

Research Proposal – Master thesis

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Examining the Information Processing of Green Social Media Advertisements by Comparing Informational and Emotional Language

Supervisor: Ruud Wetzels

Second assessor: Handan Sen

Radboud University Nijmegen

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Abstract

Purpose – Understanding how consumers process green social media advertisements provides critical insights in order to create authentic advertisements that successfully affect the consumer's purchase intention. However, research on this information processing is scarce and did not receive the needed attention yet. The current study, therefore, aims to identify drivers and outcomes of a consumer's information processing in the context of green social media advertisements.

Design/methodology/approach – In an experimental lab study, emotional and informative advertisement language was represented in a short social media advertisement concerning the sustainability of the brand Nike. Moreover, participants were wearing an eye-tracking headset which is used to monitor eye movement and subsequently provide insights into the visual (fixation duration) and cognitive processing (pupil size). The sample of 68 Dutch university students provided data concerning their information processing, goal relevance, perceived advertisement authenticity, and purchase intention. The data was examined with a PLS-SEM analysis and the SmartPLS 4 software.

Findings – Advertisement language influences perceived advertisement authenticity. The use of emotional language leads to increased perceived advertisement authenticity. The control variable brand familiarity showed significant positive effects on the perceived advertisement authenticity and the intention to purchase environmentally sustainable products.

Research limitations/implications – Despite critical limitations that need to be considered, the research contributes to the literature on green social media marketing. Specifically, the findings advance the understanding of underlying information processes in the context of green marketing activities.

Practical implications – Comparing the effectiveness of informative and emotional advertisement languages provides direct managerial insights concerning effective marketing techniques for sustainable brands.

Keywords: Sustainability, Eye-tracking, Advertisement language, Goal relevance, Green marketing

Table of contents

Abstract	2
Table of contents	3
Introduction.....	5
Practical need	6
Theoretical need	8
Research objective.....	9
Relevance.....	10
Outline	11
Theoretical background.....	11
Green social media marketing	11
Advertisement effectiveness	12
Information processing	12
Hypotheses development.....	14
Components of information processing.....	14
Drivers of information processing	17
Outcomes of information processing	22
Conceptual model and hypotheses.....	24
Methodology.....	25
Research design.....	25
Procedure	27
Participants	27
Measurements	29
Data analysis.....	32
Research ethics	32
Results	32
Data preparation.....	33
Assessment of measurement model.....	33
Assessment of structural model	34
Structural model and results.....	37
Discussion	37
Conclusion	38
Theoretical implications.....	40
Managerial implications.....	42
Limitations	43

Future research	44
References.....	45
Appendix A.....	56
Appendix B.....	57
Appendix C.....	59
Appendix D.....	61
Appendix E.....	62
Appendix F	63
Appendix G	64
Appendix H	67

Due to environmental degradation, resource depletion, globally escalating temperatures, and other extreme weather events, society's environmental awareness significantly increased in recent years (Dong et al., 2020). Such events enhanced the environmental concern of society and served as indications that it is evident to mitigate the challenges that our planet is confronted with by transitioning to a more sustainable future (Wang et al., 2020). To face these challenges people adapted their day-to-day lives and started to look for more sustainable alternatives (Han, 2021). Starting from which breakfast a consumer chooses, to the transportation to their work, a lot of activities could be ultimately linked to making a more or less sustainable choice of living. As a response to the rising environmental concerns, the topic of green marketing emerged as a vital approach aiming to address environmental issues while satisfying consumer demands for sustainable products and services (Sustainability and the consumer, 2022). Green marketing specifically defines any kind of advertisement that includes or implies any environmental benefit of the product, brand, or organization advertising (Polonsky, 1994). Therefore, they are specific advertisements that promote environmental sustainability which an individual's actions aimed to conserve natural resources, mitigating environmental harm, fulfilling the green demands of society, and improving the person's life quality (Dong et al., 2020).

As sustainability assumed a progressively paramount role in the communication of brands' offerings, social media platforms revolutionized the manner in which individuals connect and engage with one another. The transformative impact of social media is nowadays reflected within several business domains, with the marketing domain being particularly affected. While almost every brand uses social media to increase its brand awareness and to communicate its offerings, social media activities inevitably represent an integral component of each business that even presents an opportunity to gain a competitive advantage within the market (Lamberton & Stephen, 2016).

Based on this development, the convergence of green marketing and social media presents a unique opportunity to amplify environmental messages, engage a wider audience, and drive sustainable change. By leveraging the reach and interactivity of social media platforms, businesses can effectively communicate their commitment to sustainability, educate consumers about eco-friendly choices, and foster a sense of environmental responsibility.

Practical need

The surge of social media marketing activities was already recognizable approximately 10 years ago. Studies showed that almost two-thirds of large companies made use of blogs or social media platforms in order to advertise their offerings (Reilly & Hynan, 2014). Moreover, smaller businesses demonstrated an even higher propensity for employing social media advertisements due to their high effectiveness, considering the low cost and high potential to reach consumers around the world (Reilly & Hynan, 2014). Moreover, many companies recognized the importance that green marketing activities reached in recent years and aimed to apply these activities to improve their position in the market and to appeal to sustainably conscious consumers (Szabo & Webster, 2021). Indications for this change were already identified several years ago when a study showed that 82% of examined firms reported that they are planning to increase the investment of financial resources towards green marketing activities. Additionally, 74% of these companies also reported that they plan to primarily use the Internet for these green marketing activities (Minton et al., 2012). Continuing on the same notion, studies found evidence that sustainable companies have been shown to be more active on social media platforms and therefore maintain a stronger online corporate presence, compared to non-sustainable brands (Reilly & Hynan, 2014). The combination of these findings concerning sustainable brands and the increasing social media presence suggests that sustainable companies are particularly adept at harnessing the high potential of social media platforms and capitalizing on the emerging importance of green marketing.

However, simultaneously with the increase of sustainable offerings, one key issue was quickly noticeable for any consumer - differentiating the sustainable from the non-sustainable products. The main challenge in this is that the consumer's perception of the product completely depends on the information that is presented by the company. In other words, companies need to carefully and effectively make use of their green marketing activities in order to convince the consumer of the sustainability of their product. Moreover, this also emphasizes that green marketing is not only important for a consumer but also for the company, since it needs to convince the consumer of the products' sustainable features. In the context of sustainable marketing, this implies that consumers need to recognize the quality and sustainability of the product after watching the green advertisement. Especially within this topic, it is critical to convince the consumer that the product is actually sustainable and therefore satisfying their needs. More importantly, if a company fails to convince the consumer of the sustainability of its product within the advertisements, it might even appear uninteresting to the consumer and conclusively not even be considered within the customer decision process (Christopher, 1996).

This implies that a company could have a perfectly sustainable and high-quality product that fully satisfies the needs of its target consumer group, but if these characteristics are not successfully communicated within its green marketing, the company's product will not be perceived in the intended way and will not benefit the company's future success, as it could have (Graf & Maas, 2008).

Even though these findings offer strong evidence that green marketing activities provide the opportunity for a company to introduce and convince consumers of their sustainable products, the actual implementation is more complex than that. This is mainly due to the reason that not every green social media advertisement is equally effective in changing the consumer's perception and convincing them of its sustainable features (Connors et al., 2021). However, while the consumer's perception is a critical aspect of advertising, the differing effectiveness does not end there, but instead is even reflected in other business-related outcomes such as the purchase intention (Chan, 2000; Chen & Chiu, 2016; Tellis et al., 2019). One finding that might serve as an explanation for the differing effectiveness is that advertisements are often assumed to have persuasive intentions (Fransen et al., 2015). This general aversion could therefore significantly reduce the amount of information that is processed by the consumer. This processing of the information is however vital to convince the consumer and highlight the sustainable nature of a sustainable brand and is therefore a critical aspect of green marketing activities.

Additionally, while advertisements need to overcome the assumption of being persuasive, they are also often categorized as unauthentic, which adds even more complexity to the challenge (Becker et al., 2019). The phenomenon of advertisement authenticity has been repeatedly introduced by previous studies and has been shown to be a critical component for companies, especially in green marketing, in order to effectively influence the consumer's perceptions and convince them of its sustainable characteristics (Becker et al., 2019; Pittman et al., 2022). Subsequently, the consumer's perception plays a crucial role concerning the aversion towards the presented advertisement, as well as the overall perceived advertisement authenticity. This highlights that in order to overcome the challenges that effective green social media advertisements are confronted with, it is a necessity to understand how a consumer processes these advertisements and even more important how they process the information included in them. These insights could then be used to create effective green social media advertisements that can overcome general aversion and simultaneously appear authentic to the consumer. However, despite the importance of these insights for companies aiming to promote sustainable products through social media advertisements, research in this area is still relatively

scarce, and the domain of information processing in green social media marketing did not receive the necessary attention yet. Nevertheless, increasing the knowledge concerning this information processing is crucial for minimizing consumer resistance, enhancing consumer information processing, and ultimately maximizing the effectiveness of green advertisements within the context of social media.

Theoretical need

The existing literature in the green marketing field has predominantly focused on the design aspects of these advertisements overlooking how the information is processed. Previous studies examined aspects such as layout color, type of benefit promoted, and the product heritage, to identify which aspects result in a higher purchase intention (Visser et al., 2015). Additionally, various studies have investigated the use of language in sustainable advertisements, distinguishing between emotional and informational language as the primary types (Chan, 2000; Connors et al., 2021; Rayner et al., 2001). However, even though these two language types have been identified multiple decades ago, researchers found several contradicting findings concerning their effectiveness. While several studies concluded that informative content is more effective within an advertisement (Chan, 2000; Connors et al., 2021), some studies identified emotional content as more influential (Chen & Chiu, 2016; Tellis et al., 2019). Furthermore, the impact of these advertisement languages on perceived authenticity and consumer information processing has not been thoroughly examined in previous research. This research gap underscores the need for a comprehensive understanding of how consumers process sustainable advertisements within the context of green social media marketing. Such understanding is crucial for determining the most effective advertisement language and comprehending its underlying effects in order to overcome the consumer's avoidance.

Previous research provides evidence that general information processing takes place through two primary processing streams which are identified in the elaboration likelihood model (ELM) and are referred to as central and peripheral streams (Petty et al., 1983). While the central stream requires more cognitive effort and actively evaluates information, the peripheral stream simply relies on cues and heuristics. This could therefore also further explain the previously discussed findings concerning emotional and informative language. More specifically, the informational language can be assumed to be processed within the central route due to the evaluations of arguments (Petty et al., 1983). Contrary to emotional language, which

could be assumed to be processed through the peripheral route since it relies on cues and other heuristics that can be evoked through this type of advertisement language.

However, if the information processing is assumed to be based on the ELM model, there are additional factors that potentially influence this processing which are yet to be examined in green social media marketing. Primarily goal relevance is a critical aspect of the model that has been shown to affect information processing (Bermeitinger et al., 2009; Karremans et al., 2006). While the goal relevance of a consumer can be linked to the willingness to sacrifice cognitive effort and therefore directly affects the chosen information processing stream, this has not received sufficient academic attention yet and research is limited. This emphasizes again that research on the topic of information processing of green marketing advertisements requires more research to comprehend consumer processes.

Conclusively, it is of high practical but also theoretical relevance to examine the underlying research problem which is the lack of understanding of how information in green social media advertisements is processed. This is crucial in order to design an advertisement that overcomes the aversion and is perceived as authentic, resulting in an increased purchase intention of the advertised product (Becker et al., 2019; Pittman et al., 2022).

Research objective

To address these research gaps, the current study examines the following research question: what are drivers and outcomes of a consumer's information processing within the context of green social media advertisements? To answer this question the current study aims to improve the holistic understanding that was described earlier by comparing the effects of the two previously introduced advertisement languages, informational and emotional language. This comparison aims to identify differences in consumer information processing which deliver critical insights concerning the consumer's perception and the subsequent purchase intention of the advertised sustainable products. In order to analyze this information processing, the current research will measure the visual and cognitive information processing of the consumer. Several previous studies found evidence that the visual system e.g., eye movement or pupil dilation, can be linked to how the presented information is processed (Connor et al., 2004; Kardes et al., 2004; Rayner et al., 1983). Therefore, this provides the opportunity to examine how the different language types are processed by the consumer. Moreover, the participant's goal relevance will be examined and serves as an indicator of the relationship towards the topic of sustainability. The importance of the consumer's goal relevance is derived based on the ELM

model (Petty et al., 1983) and has been repeatedly shown to affect how and if a consumer processes the presented information which could potentially explain differences between consumer groups.

