Article

Eye Tracking and an A/B Split Test for Social Media Marketing Optimisation: The Connection between the User Profile and Ad Creative Components

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Abstract: In the era of digitally dominated competition, where the effectiveness of Facebook ads prompts the social media marketing strategy, new opportunities arise for most industries. In this context, this study aims to discover and summarize the key optimisations regarding the creative ad components needed to run highly personalized ads based on a user profile. The participants were Facebook users between the ages of 18 and 65+ who were interested in dental services. Qualitative methods were adopted in order to discover suitable options for professionals to grow their business. In the first stage, the A/B split test using the Facebook Ads manager labelled the most effective creative component. In the second stage, an eye-tracking experiment generated 30 heatmaps that showed the differences between the segments. The results show solutions for attracting users by increasing the level of personalization of the ads. They are more beneficial for social media campaigns aimed at brand awareness targeting women and showing them a happy human face. When the target audience is men, technical details are preferred in order for the ad to become more attractive for them. This study enriches the literature and empowers professionals to deploy social media marketing growth strategies to attract users and make them convert to their full potential.

Keywords: social media marketing; A/B split test; eye tracking; creative optimisation; digital marketing for the dental industry; business growth; personalization; user profile

1. Introduction

The extension of digital marketing and social media led to the transformation of the way in which companies and customers communicate [1–5]. Furthermore, their expansion to the transformation of business models [6] shaped digital marketing to become an important tool in business growth strategies, and in the way that consumer loyalty is gained [7]. This has also been fuelled by the increasing accessibility of smartphones and other devices, which has led to more and more frequent contact (anywhere and anytime) between brands and consumers [8–10]. The recent development of social media marketing (hereinafter SMM) is having a huge impact on all types of companies. "The meteoric growth of community websites, such as Twitter, Facebook and Linkedln, have ushered the world into a new era of social media" [11]. "Social media provides new sources of data and information that were once difficult to collect or altogether unavailable." [12]. The way in which companies communicate nowadays about their products, services and performance influences their business model and helps them to survive and grow in an increasingly competitive environment [13], as consumer attention is divided due to multitasking and a perpetual state of distraction [14].

The use of digital technologies has begun to be used more and more in patient management and online presence [15–22], and professionals are offering the opportunity

to obtain advice about health problems and build relationships with patients using digital tools, which then become great sources for medical awareness and education [23,24].

Therefore, managers and entrepreneurs quickly realized that in order to be able to grow their businesses in this rapidly changing environment they should learn how to take advantage of the newly available digital tools (eye-tracking and A/B tests, among others) for measuring, analysing and understanding customers' behaviour, characteristics and profile. However, in a world full of ads, gaining and maintaining attention is increasingly difficult, and various academic research has pointed out that the eye tracking method is providing an excellent behavioural measure of visual attention in several industries, such as tourism and clothing retail [25–27], and most recently in the health domain [28] due to the Covid-19 pandemic event [29].

Gaining visual attention is essential, yet it is not enough to turn viewers into customers, as companies such as Facebook, LinkedIn, Airbnb, Microsoft, Uber, e-Bay and Amazon have demonstrated. Studies found that they used A/B testing (or online controlled experiments) as part of their marketing strategy [30]. A/B testing is "the most common form of large-scale experimentation and data collection on the internet industry" [31], having been recognised as one of the most powerful ways to turn clicks into customers [32].

Even though online presence and social media are portrayed as key factors for dental clinics' growth [33,34], there are many issues and challenging edges that these types of businesses are facing nowadays [35,36]. For example, social media has become an integral part of patients' lives [37,38], and this fact stimulates professionals to align their promotional actions to the highly requested need for personalization. The challenging necessity of delivering a good experience and building trust and long-term relationships [39–41] represents "'the most important way to attract and convert new patients into lifelong ones" who will choose to remain faithful to a clinic [42]. Otherwise, converting them from users is almost impossible, generating negative growth for professionals and a low-quality offer for patients [35,43].

The main contribution of this paper is to improve the understanding of the social media marketing concept (hereinafter SMM) from the perspective of the quality of the creative components used in dental Facebook advertisements. Thereby, the authors aim to find suitable options for professionals to grow their businesses by conducting the users to conversion by increasing the level of personalization of the ads delivered to them using a social platform. Based on the mission the authors are enlisted in, they proposed the following research questions as critical points:

1. Are there differences between the target groups in terms of the creative components?
2. Are small logos cost-effective elements in dental advertising?
3. Is it possible that smiling women's pictures generate lower costs than mouth details?
4. Is it viable that brand colours attract the audience in online marketing campaigns?

In order to answer these questions, the authors conducted two different experiments. On the one hand, an A/B split test was performed for cost-effectiveness research, and on the other hand, a qualitative examination of the creative components was conducted in order to identify whether there were differences between the target groups. This was represented by an eye-tracking test that provided information about the users' behaviour towards visual stimuli.

The results strengthen the need for the high personalization of ads to grow dental clinic businesses by understanding the particularities of each target group's reactions. The professionals must create online marketing campaigns by applying a separate-politics thinking way to capitalize as much as possible on the interest of users. They can deploy SMM strategies with the knowledge that young women prefer to see images with the beauty of a perfect smile. Meanwhile, men between 25 and 35 years old want to visually understand the procedures of the treatment.

All of the results the authors achieved are presented in a logical, concise and specific way through the structure of this article. It contains five sections. After the introduction and the review of the scientific literature, the research methodology is introduced. After that,

the paper presents the results of the study, and the final part is allocated to the discussions and conclusions.

2. Literature Review

The review of the scientific literature compounds two different sections, namely the SMM and the personalisation concept, and the online controlled experiments and external validity. With the first of these the authors intend to introduce the readers to the essential concepts, such as the modern consumer, customization, and eye tracking as a research method. The second presents the contribution of the A/B split test as an experimental tool in the current paper.

2.1. SMM and the Personalisation Concept

As early as 2014 [44], it was shown that "entrepreneurial firms in a more advanced technological environment may perform better than entrepreneurial firms in a less advanced technological environment." Today, business digitalization is a reality that can no longer be ignored [45–50]. Given the worldwide proliferation of digital marketing and Social Media [51–56], organizations have the opportunity to interact with customers in a different and rapidly evolving way. The creation of strong brands based on binomial social marketing—happiness management leads both to the generation of a behaviour with social benefits and to the increase of the competitiveness of companies [57]. At the same time, the "'culture of happiness management and social marketing" can change habits in terms of maintaining health, especially for young people [58]. Social marketing is considered a powerful tool of which the main purpose is to increase 'social good' by changing people's behaviour in order to increase social well-being and happiness [59]. A study showed that followers' engagement increases on social media if the brand content is linked to concepts such as happiness and health and safety [60]. "Social media have been developed rapidly and it is recognized as a key strategic element of organizations competitiveness and survival" [61], and its value is recognized in various fields [62–64], being related to happiness and consumption habits [65]. The marketing options provided by Social Media to professionals elongate the modus operandi of dentists to promote their advice, practices and clinics [42,66–68]. Furthermore, the way in which oral health issues are addressed is about to change due to the innovative ways in which care is being delivered.

