Radboud University

The Effectiveness of an Appealing Social Marketing Campaign: how Antecedents of Visual Attention and Cognitive Evaluation can quell Social Media Challenges.

Master Thesis

Master of Business Administration

Marketing

13-06-2022

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§1 Introduction

An increasing problem among adolescents is obesity (Cairns, & Stead, 2009; Jane, Hagger, Foster, Ho, & Pal, 2018; Zhang et al., 2014). Adolescents are considered obese when their body stores too much redundant fat. In the long-term obesity has a detrimental effect on health (Zhang et al., 2014). Adolescents that suffer from obesity have an increased risk for cardiovascular diseases, diabetes and cancer (Pengpid et al., 2015). However, despite the long-term health risks an increase in the amount of adolescents suffering from obesity is apparent. In 2019/2020 the amount of Dutch adolescents aged 18 to 25 years that suffered from obesity was 25,3% (Centraal Bureau voor de Statistiek, 2021a). In contrast to 2000, where 15,6% suffered from obesity (Centraal Bureau voor de Statistiek, 2019). Ergo, it is crucial to explore factors that have an effect on obesity. A change in one of the factors might be associated with the increase in obesity among adolescents (Zhang et al., 2014). Subsequently, factors that are studied to have an effect on obesity include overeating, physical activity and chronic illness (Cairns, & Stead, 2009; Jane et al., 2018; Zhang et al., 2014). Contemporary research indicates that from the afore-mentioned factors, physical activity among adolescents has been dramatically decreasing (Cairns, & Stead, 2009; Moreno-Llamas, García-Mayor & De la Cruz-Sánchez 2020). A cause for the decrease in physical activity is apparent in social changes (Cairns, & Stead, 2009; Moreno-Llamas et al., 2020). Technological development and digitalization are causing social changes, including sedentary lifestyles (Cairns, & Stead, 2009; Moreno-Llamas et al., 2020). A sedentary lifestyle is conceptualized as a lifestyle where adolescents often sit and engage in little physical activity daily (Cairns, & Stead, 2009; Moreno-Llamas et al., 2020). The change to a more sedentary lifestyle among adolescents is decreasing the amount of physical activity. Therefore, managing the decrease in physical activity will assist in managing the increase in obesity.

Additionally, to manage the decrease in physical activity it is crucial that adolescents are informed of the health risks of physical inactivity (Hamilton, Ferraro, Haws, & Mukhopadhyay, 2021; Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Information search and information evaluation are the first phases in the decision-making process (Hamilton et al., 2021). Subsequent to information search and information evaluation, adolescents make decisions with regard to physical activity (Hamilton et al., 2021). This could possibly increase physical activity efforts. Information search and information evaluation are considered touchpoints in the consumer decision-making process (Lemon, & Verhoef, 2016). Touchpoints reflect actual interactions between a consumer and an offering

at a specific moment in time (Becker, & Jaakkola, 2020). Therefore, the utilization of the decision-making process can assist in managing the decrease in physical activity. Furthermore, touchpoint can be managed by different stakeholders. An ecosystem of stakeholders exists that has an effect on touchpoints (Becker, & Jaakkola, 2020), including companies, institutions, governments and consumers. The government seeks to utilize social marketing to manage touchpoints in the decision-making process (Goldberg, 1995; Peattie, & Peattie, 2009). Social marketing builds on the theoretical basis of commercial marketing, applying the tools, knowledge, techniques and concepts in pursual of a social goal (Goldberg, 1995; Peattie, & Peattie, 2009). Moreover, to manage touchpoints in the decision-making process stimuli can be utilized. Stimuli include sensorial stimuli and thematic content (Becker, & Jaakkola, 2020; Hamilton et al., 2021; Keiningham, et al., 2020; Lemon, & Verhoef, 2016). However, the tools, knowledge, techniques and concepts of social marketing are ineffective in communicating stimuli across touchpoints in a social media context. To embroider, in addition to social changes and lifestyle changes, technological development and digitalization are changing the marketing environment (Heil, Lehmann, & Stremersch, 2010; Onishi, & Manchanda, 2012; Wedel, & Kannan, 2016). New media are formed by digitalization and include the Internet and social media (Heil et al., 2010; Onishi, & Manchanda, 2012; Wedel, & Kannan, 2016). New media influence how and through which touchpoints adolescents aged 18-25 years can be reached (Heil et al., 2010; Onishi, & Manchanda, 2012; Wedel, & Kannan, 2016). In addition to changes in touchpoints, new media are causing challenges in attracting consumer attention, retaining consumer attention and stimulating cognitive evaluation (Ballings, McCullough, & Bharadwaj, 2018; Hughes, Swaminathan, & Brooks, 2019; Varadarajan, & Menon, 1988).

§1.1 Practical relevance

Challenges in attracting attention and stimulating cognitive evaluation cause problems in effectively communicating stimuli across touchpoints (Braunsberger, Buckler, & Ortinau, 2005). Effective communication of stimuli across touchpoints is crucial in informing adolescents of the cruciality of physical activity and decision-making (Lemon, & Verhoef, 2016). The afore-mentioned indicates problems for the effective utilization of social marketing to effectuate the social goal to manage the decrease in physical activity (Peattie, & Peattie, 2009). The exploration of the factors that cause challenges in attracting attention and stimulating cognitive evaluation is twofold. New media are able to reach large, targeted consumer groups (Heil et al., 2010; Onishi, & Manchanda, 2012; Wedel, & Kannan, 2016).