Conclusively, the methodological approach of this study utilizes an experimental setting to examine consumers' information processing of green social media advertisements by comparing the two commonly used advertisement languages. Moreover, the information processing is examined using an eye tracker which monitors the participant's eye movement. Additionally, a survey will provide data concerning the consumer's goal relevance, perception of the advertisement, and purchase intention. Furthermore, the current study will focus on students as a target group since previous research has indicated that students, and young consumers in general, are valuable stakeholders to keep in mind to develop successful green marketing approaches (Hume, 2010; Johnstone & Hooper, 2016; McDonald et al., 2012). Conclusively, students and young adolescents are a critical target group for sustainable offerings and are important to examine within this field.

Relevance

The current study provides valuable contributions to existing literature on green social media marketing. First, it addresses the practical and theoretical relevance of the research problem, by providing insights into the underlying reasons for the contradicting findings related to the advertisement language used in green marketing advertisements. In order to achieve this, the study focuses on examining how consumers process information in green marketing advertisements, thereby directly contributing to the field and enhancing the theoretical understanding of the topic. Second, this study increases knowledge in the domain of green marketing, by examining the impact of a consumer's goal relevance on the previously described information processing. By considering this factor, the research provides further insights into green marketing and the effectiveness of different advertisement languages. Third, the findings of this study provide direct implications for managers who aim to effectively communicate their sustainable offerings. Through a comparison and analysis of the two most commonly used advertisement language types and an examination of how consumers perceive and process them, brands can utilize these insights to create future green marketing campaigns that effectively overcome the consumer's aversion. Lastly, the improved communication of sustainable offerings resulting from this research benefits society as a whole. It increases

transparency, making it easier for consumers to identify products that meet their requirements in terms of sustainability, thus contributing to a more environmentally conscious society.

Outline

In the following paper, the theoretical background of the above-introduced constructs will be explained in more detail. For each of the constructs, the most important existing literature will be discussed to provide a solid knowledge base for the examination of the current research question. Additionally, each of the constructs will be explained in the context of the current research and then the hypotheses for the present study will be stated. After the theoretical background, the methodology will be explained including the participants, material, procedure, and the planned data analysis.

Theoretical background

Green social media marketing

The topic of green social media marketing entails the strategic use of online social media platforms to promote and advertise sustainable offerings. This combination has gained significant traction in today's marketing landscape, primarily driven by the exponential increase in social media users and the growing importance of sustainability in contemporary society (Han, 2021). Notably, younger consumer groups have emerged as key targets for green marketing initiatives, as they not only exhibit greater openness towards sustainable products but also tend to be avid users of social media platforms, such as Instagram (Kumar et al., 2021; Ottman et al., 2006).

The rise of green social media marketing can be attributed to several factors. Firstly, the proliferation of social media platforms has provided brands with unparalleled opportunities to reach and engage with a broad audience. With billions of users actively participating in social media communities, these platforms serve as ideal channels to disseminate information about sustainable products and initiatives (Kumar et al., 2021; Ottman et al., 2006). Moreover, the increasing societal emphasis on sustainability has heightened consumer awareness and demand for environmentally responsible choices. As sustainability has become a more integral part of consumers' value systems, businesses recognize the need to align their marketing efforts accordingly (Han, 2021).

In response to these changing dynamics, green marketing has evolved into a crucial aspect for companies seeking to gain a competitive advantage in the marketplace (Lamberton

& Stephen, 2016). By adopting sustainable practices and effectively communicating their environmental initiatives through social media, brands can not only attract new consumer segments but also maintain the loyalty of existing customers. Furthermore, as sustainability has emerged as one of the primary value drivers in today's economy, integrating green marketing strategies has become imperative for companies aiming to tap into new markets and stay relevant in an increasingly conscious consumer landscape (Global Sustainability Study, 2021).

Advertisement effectiveness

Despite the shift towards a more sustainable economy and the increasing adoption of green marketing activities by companies (Reilly & Hynan, 2014), creating an impactful green social media advertisement remains a challenge. One of the primary hurdles is persuading consumers about the sustainable features of a product and overcoming their skepticism, which is essential for the success of green advertisements (Reilly & Hynan, 2014). Additionally, since many companies neglected the topic of sustainability, consumers often exhibit even stronger resistance and may perceive green marketing activities as unauthentic, greatly diminishing the effectiveness of these advertisements (Becker et al., 2019; Pittman et al., 2022). Therefore, for sustainable companies specifically, it is imperative to not only prioritize sustainability but also possess the ability to effectively communicate it to consumers.

To address this challenge and determine how sustainable companies should engage their target consumer groups, it becomes vital to analyze how consumers process information related to sustainability. Consequently, examining the key elements that should be incorporated into green social media marketing efforts to effectively communicate a company's sustainability becomes imperative.

Information processing

Despite the increasing adoption of sustainable practices by a growing number of companies, simply recognizing the importance of a topic alone does not offer insights into the strategies needed to convince consumers in the target group about the sustainability of a company's products. One previously introduced essential model in the domain of information processing is the ELM. This model recognized two distinct streams of information processing: central and peripheral (Petty et al., 1983). Broadly speaking, central processing involves active evaluation of presented information, leading to enduring changes in consumer attitudes. On the other hand, peripheral processing relies on cues and heuristics, requiring less cognitive effort

but yielding a limited impact on consumer attitudes. These insights suggest that consumers are more likely to engage in central processing when the elaboration likelihood is high, while peripheral processing is employed when the likelihood is low. Thus, this model elucidates how green social media marketing activities may affect consumers through these two distinct information processing streams. However, the utilization of either stream depends heavily on the available cognitive resources and the consumer's motivation to sacrifice them (Petty et al., 1983). Consequently, the concept of goal relevance emerges, which generally refers to the extent to which the outcome of a situation aligns with a consumer's current goals (Gorayska & Lindsay, 1993).

This goal relevance has been shown to affect the consumer's willingness to spend cognitive resources and the motivation to process presented information within advertisements (Hung et al., 2017). This indicates that consumers that perceive the content as relevant to their needs and goals are more inclined to process information. Applying these insights to the two information processing streams introduced by the ELM model, it could be argued that consumers are more likely to process information from green social media advertisements through the central stream if they have a higher goal relevance to the topic since they are more motivated to actively evaluate the presented information and spend the cognitive resources. Contrary to consumers that process information through the peripheral stream where it could be argued that they have lower goal relevance and therefore are less likely to spend cognitive resources to evaluate the information.

However, while this provides strong evidence that the consumer's motivation to process the presented information is a vital element, it is important to highlight that this is not the only determinant for information processing. The MOA model further highlights that there are three key aspects that a person should have: motivation, ability, and opportunity (MOA) (MacInnis & Jaworski, 1989). These three factors have been shown to determine if a person processes the information, and if so, to which degree. This degree of information processing can generally be categorized into six domains based on the framework by MacInnis and Jaworski (1989). These domains start with the lowest level of information processing, which is the analysis of features, this is followed by the next levels which are the basic categorization, meaning analysis, information integration, role-taking, and finally the constructive processes. These six levels, therefore, represent a spectrum to what extent a consumer processes the information that is presented to him.

Furthermore, it is worth noting that the information processing of consumers encompasses a sequence of distinct segments. The three main segments that are discussed in existing

literature are sensation, perception, and cognition (Hopfinger & Mangun, 2001; Humes, 2015; Salillas et al., 2008). The sensation describes a situation in which a stimulus reaches the receptor cells of a person's sensory organs (Krishna, 2012). These sensations, therefore, include e.g. haptics, taste, or vision of a consumer. The processing of these sensations and the information resulting from them can then be referred to as sensory information processing. The actual awareness of these sensations is then considered perception. After the perception, the information is further transmitted within higher-order cognitive processes which then affect e.g., the consumer's behavior, memory, or attitude (Krishna, 2012). Conclusively, two main information processing types take place sequentially, which is first sensory information processing, followed by cognitive information processing.

Hypotheses development

Components of information processing

Sensory/Visual processing

As briefly introduced in the preceding sections, sensory information processing describes processing the input received by the receptor cells of a consumer's body organ. However, within human behavior, there is one sense that is dominant in comparison to the others, which is vision (Krishna, 2012). Given its significance and reliance, the ability to focus visual attention on key elements in the environment becomes crucial. This is considered selective visual attention and describes the process where consumers do not focus on every cue that is presented within their visual field, but selectively direct their visual attention toward certain aspects (Connor et al., 2004; Kardes et al., 2004). These insights hold particular importance in the context of green marketing, suggesting that the mere inclusion of sustainable information in an advertisement does not guarantee the consumer's visual attention and subsequent information processing. Therefore, companies need to ensure that the displayed content, and especially the features that are aimed to convince the consumer, effectively attract visual attention.

Moreover, such visual attention processes are also found to be intertwined with the consumer's perception and enable the identification and processing of relevant information (Connor et al., 2004; Kardes et al., 2004). Consequently, objects that capture the visual attention of the consumer are shown to guide the following gaze behavior of that person. This process can be observed, for instance, while reading. Previous literature found that while sentences, that include the description of objects that are within the visual context of a person, are revealed, the eyes automatically focus on these objects. Therefore, visual attention guides

the movement of the eyes and even makes a connection between the word in the sentence and the object that is displayed (Cooper, 1974; Tanenhaus et al., 1995). The oculomotor readiness hypothesis supports this notion, suggesting that the movement of visual attention, fixations, and saccades are influenced by the same neural circuitry (Klein, 1980; Rizzolatti et al., 1987). In this context, fixation takes place when consumers focus on a specific point within their environment e.g., to read a text within the advertisement. Moreover, saccades involve shifts from one fixation point to another and can be further categorized as either progressive or regressive. While progression describes the movement from a fixation in the current interest area to a fixation in a later interest area, regressions describe when there is a shift from a fixation in the current interest area to a fixation in an earlier interest area (Klein, 1980; Rizzolatti et al., 1987). Hence, it becomes evident that these visual information processes such as selective visual attention are linked to a consumer's eye movement. However, it is not solely visual information processing that is linked to eye movement but also cognitive information processing.

Cognitive processing

This cognitive information processing can be divided into two primary processing streams which have been introduced within the previously mentioned ELM model by Petty et al. (1983). The cognitive processing of the consumer, based on this model, takes place within the central and peripheral processing stream. The main premise of this model is that if there is a high elaboration likelihood, the information will be processed through the central route. Based on this framework, the central processing route forms attitudes based on an extensive evaluation of the arguments presented within the message. These attitudes, however, are also shown to be persistent over time and are also linked to the subsequent behavior of the consumer (Haugtvedt & Petty, 1989; Petty et al., 1983). Conversely, if the elaboration likelihood is low, the information will be further processed through the peripheral route. Additionally, the information processed with the peripheral route relies on heuristics or other cues instead of factual information. Even though this route requires significantly less cognitive effort, the attitude is also only temporary. Moreover, this attitude is also unaffected by the quality of the arguments inside the presented message (Petty et al., 1983) which significantly reduces the effect of informational content. Applying these insights to green marketing activities, it would mean that there are two outcomes depending on the available cognitive resources of the consumer. First, the presented information concerning sustainability would be processed through the central route which, even though it requires more cognitive processing, is reflected

in a persistent attitude change. This would be beneficial for the company due to an active evaluation process of the presented sustainability content. Second, the information would be processed through the peripheral route which does not result in an active evaluation of the sustainable information and therefore there is no persistent attitude change of the consumer.

How a consumer processes the presented information and whether the central or peripheral route is used, represents therefore a critical aspect of the effectiveness of an advertisement. Based on this, researchers examined several measurements of cognitive information processing and found evidence that pupil dilation of a consumer can be connected to the cognitive effort that is spent when information is processed. This was found when participants were exposed to either automatic or cognitive processes in a study by Querino et al. (2015). This study concluded that the cognitive processes required more cognitive effort from the participant than the automatic processes. They were able to prove that this is due to the increased pupil dilation during the cognitive processes. Moreover, they even concluded that pupil dilation as well as the cognitive effort of the consumer can differentiate between automatic and cognitive processes. This measurement of the pupil's reaction is also referred to as pupillometry. Furthermore, the before mentioned findings are in line with other studies that also found that pupil dilation and the cognitive effort that is required are higher for information reappraisal processes (Strauss et al., 2016; Urry et al., 2006; van Reekum et al., 2007). Additionally, a study explicitly linked a consumer's fixations with the presented content to information processing fluency. The findings again highlighted that a higher number of fixations and longer durations of fixations are reflected in more difficulties with information processing (Mishra et al., 2013). Therefore, this provides direct evidence that visual information processing is linked to cognitive information processing. More specifically, consumers using the central cognitive information processing route, which is associated with more cognitive effort, can therefore be assumed to have more pupil dilation, a greater number of fixations, and longer durations of these fixations. These insights can therefore also be applied to the sequential information processing model that was discussed in preceding sections and introduced by previous literature (Hopfinger & Mangun, 2001; Humes, 2015; Salillas et al., 2008). Here, the first segment, which is the sensory, and in this context, the visual information processing, can therefore be linked to the number of fixations on the presented advertisement. Moreover, this visual information processing directly affects the second segment, which is the cognitive information processing of the consumer, and which is linked to the consumer's pupil dilation. Based on these insights the following hypothesis is proposed:

H1: A higher amount of visual processing leads to an increase in cognitive processing of a consumer within green social media advertisements

Drivers of information processing

Based on the sections above, there is clear evidence in the existing literature that a consumer's level of information processing is influenced by several different factors. Previous literature identified that these factors can be categorized into one of two groups, the bottom-up and the top-down factors (Pieters & Wedel, 2004). The bottom-up factors describe stimuli that are designed to grab the attention of the consumer. Especially within social media advertisements the visual stimuli are responsible to evoke the interest of the viewer and attract visual attention, therefore, representing a bottom-up factor (Pieters et al., 2010). Therefore, the words and the type of language used within an advertisement are capable of, and even responsible for, capturing the viewers' attention.