That is why it is necessary to adapt brands to new practices in order to attract attention and offer value to users using this form of internet marketing. Hence, social media has enkindled the interest of companies to manage customer relationships with Facebook brand pages [69]. These pages represent the key platform for users to interact with companies and provide users with the content that might interest them. Recent studies have referred to brand pages and consumer behaviour [60,69,70], and it has been shown that companies can attract users with the right content posted on social media. Based on this fact, the authors used a dental clinic's brand Facebook page to achieve the aim of the research.

Over the last decade, companies have conducted their business by integrating SMM to improve their marketing strategy [71–77], which is also true for the dental industry [68,78–82].

SMM is an interdisciplinary and cross-functional concept that uses social media to achieve organizational goals by creating value for stakeholders [83]. Based on this concept, marketers enjoy a huge potential. They have the opportunity to enhance customer journeys, and to analyse and influence engagement behaviours via online channels. In this context, the effectiveness of SMM is a topic of great interest for researchers as well as marketers, but it is worth mentioning that the connected consumer is at the centre of these concerns.

The modern consumer is seen by specialists as responsible, digital and intelligent, with new behaviour, all representing prerequisites which are conducive to changes in the way of making purchasing decisions [84]. As a result, companies have to deal with consumers with increasingly different choices due to the action of many influencing factors. This is the reason why the specialists think that a better understanding of their behaviour

can help in making decisions about marketing strategies [85]. This new kind of consumer, called by specialists the generation C, is increasingly adopting a digital lifestyle, posing as a category of the connected users composed of different categories of consumers. These categories depend on how much they have adopted digitization and the new ways of communicating the need for recognition [86]. It is clear that consumer demands have changed, and this requires more creative and innovative ads in order to achieve business goals [87]. The creative components of advertisements (text, images) play an extremely important role in online advertising. In the process of choosing the most suitable variants, knowledge about the brand, together with history promotion, requires time invested in the research market and the generation of ideas [88]. For example, due to these concerns, it was possible for researchers [89] to explain that the purchase decision is most affected by the image of the advertisement (41.6%), followed by its typography, design and colour.

Customizing consumer content enhances the consumer experience [90], and advertising personalization has become one of the ways in which consumer interest and customer awareness can be increased [91]. This can be achieved by customizing the product and displaying the creative content of the ads [92].

Customization is defined by [93] "as the strategic creation, modification, and adaptation of content and distribution to optimise matching user's characteristics, interests, preferences, communication styles, and behaviours". The relevance of promotional messages, and how the message responds to the needs of consumers, increases the attention paid to these messages. It reduces the risk of rejection [94–97] and represents the predictor of a positive response [98]. Experts consider that the two methods used in content marketing, storytelling and visual art, are often ignored by content creators [99]. Furthermore, [100] showed that photographs that feature happy and/or smiling individuals or advertising are ranked as the least important components when the respondents have to choose orthodontic practice. However, advertising creatives are gaining more and more attention in digital marketing, and experts believe that "aesthetic creatives may improve the click-through rate of products" [101]. As a consequence, in the future, research in this field should focus on creative development and creative effectiveness [102,103].

Nowadays, social media networks are becoming "one of the largest environments of human interaction", a global phenomenon, with Facebook as the preferred network for it [104–106]. For this reason, the consumer involvement and evaluation of advertisements spread on social networks must be contextually analysed [107]. Each social platform is offering a different type of experience, so social media cannot be considered an umbrella concept [108]. Many managers do not have enough knowledge about what they can offer, and have difficulties in approaching this constantly evolving communication environment [109]. Using Facebook ensures that the target segments are identified much faster and more efficiently, but there are still many aspects to explore when using this tool to its full potential [104,105,110]. As social media marketing companies become more and more popular, there are many studies that track user behaviour on social networks, some using eye-tracking analysis to better target the advertising area. For example, one study [111] used eye-tracking technology to monitor participants, as well as to analyse the differences in the distribution of visual attention during browsing. Another study looked at the association between the excessive use of social media and distraction by tracking eye movement [112]. A very recent piece of research looked at the patterns of visual attention of socially anxious people when using Facebook by eye tracking [113], and another one examined the effect of online advertising indices on human responses using eye tracking [114].

Experts say that the potential has not been fully explored regarding the personalization of ads running within these networks, and that customization can be achieved by adapting them to consumer characteristics [104,105,115]. Eye tracking as a research method can improve the process of personalization, which has been shown to be a means to help "consumer-brand identification and self-brand connection" with positive effects on "brand equity and brand usage intention" [116,117]. Artificial intelligence—through

components such as sound, time series, text, image, or video—will become a foundation for customization, and this custom is considered not only acceptable to consumers but also required by "fickle customers" [118].

Although, nowadays, practice shows that successfully used experiment-based learning leads to improved communication policy, and although more companies are testing/experimenting with online ads in order to identify the most profitable ways to deliver their message to consumers, they allocate fewer funds in this direction [119,120].

2.2. Online Controlled Experiments and External Validity

Online controlled experiments have become an indispensable tool, and their use is growing for startups and smaller websites [121–123]. Internet growth prompted large companies such as LinkedIn, Facebook and Google, etc., to run umpteen experiments to optimise user interface, ads and apps, etc. [124]. For example, [125] declared that they were running 1000 concurrent experiments at any given moment across different products and target groups, allowing them to rapidly validate ideas. In the same manner, the literature highlights that the advertisers that ran 15 experiments (versus none) in a given year obtained about a 30% higher ad performance that year; those that ran 15 experiments in the prior year saw about a 45% increase in their performance, highlighting the positive longer-term impact of this strategy [119].

As a research tool for the social sciences [126], the Facebook platform is rapidly gaining recognition among researchers. It is the biggest social network worldwide [71], with roughly 2.85 billion monthly active users as of the first quarter of 2021 [127]. The effectiveness of using this platform was highlighted in previous studies [128–131], and is has been proven that—if applied correctly—a strategy that includes this tool grows the organization.

Using Facebook to conduct research is part of the "external validity—the confidence that results can be generalized to different populations" and settings [122,132–134]. Although internal validity is the priority in research [135], it is also "important that external validity be emphasized and strengthened" [136].

"Field experiments represent a viable way to overcome issues of setting artificiality and to show that the focal effects persist in the real world" [122]. This is the reason why the authors aim to run a cost-effective online field experiment through a Facebook A/B split test (FBST) in order to discover which of two or more experimental variables has the strongest effect on one or more managerially dependent variables. FBST allows changing variables (creatives in this case) to determine which strategy performs better, and to improve future campaigns for the boosting of companies' performance and growth. The authors of this study hypothesize that a creative component that shows the audience a woman smiling will outperform the strategy of attracting more users.