Subsequently, adolescents have commenced ignoring advertisements and attention-spans are shortening. To start with, adolescents have commenced ignoring advertisements (Ballings et al., 2018; Hughes et al., 2019; Varadarajan, & Menon, 1988). New media increase the ease of repetition (Pieters, Rosbergen, & Wedel, 1999, p. 424). An increase in repetition increases "attention wear-out" (Pieters et al., 1999, p. 424). In addition to attention wear-out, new media increase advertising competition (Ballings et al., 2018; Hughes et al., 2019; Varadarajan, & Menon, 1988). An increase in advertising competition causes consumer information overload (Ballings et al., 2018; Hughes et al., 2019; Varadarajan, & Menon, 1988). Subsequently, the afore-mentioned factors have a negative effect on attention attraction. To manage attention wear-out and information overload adolescents have commenced ignoring advertisements (Ballings et al., 2018; Hughes et al., 2019; Varadarajan, & Menon, 1988). When adolescents ignore advertisements, the stimuli will not be able to attract attention (Ballings et al., 2018). Thereupon, information cannot effectively be communicated to influence the decision-making process of adolescents and limits the influence of social marketing on the decision-making process (Lemon, & Verhoef, 2016). Finally, new media are shortening consumer attention-spans (Yoganathan, Osburg, & Akhtar, 2019). Attention-span is defined as the amount of time that an adolescent can allocate sufficient attentional resources to any element (Braunsberger et al., 2005; Stafford, 2000; Van Noort, Voorveld, & Van Reijmersdal, 2012). The level of attentional processes influence the evaluation of information and experiences (Braunsberger et al., 2005; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal, Rozendaal, & Buijzen, 2012). When an adolescent cannot allocate a sufficient amount of attentional resources to an element for a sufficient amount of time, cognitive evaluation is not effectively stimulated (Braunsberger et al., 2005). Subsequently, the shortening of the attention-span has a negative effect on the stimulation of cognitive evaluation. Ergo, ineffective evaluation of information limits the influence of social marketing on the decision-making process.

The negative effects that the afore-mentioned factors have on the effectiveness of social marketing are detrimental in achieving a social goal of altering attitudes and behavioral intentions toward physical activity. Therefore, it is crucial to study how attention can be more effectively attracted and how cognitive evaluation can be more effectively stimulated.

§1.2 Academic Relevance

In order to study how attention can be more effectively attracted and how cognitive evaluation can be more effectively stimulated, a holistic perspective on customer experience

has to be adapted. Becker and Jaakkola (2020) define customer experience as: “non-deliberate, spontaneous responses and reactions to particular stimuli” (Becker, & Jaakkola, 2020, p. 637). To gain a better understanding of this definition, De Keyser, Verleye, Lemon, Keiningham and Klaus (2020) have conceptualized three interconnected components: touchpoints, context and qualities. Understanding the mechanics of the afore-mentioned components can assist in exploring effective attraction of attention and effective stimulation of cognitive evaluation. Pieters and Wedel (2004) have developed a framework that assists in understanding the mechanics of the customer experience components. The framework consists of bottom-up and top-down factors (Pieters, & Wedel, 2004, p. 38). Bottom-up factors are found in stimuli (Pieters, & Wedel, 2004, p. 38). Stimuli can be utilized to manage touchpoints (Becker, & Jaakkola, 2020). Pieters and Wedel (2004) demonstrate that stimuli can be utilized to capture attention (Pieters, & Wedel, 2004). Attention is a crucial factor for causing qualities. Qualities are conceptualized as responses (Pieters, & Wedel, 2004). Responses include sensorial responses, cognitive responses, physical responses, emotional responses and social responses (Lemon, & Verhoef, 2016). Sensorial responses can assist in the explorations of how attention can be more effectively attracted. Sensorial responses consider sensations (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Sensations include auditory, visual, taste, smell and tactile experiences through senses (Simmonds, Bogomolova, Kennedy, Nenycz-Thiel, & Bellman, 2020; Yoganathan et al., 2019). Simmonds et al. (2020, p. 1059) indicate that “biologically relevant stimuli” are crucial in attracting attention in a social media context. Biologically relevant stimuli include fun appeals and fear appeals (Simmonds et al., 2020, p. 1059). Biologically relevant stimuli are able to attract automatic attention and transpose automatic attention to active attention (Simmonds et al., 2020, p. 1059). Furthermore, customer contingencies can have an effect on sensory stimulation (Becker, & Jaakkola, 2020). Customer contingencies include sensation-seeking (Iyer, Blut, Xiao, & Grewal, 2019). The level of sensation-seeking has an effect on the strength of biologically relevant stimuli to transpose automatic attention to active attention (Iyer et al., 2019). Thereupon, sensation-seeking can have an effect on attention attraction.

Furthermore, the context component of customer experience is illustrated by top-down factors. Context is conceptualized as the availability of resources (De Keyser et al., 2020). Top-down factors are found in a person and include attentional processes (Pieters, & Wedel, 2004, p. 38). Attentional processes include motivation, ability and opportunity (Braunsberger et al., 2005; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal et al., 2012). Top-down factors determine the level of attention that is paid to advertising elements