Top-down on the contrary are factors that are under the control of the consumer e.g., by being based upon personal beliefs or interests. These factors, therefore, include for example the motivation of the consumer and are also responsible for the focus of selective visual attention (Pieters & Wedel, 2004). Both of these types of factors, top-down and bottom-up, are therefore directly involved in the visual and cognitive information processes.

Bottom-Up factors

Advertisement language. One bottom-up factor that has been repeatedly shown to be influential within the context of information processing, is the advertisement language used. As briefly introduced before, based on previous literature two main language types were identified to affect the consumer the most, being informative and emotional language (MacInnis & Jaworski, 1989). These language types are also reflected within the integrative model introduced by MacInnis and Jaworski (1989) which identified an informational and an emotional pathway through which advertisements affect consumers. More precisely, the emotional pathway in this model describes the process of evoking an emotional response to a presented message through the use of emotional content within that message (Lee & Hong, 2016). Emotions can be described as “multidimensional feelings that are reflected information about consumers' relationship to their social and physical surroundings as well as their interpretations regarding these relationships” (Achar et al., 2016; Lambie & Marcel, 2002; Smith & Ellsworth, 1985). However, the informative pathway describes a process where

“consumers are informed about product alternatives that enable them to make choices yielding the highest value” (Rotzoll et al., 1996). Therefore, these are more factual aspects regarding the product compared to the emotional content. Additionally, the informational pathways make use of rational appeal since it allows consumers to form a fact and informational-based judgment. The emotional and informative approaches can therefore be considered conceptually distinct from each other.

Previous studies also showed that the utilization of these types of language affects the information processing of the consumer which can be ultimately translated into business performance outcomes such as the purchase intention (Chan, 2000; Chen & Chiu, 2016; Connors et al., 2021). However, the effect of these language types remains rather vague due to contradicting findings of the studies that have been conducted. Therefore, there are several findings that need to be evaluated to better understand the construct of advertisement language.

First, while examining previous studies, there were several findings that informational language is more effective compared to emotional language. A study by Connors et al. (2021) investigated the construal level theory which describes the concept of matching concrete and abstract language to the physical distance of the consumer to the product. In the study, low-level abstract construals are defined as schematic and decontextualized representations that extract the essence or main idea from the available information. This describes therefore rather emotional statements since they do not include actual informational statements but rather relate to decontextualized aspects. In contrast, concrete language is defined as representations that are relatively unstructured and contextualized, encompassing subordinate and incidental features of events (Connors et al., 2021). This can therefore be linked to informational language due to the factual nature of the statements by including exact contextualized features.

These findings are in line with another study by Chan (2000), which also found evidence that consumers responded more favorably towards concrete and factual information regarding claims containing environmentally friendly attributes. More specifically, this highlights that the positive evaluation and response by the consumer is therefore based upon the visual information processing of these environmentally friendly attributes presented within the message. Conclusively, both of the above-mentioned studies found evidence that using more concrete and informational messages should positively affect the consumer's response toward the brand and the overall information processing fluency.

Second, even though these studies provided strong support for the effectiveness of informational language, some studies reported findings, supporting the effectiveness of emotional language. A study by Chen & Chiu (2016) for example, also examined the varying

effects of different types of messages to communicate sustainable offerings and came to rather contradicting findings when compared to the previously discussed studies. Even though the types of messages compared were similar, the study showed, that consumers that are more environmentally conscious, perceive sustainable offerings' effectiveness, as well as the brand attitude, higher when abstract messages are used. Moreover, consumers who are less environmentally conscious responded equally favorably to concrete and abstract messages. Noticeable, these findings are not in line with the previously discussed studies (Chan, 2000; Connors et al., 2021) which argued that concrete informational messages, especially for consumers who have a closer relationship with the brand, should be more effective.

Third, the two language types can also be explained within the frame of the central and peripheral information processing streams (MacInnis & Jaworski, 1989; Petty et al., 1983). In this case, it would be assumed that informational language is processed through the central route which requires more cognitive effort but also establishes persistent behavioral attitudes of the consumer, while the emotional language would be processed with the peripheral route which relies less on factual statements and information but more on cues and heuristics. Therefore, it would heavily depend on the individual consumer how the advertisement is processed depending on the available cognitive resources, and how motivated the consumer is to sacrifice these resources. However, based on these insights, it can be assumed that the different types of language used, have different effects on information processing due to the different pathways that are used (MacInnis & Jaworski, 1989; Petty et al., 1983).

Conclusively, informational and emotional advertisement language has been repeatedly found to affect how a consumer processes the presented information within green marketing. However, the direction of the effect varied throughout the different studies which results in uncertainty about the effectiveness of both. Despite this uncertainty, there is strong evidence based on the studies by Chan (2000) and Connors et al. (2021), that informative advertisement language can be linked to more visual information processing of the consumer. More specifically, several studies indicate that in order to process informational content, an increased amount of attention is necessary due to the active evaluation of factual statements (Chan, 2000; Connors et al., 2021; MacInnis & Jaworski, 1989; Petty et al., 1983)

These findings, therefore, provide evidence that the informational advertisement language requires significantly more visual information processing from the consumer and serves as a foundation for the following hypothesis:

H2: Informative advertisement language leads to more visual information processing of a consumer compared to advertisements including emotional language in a green social media context.

Top-Down factors

Goal relevance. Contrary to the advertisement language which is considered a bottom-up factor, research also repeatedly highlighted an important top-down factor which is the goal relevance of the individual to the presented information. Studies have repeatedly found evidence that the goal relevance of the consumer can affect visual attention and also cognitive effort (Yarbus et al., 1967). This is mainly found to be due to the attention that consumers are willing to pay to the advertisement, followed by how much cognitive resources they want to spend. Consumers who are intrinsically motivated and are interested in the presented information are therefore more likely to pay attention to the advertisement and conclusively process the information. Within the context of green marketing, this concept can be described as the environmental concern of the consumer, which represents how much they care about environmental sustainability and therefore how relevant they perceive this topic and information related to it. Therefore, it is evident that the goal relevance of the consumer towards the information within the advertisement is a critical aspect that needs to be included in order to investigate how information is processed. Moreover, previous studies have shown that for messages to be effective and to positively increase the favorability towards one product, the person needs to perceive the displayed product as relevant to their current situation (Bermeitinger et al., 2009; Karremans et al., 2006). Taking into account the previously discussed findings and in the case of perceived sustainability, this would imply that advertising a product and emphasizing its sustainable aspects, would only lead to a beneficial effect if the consumer perceives sustainability as a relevant aspect in their current situation and therefore would express this by showing environmental concern.

This phenomenon was also identified in previous studies where the results showed that for consumers that have a close psychological brand relationship, the claims made with low-level, concrete messages led to an increase in the information processing, as well as the overall brand being perceived more favorably compared to when high-level abstract messages were used (Connors et al., 2021). This means that in the case that a consumer has a close relationship with the sustainable brand, there is a smaller psychological distance towards that brand and the company should use more concrete detailed information within these messages in order to increase the information processing fluency of the consumer

Additionally, previous research concluded that low involvement levels of the consumer are associated with a lack of active information seeking, lower motivation to compare product attributes, and finally the limited personal relevance of what the product has to offer (Zaichkowsky, 1985). These findings can again be linked to the ELM by Petty et al. (1993). Here it is described that an individual's motivation can be affected by a variety of factors, including whether or not the message has personal relevance (Kitchen et al., 2014; Petty et al., 1983). Therefore, if a consumer has a high goal relevance, the motivation to process the displayed information is higher as well. Additionally, the ELM proposes that higher involvement or goal relevance of the consumer would result in an increased cognitive elaboration of the presented information. This would then lead to increased information evaluation previous to drawing conclusions or making decisions.

Conclusively, this provides evidence that the goal relevance to the content of the displayed message affects the overall motivation of the consumer which can be further examined with the earlier introduced MOA model. Based on this model, a consumer needs to have the motivation, ability, and opportunity in order to optimally process presented information (Hung et al., 2017). Since motivation is the first step in this process, this represents a critical factor. Furthermore, the motivation to process the presented information also sequentially affects the consumer's ability to further process this information. Moreover, it was found that for consumers to be motivated to process the information, it is required that they experience a need for the presented information (Hung et al., 2017). This again describes the equivalent of the goal relevance of the consumer. Therefore, due to the MOA design, it can be assumed that people with high goal relevance for environmental sustainability have more motivation and interest to process informational content. This is in line with the earlier discussed findings of Connors et al. (2021) which concluded that informational content is more effective for people with a close relationship with the product. People with low goal relevance would therefore have a lower motivation to process concrete informational language and would be more convinced when emotional language is used. This conclusion can additionally be supported by the assumptions of the ELM (Petty et al., 1983) and would strengthen the idea that informational content is processed through the central route as long as the consumer perceives the information of the advertisement as relevant and is therefore motivated to process it. If this is not given, then the consumer can be assumed to be less likely to sacrifice sufficient cognitive resources towards the processing of the information within the message of the advertisement. In this case, using an emotional language that is processed through the

peripheral route using less cognitive effort should be more effective within an advertisement since fewer cognitive resources are required.

Conclusively, the findings discussed above (Andrews, 1988; Bermeitinger et al., 2009; Connors et al., 2021; Karremans et al., 2006) provide clear evidence for the following hypotheses:

Goal relevance moderates the relationship between advertisement language and customer visual information processing in a social media context such that:

H3A: High goal relevance strengthens the effect of Informative advertisement language on the information processing of the consumer within a green social media context

H3B: Low goal relevance strengthens the effect of emotional advertisement language on the information processing of the consumer within a green social media context

Outcomes of information processing

Perceived advertisement authenticity

As continuously highlighted throughout the current research, the consumers' information processing of the presented sustainable information within green marketing is reflected in different consumer and business outcomes. One of these outcomes, which can be directly linked to the effectiveness of a green marketing advertisement, is the perceived advertisement authenticity (Morhart et al., 2015). More specifically, previous research indicates that if the message and the advertisement itself are not perceived as authentic and trustworthy, it could drastically reduce the effectiveness of the advertisement, potentially even leading to a reduced brand image (Miller, 2015). Therefore, ad authenticity is considered a critical component of effective advertising and a direct outcome of information processing (Beverland et al., 2008; Morhart et al., 2015). Even though the definitions for authenticity differ, the main essence includes that authenticity encapsulates something honest, real, and genuine (Becker et al., 2019). Based on this main concept, researchers include several different dimensions in order to form a more detailed construct of authenticity within research. The study by Becker et al. (2019) e.g., included four dimensions forming the latter construct of ad authenticity 1) preserving the essence of the brand, 2) honoring the heritage of the brand, 3) displaying a plot that is considered realistic, and 4) presenting a credible message within the advertisement. Especially dimensions 3 and 4 provide a crucial argument for the current study. Since, according to Becker et al. (2019), it can be assumed that a realistic plot and an

advertisement that includes a credible message are perceived as more authentic, this could be linked to the informational advertisement language type. More specifically, the informational language includes more credible information due to the factual statements and should therefore be perceived as more authentic than emotional statements. These insights serve as a foundation for the following hypothesis regarding the advertisement language and the perceived advertisement authenticity:

H4: Advertisement language influences the advertisement authenticity as such that informative language positively influences the perceived advertisement authenticity by the customer in a green social media context.