According to [137], the algorithm divides the budget equally, and divides exposure randomly between each version of the creative component. After doing that, FBTS software can measure the performance of each strategy regarding a specific metric or more. Orazi's contribution [122] supports the authors' action of choosing the FBST as the method of research for this study. It was launched by the platform with the same name in 2017, and it allows users to pre-test online campaigns, and to optimise advertising expenditures. It is a cost-effective experiment, and it aims to support managers and researchers to increase the effectiveness of campaigns, as other companies did. For example, [138] showed a set of 48 ads and ran experiments that revealed that images with simple designs perform better than complex ones, and that a small logo generates a cheaper cost per click (CPC) than a large logo, or than images with no logo. The same study showed that smiling women lead to more clicks, and women's images performed better than men's images.

Having this in mind, this work was conducted for the investigation of the impact of creatives on user's behaviour in the dental industry. An FBST was run to identify which of the variables has a major effect on the customer journey, and which of its features prompt the user the most to continue the journey to possible conversion.

3. Materials and Methods

In the first stage of this research, the authors adopted an inherent method of external validity to investigate the effectiveness of online campaigns for the dental industry: the FBST. Secondly, an eye-tracking experiment was performed in order to fight the threat of low external validity (to generalize to another context in terms of people, place and times). Thus, qualitative methods (two experiments) were adopted to boost the dental clinics' campaigns' performance for a creative component optimisation proposal. The participants of this study were Facebook users between 18 and 65+ years of age, all of whom were interested in dental services. The authors took into consideration the results of previous studies [138–140], and performed the research according to the following step-by-step methodology.

3.1. A/B Split Test (FBST)

The first step for this experiment was to create an online campaign for a local dental clinic using the A/B split test from the Ads Manager Tool provided by Facebook. The objective of this campaign was set to traffic (the sale funnel consideration stage) [141], with no 'Campaign Budget Optimisation' option in order to avoid confounding from delivery optimisation algorithms [122]. After that, the ad sets were created, one for each type of creative component (Figure 1), keeping the other settings the same in order not to damage the results of the test.

Figure 1. Campaign creative components: (**a**) mouth details, (**b**) woman smiling.

The structure of the campaign was set to cover two ad sets, one for each ad (Figure 2).

The objective of the campaign was traffic, aiming to hook the audience that considers the brand. The key metric, cost per 1000 people reached was selected in order to judge the success of the campaign. It started by performing with the same budget ($ xx.42 per day) for each ad set, as well as the audience, placements and delivery targeting options. The only variable used was represented by the creative components, i.e., those on the images used to run the ads. The following Facebook metrics were analysed:

Reach: This measures the number of unique users exposed to the experiment, and it is calculated using the sample data.

Impressions: This measures the number of times (or views) the ads were shown to the same users.

Frequency: This is an estimated metric that shows the average number of times that a unique user sees the ad. It is the ratio between the impressions and reach, and is ideally

equal to one. It is calculated using sampled data, and is used to grow the awareness of a brand, and to recall it by showing the message to users for a specific audience.
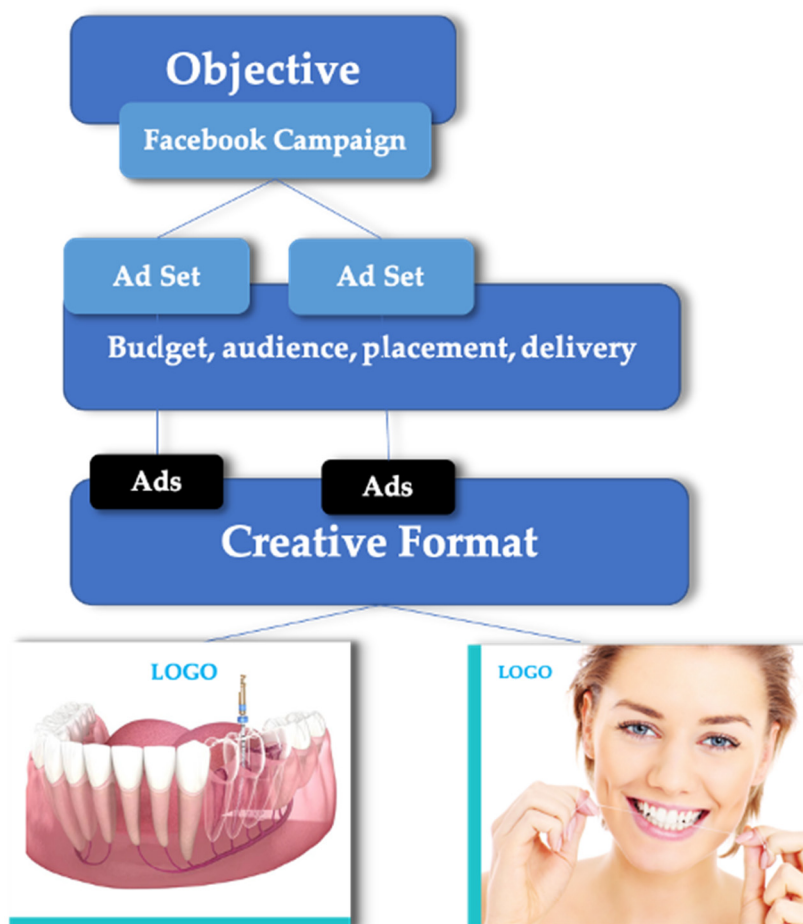

Figure 2. The structure of the Facebook campaign.

Amount spent: This represents the total cost for running the campaign, and it must be the same in all of the experimental conditions in order to avoid the alteration of the variables' performance analysis.

Clicks: This shows the number of clicks for each experimental condition, with the possible actions being clicks on an image or a call to action, and clicks on URL links, ad formats or websites.

Click-through-rate (CTR): This measures the number of times unique users see the ad and perform link clicks. The percentage provides information about the number of link clicks on the ad compared to the number of impressions the ad received. The major impact of this metric is on marketers' and advertisers' understanding of the ways in which the ads are driving traffic to websites or other destinations. It is calculated as the number of link clicks divided by the number of impressions.

Cost-per-click (CPC): This is the cost for every link click performed by users. It illustrates the benchmark for the performance and the efficiency of the campaigns.

Cost per 1000 people reached: This metric measures the people reached across the platforms (Facebook, Instagram, Messenger and Audience Network), and is calculated as the total amount spent, divided by reach, and multiplied by 1000. The reach is more insightful than the impressions, and the reason is that it provides the measurement of how many people are exposed to the message conveyed, and how efficiently the campaign reached them.

3.2. Images Analysis with Eye-Tracking Technology

The experiment was completed using GazeRecorder, a software specializing in eye monitoring and the creation of statistical analyses (https://app.gazerecorder.com/ (accessed on 14 May 2021)). With the help of this online application, the experiment was created by uploading both images which it was necessary to display. Because the experiment was conducted with an online web application, the participants did not require special hardware or software resources, only a webcam.