(Pieters, & Wedel, 2004). Previous research indicates that attentional processes are considered to be resources (Pieters, & Wedel, 2004). When the level of attention that is paid to one advertisement element is high, the attentional resources available for additional advertisement elements is limited. Subsequently, touchpoints and context have an effect on qualities (Pieters, & Wedel, 2004). The level of attentional processes that is allocated to an advertisement-element has an effect on cognitive evaluation (Pieters, & Wedel, 2004). Cognitive responses can assist in the exploration of the effect that attentional processes have on cognitive evaluation (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Cognitive responses consider thinking, or thoughts (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Thinking includes the evaluation of information and experiences (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Pieters and Wedel (2004) indicate that attention and consumer knowledge structures cooperate to direct attention across an advertisement (Pieters, & Wedel, 2004; Shen, Jiang, & Adaval, 2010). When attentional processes are limited, automatic attention is not transposed to active attention (Simmonds et al., 2020, p. 1059). Active attention is an essential component in the recall of knowledge structures. The recall of knowledge structures is limited if automatic attention is not transposed to active attention (Simmonds et al., 2020). However, the recall of knowledge structures is crucial to stimulate cognitive evaluation. Thereupon, Simmonds et al. (2020) indicate that biologically relevant stimuli are able to transpose automatic attention to active attention and therefore positively affect the recall of knowledge structures. In addition, the level of sensation-seeking is associated with attentional processes. The level of sensation-seeking has an effect on preferred stimulation and arousal (Iyer et al., 2019). When the level of sensation-seeking is high adolescents explore experiences that provide them with an increasing amount of stimulation and arousal (Iyer et al., 2019). Subsequently, to identify sources of stimulation and arousal more attentional resources such as motivation are allocated for identification (Iyer et al., 2019). However, the proposed effects of biologically relevant stimuli and sensation-seeking have not been extensively studied for social marketing in a new media context.

§1.2.1 Literature gaps

Dissimilar gaps in the literature are observed with regard to social marketing, attracting attention and stimulating cognitive evaluation. Goldberg (1995), and Luck (1974) indicate the necessity of more research into social marketing from a government perspective. At the present moment, research that studies attention and cognitive evaluation beyond that of

traditional marketing research is scarce (Goldberg 1995; Luck, 1974). In addition, Goldberg (1995) indicates that previous research is challenged by channel problems, including challenges in attracting attention and stimulating cognitive evaluation (Ballings et al., 2018; Hughes et al., 2019; Pieters et al., 1999; Varadarajan, & Menon, 1988). The afore-mentioned indicates an important research gap with regard to social marketing from a government perspective and in a social media context. Therefore, this research aims to extend the literature of social marketing in a social media context and explore challenges in attention attraction and cognitive evaluation. To start with, the proposed effects of biologically relevant stimuli on attention and cognitive evaluation remain understudied for social marketing in a social media context (Pieters et al., 1999; Pieters et al., 2010; Simmonds et al., 2020). The cause for the afore-mentioned is found in discrepancies with regard to traditional marketing research. Previous traditional marketing research indicates that tactile stimuli are essential to attract attention (Bolton, Gustafsson, McColl-Kennedy, Sirianni, & Tse, 2014; Yoganathan et al., 2019). However, in a social media context consumers cannot physically touch or hold an advertisement. In contrast, Simmonds et al., (2020) indicate that tactile stimuli are not essential in a social media context. In a social media context, the visual sense is indicated to be a crucial factor in attracting attention (Chen, Burke, Hui, & Leykin, 2021; Pieters et al., 1999; Pieters et al., 2010). Subsequently, the discrepancies in traditional marketing research are a barrier that stop research into biologically relevant stimuli from extending to social marketing research.

Moreover, the proposed effects of sensation-seeking, on attention and cognitive evaluation remain understudied for social marketing in a social media context (Becker, & Jaakkola, 2020; Galloway, 2009; Iyer et al., 2019). The cause for the afore-mentioned is found in discrepancies with regard to research into the effects of stimuli on attention and cognitive evaluation and the vast body of customer contingencies in existence. Previous research demonstrates a direct effect of stimuli on attention and cognitive evaluation (Simmonds et al., 2020). In contrast, Becker and Jaakkola (2020) demonstrate that there is no direct effect of stimuli on cognitive evaluation. Alternatively Becker and Jaakkola (2020) indicate that customer contingencies might have a direct effect on cognitive evaluation. The paper of Becker and Jaakkola (2020) is a relatively recent academic paper. Subsequently, this indicates that implications for future research are relatively recent. In addition to the relative recentness of the research implications, there is a vast body of customer contingencies that can be studied, including sensation-seeking (Becker and Jaakkola, 2020). Ergo, the effect of customer contingencies on visual attention and cognitive evaluation remains understudied

since the implications for future research are relatively recent. However, challenges in attracting attention and stimulating cognitive evaluation cause ineffective communication (Braunsberger et al., 2005; Lemon, & Verhoef, 2016). Thereupon, the social goal remains unachieved if research into biologically relevant stimuli and customer contingencies is not extended into social marketing research. Therefore, it is crucial to extend literature on the effects of biologically relevant stimuli on attention and cognitive evaluation to social marketing research in a social media context.

§1.3 Approach

The aim of this research is to identify the effects that biologically relevant stimuli (fun appeals and fear appeals) and customer contingencies (sensation-seeking) have on the effectiveness of social marketing campaigns in a social media context. The antecedents of consumer responses indicate that fun appeals, fear appeals and the level of sensation-seeking are crucial in attracting attention and stimulating cognitive evaluation (Becker and Jaakkola, 2020). Fun appeals are demonstrated to evoke positive emotions, increase faith, to remember better times, to bring happy moments and to evoke pleasure (Fiore, Jin, & Kim, 2005; Schiffman, & Wisenblit, 2019). Additionally, fear appeals are often utilized in health and safety campaigns (Hastings, Stead, & Webb, 2004; Schiffman, & Wisenblit, 2019). In addition to the antecedents, the outcomes indicate that attracting attention and stimulating cognitive evaluation are factors for advertising effectiveness (Ajzen, & Driver, 1992). Advertisement effectiveness is conceptualized as altering behavioral intention (Ajzen, & Driver, 1992). Finally, this research will utilize two types of research methods. To start with, this research will rely on eye-tracking. Finally, a survey will be utilized. In conclusion, the afore-mentioned research design is utilized to answer the following research question:

- *How do fun appeals and fear appeals in a social media context affect visual attention and cognitive evaluation and how does this translate to behavioral intention?*

§1.4 Contributions

In conclusion, this research contributes to finding solutions for practical problems and advances academic knowledge in multiple research areas. To start with, this research advances academic knowledge in multiple research areas. Research into the effects of biologically relevant stimuli and sensation-seeking on attention and cognitive evaluation is crucial to manage the current ineffectiveness of social marketing in a social media context (Becker and Jaakkola, 2020). Current discrepancies in traditional marketing research cause a

barrier that stops research into biologically relevant stimuli from extending into social marketing research (Bolton et al., 2014; Chen et al., 2021; Yoganathan et al., 2019). This research will study the effects of biologically relevant stimuli on attention and cognitive evaluation with regard to social marketing in a social media context. Subsequently, the first contribution of this research will be to extend research into biologically relevant stimuli to social marketing research in a social media context. The second contribution of this research will be to advance academic knowledge of the effects of biologically relevant stimuli on attention and cognitive evaluation with regard to social marketing in a social media context. Furthermore, implications for future research into the effects of customer-contingencies on attention and cognitive evaluation are recent (Becker and Jaakkola, 2020). This study will explore the implications for future research into the effects of the customer contingency sensation-seeking on attention and cognitive evaluation. Ergo, the third contribution of this research will be to advance academic knowledge of the effects of sensation-seeking on attention and cognitive evaluation with regard to social marketing in a social media context. In conclusion, this research will advance academic knowledge on the effects of biologically relevant stimuli and sensation-seeking on attention and cognitive evaluation for social marketing in a social media context. Additionally, this research will contribute to advancing academic knowledge on the utilization of eye-tracking. Previous research has measured responses to stimuli utilizing self-report measures. Multiple problems impair the measurement of sensorial responses and cognitive responses with such self-report measures (Cacioppo, Cacioppo, and Petty, 2018; Evans & Stanovich, 2013; Otterbring, Wästlund, & Gustafsson, 2016). Therefore, Fox, Nakhata, and Deitz (2019) recommend eye-tracking to provide more accurate predictions of realistic consumer responses to stimuli (Fox et al., 2019). However, research into the utilization of eye-tracking in measuring the effectiveness of social marketing in a social media context is limited (Fox et al., 2019; Harz, Hohenberg, & Homburg, 2021; Menon, Sigurdsson, Larsen, Fagerstrøm, & Foxall, 2016). Ergo, this research will contribute to advancing academic knowledge on the utilization of eye-tracking in measuring the effectiveness of social marketing in a social media context.

Finally, this research contributes to practical problems by exploring how biologically relevant stimuli and sensation-seeking can assist in the management of attention and cognitive evaluation challenges. Challenges in attracting attention and stimulating cognitive evaluation cause ineffective communication (Braunsberger et al., 2005; Van Reijmersdal et al., 2012). Subsequently, the social goal remains unachieved (Peattie, & Peattie, 2009).

Therefore, this research contributes to practical problems by providing means to develop an effective social marketing campaign in social media context.

§1.5 Structure of thesis

First, the theoretical background will be discussed (§2), followed by the development of the hypothesis (§3), and a discussion of the methods for studying the hypothesis (§4). Then, the experiment is conducted, and results will be discussed (§5). Finally, a discussion will be held, followed by a conclusion, and implications (§6).

§2 Theoretical Background

§2.1 Social marketing

The government can alter attitudes and behavioral intentions toward physical activity through dissimilar channels. These dissimilar channels include regulations (Crié & Chebat, 2013; Goldberg 1995; Heil et al., 2010) and social marketing (Crié & Chebat, 2013; Goldberg 1995; Peattie, & Peattie, 2009). Social marketing builds on the theoretical basis of commercial marketing, applying the tools, knowledge, techniques and concepts (Goldberg, 1995; Peattie, & Peattie, 2009). Commercial marketing is utilized to achieve competitive advantages, market performance, and financial performance across markets (Morgan, 2012; Wedel, & Kannan, 2016). In contrast, social marketing is utilized to achieve a social goal (Goldberg, 1995; Peattie, & Peattie, 2009). Social goals refer to marketing activities that influence individual behavior in a social system (Goldberg, 1995; Luck, 1974). The government can define social goals for dissimilar situations and contexts, including the public health spectrum (Goldberg, 1995).

§2.2 Customer Experience

In order to alter attitudes and behavioral intentions in realization of a social goal, a holistic perspective on customer experience has to be adapted. Becker and Jaakkola (2020) define customer experience as: “non-deliberate, spontaneous responses and reactions to particular stimuli” (Becker, & Jaakkola, 2020, p. 637). To gain a better understanding of this definition, De Keyser et al., (2020) have conceptualized three interconnected components: touchpoints, context and qualities.