Furthermore, the above-discussed dimensions have been adapted to visual platforms such as Instagram where primarily visual content is displayed such as photos and videos (Maares et al., 2021). Moreover, within these visual platforms, the presented content's authenticity is also examined through aspects such as the absence of editing (Lobinger & Brantner, 2015). Therefore, especially for visual social media, authenticity heavily relies on how the advertisement is evaluated through the information gathered by the consumer's visual and subsequently the cognitive information processing. Furthermore, regardless of how the advertisement is processed, central or peripheral, if the presented advertisement is not authentic to the brand, it is unlikely to have the intended effect on the consumer's purchase intention. This highlights that not only do marketers need to increase the information processing of the consumer, but they also need to ensure that this information is perceived as authentic by the consumer in order to improve, on the one hand, the information processing, and on the other hand, business-related outcomes such as the purchase intention, profits, or the attitude towards the brand. These findings provide reasons for the following hypothesis:

H5: Consumer information processing, including visual information processing and cognitive information processing, mediates the effect of advertisement language on advertisement authenticity in a green social media context, such that the advertisement language positively influences information processing, which in turn positively affects advertisement authenticity.

Intention to purchase environmentally sustainable products

Ultimately, the most critical moment for both the brand and the consumer is the point at which the purchase decision must be made. Within this study, the purchase decision is

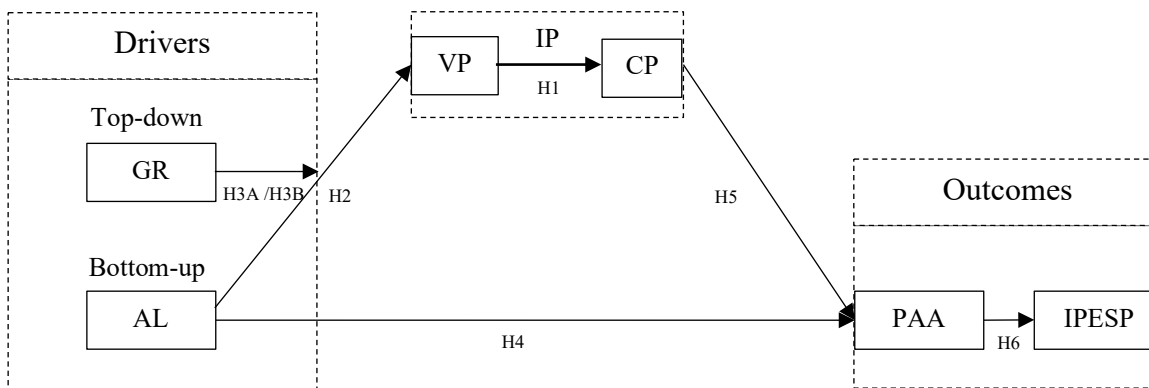
defined as an individual's conscious plan to make an effort to purchase a brand (Spears & Singh, 2004). However, this critical situation has been shown to be significantly affected by the perceived advertisement authenticity of the consumer. Research showed that advertisements that are perceived as congruent with the brand's characteristics can positively influence the brand's sales and therefore the purchase intention of consumers (Becker et al., 2019). Moreover, a more recent study examined advertisement authenticity in a digital green marketing context and was able to prove that especially within social media platforms such as Instagram and Facebook, advertisement authenticity is a crucial component that influences the subsequent purchase intention of the consumer (Pittman et al., 2022). Based on these findings the following hypothesis is formed:

Perceived advertisement authenticity influences the consumer's intention to purchase environmentally sustainable products as such that:

H6: A higher level of perceived advertisement authenticity positively affects the consumer's intention to purchase environmentally sustainable products in the context of green social media advertisements.

Figure 1.1

Conceptual model and hypotheses



Abbreviations: AL= Advertisement Language, GR = Goal Relevance, IP= Information Processing, CP= Cognitive Processing, VP= Visual Processing, PAA= Perceived Advertisement Authenticity, IPESP= Intention to Purchase Environmentally Sustainable Product

Methodology

Research design

To examine the above-described research on the advertisement effectiveness and the information processing of green social media advertisements, a lab experiment with a one-factor between-subjects design will be conducted. The experimental approach allows to directly compare the two advertisement language types and assess the potential moderating or mediating effects of the other variables included. Additionally, the possible influence of external factors will be eliminated with this approach. Therefore, to examine the effects, two groups will be compared, an informative language group and an emotional language group.

To analyze this, the present study will consist of two main parts. After reading the consent form (Appendix B), the participants will first watch an advertisement, depending on which of the two groups they got assigned to, and afterward complete a short questionnaire. To analyze how the advertisement information is processed, an eye-tracking system will be used. Moreover, the study will be conducted with the Qualtrics website on a computer in a separate room at Radboud University.

Advertisement language (AL)

Advertisement language presents the actively manipulated categorical independent variable of the current study and consists of two categories, informational and emotional advertisement language. Broadly described, the current study implements emotional language by directly addressing the participant to engage in a pro-environmental behavior that aims to evoke an emotional response (Lee & Hong, 2016). Moreover, the informational language is implemented by using factual statements including numbers, and with an objective tone. Both of these approaches also closely reflect the approach described in the integrative model by MacInnis and Jaworski (1989). The exact statements that are used within the two advertisements can be found in Appendix A. Within the experiment, participants will be randomly assigned to one of the two languages to minimize the chance of sample bias. Moreover, the study also includes a manipulation check after the advertisements by asking the participant to rate their informativeness and emotionality. This aims to ensure that the advertisement had the intended effect on the participant.

This perception and interpretation of the statements will also be assessed with a pre-test prior to the actual data collection. Furthermore, the presented advertisement will be from

the brand Nike which was chosen due to its popularity. More specifically, Nike was 2021 the world's leading sportswear brand (Statista, 2022). By using the popularity of Nike, the researcher aims to minimize the chance of individual biases and unknowingness of individual participants. Additionally, since Nike has already launched several sustainability campaigns, it also provides a realistic frame for the participant. The concept of the advertisement was retrieved from an original Nike advertisement concerning racism within American society (Nike, 2020). This concept was chosen due to its simplistic design which emphasizes the actual content and is therefore assumed to accurately concentrate the focus of the participant. Moreover, this minimalistic design increases the reliability of the eye-tracker since there are fewer distracting features and cues that the participant could potentially focus on.

Pre-test

As mentioned above, the perception of the emotional and informative advertisements was examined prior to the start of the actual experiment. Within this pre-test, participants were sent a link containing an adapted version of the survey which only includes a short information letter, one of the two advertisements, and the four-item manipulation check which assesses the perception and interpretation of the statements (Appendix C, Table 2.1). These four items examined whether the participant perceived the advertisement as informational, emotional, lengthy, and credible. Therefore, these four items aimed to identify whether the advertisement has the intended effect and whether there are possible differences in the perceived length or credibility. Moreover, all of the participants in the pre-test were approached through the researcher's social network and then received a link to the study. Additionally, they were instructed to complete the pre-test on a laptop, with sound on, and in a quiet environment. This was important since 1) it aims to reduce distractions in the participant's environment, 2) it ensures the participant hears the music included in the advertisement, and 3) it resembles the environment of the actual experiment. However, it is important to mention that since the researcher was not present during the study, it is not guaranteed that all of the participants complied with these instructions. In the final sample of the pretest, there were 14 participants. Therefore, there were seven participants for both, the informational, and the emotional condition.

After conducting an independent sample t-test, it was recognizable that the two language types are indeed perceived as emotional and informative (Appendix C, Table 2.2). Moreover, there was no significant difference concerning the perceived lengthiness or the

credibility of the advertisements (Appendix C, Table 2.2). These findings, therefore, validate the two advertisement types for the actual experimental setting.

Procedure

As mentioned before, the study will consist of two main parts. The whole study will be administered using the Qualtrics website. On the first page, the participant will receive the information letter and consent form which provides a short description of the study in which they are about to participate. If the participants do not give consent, they will be thanked for their time and the study ends. If participants give consent, the study will continue with the explanation of how the eye-tracking headset works and it will be, together with the researcher, adjusted to the participant's head and eye position. After this, the calibration will be started which is used to correlate the world cameras input with the input from the two eye cameras. After the successful calibration, the researcher will leave the room and the participant continues to the next page which includes the instructions and the scenario for the advertisement, as well as the actual advertisement. After reading about the scenario that was described earlier, the participant will be exposed to the Nike advertisement containing either informative or emotional language. Which of the two advertisements the participant is exposed to fully is determined through the randomization tool of Qualtrics. After the advertisement, the participant is instructed to notify the researcher and who then assists them in taking the eye-tracker off. Afterward, the researcher leaves the room again and the participant continues to the next part which contains the questionnaire. This questionnaire includes demographic questions, as well as the scales concerning the goal relevance, perceived advertisement authenticity, and purchase. After this, the participant will be debriefed and thanked for their participation.

Participants

The current study focuses on students and young adolescents as a target group. The reason for this is that this target group is shown to have a higher awareness of environmental issues around them (Kautish & Sharma, 2019), and they additionally have a higher concern regarding the environment (Diamantopoulos et al., 2003; Naderi & Van Steenburg, 2018). Moreover, existing literature also found evidence that younger consumers are more likely to actively search for sustainable product alternatives (Uddin & Khan, 2018; Yadav & Pathak, 2016). Furthermore, it is critical to focus on young consumers given their increased

receptiveness towards new changes and ideas which also presents them as potential catalysts for sustainable change (Kumar et al., 2021; Ottman et al., 2006). This is due to the fact that young consumers are more likely to encourage their peers and their family than other consumer groups (Caruana & Vassallo, 2003; Lee, 2009).

Followed by the significant pre-test, the actual data collection for the current research could start. To calculate an estimation of the required sample size, an a priori power analysis was conducted with the G*Power software program. This analysis determined an ideal sample size of 159 participants when a medium effect size of 0.25 and a power of .80 is used. Moreover, this sample size additionally fulfills the criteria of the central limit theorem. This theorem describes that there will be an approximately normal distribution of the sum of independent variables and identically distributed random variables, if the amount of these variables increases, despite the actual individual distribution of these variables (Kwak & Kim, 2017). However, for the central limit theorem to hold, a certain sample size must be achieved, which is the case with a sample of 159 participants and the current research design.

As explained in earlier sections, the target audience of the current research is young adolescents ranging from 18-25. This audience was chosen due to the enhanced awareness of environmental issues (Kautish & Sharma, 2019), higher concern for the environment (Diamantopoulos et al., 2003; Naderi & Van Steenburg, 2018), and increased receptiveness of young consumers (Uddin & Khan, 2018; Yadav & Pathak, 2016). These arguments make young adolescents a crucial target group for sustainable brands and are therefore even more critical to understand.

Final sample

Potential participants for the current study were approached on the campus of Radboud University, and through different social media platforms (LinkedIn, Instagram, and WhatsApp) via the researcher's network. Therefore, the sampling method of the current research was a non-probability judgment sampling since possible appropriate participants were individually selected and approached by the researcher (Malhotra & Malhotra, 2019).

The final sample of the current research consisted of 68 participants. Even though this value is below the suggested sample size by the G-Power analysis, it is still sufficient to continue with the analysis since the minimum required sample size for the PLS-SEM analysis, suggested by Hair et al. (2018) is achieved. Moreover, based on the information provided by the Qualtrics website, there were no missing values or invalid answers within the surveys. Therefore, Qualtrics reported 100% progress for each of the participants which qualifies all of

them for further analysis in the research. Additionally, it is important to mention that the whole sample was approached at the same location the Radboud University sports center. Additionally, it is worth mentioning that the gender of the participants was almost completely even distributed with 48.4% male participants and 51.6% female participants. Moreover, the sample primarily consisted of Dutch (48.4%) and German (38.7%) participants. The remaining participants came from different countries including Iraq, China, Spain, Bulgaria, and Aruba.

Measurements

To assess the measured variables within this study behavioral, as well as attitudinal measures, will be included to accurately assess the effects. More precisely, the attitudinal measures are assessed by applying different scales that have been extensively used and validated by previous researchers. The behavior measures will be assessed with the use of the eye-tracker which is able to analyze the eye movement and pupil dilation of the participant. The different scales corresponding to the different variables, and the eye-tracking will be explained in more detail below.

Operationalization

The operationalization of the measurements, including the definition of the attitudinal measurements is provided in Appendix D.

Attitudinal Measures

Goal Relevance (GR). The goal relevance of the participant which is expressed as environmental concern represents a moderating variable within this study. In order to fully capture to what extent the participant perceives the sustainable aspects within a green social media advertisement as relevant, a combination of two scales will be used. The pro-environmental views scale (PEVS), as well as the environmental awareness scale (EAS), were developed by Maquart-Pyatt (2012) and were derived from the International Social Survey Programme (ISSP). These two scales have been extensively tested and used together, and separately, in order to assess the environmental concern of a person. The EAS on the one hand is a questionnaire that consists of five items that are used to examine the individual's awareness of environmental issues. The PEVS on the other hand is a six-item questionnaire and is designed to measure the participant's feelings and personal beliefs, towards the value of the environment, the individual, and/or the collective support for the protection of the environment.

Therefore, the combination of the two scales should provide great insights into a participant's environmental concern and therefore serve as an estimate of how relevant sustainability is for the person.