The experiment consisted of monitoring the eyes of 30 participants when displaying both advertising images for ten seconds each on a computer equipped with a webcam. Only subjects over 18 years of age to whom the study was explained participated in the experiment, and the following instructions were presented:

- The first phase is to calibrate the system, detecting the pupils of each individual.
- For the calibration, each individual must follow a red ball on the blank screen. At first, the red ball is fixed, then it must be watched as it moves across the screen.
- After the calibration, which lasts 40–50 s, the subject is notified that the calibration stage has been successfully completed, and the experiment will begin.
- The second phase is represented by the experiment. During the experiment, the two images are displayed for each subject for ten seconds each.

In total, each participant had 60 s to run the experiment entirely. A fact sheet for all of the randomly selected subjects is referenced in Appendix A. The data file with the eye detection records contains 12,800 records related to the 30 subjects. A fragment of this file is presented in Table 1.

Table 1. The structure of the data file.

# [Participant No *]	[Timestamp ms]	[Gaze x%]	[Gaze y%]
0	0	0.605	0.616
0	0	0.608	0.613
0	34	0.609	0.617
0	58	0.612	0.616
0	108	0.613	0.614
. . .	. . .	. . .	. . .
7	0	0.482	0.502
7	0	0.475	0.503
7	98	0.471	0.511
. . .	. . .	. . .	. . .
15	0	0.437	0.252
. . .	. . .	. . .	. . .
29	9939	0.423	0.21

* Note: For each participant, the GazeRecorder application assigned a number, the first one being 'zero' by default. The table presents an excerpt of the characteristics for some participants, together with the last line of the database for the last participant.

All of the participants received an online link where they could access the experiment. The process began for each participant by calibrating the eye tracker. For this, a maximum accuracy calibration was used, using 16 points (lower quality calibrations could be made using 1.5 or 9 points). The authors chose the 16-points calibration for the very good accuracy of the results, although the calibration time was longer. This choice was made in order to analyse the results containing more details regarding the focus of the gaze compared to the lower calibration settings. In Figure 3 is pictured the group structure of the users that were part of this experiment.
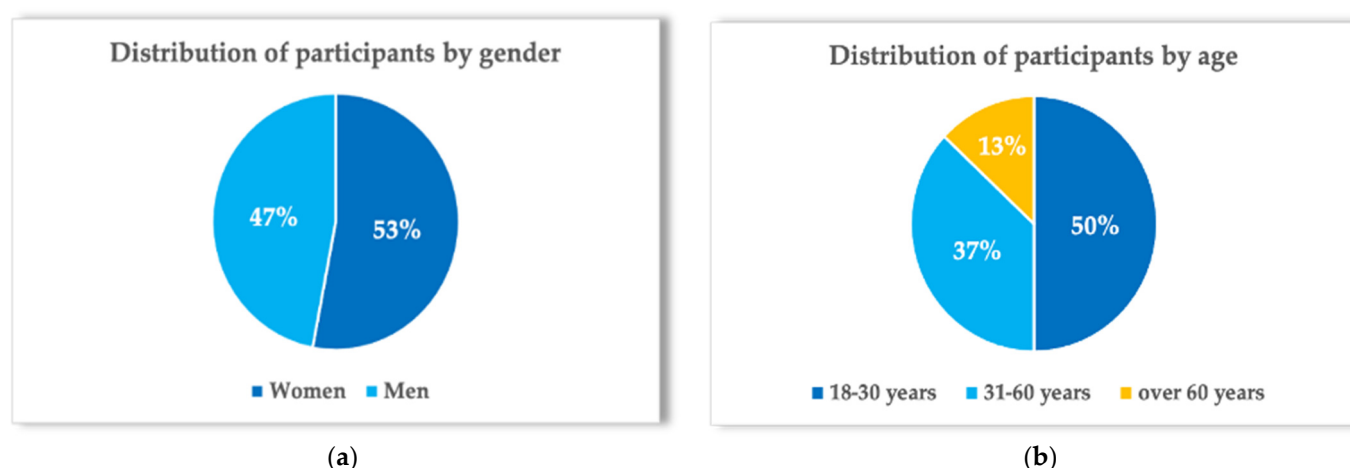
(**a**)   (**b**)

Figure 3. Division of the participants by gender (**a**) and age categories (**b**).

4. Results

4.1. A/B Split Test Results

The campaign showed the ads to the selected audience, reaching 6910 users and generating 12,974 impressions with cost-effective performance. The results of the experiments are presented in Table 2.

Table 2. A/B split test performance.

Performance Metrics/Campaign	Cost per 1000 People Reached	Reach	Impressions
Image A (mouth details ad)	$ xx.03	3979	6876
Image B (woman smiling ad)	$ xx.76	2931	6098

Source: Ads Manager report.

4.1.1. Cost per 1000 People Reached

Concerning this metric, the versions registered different performances, and the A/B test highlights version A (mouth details) as the most cost-effective ad creative component, with $ xx.03 per 1000 people reached, to the detriment of version B (woman smiling), which spent $ xx.76 per 1000 people reached.

The experiment revealed some interesting issues. First, the mouth details ad set generated a lower cost per 1000 people reached than the woman smiling for the audience composed of by men aged between 35 and 44 years. The conclusion can be drawn that the men at this age are more attracted by the ad which showed mouth details rather than a human happy face. Secondly, significant costs were registered regarding the 65+ age, with this being larger than twice the cheapest audience (Figure 4).

Third, the mouth details campaign presents a high cost for women as well (to a similar extent to the uncategorised), with $ x2.11 per 1000 people reached (Figure 5).

4.1.2. Cost per Link Click

Fourth, the link click represents the result for the running test. The cost for it varies depending on the performance of the campaign. Considering this metric, the mouth details creative component was the most efficient for the 25–34 age range ($ xx.14). The experiment highlighted the most expensive audience (the 45–54 age range), which spent $ xx.44 per link click.

Furthermore, a paradox was noticed concerning the performance of this campaign because the male audience presents good performance regarding the cost per 1000 people reached, whereas the cost for their click on the ad is the highest (Figure 6).
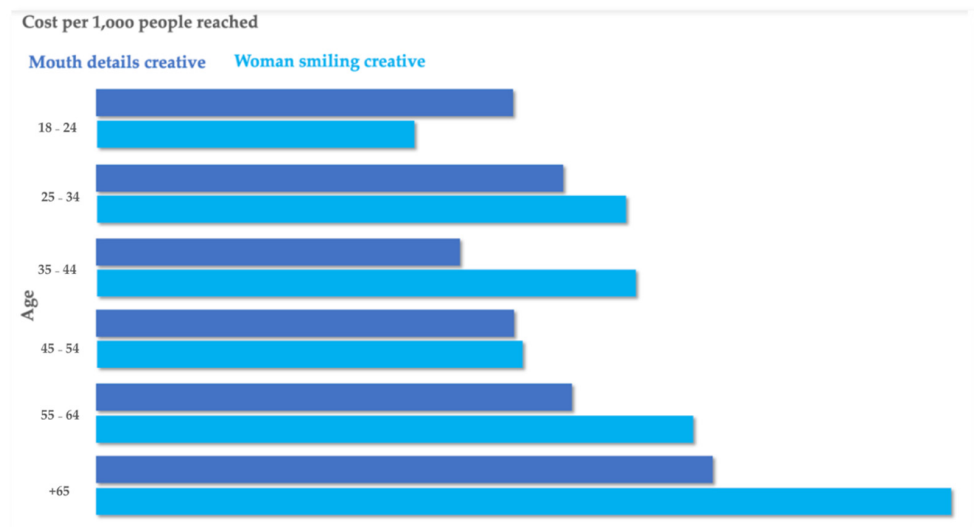
Cost per 1,000 people reached