To start with, touchpoints reflect actual interactions between a consumer and an offering at a specific moment in time (Becker, & Jaakkola, 2020). Previous research demonstrates that touchpoints exist in different phases of the decision-making process,

including information search and information evaluation (Hamilton et al., 2021). In order to manage dissimilar touchpoints Becker, & Jaakkola (2020) explore the utilization of stimuli as input for touchpoints. Stimuli are able to cause responses that can have an effect on evaluative outcomes (Hamilton et al., 2021; Keiningham, et al., 2020; Lemon, & Verhoef, 2016). However, consumer responses are not solely influenced by touchpoints. Context is a crucial component of the customer experience (De Keyser et al., 2020). Context is defined as the availability of resources at a specific moment in time (De Keyser et al., 2020). If stimuli are present, however, the availability of resources is limited, then the desideratum responses will not occur. Therefore, touchpoints and context are interconnected in their effect on responses. Responses are the conceptualization of qualities (De Keyser et al., 2020). Dissimilar responses to stimuli exist, including sensorial responses, cognitive responses, physical responses, emotional responses and social responses (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). In order to gain a better understanding of how the customer experience components cooperate to cause responses, the mechanics have to be explored.

§2.3 Bottom-up and top-down factors

Pieters and Wedel (2004) have developed a framework that assists in understanding the mechanics of the customer experience components. The framework consists of bottom-up and top-down factors (Pieters, & Wedel, 2004, p. 38).

Bottom-up factors are found in stimuli and include advertisement features such as size and shape (Pieters, & Wedel, 2004, p.38). Stimuli can be utilized to manage touchpoints (Becker, & Jaakkola, 2020). The first step to interaction between a consumer and stimuli is to capture attention. Bottom-up factors are capable of capturing automatic attention (Pieters, & Wedel, 2004, p.38). Automatic attention indicates that consumers are not searching for specific features (Pieters, & Wedel, 2004, p.38). However, there is a discrepancy in previous research with regard to what stimuli are effective in capturing automatic attention. Previous research indicates that tactile stimuli are essential to attract attention (Bolton et al., 2014; Yoganathan et al., 2019). However, in a social media context consumers cannot physically touch or hold an advertisement. In contrast, Simmonds et al., (2020) indicate that tactile stimuli are not essential in a social media context. In a social media context, visual stimuli are indicated to be a crucial factor in attracting attention (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010). Attention that is attracted through visual stimuli is defined as visual attention (Pieters, Wedel, & Batra, 2010; Simmonds et al., 2020; Sütterlin, Brunner, & Opwis, 2008).

Moreover, top-down factors are found in a person and include attentional processes such as motivation, ability and opportunity. Top-down factors determine the level of attention that is paid to advertising elements (Pieters, & Wedel, 2004). Attentional processes cooperate with customer perception of stimuli to guide attention across advertisement elements and to recognize and understand the advertisement (Pieters, & Wedel, 2004, p.38). When attentional processes are limited, automatic attention is not transposed to active attention (Simmonds et al., 2020, p. 1059). Active attention is an essential component in the recall of knowledge structures. The recall of knowledge structures is limited if automatic attention is not transposed to active attention (Simmonds et al., 2020). However, the recall of knowledge structures is crucial to stimulate cognitive evaluation. Ergo, attention and attentional processes are crucial factors in stimulating cognitive evaluation. Subsequently, visual attention and cognitive evaluation are crucial to effectively transpose stimuli to evaluative outcomes.

§2.4 Antecedents

§2.3.1 Biologically relevant stimuli

Visual attention and cognitive evaluation are crucial to effectively transpose stimuli to evaluative outcomes (Becker, & Jaakkola, 2020). However, there are discrepancies in existing research with regard to what stimuli can overcome attention wear-out, information overload and the shortening of attention spans (Braunsberger et al., 2005). Therefore, antecedents of visual attention and cognitive evaluation should be explored. Previous traditional marketing research indicates that tactile stimuli are essential to attract attention (Bolton et al., 2014; Yoganathan et al., 2019). In contrast, Simmonds et al., (2020) indicate that tactile stimuli are not essential in a social media context. Ergo, previous research indicates that visual sensations are a crucial factor in attracting attention in a social media context (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010). Visual sensations can be caused by what Simmonds et al. (2020, p. 1059) conceptualize as “biologically relevant stimuli” and it is indicated that biologically relevant stimuli should be able to overcome attention wear-out, information overload and the shortening of attention spans. Biologically relevant stimuli can attract automatic visual attention and transpose automatic visual attention to active visual attention (Simmonds et al., 2020). Thereupon, active visual attention has a positive effect on the recall of knowledge structures which is a crucial factor for cognitive evaluation (Simmonds et al., 2020). In conclusion, biologically relevant stimuli have an effect on visual attention and cognitive evaluation.