Perceived Advertisement Authenticity (PAA). The authenticity of the advertisement is another variable and will be examined by the use of the ad authenticity scale developed by Miller (2015) (Appendix E). This seven-item scale has been shown to capture the impression to which a consumer perceives an advertisement as authentic with statements such as ‘this advertisement accurately reflects the brand's personality’ to which the participants need to respond on a 7-point Likert scale whether they agree or disagree with the statement.

Intention to Purchase Environmentally Sustainable Product (IPESP). Lastly, the final dependent variable of the current study is the participant's intention to purchase an environmentally sustainable product, and will also be determined using the MPS scale by Kim et al. (2015). However, for the assessment of this variable, the questions concerning the purchase intention will be derived from the MPS (Appendix F). This selection results in three items concerning the IPESP of the participant.

Behavioral Measures

Information processing / Eye-Tracking. The concept of information processing within this study consists of two dimensions, visual processing in the form of the number of fixations and the duration of these fixations (Mishra et al., 2013; Yarbus et al., 1967) and cognitive processing in the form of pupil dilation (Strauss et al., 2016; Urry et al., 2006; van Reekum et al., 2007; Querino et al. 2015). Together, these two processing types form the concept of information processing of the consumer which represents a mediating variable within the present research. However, this data is often rather elusive if the researcher needs to rely on the subjective answers of the consumer. Due to this difficulty, the popularity of using an eye-tracker to examine the eye movement and the pupil dilation of the consumer is drastically increasing within research (Ashby et al., 2016). Eye-tracking, therefore, allows the researcher to retrieve valuable information that might otherwise be unnoticed.

Therefore, the information processing variable within this study will be assessed by evaluating the data provided through an eye-tracker. The eye-tracker that is used is the Pupil Labs Core. This headset includes three cameras capturing each of the pupils and the point of view (POV) of the person wearing it which enables a binocular eye-camera set-up. The two cameras capturing the pupils are referred to as ‘eye cameras’ and the camera catching the person's POV is referred to as ‘world camera’. This setup allows to closely monitor the visual

information processing of the person by assessing the eye movement, as well as the cognitive information processing through pupil dilation. This activity will be recorded while the participant is confronted with the advertisement, to store the individual data and later make an assessment based on the output that is provided by the Pupil Labs software (e.g. number of fixations made with interest area, duration of fixations, etc.). In order to retrieve the relevant data for this study, the researcher will create two areas of interest (AOI). This generally describes an area of the screen that the researcher wants to analyze within the research (Mathias et al., 2021) The software then provides, among other things, the number of fixations, and the duration of these fixations for each of these AOI. Within the current research, this area is primarily the center of the screen where the different emotional or informational statements are presented. Additionally, there will be a Nike logo presented at the bottom which will also be an area of interest. Moreover, the software also constantly measures the pupil size of the participant. This output, therefore, provides the relevant data that can then be used to further examine the consumer's information processing. Additionally, the recordings of each participant will be cut to the exact duration of the advertisement to ensure that the recording length is equal among the participants.

Control variables

Brand familiarity. Within this study, brand familiarity with Nike will be included as a control variable. This is due to the fact, that people that are more familiar with Nike might be more likely to rate the advertisement as authentic and indicate a higher purchase intention. The underlying process that could take place here is the mere exposure effect. The mere exposure effect describes that consumers that have been more exposed to certain stimuli, feel more comfortable with them and evaluate them more positively simply due to repeated exposure (Zajonc, 2001). Within the context of the current research, this would mean that participants who experienced more exposure to the brand Nike, might evaluate it better because they are more familiar with it than participants who have been less exposed. Even though Nike was chosen due to its popularity, this information should still be considered within the evaluation to rule out any possible influence.

Pupil size affecting substances. In addition to brand familiarity, there are several substances that have been shown to affect pupil size and which could therefore potentially affect cognitive processing measurement of the current study. First, **alcohol consumption** will be included as a control variable. Alcohol has been shown to increase the pupil size of a person for several hours after consumption and therefore could be an external factor influencing the

pupil size of the consumer (Tomeo-Reyes et al., 2016). Second, other **drug consumption** will also be controlled. Several drugs such as cocaine, cannabis, or LSD have been shown to influence the pupil diameter and could therefore potentially affect the measurements (Li et al., 2008; Tomeo-Reyes et al., 2016). Lastly, **medication intake** will be included as a control variable. Again, different medications have been shown to decrease or increase pupil size and could therefore be an explanation for differences among participants in the current study (Li et al., 2008; Tomeo-Reyes et al., 2016).

Data analysis

The planned data analysis of this study is moderated mediation analysis using SmartPLS 4 (Hair et al., 2018). In order to achieve this, partial least squares structural equation modeling (PLS-ESM) will be used in order to examine the moderated serial mediation effect. With this analysis, the main effect of the advertisement language, as well as the moderating, and mediating effects can be examined. Participants will be excluded from the current study if there are too many missing values or if the study is not completed.

Research ethics

Ethical aspects play a crucial role in every study and are also considered in the current study design. As described earlier, the participant will receive an information letter and a consent form before the actual start of the experiment. Within these documents, the participant will be informed about any potential risks that the study includes and also how their data will be further processed. Additionally, the participation is completely voluntary which also implies that none of the potential participants need to give consent and continue with the study if they do not feel comfortable. Moreover, since the data will be collected and processed completely anonymously. Therefore, even though the final data of the study will be uploaded to the thesis repository of Radboud University, there will be no personal data of any of the participants publicly made available or shared with external parties.

Results

To examine the collected data, the current research used IBM SPSS and SmartPLS 4. The SPSS software was used to examine the descriptive statistics. Afterward, the SmartPLS software was used to first, analyze the structural model, perform a bootstrapping technique, and then analyze the measurement model. This method allows the researcher to separately

assess the validity and reliability of the outer model including the indicators of each construct before continuing to the hypothesis testing. Moreover, the PLS-SEM also enables the researcher to examine more complex models consisting of several latent variables with multiple indicators. Additionally, the current analysis allows to test the moderated serial mediation effect which is a crucial hypothesis in the current analysis.

Data preparation

Missing and unusable data

Even though all of the survey data was complete which would indicate that all of the participants are valid and can be used for the analysis, there were some observations with that unusable data from the eye-tracking software. In total, there were six observations that could not be included in the analysis. The main underlying reason for these invalid measures was that five participants repositioned themselves after the calibration of the eye-tracker, and after the researcher left the room. This shifted the position of the cameras of the eye-tracker and affected the measures concerning the fixations and pupil size. This resulted in zero recorded fixations throughout the whole advertisement for these participants. Moreover, one participant did not properly read the instructions and did not remove the headset before continuing to the questionnaire. Even though it is not certain that this led to a bias in his answers, there is still a possibility, and the observation will therefore also be excluded. Therefore, after the exclusion of these six observations, a remaining sample of 62 observations remains which are usable and valid for the further analysis of the underlying research.

Assessment of measurement model

The measurement model of the current study was assessed following the suggested approach by Hair et al. (2018) and involves several critical values. First, the internal reliability of the model needs to be assessed using composite reliability. The composite reliability value should be bigger than .600 in order to be considered acceptable (Dash, & Paul, 2021). Second, the measurement's construct reliability was examined with Cronbach's alpha values. These values can range from 0 to 1 and the lowest acceptable values are 0.6-0.7 according to Hair et al. (2018). Third, the convergent validity of the model is assessed with the average variance extracted (AVE). This value is considered acceptable if it is bigger than .500. Lastly, the discriminant validity was assessed by examining the Heterotrait-Monotrait (HTMT) ratio of correlations. The suggested cutoff point for this value is $<.850$ according to Hair et al. (2018).

After assessing the original measurement model, the 'GR' variable was the only one out of the six variables that reported AVE and composite reliability values that were below the suggested threshold (Appendix G, Table 3.1). In order to increase these values to an acceptable level, indicators of the variable were iteratively deleted starting with the lowest loadings (Appendix G, Table 3.2). Based on this approach the following indicators were deleted from the GR variable: 'GRPEVS_1' (-0.304), 'GREAS_3' (0.066), 'GREAS_4' (0.362), 'GRPEVS_6' (0.423), 'GRPEVS_4' (0.525), 'GREAS_2' (0.569). The exclusion of these indicators resulted in acceptable AVE and composite reliability values for the 'GR' variable. Even though there were still three indicators with loadings below the threshold, they were retained due to the sufficient AVE value (Appendix G, Table 3.3). Afterward, all of the variables reported acceptable composite reliability and AVE values (Appendix G, Table 3.4). Moreover, all of the variables also reported acceptable Cronbach's alpha and HTMT values (Appendix G, Table 3.4; Appendix G, Table 3.5).

Assessment of structural model

After assessing and adjusting the measurement model, the structural model can be assessed. For this assessment, there are again several values that need to be examined. The first one is the variance inflation factor (VIF), which is used to evaluate whether the predictor constructs in the structural model exhibit collinearity. After this, the Goodness of Fit (GoF), coefficient of determination (R^2), effect size (f^2), cross-validated redundancy (Q^2), and path coefficient size and significance will be examined.

First, while examining the collinearity statistics, it was noticeable that the four indicators related to the visual processing variable exhibited comparably high VIF values (Appendix H, Table 4.1). The values ranged between 23 and 31 and therefore clearly exceeded the suggested cutoff point of 5. Since these values indicate high multicollinearity among the indicators, the 'numbers of fixations' indicators of both AOIs were disregarded from the statistical model, resulting in acceptable VIF values for the inner and outer model (Appendix H, Table 4.2; Appendix H, Table 4.3). Followed by the assessment of the VIF values, the GoF could be examined using the updated values (Table 1.1, Appendix H, Table 4.4). The GoF index is used to examine the model fit in the current research and is categorized into three levels (Tenenhaus et al., 2005; Wetzels et al., 2009). A value of 0.1 represents the small threshold, 0.25 represents the medium threshold, and a value of 0.36 is the large threshold. In order to calculate this value, the mean construct communality and the mean R^2 are needed.

Within the current research and using the updated values, the GoF index was found to be 0.297 and therefore surpasses the medium threshold of .25 (Appendix H, Table 4.5).

Table 1.1

Factor loadings, composite reliability, and average variance extracted

Components and manifest variables	Loading (t-value)
Goal relevance	CR: 0.797; AVE: 0.539
Air pollution caused by cars is: extremely dangerous - not dangerous at all	0.546 (2.002)
The rise in the world's temperature caused by the 'greenhouse effect' is: extremely dangerous - not dangerous at all	0.838 (3.354)*
We worry too much about the future of the environment and not enough about prices and jobs today: strongly agree - strongly disagree	0.813 (3.281)*
People worry too much about human progress harming the environment: strongly agree - strongly disagree	0.791 (2.795)*
There are more important things to do in life than protect the environment: strongly agree - strongly disagree	0.641 (2.384)*
Intention to Purchase Environmentally sustainable products	CR: 0.924; AVE: 0.745
If I were going to purchase a sportswear product, I would consider buying Nike	0.791 (13.763)*
If I were shopping for a sportswear product, the likelihood I would purchase a Nike product is high	0.892 (31.438)*
My willingness to buy a Nike product would be high if I were shopping for a sportswear brand	0.869 (24.049)*
The probability I would consider buying a Nike product is high	0.896 (27.062)*
Perceived advertisement authenticity	CR: 0.878; AVE: 0.628
The advertisement reflects Nike's originality	0.637 (4.764)*
The advertisement accurately reflects Nike's brand personality	0.688 (8.343)*
This is a classic Nike advertisement	0.880 (14.498)*
This advertisement reminds me of other Nike advertisements	0.818 (10.456)*
I would expect to see Nike in this advertisement	0.851 (12.419)*
This is a typical Nike advertisement	0.8549 (11.830)*
Notes: CR = Composite Reliability; AVE = Average Variance Extracted; *p < 0.01	

Next, the coefficient determination was assessed using the R^2 value. This value is generally used as an indication of the structural model's predictive power (Hair et al., 2018). Overall a value of 0 indicates that there is no relationship at all, and a value of 1 indicates that there is a perfect relationship. General guidelines however categorize values bigger than .75 as substantial, bigger than .50 as moderate, and bigger than .25 as weak (Hair et al., 2018). However, while evaluating the R^2 value it is important to consider that the acceptability of this value heavily depends on the research context, and even values around 0.10 can be acceptable.

In the current research, the values are overall of very low predictive power, and only ‘PAA’ (0.240) and ‘IPESP’ (0.239) reported values bigger than 0.10. The remaining variables ‘CP’ (0.021), ‘VP1’ (0.033), and ‘VP2’ (0.013) did not indicate a significant effect (Appendix H, Table 4.5).