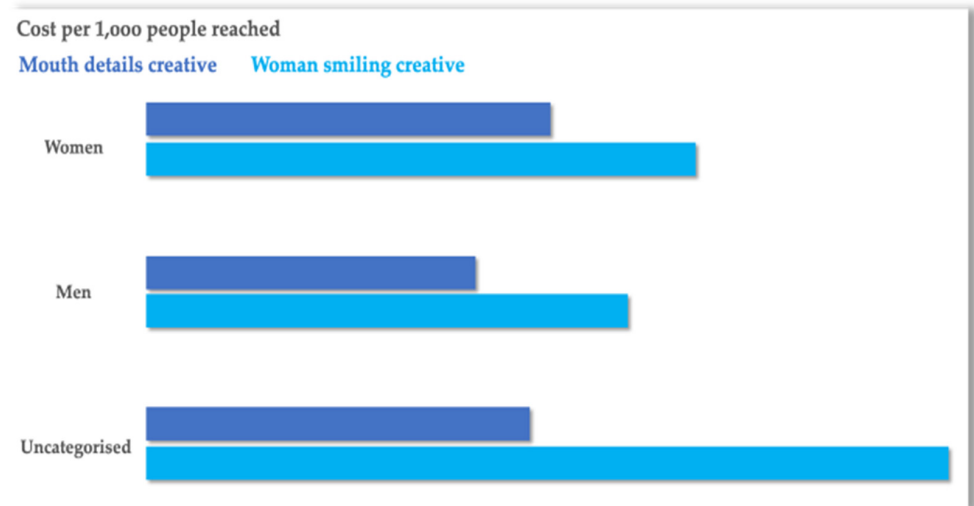**Mouth details creative**   **Woman smiling creative**

Age

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- +65

Figure 4. The cost per 1000 people reached by age.

Cost per 1,000 people reached

Mouth details creative   **Woman smiling creative**

- Women
- Men
- Uncategorised

Figure 5. The cost per 1000 people reached by gender.

CPC (Cost per link click)

Mouth details creative   **Woman smiling creative**
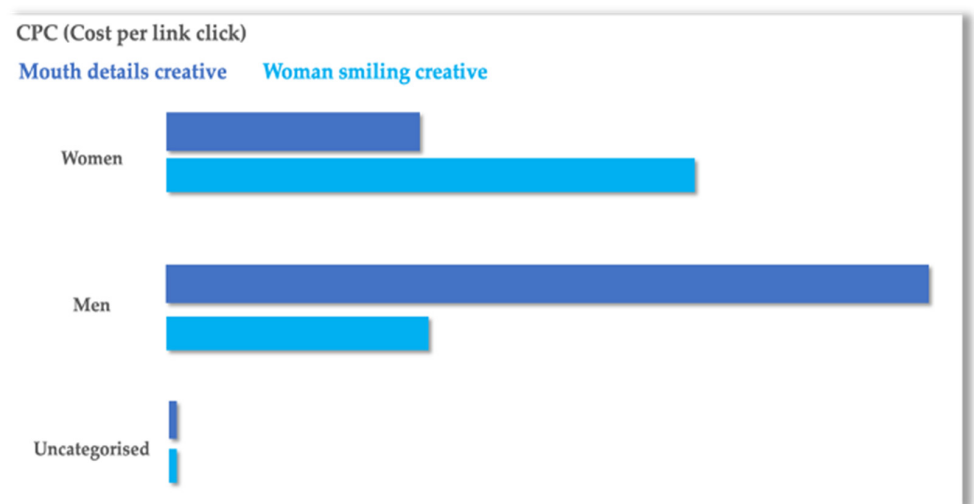
- Women
- Men
- Uncategorised

Figure 6. Cost per link click by gender.

Even so, after running the FBST, the winning ad set with the lowest CPC was the one that contained the creative component with mouth details, at $ x.17. Version B, in which the woman is smiling, spent $ x.22 per link click.

The results were obtained based on a 7-day attribution window. This setting is assumed from a finite period during which conversions are credited to the ads. All A/B tests use a 7-day click window, and the results are validated by Ads Manager technology, even though the split test ended earlier than the set period due to the Facebook algorithm that 'decided' the winner before the schedule.

Other metrics also confirm the performance of Version A of the campaign. The frequency for the ad set with mouth details is close to the ideal value, one (1.65), while the ad set with the women smiling is further away (2.02). The risk of redundancy and annoying the users is quite present in the case of version B.

The unique link clicks are more numerous in version A (61%) than version B (38%), with the first one reaching 62% of all people reached.

The woman smiling campaign shows a lower cost per 1000 people reached for the age range of 18–24 than the age range of 35–44 for the mouth details campaign. This result prompts a question, taking into account the performance for the second one. Therefore, to deepen this study, the second experiment was conducted. It consisted of the eye-tracking test, to discover the behaviour's particularities regarding the users, whose results are presented in the next subsection.

4.2. Eye-Tracking Experiment Results

After recording the eye movement while displaying the images, a heatmap for each participant was created using four colours, depending on their frequency (from red for very common, to yellow, green and blue for rare frequencies).

In order to obtain the global results, the data of all 30 heatmaps made for all of the participants in the experiment were superimposed. For the results by categories (gender or age), active filters were used before overlapping the individual images of the selected participants.

In order to test for bias, we used the following method: the data obtained from GazeRecorder was split based on the two images, and for each one we used Harman's single factor test based on Principal Axis Factoring with no rotation. The values obtained for the explained variance (5.012% for the first image, 21.209% for the second image, and 13.041% for the whole sample without splitting) was well below the 50% variance explained recommended threshold, which allows us to say that there is no bias in our sample.

4.2.1. Global Results

For the global results, the data of all 30 heatmaps were superimposed, generating two global heatmaps (Figure 7).

After completing the experiment, two areas of interest could be identified in each image: in Image A, area 1—the professional utensil, and area 2—the logo; and in Image B, area 1—the mouth area, and area 2—the logo area (Figure 8).

As can be easily seen in Figure 9, and as is substantiated by the data analysis, in Image A, the most viewed area was the professional utensil, where the affected time was 4.81 s of the 10 s available, i.e., representing 49% of the time. The average time in which attention was paid to this area was 0.87 s from the display of the image, from which we can deduce a great interest in that content. It should be mentioned that the respective area represents the only area with technical content where the treatment procedure is displayed.