§2.3.2 Sensation-seeking

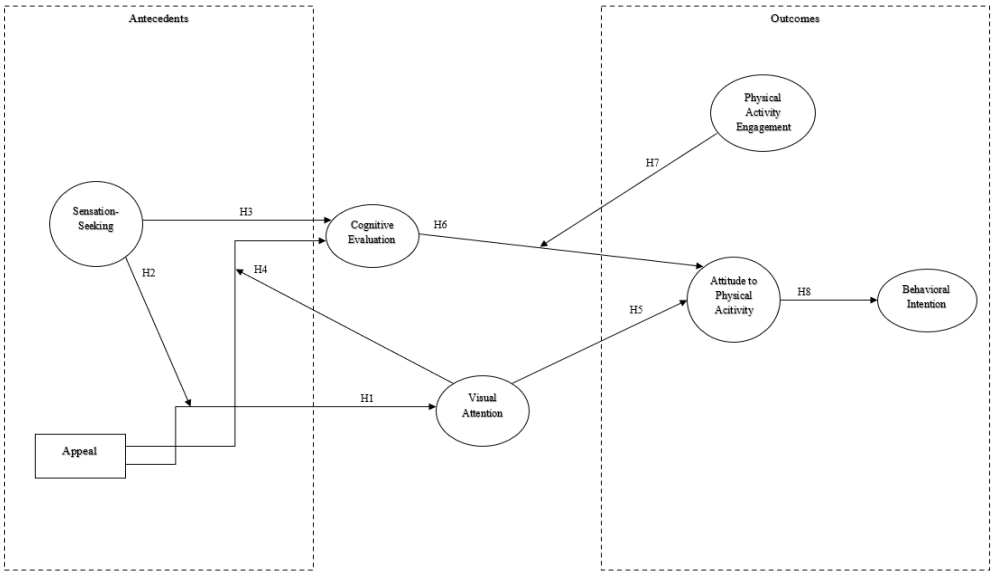
In addition to biologically relevant stimuli, customer contingencies can have an effect on visual attention (Becker, & Jaakkola, 2020). Customer contingencies include characteristics (Becker, & Jaakkola, 2020). There is a vast body of research available with regard to customer characteristics, including research on age, gender, and educational level. However, previous research indicates that sensation-seeking is a customer contingency that is associated with biologically relevant stimuli (Galloway, 2009; Iyer et al., 2019; Martin, Sherrard, & Wentzel, 2005; Mittelstaedt, Grossbart, Curtis, & Devere, 1976). It is demonstrated that the level of sensation-seeking has an effect on sensory stimulation preferences. Consumers that score high on sensation-seeking prefer higher-level sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). Subsequently, consumers that score low on sensation-seeking prefer lower-level sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). Sensory stimulation is caused by biologically relevant stimuli (Simmonds et al., 2020). In addition, previous research indicates that the level of sensation-seeking has an effect on the strength of biologically relevant stimuli to transpose automatic visual attention to active visual attention (Iyer et al., 2019). Therefore, sensation-seeking and biologically relevant stimuli are associated in their effects on visual attention.

Furthermore, sensation-seeking can have an effect on cognitive evaluation. In contrast to the literature on biologically relevant stimuli, previous research demonstrates no direct effect of stimuli on cognitive evaluation (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976). An alternative explanation provided by previous research is that the attentional processes associated with cognitive evaluation are directly influenced by customer contingencies (Becker, & Jaakkola, 2020), including sensation-seeking (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). In addition, the level of sensation-seeking has an effect on attentional processes. The level of sensation-seeking has an effect on preferred stimulation and arousal (Iyer et al., 2019). When the level of sensation-seeking is high adolescents explore experiences that provide them with an increasing amount of stimulation and arousal (Iyer et al., 2019). Subsequently, to identify sources of stimulation and arousal more attentional resources such as motivation are allocated for identification (Iyer et al., 2019). Ergo, sensation-seeking has an effect on visual attention and cognitive evaluation. In conclusion,

biologically relevant stimuli and sensation-seeking are crucial in overcoming the challenges associated with visual attention and cognitive evaluation.

§3 Hypotheses

Figure 3.1. Conceptual model.



§3.1 Sensorial responses

Biologically relevant stimuli and sensation-seeking are crucial in overcoming the challenges associated with visual attention and cognitive evaluation. The afore-mentioned antecedents are associated with visual sensations in a social media context. Biologically relevant stimuli and sensation-seeking have an effect on visual sensations (Galloway, 2009; Iyer et al., 2019; Simmonds et al., 2020). Visual sensations are a component of sensorial responses (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Sensorial responses include more than visual sensations. Sensations include auditory, visual, taste, smell and tactile experiences through senses (Simmonds et al., 2020; Yoganathan et al., 2019).

Furthermore, visual sensations are a crucial factor in attracting attention (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010). Previous research indicates that visual sensations can be caused by biologically relevant stimuli (Simmonds et al., 2020). Ergo, biologically relevant stimuli have an effect on visual attention (Simmonds et al., 2020). Biologically relevant stimuli can attract automatic visual attention and transpose automatic visual attention to active visual attention (Simmonds et al., 2020). Simmonds et al. (2020) provide insights in the biologically relevant stimuli that can be utilized to attract attention.

Biologically relevant stimuli that can be utilized to attract attention include fun appeals and fear appeals (Simmonds et al., 2020, p. 1059).

Fear appeals are often utilized in health and safety campaigns (Hastings et al., 2004; Schiffman, & Wisenblit, 2019). Mild fear appeals are demonstrated to be effective in attracting consumer attention (Schiffman, & Wisenblit, 2019). In contrast, there is previous research which indicates that fear appeals might not be effective for all target segments, including adolescents (Hastings et al., 2004; Schiffman, & Wisenblit, 2019). Fear appeals can be less effective for adolescents for reasons of mentality (Hastings et al., 2004). If the fear appeal does not match existing values, it is ignored and will not attract attention (Hastings et al., 2004; Schiffman, & Wisenblit, 2019). Subsequently, Schiffman and Wisenblit (2019) advise researchers to consider alternative biologically relevant stimuli. An alternative to fear appeals are fun appeals. Fun appeals are often utilized to evoke positive emotions, increase faith, remember better times, bring happy moments and evoke pleasure (Fiore et al., 2005; Schiffman, & Wisenblit, 2019). It is demonstrated that fun appeals have a positive effect on sensations, experiences and memory storage (Fiore et al., 2005; Schiffman, & Wisenblit, 2019). In addition to the positive effects, fun appeals were studied to have no serious concerns with regard to target segments (Fiore et al., 2005; Schiffman, & Wisenblit, 2019).