Followed by this, the effect size (f^2), which represents the change that occurs for the R^2 value, if specified exogenous construct is excluded from the structural model, can be assessed (Hair et al., 2018). The f^2 value can be categorized as large if the value is bigger than 0.35, medium if it is 0.15, and small if it is 0.02. Below 0.02, there is no reported effect. The values of the current data showed that ‘AL’ has a small effect on ‘PAA’ (0.095). Moreover, the data also indicates a small effect of ‘CP’ on ‘PAA’ (0.034) (Appendix H, Table 4.7). The other reported effect sizes are below the threshold of 0.02 and therefore indicate no effect (Appendix H, Table 4.7).

Afterward, a bootstrapping measure was performed with a sample size of 10,000 in order to accurately assess the size and significance of the path coefficients. In order to do this, the path coefficient also referred to as the β coefficient, the p-value, and the R-squared of each hypothesis will be examined. First, the current data showed no support of H1 and did not indicate any significant effect for ‘VP1’ ($\beta = 0.141$; $p > 0.05$; $R^2 = 0.021$) or ‘VP2’ ($\beta = 0.008$; $p > 0.05$; $R^2 = 0.021$) on ‘CP’. Moreover, concerning H2, the data did not provide any evidence of a significant effect of ‘AL’ on ‘VP’ for neither concept ‘VP1’ ($\beta = 0.225$; $p > 0.05$; $R^2 = 0.033$) nor the concept ‘VP2’ ($\beta = 0.049$; $p > 0.05$; $R^2 = 0.013$). In addition to that, the data does not support H3A ($\beta = 0.080$; $p > 0.05$; $R^2 = 0.033$) or H3B ($\beta = -0.130$; $p > 0.05$; $R^2 = 0.013$) since there was no significant difference in ‘VP’. Contrary to the insignificant findings of the previously discussed hypotheses, the data supported H4 and showed a significant positive effect of ‘AL’ with informational language as a baseline, on ‘PAA’ ($\beta = 0.541$; $p < 0.01$; $R^2 = 0.240$). Continuing with H5, the data did not show significant evidence of an effect of ‘CP’ on ‘PAA’ ($\beta = 0.164$; $p > 0.05$; $R^2 = 0.240$). Lastly, the data provided no evidence of H6 and therefore no significant difference for the ‘IPESP’ ($\beta = 0.26$; $p > 0.05$; $R^2 = 0.293$).

In addition to these direct effects, also the specific indirect effects were examined to test the potential moderated serial mediation effect. An overview of these effects is displayed in Appendix G (Table 4.7). However, also while analyzing these values there was no moderated mediation effect to be found for either, ‘VP1’ ($p > 0.05$), or ‘VP2’ ($p > 0.05$).

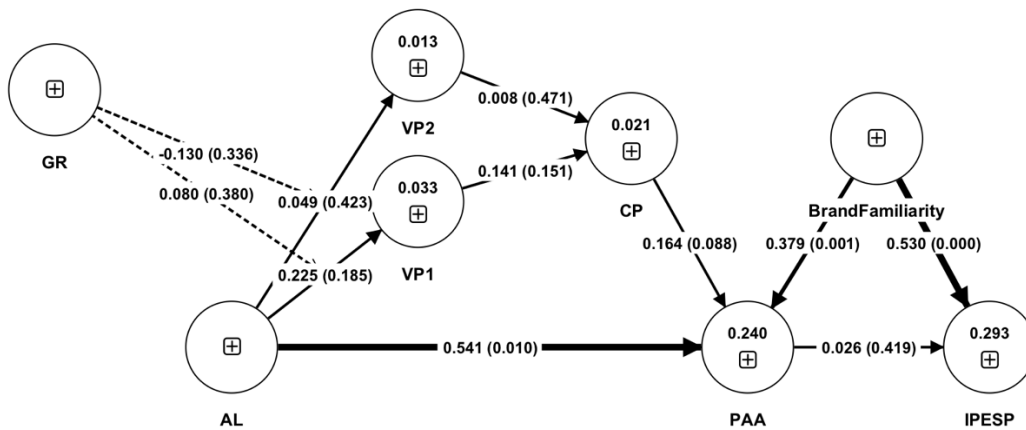
In addition to the tested hypotheses, the analysis also showed that the control variable ‘BrandFamiliarity’ had a significant effect on ‘PAA’ ($\beta = 0.379$; $p < 0.01$; $R^2 = 0.240$) as well as on ‘IPESP’ ($\beta = 0.530$; $p < 0.01$; $R^2 = 0.293$). The effect of the remaining control variables

(‘Drugs’, ‘Alcohol’, ‘Medication’) could not be assessed because there were not enough positive responses and therefore a lack of variance for these variables. The categories were therefore not representative of the sample and SmartPLS was not able to analyze the underlying effect.

Lastly, even though the manipulation check of the pre-test found significant effects of the manipulation, the assessment of the manipulation check within the actual sample did not replicate these effects and showed very similar means and therefore non-directional results (Appendix H, Table 4.9; Appendix H, Table 4.10). The potential impact of these findings will be discussed in later chapters.

Figure 1.2

Structural model and results



Discussion

The key findings of this research are presented in figure 1.2 and will be discussed in more detail below. First, the data does not indicate that the visual processing of an advertisement significantly affects the cognitive processing. Second, there is no evidence within the current data that the choice of advertisement language, informational or emotional, influences the extent of visual processing of the advertisement. In other words, neither emotional nor informational advertisement language can be linked to more or less visual processing. More specifically, in terms of the current research, the choice of advertisement language did not lead to longer fixations on the AOIs. Third, there is no support for the moderating role of goal relevance on the relationship between advertisement language and the visual processing of a consumer. This implies that regardless of whether the consumer perceives the advertisement content as personally relevant or not, the degree of visual

processing does not differ. Fourth, the data indicates that advertisement language has a significant effect on the consumer's perceived advertisement authenticity. Especially the emotional advertisement language ($M= 3.172$) appears to affect the perceived advertisement authenticity. This shows that while the choice of advertisement language could not be linked to the amount of information processed by the consumer, it still affects the consumer in terms of perceived advertisement authenticity. Fifth, there is again no support for an effect of the consumer's cognitive processing on perceived advertisement authenticity. Lastly, there is no evidence that perceived advertisement authenticity significantly influences the intention to purchase environmentally sustainable products. In addition to the tested hypotheses, the analysis of the control variables provided additional insights. Due to the exclusion of the 'drugs', 'medication', and the 'alcohol' control variables, the only variable that could be accurately assessed was the one concerning the brand familiarity towards the brand Nike. The analysis of this variable showed significant effects on the perceived advertisement authenticity and the intention to purchase environmentally sustainable products. This suggests that familiarity with a brand plays a critical role in green marketing and represents a direct driver for business-related outcomes.

To summarize, despite previous literature hinting at a moderated serial mediation effect concerning the advertisement language, goal relevance, and visual and cognitive information processing (Chen & Chiu, 2016; Tellis et al., 2019), the current research was not able to find any proof for this effect. However, the findings still indicate that the advertisement language that is used has an effect on the perceived advertisement authenticity. More specifically, within the current research, the emotional advertisement language was more effective in terms of perceived advertisement authenticity than the informational advertisement language. Furthermore, based on the findings it can also be concluded that brand familiarity plays a more important role than previously expected and significantly influenced, not only the perceived advertisement authenticity but also the purchase intention.

Conclusion

The aim of this study was to investigate the drivers and outcomes of consumer information processing in the context of green social media marketing advertisements. Specifically, emotional and informational advertisement language were compared in terms of their effectiveness measures, namely perceived advertisement authenticity and purchase intention. However, the results did not reveal any significant moderated mediation effect of

visual and cognitive information processing, making it challenging to identify the variables as drivers or outcomes of consumer information processing. Neither type of advertisement language significantly influenced consumers' visual information processing, indicating that they cannot be considered as drivers. Additionally, the inclusion of consumer goal relevance as a moderator did not yield any significant evidence and cannot be considered a driver of information processing either. Moreover, the perceived advertisement authenticity of consumers was not significantly affected by their cognitive information processing, indicating that it is not an outcome of information processing. Despite the lack of effect on information processing, the advertisement language still had a significant impact on perceived advertisement authenticity. Emotional advertisement language was found to elicit significantly higher perceived advertisement authenticity compared to informational advertisement language.

While these findings align with previous studies (Chen & Chiu, 2016; Connors et al., 2021; Tellis et al., 2019), it is crucial to consider a critical aspect while interpreting the current research. The manipulation check did not yield significant results in the actual study sample, although the pre-test sample perceived the informational and emotional advertisements as intended. This discrepancy in perception between the pre-test and actual sample raises surprising findings, given that the advertisements were the same, with only the setting changed. However, there are plausible explanations for this disparity. One possibility is that there may have been a bias in the pre-test sample, as the entire sample was approached through the researcher's social network, which opens the potential for biased selection (Smith & Noble, 2014). Additionally, despite instructing participants not to exchange information about the study, this cannot be guaranteed in an online setting. Another factor to consider is the effect of the setting change, as a participant's environment can continuously influence their perception (Marteau et al., 2012), including aspects such as mood (Stone, 1998). While the exact cause for the nonsignificant effect of the manipulation check in the actual sample cannot be determined, there are several plausible explanations. Nevertheless, due to the lack of perceived differences between the informational and emotional advertisements in the actual sample, it is challenging to draw reliable conclusions regarding the significant effect of advertisement language on perceived advertisement authenticity.

Considering these concerns, the absence of significance in the manipulation check could also explain the nonsignificant findings concerning information processing. Since the groups did not perceive significant differences between the two advertisements, it would be unlikely to observe a difference in information processing. Therefore, while the nonsignificant

effects related to information processing contradict the proposed hypotheses, they are consistent with the nonsignificant manipulation check. Finally, the control variable of brand familiarity was found to significantly influence perceived advertisement authenticity and purchase intention. These findings support previous literature that suggests increased brand familiarity instills consumer confidence in the brand and ultimately influences purchase intention (Laroche et al., 1996).

Overall, this study provides valuable insights into the drivers and outcomes of consumer information processing in the context of green social media marketing advertisements. However, it is essential to consider the limitations related to the manipulation check and the potential bias in the pre-test sample.

Theoretical implications

Existing literature in the green marketing field was characterized by repeated contradicting findings concerning the choice of advertisement language (Chan, 2000; Chen & Chiu, 2016; Connors et al., 2021; Tellis et al., 2019). The current state of the literature, therefore, did not provide clear insights into which advertisement language is more effective in order to communicate sustainable offerings. While this highlighted the complexity of a consumer's perception and the difficulty of overcoming consumers' aversion towards advertisements, it also increased the value of understanding how consumers process the presented information in order to identify the underlying reasons for the previously found conflicting findings. Despite the increased relevance of the consumer's processing, the information processing was not sufficiently examined up until this point. Hence, the current research aimed to address this research gap and the theoretical relevance by examining consumers' information processing in the context of green social media advertisements.

Previous findings concerning general information processing indeed indicated that the consumer's information processing could explain the differing effectiveness. More specifically, studies suggested that due to the aversion of consumers, there might be less information processing which is a vital aspect of green marketing (Fransen et al., 2015). Concerning the findings of this study, the results report a significant positive effect of emotional advertisement language. However, in contrast to the suggestions, the data did not provide any evidence that the information processing of the consumer can be used to explain this. While these findings are not in line with previously stated hypotheses, they still provide valuable insights and contribute novel theoretical implications to the green marketing literature.

Mainly, this demonstrates again that the consumer's perception is an incredibly complex construct that is difficult to measure. Moreover, considering the non-significant results of the manipulation check, there is still a possibility that a consumer's information processing is involved in the evaluation of green social media advertisements. Nevertheless, the findings concerning the advertisement language still directly contribute to the literature on green social media advertisements and further strengthen the support for the effectiveness of emotional content. While this is contradicting the previously stated hypotheses, the conclusion is still in line with several of the discussed studies (Chen & Chiu, 2016; Tellis et al., 2019).

Additionally, this study did not find a significant moderating effect of goal relevance on the chosen advertisement language and visual information processing. These insights are again contrary to the previously discussed literature (Bermeitinger et al., 2009; Karremans et al., 2006) and the hypotheses and indicate that regardless of the personal relevance to the topic of sustainability, consumers do not differ in the visual information processing of the different advertisement languages. Previous literature did not extensively examine the communication of sustainable offerings considering the consumer's goal relevance in the form of environmental concern. Even though this could have explained the consumer's motivation to process information based on the ELM model (Petty et al., 1983), the data did not show an effect that supports this. Regardless of the nonsignificant effects, these findings still provide valuable insights into green marketing literature due to the limited attention that the consumer's goal relevance received within research on the communication of sustainable offerings. However, again considering the nonsignificant effect of the manipulation check, goal relevance should not be completely ruled out as a moderator in this relationship and the findings should be interpreted with caution.