The second area of interest for Image A (Figure 10) was the logo area, viewed by 73% of the subjects, where the viewing time was very short, 1.24 s, i.e., 9% of the total time. The time elapsed from the beginning was quite long, i.e., 1.93 s.
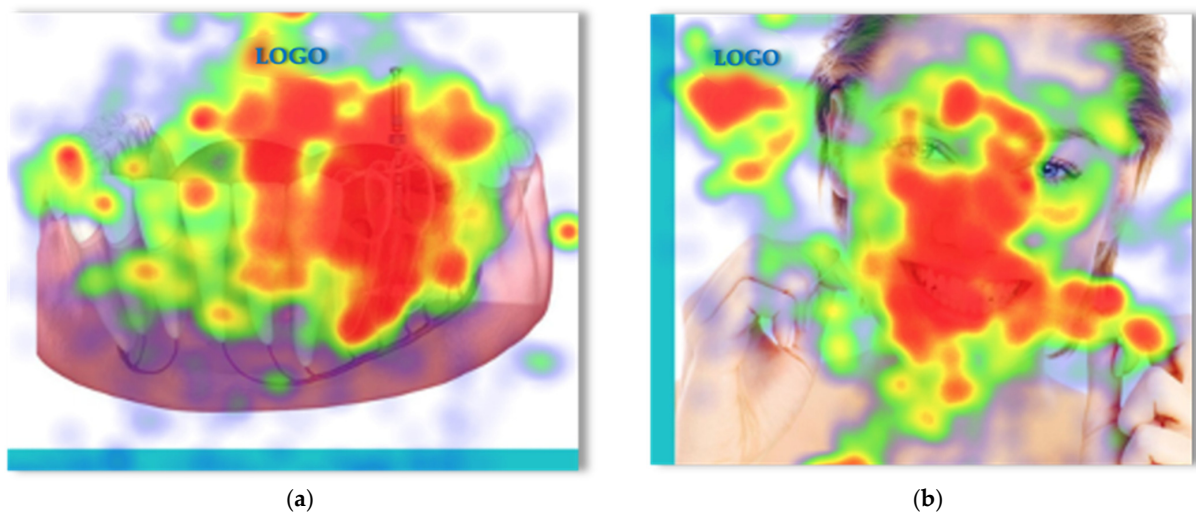
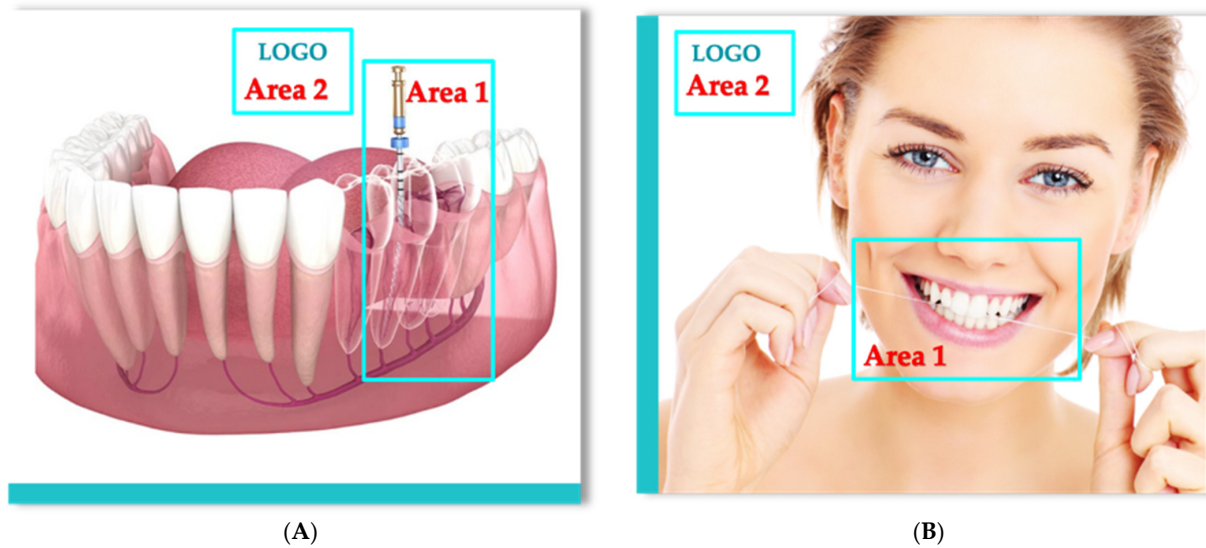**Figure 7.** Heatmap: cumulative data for all of the participants: (**a**) image A (mouth details); (**b**) image B (woman smiling).

Figure 8. Images (**A**) and (**B**) with the designation of areas of interest 1 and 2.

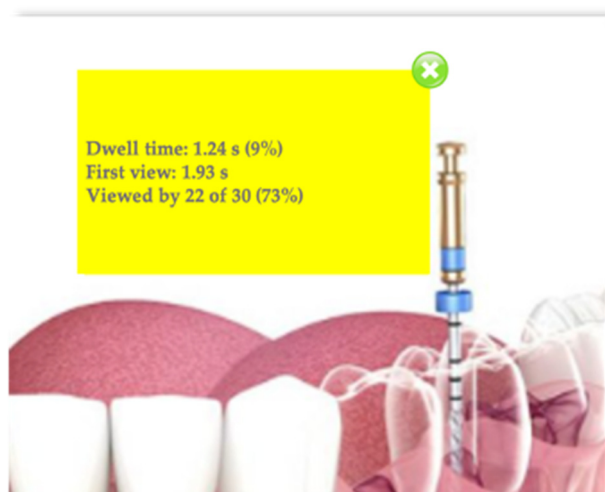**Figure 9.** Heatmap analysis: Image A—area 1.

Figure 10. Heatmap analysis: Image A—area 2.

Compared to area 1 (Figure 11), the second area of interest for Image B (Figure 12) was the logo, an area watched by 50% of the subjects. The viewing time was short, only 1.47 s, i.e., 7% of the total time, and the time elapsed after viewing from the beginning was quite long, i.e., 3.1 s.
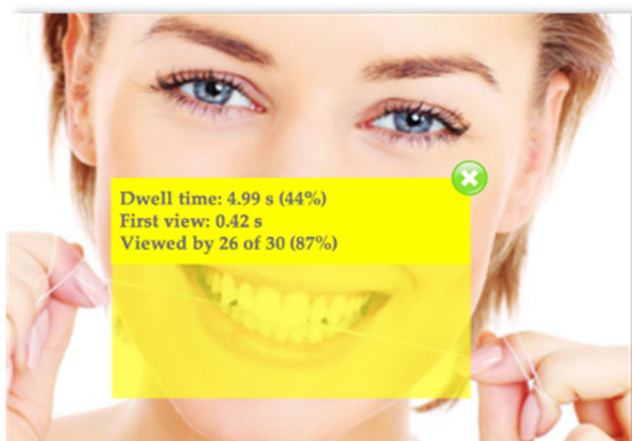

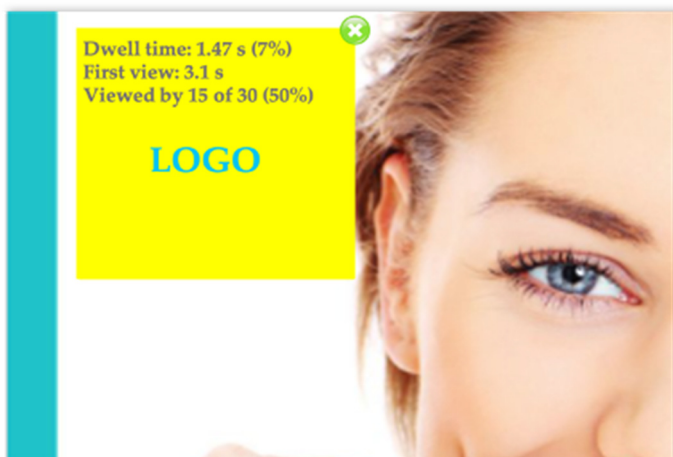**Figure 11.** Heatmap analysis: Image B—area 1.

