors with the experimental groups with manipulated colours showed a significant difference in sponsor recall and recognition rates. Sponsor recognition rates were also higher than the sponsor recall rates in all groups, which is in line with earlier studies that recognition rates are usually higher than recall rates due to the lower cognitive effort required (Meenaghan & O'Sullivan, 2013).

Physiological data from the eye tracker also showed that sponsors in the original colours were more visually attractive when compared to the manipulated images. This suggests that when the colours of the sponsors were changed, respondents were less attracted to the sponsors and less likely to recall or recognise the sponsors. However, differences between specific colours were not found.

Sponsor recall and recognition rates could vary due to many different factors including duration of exposure and brand familiarity (Walliser, 2003). In this study, it was found that respondents were visually more attracted to the original colours of the sponsors as respondents recorded a longer glance duration and a higher number of fixations. This could be due to respondents being more familiar with the logos in their original colours (Gunaratne et al., 2019). When the background colours were manipulated, respondents may not recognise the logos and

therefore found them less visually attractive. In turn, due to the shorter visual attention and brand familiarity, recall and recognition rates were lower in the groups with the colour-manipulated groups.

While manipulating the background colours led to a decrease in visual attention and sponsor recall, the study did not find any difference between the experimental groups. Respondents exposed to greyscale, blue and red backgrounds had similar levels of sponsor recall and visual attention. This concurs with earlier studies that there may not be any difference across colours (Breuer & Rumpf, 2015). This study further suggests that using the original colours of sponsors may be more effective in terms of visual attention.

The hypothesised effect of warm and cool colours on marketing communications was not found. This concurs with the findings from the earlier studies conducted with signages and banners in sporting venues (Breuer & Rumpf, 2015; Park & Choi, 2011). As such, this study demonstrates that the effect of warm and cool colours in sponsorship may not exist in sports sponsorship. It further echoes the view that the effect of colours in marketing communication remains unclear (Leckner, 2012).

While some companies believe that changing the colours of their logos may be more effective in sponsoring sports events (Henderson et al., 2019), the findings from this study suggest that marketers should consider retaining the original colours of sponsor logos. Manipulating colours to adapt to trends, themes or team colours may result in lower sponsor recall rates. This is a strategy that may lead to a lower level of sponsorship effectiveness.

Conclusion

Earlier studies in the area of sports sponsorship had postulated the effect of colours on sponsor recall but few studies had examined this factor empirically. When studies were

conducted, they were focused on sponsor recall at sports venues (Breuer & Rumpf, 2015; Park & Choi, 2011). This aim of this study was to investigate the effect of colour on both visual attention and sponsorship awareness in sports event advertisements. It was found that when the colours of sponsors are manipulated, it reduces the level of visual attention and sponsor recall rate. This may be due to the reduced familiarity of the brand when the colours are manipulated, causing consumers to be unable to recognise the brand.

In addition, it was found that there was no significant difference across the different types of colour manipulation. The level of visual attention and sponsor recall rates were similar when the background colours were changed to greyscale, blue or red. Specifically, there were no differences in visual attention and sponsor recall across warm (i.e. red) and cool (i.e. blue) colours. This finding provides further empirical support that the hypothesised effect of warm and cool colours may not exist in sports sponsorship (Breuer & Rumpf, 2015; Park & Choi, 2011).

From a practitioner perspective, while the industry has been manipulating the colours of sponsors' logos in its quest to be more innovative in its marketing strategies (Henderson et al., 2019), the findings from this study suggests that manipulating the colours of sponsors may be detrimental to sponsorship effectiveness. Consumers may not recognise the manipulated images and fail to associate the sponsor with the sports event. Consequently, it may be more prudent to keep to the original colours of the sponsors.

There are several limitations in this study. Firstly, while sponsorship in sports events remains popular, sponsorship exists in other industries as well (Meenaghan, 1991). As such, whether the findings from this study, which is limited to sports sponsorship, can be generalised to sponsorship in other industries remains to be tested. Secondly, as experiments involving the use of eye trackers generally have smaller sample sizes, there exists a potential for sampling

errors (Gegenfurtner et al., 2011). This remains a limitation of this study. Finally, as this study took place in a research laboratory in a university with a sample consisting of university students, the results may not be representative of the larger population. Future studies should employ respondents from other demographic groups to examine the generalisability of the findings from this study.

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Table 1

List of sponsors and dummy sponsors used in advertisements

| Sponsors | Dummy Sponsors | Category |
|-----------------|-----------------------|---------------------|
| 100 Plus | Pocari Sweat | Sport Beverages |
| Compressport | 2XU | Compression Garment |
| Garmin | Fitbit | Sports Technology |
| Seiko | Casio | Watches |
| TATA | Infosys | IT Consultancy |
| Tiger Balm | Salonpas | Medicine |
| Toyota | Honda | Automobile |

Table 2

Sponsor Recall and Recognition Rates Across Groups

| | Control | Exp 1 | Exp 2 | Exp 3 | | | |
|-------------|-----------------------|------------------------|-------------------|------------------|----------|----------|----------|
| | Original ^a | Greyscale ^b | Blue ^c | Red ^d | | | |
| | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> | <i>F</i> | <i>p</i> | η^2 |
| Recall | 2.35 (1.72) | 1.47 (.96) | 1.38 (1.24) | 1.36 (1.50) | 2.55 | .06 | .09 |
| Recognition | 3.83 (1.61) | 2.79 (1.62) | 3.10 (1.45) | 2.95 (1.56) | 1.88 | .14 | .06 |

^an=23; ^bn=19; ^cn=21; ^dn=22

Table 3

Visual Attention Measures Across Groups

| | Control | Exp 1 | Exp 2 | Exp 3 | | | |
|----------------|-----------------------|------------------------|-------------------|------------------|----------|----------|----------|
| | Original ^a | Greyscale ^b | Blue ^c | Red ^d | | | |
| | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> | <i>F</i> | <i>p</i> | η^2 |
| Glance | 3247.53 | 1876.61 | 1729.25 | 1990.55 | 1.68 | .18 | .06 |
| Duration (ms) | (3491.90) | (2495.86) | (1383.43) | (2248.66) | | | |
| Fixation | 6.48 | 3.79 | 3.71 | 3.77 | 2.13 | .10 | .07 |
| Count (times) | (6.08) | (3.99) | (2.90) | (3.84) | | | |
| Average | 321.75 | 291.87 | 258.74 | 289.93 | .82 | .49 | .03 |
| Fixation (ms) | (152.94) | (127.13) | (103.25) | (142.54) | | | |
| First Fixation | 276.34 | 248.63 | 238.75 | 257.60 | .51 | .68 | .02 |
| (ms) | (128.70) | (87.25) | (95.44) | (101.40) | | | |

^an=23; ^bn=19; ^cn=21; ^dn=22

Figure 1. Fictitious advertisement used in the study

It's not a marathon without you.



IT'S
OURS TO RUN.

Title Sponsor

Standard Chartered 

If you're looking to work up a sweat and push your limits, be sure to sign up for one of Singapore's most popular races—the Standard Chartered Singapore Marathon.

Every year, the Standard Chartered Singapore Marathon is the event where individual stories and personal battles converge, and people from all walks of life run alongside each other, cheered on by a supportive community.

This is a race where no one has to lose so someone else can win, it's one where we root equally for everybody to cross the finish line.

On this day, where the toughest obstacles are those in the mind, the camaraderie, community spirit & support truly make a difference.



Standard Chartered
Singapore Marathon

42.195km | 21.1km | 10km | 5km
Ekiden | Kids Dash

5 – 6 December 2020

F1 Pit Building

Official Sponsors