Therefore, it is indicated that fun appeals are more effective in attracting adolescent attention and fear appeals are less effective in attracting adolescent attention. In conclusion, the following hypothesis was developed:

- *Hypothesis 1: Fun appeals will have a stronger positive effect on visual attention than fear appeals.*

Furthermore, previous research indicates that sensation-seeking has a role in the effect of biologically relevant stimuli on visual attention. It is demonstrated that the level of sensation-seeking has an effect on sensory stimulation preferences. Consumers that score high on sensation-seeking prefer higher-level sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). Subsequently, consumers that score low on sensation-seeking prefer lower-level sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). In addition, previous research indicates that consumers with a high score on sensation-seeking are influenced stronger by fun appeals (Fiore et al., 2005; Schiffman, & Wisenblit, 2019) and weaker by fear appeals (Hastings et al., 2004; Schiffman, & Wisenblit, 2019). In contrast, the afore-

mentioned research does not indicate the opposite effect when consumers have a low score on sensation-seeking. Subsequently, it is inappropriate to provide claims on the effects of low sensation-seeking on fun appeals and fear appeals.

Therefore, it is indicated that sensation-seeking has a moderating role in the effects of fun appeals and fear appeals on attention. In conclusion, the following hypothesis was developed:

- *Hypothesis 2: Sensation-seeking moderates the strength of the effect of stimuli on visual attention, such that when sensation-seeking is high, fun appeals will have a stronger positive effect on visual attention than fear appeals*

§3.2 Cognitive responses

In addition to visual attention, the afore-mentioned antecedents are associated with attentional processes in a social media context. Biologically relevant stimuli and sensation-seeking have an effect on attentional processes (Galloway, 2009; Iyer et al., 2019; Simmonds et al., 2020). Previous research has demonstrated an effect of stimuli on cognitive evaluation when the effect is moderated by visual attention (Simmonds et al., 2020). In contrast Becker and Jaakkola (2020) indicate that there is no direct effect of stimuli on cognitive evaluation. However, an implication for further research is the direct effect of sensation-seeking on cognitive evaluation (Becker, & Jaakkola, 2020; Iyer et al., 2019). Ergo, the two afore-mentioned implications are studied.

To start with the moderating role of visual attention, Pieters and Wedel (2004) indicate that visual attention and consumer knowledge structures cooperate to direct attention across an advertisement (Pieters, & Wedel, 2004; Shen et al., 2010). The level of attentional processes that is allocated to an advertisement-element has an effect on cognitive evaluation. Cognitive responses can assist in the exploration of the effect that attentional processes have on cognitive evaluation (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Cognitive responses consider thinking, or thoughts (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Thinking includes the evaluation of information and experiences (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). When attentional processes are limited, automatic visual attention is not transposed to active attention (Simmonds et al., 2020, p. 1059). Active visual attention is an essential component in the recall of knowledge structures. The recall of knowledge structures is limited if automatic visual attention is not transposed to active visual attention (Simmonds et al., 2020). However, the recall of knowledge structures is crucial to stimulate cognitive evaluation. Ergo, there are stimuli that have a positive effect on the

transposure of automatic visual attention to active visual attention. Simmonds et al. (2020) demonstrate that in addition to attracting automatic visual attention, biologically relevant stimuli transpose automatic visual attention to active visual attention. Subsequently, when automatic visual attention transposes to active visual attention it should have a positive effect on the recall of knowledge structures. Subsequently, if there is a direct effect of stimuli on cognitive evaluation, this effect is moderated by visual attention (Simmonds et al., 2020). Without the transposure of automatic visual attention to active visual attention, the amount of attentional resources that are allocated will be insufficient to stimulate cognitive evaluation (Simmonds et al., 2020).

Therefore, it is indicated that visual attention has a moderating role in the effects of fun appeals and fear appeals on cognitive evaluation. In conclusion, the following hypothesis was developed:

- *Hypothesis 3: Visual attention moderates the strength of the effect of stimuli on cognitive evaluation, such that when visual attention is high, stimuli will have a stronger positive effect on cognitive evaluation than when visual attention is low.*

Furthermore, previous research indicates the direct effect of sensation-seeking on cognitive evaluation should be studied (Becker, & Jaakkola, 2020; Iyer et al., 2019). It is indicated that the level of sensation-seeking has an effect on attentional processes. The effect can be clarified by the mechanics of attentional processes. As was previously discussed, the level of sensation-seeking has an effect on preferred stimulation and arousal (Iyer et al., 2019; MacInnis, Moorman, & Jaworski, 1991). When the level of sensation-seeking is high, adolescents explore experiences that provide them with an increasing amount of stimulation and arousal (Iyer et al., 2019; MacInnis et al., 1991). Subsequently, to identify sources of stimulation and arousal more attentional resources such as motivation are allocated for identification (Iyer et al., 2019; MacInnis et al., 1991). Opportunities for stimulation and arousal are cognitively evaluated to fulfill the need for stimulation and arousal (Iyer et al., 2019; MacInnis et al., 1991). Ergo, to identify an opportunity for stimulation and arousal, cognitive evaluation is crucial to process any relevant information. Subsequently, when the level of sensation-seeking is low adolescents do not need to allocate the same amount of attentional resources to identify sources of stimulation and arousal (Iyer et al., 2019; MacInnis et al., 1991). In line with previous research, it is indicated that sensation-seeking has a direct positive effect on sensation-seeking. When the level of sensation-seeking is high,

the level of evaluation should be high. Subsequently, when the level of sensation-seeking is low, the level of evaluation should be low.