Figure 12. Heatmap analysis: Image B—area 2.

4.2.2. Results by Gender and Age

The authors filtered the results according to these criteria, and globally; they noticed that in Image A, the area with the mouth details and utensil was viewed by 100% of the subjects (Table 3), compared to the mouth area in Image B, which was viewed only by 87% of the subjects (Table 4). At the brand level, we observed a big difference between the two images in the logo area. For Image A, the logo area was viewed by 73% of the participants, with a viewing time of 1.24 s, while in Image B, the logo area was viewed only by 50% of the participants, with a viewing time of 1.47 s.

Table 3. Gender analysis. Image A.

	Image A, Area 1			**Image A, Area 2**		
	Global	**Women**	**Men**	**Global**	**Women**	**Men**
Dwell time	4.81 s	4.55 s	5.09 s	1.24 s	1.06 s	1.42 s
First view	0.87 s	1.18 s	0.52 s	1.93 s	2.29	1.57 s
Viewed by	100%	100%	100%	73%	83%	63%

Table 4. Gender analysis. Image B.

	Image B, Area 1			**Image B, Area 2**		
	Global	**Women**	**Men**	**Global**	**Women**	**Men**
Dwell time	4.99 s	4.85 s	5.13 s	2.47 s	1.91	3.03 s
First view	0.42 s	0.49 s	0.35 s	3.1 s	2.63	3.57 s
Viewed by	87%	93%	81%	50%	64%	36%

Considering the gender, the authors noticed that in Image A (mouth details creative component) all of the participants—regardless of gender—viewed the area, while the logo area was viewed more by women (83%) than men (63%), although the average time to focus on this area was higher for women (2.29 s) compared to men (1.57 s) (Table 3). We noticed large differences in the logo area of both images, where women watched in a higher percentage (83% vs. 63% for Image A and 64% vs. 36% for Image B).

Concerning the age segments, large differences were highlighted in the case of viewing the logo: in Image A (mouth details creative), this area was viewed by 73% of those between 18 and 30 years old, compared to only 50% for people over 60 years old (Table 5).

Table 5. Age segments analysis. Image A.

	Image A, Area 1			**Image A, Area 2**		
	Global	**18–30 Years**	**Over 60 Years**	**Global**	**18–30 Years**	**Over 60 Years**
Dwell time	4.81	3.76 s	5.2 s	7.64 s	1.24 s	1.09 s
First view	0.87 s	0.92 s	0.83 s	0.8 s	1.93 s	1.26 s
Viewed by	100%	100%	100%	100%	73%	80%

This is also true for Image B, where the logo area was viewed by 60% of those between 18 and 30 years old, compared to only 25% for people over 60 years old (Table 6).

Table 6. Age segments analysis. Image B.

	Image B, Area 1			**Image B, Area 2**		
	Global	**18–30 Years**	**Over 60 Years**	**Global**	**18–30 Years**	**Over 60 Years**
Dwell time	4.99 s	4.85 s	3.53	6.59 s	1.47 s	0.46 s
First view	0.42 s	0.51 s	0.15	0.6 s	3.1 s	2.42 s
Viewed by	87%	87%	74%	100%	50%	60%

In order to establish a conclusion, the authors rely on a statistical test to find out if the difference is statistically significant. To do so, they performed a non-parametric test (a chi-square comparison regarding the time spent to watch the creatives).

The data analysis was performed comparing the proportion of users who watched the logo in each image and the afferent milliseconds spent watching them. According to Tables 3 and 4, the mouth details image attracted 73% of the participants, versus 50% attracted by the woman smiling image; the time spent watching the logo area was 1.24 s for the mouth details campaign and 1.47 s for the woman smiling image. The percentage and the time were inserted as columns in the crosstab, and the images as rows. To run the test, we used the application platform [142]. The chi-square with one degree of freedom confirmed a significant difference in the proportion, $\chi^2(1) = 8.7428$, $p < 0.05$, such that image A generated a higher click-through rate (2.33%) in the A/B split test compared to Image B (1.19%). The same type of test underlined the significant difference regarding the age (for both images and areas), and a significant difference concerning the gender for Image B. An extended explanation complements these outputs with the A/B split test results in the discussions section, where the authors argue the reasons why, for cost-effective campaigns, high personalization in terms of age, gender and creative type is imperative.

5. Discussion

The results of this study complement the studies of scientific literature in this field and empower business researchers to implement SMM growth strategies to attract users interested in dental services content. The specialists can drive them to conversion in a full potential sphere of activity using SMM and the findings of this research. Considering the pitfalls into which professionals might fall [109], the highly personalised marketing solutions for the conversion of users into patients can represent the key factor for dental clinics' growth. The significant role of the Facebook platform in the SMM strategy vigorously strengthens the necessity to align the advertisements with the highly requested need for personalization according to the user profile's characteristics.

Reflecting on this context, the authors aimed to enrich the literature by conducting two experiments that generated valuable opportunities for professionals. The scientific contribution of this study results from the originality of testing different elements of the creative components used in online dental campaigns to advance toward optimisation actions by offering a high level of personalization of dental Facebook ads to attract users and to prevent the risk of rejection.

Highlighting the intelligence, the responsibility, and the new behaviour of the modern consumer [84], this study meets the need for the customization of the delivered content to future patients according to some specific features. The authors desire to underline the term 'some' to make the reader aware that there possibly exist umpteen elements and factors that stimulate the reactions and the interest in a creative component, but with the present study they can cover a few of them, even representing notable contributions. Moreover, the pointed gap expressed by experts consolidates the significance of the study's results [104,105,115]. Personalizing the ads running within Facebook, customization can be achieved by adapting them to the user profile's characteristics. The authors thought that the creative components represent a good point to start from.