Lastly, the current study provides further theoretical implications concerning the effects of the control variable brand familiarity. Even though this effect was suggested by previous literature on the topic (Laroche et al., 1996; Zajonc, 2001) as well as underlying psychological processes such as the mere exposure effect (Zajonc, 2001), the findings still extend the knowledge within the green marketing literature. More specifically, even though the relationship between brand familiarity and purchase intention has been examined and proven several times (Laroche et al., 1996), research on this relationship in the specific context of green social media advertisements is rather scarce. Therefore, the current findings contribute to this literature stream and again identify the importance of brand familiarity on business-related outcomes such as perceived advertisement authenticity and the purchase intention of sustainable offerings.

Managerial implications

In addition to the theoretical implications, the current research provides direct managerial implications concerning the topic of green marketing and specifically within a social media context. Due to the previously mentioned contradicting findings concerning the language choice in green advertisements, there were limited guidelines for managers aiming to effectively design advertisements of sustainable offerings. While the current study was not able to identify the underlying reasons for the contradicting findings, it still supports the choice of an emotional advertisement language to communicate sustainable offerings on social media. Due to the higher levels of perceived advertisement authenticity of the emotional advertisement, it appears to be the most effective choice to persuade the consumer. These insights, therefore, serve as guidelines for managers and brands that aim to advertise their sustainable offerings on social media platforms such as Instagram.

Moreover, the nonsignificant effect of the consumer's goal relevance on information processing provides valuable and novel insights concerning different target consumer groups for brands. Specifically, this implies that brands do not need to differentiate between consumer groups with different relations to the topic of sustainability. Instead, the chosen advertisement language is processed equally in terms of visual and cognitive processing, regardless of the consumer's goal relevance. Therefore, the choice of language appears to be more important for consumers than the relationship to the advertised content. These insights further contribute to managerial guidelines for the communication of sustainable offerings and should be considered for green social media advertisements.

Additionally, the previously discussed findings concerning brand familiarity directly contributes to managerial implications. Not only did the data indicate that brand familiarity affects the consumer's perception of the advertisement in terms of perceived advertisement authenticity, but it also showed evidence that brand familiarity affects purchase intention. These are critical insights for managers and brands and suggest that brand awareness is a vital aspect in the context of green social media advertisements. Based on previous literature it could be argued that an increase in brand familiarity is related to trust in the brand which then could explain the increase in perceived advertisement authenticity (Laroche et al., 1996). Nevertheless, these findings suggest that increasing consumer's familiarity with the brand by, for instance increasing brand awareness (Delgado-Ballester et al., 2012), represents a critical aspect of sustainable brands. Conclusively, the results of the current study indicate that brands

should prioritize increasing brand awareness and use green social media advertisements using emotional advertisement language to overcome the consumer's aversion and to communicate sustainable offerings most effectively to young consumer groups. However, these implications should again be applied with caution considering the nonsignificant manipulation check of the study.

Limitations

Concerning the limitations of the current study there are several aspects that need should be considered. First, the main limitation of the current study, as already extensively discussed, is the nonsignificant manipulation check. Since the manipulation was not perceived as previously assessed with the pre-test, it is difficult to interpret the underlying effects which subsequently reduces the overall validity of the current research. More specifically, the construct validity is affected since the manipulation did not accurately reflect what it was intended to do.

Second, due to the limited timeframe of the current study, the ideal sample size, that was assessed with the G-Power analysis prior to the study, was not reached. This results in a reduced statistical power which is also described as the probability of finding a true effect if one exists. Since the suggested sample size was not reached, it is increasingly difficult to find significant effects in the data which simultaneously increases the risk of type 2 errors. The type 2 error describes the situation where a researcher fails to reject the null hypothesis when it is false (Lieberman & Cunningham, 2009).

Third, considering the complete absence of significant effects surrounding the information processing variables it should also be considered whether the eye-tracking measurements were accurate. Another indicator for this is the wide range of numbers of fixations. While several participants had fixations in the lower one-digit range from 1-9, there were also participants with more than 200 fixations. While this is theoretically possible and neither of these values qualifies for exclusion from the analysis, the differences are still rather drastic and might indicate that there were issues with the measurement.

Fourth, due to the participant wearing an eye-tracker, the ecological validity of the current findings is significantly reduced. Since the scenario that the participants were told about, involved them sitting at home, scrolling through their Instagram feed, it is questionable how well they were actually able to imagine themselves in that scenario. Especially considering that they were wearing an eye-tracking headset and they were sitting in front of two PC screens.

Therefore, the setup of the research did not allow it to fully resemble the described scenario or any real-life situation.

Lastly, the current study only examined university students from a single university in the Netherlands. Moreover, participants in the study were selected and approached by the researcher. This creates the opportunity for a subconsciously biased selection and subsequently could result also in a biased sample. Moreover, even if the sample itself would not have any biases, it is still a very specific sample and difficult to generalize to other population groups which significantly reduces the generalizability of the current results.

Future research

Lastly, considering the findings and limitations of the current research, there are several suggestions for further research that can be mentioned. First, a replication of the current research design would be crucial to identify the cause for the non-significant manipulation check. If this would result again in a significant manipulation check in the pre-test and a non-significant manipulation check in the actual study, it would show that the sample was indeed not the cause and that the issue might be related to the research setting. Additionally, the replication study could also aim to achieve a bigger sample size to minimize the issues of the current study concerning the statistical power. Therefore, a replication study would certainly provide rich insights into 1) the cause of the nonsignificant findings of the current study and 2) the initial goal of this research, to identify drivers and outcomes of information processing. Second, due to the overall limited research on the topic of information processing of advertisements, more research aiming to comprehend how consumers process different advertisement features is crucial. More specifically, it would be interesting to further examine the contradicting findings concerning the used advertisement language. By comparing the effectiveness of informational and emotional language across different contexts and consumer groups, it could provide an explanation for the findings of previous studies. Therefore, there might be an underlying moderator or mediator that is yet to be discovered, which is responsible for the differing conclusions. Third, future research could also further approach the limitations of the current study and use not only a bigger sample but also a less specific sample. While it still makes sense to focus on young consumers, a more diversified sample can be easier generalized and is more representative of the general population.

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Appendix A

Statement overview

Emotional

Informative

For once,
Don't Do It.



Don't pretend
there's not a problem.



Don't pretend
there's not a problem.



Don't turn your back
on the environment.



Nature is being destroyed,
there needs to be a change.



Nike products now contain recycled
materials, so you can make a difference.



78% of Nike products now
contain recycled material.



To shape our, and your future, we
fully rely on renewable energy.



Nike manufacturing facilities now use
100% renewable energy.



We are part of the change.
You should be too.



Nike is part of the change.



Appendix B

Consent form

Welcome to this study

This page includes the consent form which provides a short overview of what you can expect within this research study. Please read the following page carefully before deciding if you want to participate.

Consent form

Purpose

The purpose of this research study is to investigate the information processing of consumers when presented with social media advertisements on Instagram.

Equipment

Pupil Labs eye-tracking headset/software (provided by the researcher), Laptop (provided by the researcher)

Procedure

This research consists of two parts: an eye-tracking part and a short questionnaire. Participants will be asked to wear an eye-tracking headset while watching a social media advertisement on this laptop. After giving consent, the researcher will instruct the participant how to setup the eye-tracking headset. If the headset is properly adjusted the eye movements will be calibrated within the Pupil labs software. This calibration ensures that the eye movement is accurately recorded. Afterwards, the researcher will leave the room and the participant will continue to the advertisement. After the advertisement is done, the researcher will help the participant take off the eye-tracker and the participant can individually continue to the questionnaire. This research will take about 10 to 15 minutes for both parts (including set up, calibration, advertisements and survey).

Please confirm the following:

- I understand that my eye-movements and pupil dilation are being tracked and that this data is used within the analysis of the current study.
- I confirm that I do not have any physical, mental or health-related reasons or problems that should preclude my participation in the eye-tracking experiment (e.g. cataract or cross-eyed).
- I confirm that I assume all of the psychological risks that are associated with the use of eye-tracking software.

If you agree to participate in this study, you will be asked to do the following:

- Be immersed in an eye-tracking experiment using the eye-tracking headset. The eye-tracking equipment measures your physiological response in terms of pupil fixations and pupil dilation during the immersion.
- Watch a video advertisement
- Complete a short questionnaire afterwards.

Health Notice/Risks:

The video you will be shown represents a regular Instagram advertisement. It is not expected that exposure to this video will cause any harm or discomfort. However, if you experience feelings of distress as a result of participation in this study you can let the researcher know and he will provide you with assistance.

Confidentiality of the research data:

The research data will be collected anonymously and safely stored according to the research data management guidelines of the Radboud University and conform General Data Protection Regulation since there are no contact details requested that can identify the participant. As soon as possible, any remaining personal data will be deleted. The researcher involved in this study, will use the research data for academic publications and presentations. The anonymous data may become available in the context of Open Science so that other researchers can refer to and reuse it. For research integrity purposes, the research data will be accessible to the academic community for a period of at least 10 years.

Voluntary participation:

Your participation in this research is voluntary. This means that you can withdraw your participation and consent at any time during the data collection period, without giving a reason. Even up to six weeks after participating you can have your research data and personal data removed, by sending a request to vincent.steinebach@ru.nl.

Contact and Questions:

If you have any questions regarding this study, or you want to be informed about the results/ the final research project, you may contact the researcher via vincent.steinebach@ru.nl

Statement of Consent:

Please select your choice below.

Clicking the "Agree" button below indicates that:

- you have taken note of and you understand this information
- you voluntarily agree to participate
- you are at least 18 years of age
- you have asked any questions regarding the experimental procedure and they have been answered to your satisfaction

If you do not wish to participate in this study, please decline participation by clicking on the "I do not want to participate" button.

Appendix C

Pre-test

Table 2.1

Group statistics

		Group Statistics			
		N	Mean	Std. Deviation	Std. Error Mean
I watched the whole advertisement in a quiet environment and in full screen mode.					
Please rate the advertisement that you just saw - The advertisement was informative	Informational	7	4.43	.535	.202
	Emotional	7	2.00	.816	.309
Please rate the advertisement that you just saw - The advertisement was emotional	Informational	7	2.00	.577	.218
	Emotional	7	4.71	.756	.286
Please rate the advertisement that you just saw - The sentences were lengthy	Informational	7	1.57	.787	.297
	Emotional	7	1.86	.690	.261
Please rate the advertisement that you just saw - The advertisement was credible for a Nike advertisement	Informational	7	4.14	.690	.261
	Emotional	7	4.14	.690	.261

Table 2.2

Independent sample test

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Please rate the advertisement that you just saw - The advertisement was informative	Equal variances assumed	.160	.696	6.584	12	<.001	<.001	2.429	.369	1.625	3.232
	Equal variances not assumed			6.584	10.345	<.001	<.001	2.429	.369	1.610	3.247
Please rate the advertisement that you just saw - The advertisement was emotional	Equal variances assumed	.550	.472	-7.550	12	<.001	<.001	-2.714	.360	-3.498	-1.931
	Equal variances not assumed			-7.550	11.223	<.001	<.001	-2.714	.360	-3.504	-1.925
Please rate the advertisement that you just	Equal variances assumed	.587	.458	-.722	12	.242	.484	-.286	.396	-1.148	.576

saw - The sentences were lengthy	Equal variances not assumed			-.722	11.799	.242	.484	-.286	.396	-1.149	.578
Please rate the advertisement that you just saw - The advertisement was credible for a Nike advertisement	Equal variances assumed	.000	1.000	.000	12	.500	1.000	.000	.369	-.804	.804
	Equal variances not assumed			.000	12.000	.500	1.000	.000	.369	-.804	.804

Appendix D
Operationalization

Construct	Definition	Measurement	Source
Cognitive information processing (BM)		Pupil dilation (Eye-Tracking)	
Goal relevance (AM)	extent to which an outcome of a situation is relevant to the current goals of a consumer	PEVS and EAS	(Gorayska & Lindsay, 1993; Maquart-Pyatt, 2012)
Perceived Advertisement Authenticity (AM)	encapsulating something honest, real, and genuine	Ad authenticity scale	(Becker et al., 2019; Miller, 2015)
Purchase Intention of Environmentally Sustainable products (AM)	an individual's conscious plan to make an effort to purchase a brand	MPS scale	(Kim et al., 2015; Spears & Singh, 2004)
Visual information processing (BM)		Number of fixations and fixation duration (Eye-Tracking)	