Taking into account other previous experiments [138], the deployed methodology encapsulated elements like the logo, an image with mouth details, the brand colour, or a human happy face. In the first stage, the A/B split test generated results that revealed a difference in terms of performance between two different creative components. The one that pictured mouth details and the procedure of the treatment performed better than the image that presented a woman smiling. In particular, a campaign that promotes the technical details and the process of the treatment is more cost-effective than a brand awareness campaign if it is targeted at men, rather than women. In order to realise the potential of a good brand awareness campaign in the dental industry, it must be shown to women with happy human faces. Aligning these results to other mentions of the experts [101], the best-performing ad (with mouth details) confirmed that a good creative component generates a better click-through rate, demonstrating creative development and creative effectiveness [102].

Women and men react differently, and the professionals must engage properly with them if they desire to attract, convert and build trust, and to develop long-term relationships. Gender is significant in the process of enhancing the consumer experience [90], and the age of all of the users that interact with the clinic's brand is, as well. For example, an important finding of the research concerns the age of users over 65. This target group has incurred significant costs, and the reason is not clear. The eye-tracking experiment showed a significant difference regarding both characteristics, and the chi-square test confirms the results. Women prefer human beings and the state of cheerfulness in the personalized ads; meanwhile, men enjoy the procedure of the treatment. These outputs encourage professionals to deploy SMM strategies to convert Facebook users from visitors, followers or fans into conversions by implementing custom solutions for each user profile's characteristics. By communicating in a manner adapted to the consumer behaviour regarding the services, the dental clinics will become more competitive in an increasingly growing environment [13].

Furthermore, given the benefits of social marketing and happiness management for increasing the competitiveness of a firm [57–59], customizing promotional content is more effective if it gives consumers feelings like happiness and well-being [60]. In this way, users are more attracted to the ads that make them feel good, making the social media marketing campaign more effective.

6. Conclusions and Proposals

The incontestable need for the customization of ads in a digital environment places the results of the present study on new heights. The need for increasing personalization is expressed in the field of the dental industry, too, and it demands that professionals deploy these opportunities. The optimisation of creative components based on the user profile's characteristics is the main proposal presented by the authors. Others were highlighted on the occasion of the results' presentation, in sections four and five. However, in order to be more specific, the authors shortly split them into two perspectives: the managerial and theoretical implications.

The managerial implications point to the involvement of the professionals in a transformational process in which the optimisation technique of the creative components is among the key factors to attract users. Firstly, analysing the audience, dental clinics' representatives have to aspire to highly personalized ads depending on the user profile's characteristics. They have to separately think of strategies focusing on women and men, but at the same time not ignoring their age, with each segment presenting different characteristics. If the marketing team set up an SMM campaign, it is more advantageous for brand awareness to target women and to show them a happy human face. If the target group is represented by men and the goal is to convert as soon as possible, technical details are preferred, with it being easier for them to understand the dental service in this manner, generating low costs with high-performance campaigns.

The theoretical implications consist in the opportunity for stakeholders to manage learning programs with which new and high-performance specialists can meet the demands of the professionals. Their advice and support for increasing the degree of customization will boost the performance and increase the level of digitalization of these types of businesses, thus contributing to the acceleration of the growth of the businesses.

The first limit of the study is the metrics estimated by Facebook. Based on the social network's technology, the sampling and modelling process provides directional insights for outcomes that are hard to precisely quantify and need to be completed by quantitative research for the extrapolation of the results. The second limit is running the experiments on a single dental clinic, not for more, which portrays the situation for a single case, not for the whole research population. The short period in which the A/B split test was scheduled is another limit for the study. The experiment was running only for seven days, which can distort, to a small extent, the accuracy of the results. More accurate results can be obtained if the period and budget are extended. Another limit is the low number of variables that

the authors took into consideration. For this study, the authors decided to analyse only the creative components, but the opportunities can be widely addressed if the researchers will take into consideration the placements, the audiences, or the budget in order to improve the effectiveness of the social media marketing campaigns.

Thus, future studies could explore more elements like the type of creative component, its placement, and the delivery for more accurate results. The audience can be extended and split into more ad sets so that researchers can cover more hypotheses. A regression equation can be formulated to discover the type of relationship between variables. Furthermore, quantitative research can be conducted to survey potential patients in order to find out what their expectations are when they meet Facebook ads. The final future research proposal is formulated based on hypothesis number four of this study, and it emerges from the research question "after all, is it viable that brand colours attract the audience in online marketing campaigns?" Neither of the two global heatmaps recorded any interest in the brand's colours (the lines on the images' edges). Otherwise, the same colours are found in the clinic's logo, which was represented as an area of interest. Why did no-one look at the coloured edges? This question can lead the authors to future research aiming to understand how the colours of the brand and its position in the images can influence the effectiveness of Facebook campaigns.

Appendix A

Table A1. The fact sheet of all of the participants.

# [Participant No]	Gender	Age	GazeCloud Session
# 0	Male	41	Thursday, 24 June 2021 15:43:22 GMT
# 1	Male	20	Thursday, 24 June 2021 15:41:03 GMT
# 2	Male	20	Thursday, 24 June 2021 15:38:40 GMT
# 3	Female	20	Thursday, 24 June 2021 15:36:48 GMT
# 4	Female	20	Thursday, 24 June 2021 15:35:00 GMT
# 5	Male	20	Thursday, 24 June 2021 15:33:15 GMT
# 6	Female	20	Thursday, 24 June 2021 15:31:14 GMT
# 7	Male	19	Thursday, 24 June 2021 15:29:25 GMT
# 8	Female	20	Monday, 21 June 2021 07:35:08 GMT
# 9	Female	54	Sunday, 20 June 2021 17:28:20 GMT
# 10	Female	54	Sunday, 20 June 2021 17:24:29 GMT
# 11	Female	20	Friday, 18 June 2021 17:54:58 GMT
# 12	Female	20	Friday, 18 June 2021 08:41:42 GMT
# 13	Male	20	Friday, 18 June 2021 08:02:18 GMT

Table A1. *Cont.*

# [Participant No]	Gender	Age	GazeCloud Session
# 14	Male	22	Friday, 18 June 2021 08:00:16 GMT
# 15	Female	19	Friday, 18 June 2021 07:58:09 GMT
# 16	Female	19	Friday, 18 June 2021 07:55:59 GMT
# 17	Male	67	Friday, 18 June 2021 07:52:42 GMT
# 18	Male	42	Friday, 18 June 2021 07:48:21 GMT
# 19	Female	44	Friday, 18 June 2021 07:01:25 GMT
# 20	Male	40	Friday, 18 June 2021 06:56:26 GMT
# 21	Male	37	Friday, 18 June 2021 06:49:57 GMT
# 22	Male	52	Friday, 18 June 2021 06:47:24 GMT
# 23	Male	62	Friday, 18 June 2021 05:59:54 GMT
# 24	Female	58	Friday, 18 June 2021 05:57:25 GMT
# 25	Female	24	Friday, 18 June 2021 05:54:42 GMT
# 26	Female	62	Friday, 18 June 2021 05:52:26 GMT
# 27	Female	63	Friday, 18 June 2021 05:50:02 GMT
# 28	Male	40	Friday, 18 June 2021 05:45:17 GMT
# 29	Female	42	Friday, 18 June 2021 05:31:16 GMT

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