Abbreviations: AM = Attitudinal Measurement, BM = Behavioral Measurement

Appendix G

Statistical figures – measurement model

Table 3.1

Construct reliability and validity before transformations

	Cronbach's alpha	Composite reliability (rho a)	Composite reliability (rho c)	Average variance extracted (AVE)
BrandFamiliarity	0.831	0.894	0.899	0.75
GR	0.771	0.443	0.671	0.236
IPESP	0.887	0.928	0.921	0.744
PAA	0.879	0.878	0.909	0.629
VP1	0.989	0.99	0.995	0.989
VP2	0.992	1.003	0.996	0.992

Table 3.2

Factor loadings before adjustments

	BrandFami liarity	CP	GR	IPESP	PAA	VP1	VP2	conditio n
@#fixationson AOI1						0.995		
@#fixationson AOI2							0.995	
BrandFamiliarity_1	0.709							
BrandFamiliarity_2	0.947							
BrandFamiliarity_3	0.923							
GREAS_1			0.491					
GREAS_2			0.387					
GREAS_3			-0.039					
GREAS_4			0.127					
GREAS_5			0.666					
GRPEVS_1			-0.308					
GRPEVS_2			0.648					
GRPEVS_3			0.624					
GRPEVS_4			0.577					
GRPEVS_5			0.623					
GRPEVS_6			0.346					
IPESP_1				0.783				
IPESP_2				0.895				
IPESP_3				0.87				
IPESP_4				0.897				
PAA_1					0.637			

PAA_2		0.685		
PAA_3		0.881		
PAA_4		0.82		
PAA_5		0.852		
PAA_6		0.851		
avgpupilsiz condition	1			1
fixationdurati onAOI1			0.994	
fixationdurati onAOI2				0.996

Table 3.3

Factor loadings after first adjustment

	AL	BrandFamiliarity	CP	GR	IPESP	PAA	VP1	VP2
@#fixationsonAOI1							0.995	
@#fixationsonAOI2								0.996
BrandFamiliarity_1		0.709						
BrandFamiliarity_2		0.947						
BrandFamiliarity_3		0.923						
GREAS_1				0.537				
GREAS_5				0.840				
GRPEVS_2				0.822				
GRPEVS_3				0.796				
GRPEVS_5				0.630				
IPESP_1					0.783			
IPESP_2					0.895			
IPESP_3					0.870			
IPESP_4					0.897			
PAA_1						0.637		
PAA_2						0.685		
PAA_3						0.881		
PAA_4						0.820		
PAA_5						0.852		
PAA_6						0.851		
avgpupilsiz condition			1					
fixationdurationAOI1							0.995	
fixationdurationAOI2								0.996

Table 3.4

Construct reliability and validity after first adjustment

	Cronbach's alpha	Composite reliability (rho a)	Composite reliability (rho c)	Average variance extracted (AVE)
BrandFamiliarity	0.831	0.894	0.899	0.750
GR	0.778	0.803	0.851	0.540
IPESP	0.887	0.928	0.921	0.744
PAA	0.879	0.878	0.909	0.629
VP1	0.989	0.989	0.995	0.989
VP2	0.992	0.993	0.996	0.992

Table 3.5*Discriminant validity - HTMT value matrix after first adjustment*

	AL	BrandFamiliarity	CP	GR	IPESP	PAA	VP1	VP2
AL								
BrandFamiliarity	0.059							
CP	0.119	0.155						
GR	0.059	0.218	0.089					
IPESP	0.103	0.574	0.089	0.138				
PAA	0.235	0.444	0.224	0.198	0.238			
VP1	0.106	0.115	0.132	0.170	0.086	0.160		
VP2	0.019	0.069	0.040	0.102	0.091	0.292	0.280	

Appendix H

Statistical figures – structural model

Table 4.1

VIF values outer model after first adjustment

	VIF
@#fixationsonAOI1	23.224
@#fixationsonAOI2	31.217
BrandFamiliarity_1	1.44
BrandFamiliarity_2	3.81
BrandFamiliarity_3	3.397
GREAS_1	1.232
GREAS_5	2.15
GRPEVS_2	1.935
GRPEVS_3	2.153
GRPEVS_5	1.328
IPESP_1	2.015
IPESP_2	3.172
IPESP_3	1.996
IPESP_4	3.462
PAA_1	1.365
PAA_2	1.438
PAA_3	4.271
PAA_4	3.396
PAA_5	3.111
PAA_6	3.747
avgpupilsizes	1
condition	1
fixationdurationAOI1	23.224
fixationdurationAOI2	31.217
GR x AL	1

Table 4.2

VIF values outer model after second adjustment

	VIF
BrandFamiliarity_1	1.44
BrandFamiliarity_2	3.81
BrandFamiliarity_3	3.397
GREAS_1	1.232
GREAS_5	2.15

GRPEVS_2	1.935
GRPEVS_3	2.153
GRPEVS_5	1.328
IPESP_1	2.015
IPESP_2	3.172
IPESP_3	1.996
IPESP_4	3.462
PAA_1	1.365
PAA_2	1.438
PAA_3	4.271
PAA_4	3.396
PAA_5	3.111
PAA_6	3.747
avgpupilsizesize	1
condition	1
fixationdurationAOI1	1
fixationdurationAOI2	1
GR x AL	1

Table 4.3*VIF values inner model after second adjustment*

	AL	BrandFamiliarity	CP	GR	IPESP	PAA	VP1	VP2	GR x AL
AL						1.016	1.003	1.003	
BrandFamiliarity					1.177	1.019			
CP						1.031			
GR							2.951	2.951	
IPESP									
PAA					1.177				
VP1			1.089						
VP2			1.089						
GR x AL							2.946	2.946	

Table 4.4*Overview of SmartPLS model*

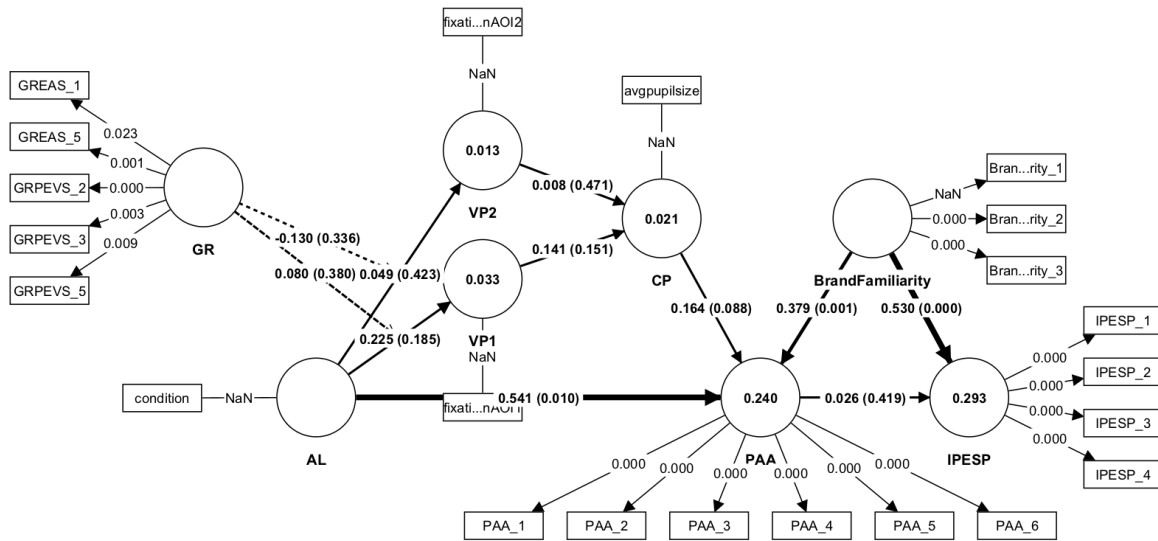


Table 4.5

GoF Index after second adjustment

GoF-Index calculation	
Mean construct communality:	<p>GR $(0.546 \cdot 0.546) + (0.838 \cdot 0.838) + (0.813 \cdot 0.813) + (0.791 \cdot 0.791) + (0.641 \cdot 0.641)$ $= 2.697891 / 5$ $= 0.5395782$</p> <p>IPESP $(0.783 \cdot 0.783) + (0.895 \cdot 0.895) + (0.87 \cdot 0.87) + (0.897 \cdot 0.897)$ $= 2.975623 / 4$ $= 0.74390575$</p> <p>PAA $(0.637 \cdot 0.637) + (0.685 \cdot 0.685) + (0.881 \cdot 0.881) + (0.820 \cdot 0.820) + (0.852 \cdot 0.852) + (0.851 \cdot 0.851)$ $= 3.77366 / 5$ $= 0.754732$</p> <p>Mean construct communality : $0.5395782 + 0.74390575 + 0.754732$ $= 2.03821595 / 3$ 0.67940532</p>
Mean r ² :	$0.021 + 0.294 + 0.293 + 0.031 + 0.009$ $= 0.648 / 5$ $= 0.1296$
Mean construct communality x Mean R ²	$= 0.67940532 \cdot 0.1296$ $= 0.088050929$
GoF-Index:	$= \sqrt{0.088050929}$

	= 0.29673377
--	--------------

Table 4.6

R-square values

	R-square	R-square adjusted
CP	0.021	-0.013
IPESP	0.293	0.269
PAA	0.24	0.2
VP1	0.033	-0.017
VP2	0.013	-0.038

Table 4.7

F-square values

	AL	BrandFamiliarity	CP	GR	IPESP	PAA	VP1	VP2	GR x AL
AL						0.095	0.013	0.001	
BrandFamiliarity					0.338	0.186			
CP						0.034			
GR							0.003	0.011	
IPESP									
PAA					0.001				
VP1			0.019						
VP2			0						
GR x AL							0.001	0.004	

Table 4.8

Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AL -> VP2 -> CP	0	-0.007	0.028	0.014	0.495
AL -> VP1 -> CP -> PAA -> IPESP	0	0	0.002	0.065	0.474
GR -> VP1 -> CP -> PAA -> IPESP	0	0	0.002	0.028	0.489
VP1 -> CP -> PAA -> IPESP	0.001	0.001	0.007	0.093	0.463
GR x AL -> VP2 -> CP	-0.001	-0.002	0.037	0.027	0.489
GR -> VP2 -> CP -> PAA	0	0.001	0.007	0.032	0.487
VP2 -> CP -> PAA -> IPESP	0	0	0.003	0.011	0.496
GR -> VP1 -> CP	0.013	0.026	0.05	0.248	0.402

AL -> VP1 -> CP -> PAA	0.005	0.007	0.014	0.37	0.356
AL -> VP2 -> CP -> PAA	0	-0.001	0.006	0.011	0.496
GR -> VP1 -> CP -> PAA	0.002	0.006	0.013	0.159	0.437
GR x AL -> VP2 -> CP -> PAA -> IPESP	0	0	0.001	0.004	0.498
AL -> VP1 -> CP	0.032	0.033	0.059	0.538	0.295
GR x AL -> VP2 -> CP -> PAA	0	0	0.008	0.021	0.492
GR x AL -> VP1 -> CP -> PAA	0.002	0.001	0.012	0.15	0.44
GR -> VP2 -> CP	0.001	0.008	0.036	0.039	0.485
VP2 -> CP -> PAA	0.001	0	0.022	0.057	0.477
VP1 -> CP -> PAA	0.023	0.031	0.037	0.621	0.267
GR x AL -> VP1 -> CP -> PAA -> IPESP	0	0	0.002	0.03	0.488
AL -> PAA -> IPESP	0.014	0.015	0.078	0.184	0.427
AL -> VP2 -> CP -> PAA -> IPESP	0	0	0.001	0.002	0.499
CP -> PAA -> IPESP	0.004	0.004	0.029	0.151	0.44
GR -> VP2 -> CP -> PAA -> IPESP	0	0	0.001	0.006	0.498
GR x AL -> VP1 -> CP	0.011	0.003	0.051	0.22	0.413
BrandFamiliarity -> PAA -> IPESP	0.01	0.013	0.05	0.201	0.42

Table 4.9

Manipulation check – Independent sample test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Significance One-Sided p	Two-Sided p	Mean Difference	Std. Error	Lower	Upper
Manipulation check †_1	Equal variances assumed	6.404	.014	-1.338	60	.093	.186	-.385	.288	-.962	.191
	Equal variances not assumed			-1.325	53.272	.095	.191	-.385	.291	-.969	.198
Manipulation check †_2	Equal variances assumed	.723	.398	.034	60	.486	.973	.010	.304	-.598	.619
	Equal variances not assumed			.034	58.018	.486	.973	.010	.305	-.601	.621

Table 4.10

Manipulation check – Group statistics

condition	N	Mean	Std. Deviation	Std. Error Mean
-----------	---	------	----------------	-----------------

Manipulation check[†]_1	informational	30	3.33	1.295	.237
	emotional	32	3.72	.958	.169
Manipulation check[†]_2	informational	30	3.67	1.269	.232
	emotional	32	3.66	1.125	.199