Therefore, it is indicated that sensation-seeking has a positive effect on cognitive evaluation. In conclusion, the following hypothesis was developed:

- *Hypothesis 4: A high level of sensation-seeking will have a stronger positive effect on cognitive evaluation than a low level of sensation-seeking.*

§3.4 Outcomes

§3.4.1 Evaluative outcomes

In addition to the antecedents, visual attention and cognitive evaluation can have an effect on outcomes. The effects that antecedents have on visual attention and cognitive evaluation determine the effectiveness of social marketing (Becker, & Jaakkola, 2020). Visual attention and cognitive evaluation are demonstrated to be input for evaluative outcomes (Ajzen, & Driver, 1992; Sheppard, Hartwick, & Warshaw, 1988). Evaluative outcomes are crucial to change behavioral intention toward physical activity, since consumers evaluate the consequences of outcomes (Ajzen, & Driver, 1992; Sheppard et al., 1988). Therefore, the first step is to explore evaluative outcomes.

There are two levels of evaluative outcomes. The first level of evaluative outcomes are personal-level evaluative outcomes (Ajzen, & Driver, 1992; Hamilton et al., 2021; Steinhoff, & Zondag, 2021). Personal-level evaluative outcomes include loyalty (Steinhoff, & Zondag, 2021, p. 72), perceived quality (Lemon, & Verhoef, 2016. p. 74), perceived value-in-utilize (Becker, & Jaakkola, 2020, p. 638), satisfaction (De Keyser et al., 2020, p. 446) and attitude-formation (Ajzen, & Driver, 1992; Sheppard et al., 1988). The second level of evaluative outcomes are social-level evaluative outcomes (Ajzen, & Driver, 1992; Hamilton et al., 2021; Steinhoff, & Zondag, 2021). Social-level evaluative outcomes include sharing (Hamilton et al., 2021), word-of-mouth (Lemon, & Verhoef, 2016, p. 74) and recommendation (Voorhees, et al., 2017, p. 271).

Furthermore, previous research demonstrates that positive experiences have a positive effect on attitudes (Ajzen, & Driver, 1992; Sheppard et al., 1988). Experiences include the responses of visual attention and cognitive evaluation to stimuli (Becker, & Jaakkola, 2020). Subsequently, if visual attention is high it is indicated to have a positive effect on attitudes (Ajzen, & Driver, 1992; Sheppard et al., 1988).

Therefore, it is indicated that visual attention has a positive effect on attitudes. In conclusion, the following hypothesis was developed:

- *Hypothesis 5: A high level of visual attention will have a stronger positive effect on attitudes than a low level of visual attention.*

In addition to visual attention, cognitive evaluation is indicated to have a positive effect on attitudes (Ajzen, & Driver, 1992; Sheppard et al., 1988). Positive experiences provide consumers with new information, including information with regard to consequences of physical inactivity (Ajzen, & Driver, 1992; Braunsberger et al., 2005; Simmonds et al., 2020; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal et al., 2012; Sheppard et al., 1988). Subsequently, new information is cognitively evaluated producing new and re-evaluated attitudes (Ajzen, & Driver, 1992; Braunsberger et al., 2005; Simmonds et al., 2020; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal et al., 2012; Sheppard et al., 1988). In line with previous research, it is demonstrated that cognitive evaluation has a positive effect on the (re-evaluation) of attitudes.

Therefore, it is indicated that cognitive evaluation has a positive effect on attitudes. In conclusion, the following hypothesis was developed:

- *Hypothesis 6: A high level of cognitive evaluation will have a stronger positive effect on attitudes than a low level of cognitive evaluation.*

Moreover, the re-evaluation of attitudes indicates existing attitudes with regard to physical activity (Ajzen, & Driver, 1992; Braunsberger et al., 2005; Simmonds et al., 2020; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal et al., 2012; Sheppard et al., 1988). Previous research indicates that existing attitudes with regard to physical activity are formed by the cognitive evaluation of previously obtained information and consequences of previous decisions (Ajzen, & Driver, 1992; Sheppard et al., 1988). Courneya and McAuley (1994) demonstrate that existing physical activity engagement efforts can be considered previously obtained information and consequences of previous decisions. Subsequently, it is indicated that existing physical activity engagement efforts have a moderating role in the effect of cognitive evaluation on attitudes (Courneya, & McAuley, 1994; Magaraggia, Dimmock, & Jackson, 2014).

Therefore, research into the moderating effect of physical activity engagement on the relationship between cognitive evaluation and attitudes is crucial in developing an effective social marketing campaign. In conclusion, the following hypothesis was developed:

- *Hypothesis 7: Physical activity moderates the strength of the effect of cognitive evaluation on attitudes, such that when physical activity engagement is high,*

cognitive evaluation will have a stronger positive effect on attitudes than when physical activity engagement is low.

§3.4.2 Behavioral intention

Behavioral intention is an important measure to explore the effectiveness of social marketing (Ajzen, & Driver, 1992; Sheppard et al., 1988). Behavioral intention is conceptualized as the intention to exercise a behavior in the (near) future (Ajzen, & Driver, 1992; Sheppard et al., 1988). When behavioral intention is to engage in physical activity in the near future, then the social marketing effort is considered effective. However, when behavioral intention is to remain inactive, the social marketing effort is considered ineffective. Subsequently, behavioral intention can be influenced by attitudes (Ajzen, & Driver, 1992; Sheppard et al., 1988). Consumers evaluate the consequences of outcomes and form an attitude (Ajzen, & Driver, 1992; Sheppard et al., 1988). Attitudes are then utilized as input for behavioral intention (Ajzen, & Driver, 1992; Sheppard et al., 1988). Ergo, previous research demonstrates that attitudes have an effect on behavioral intention (Ajzen, & Driver, 1992; Sheppard et al., 1988).

In line with previous research, positive attitudes are indicated to have a positive effect on behavioral intention. In contrast, negative attitudes have a negative In conclusion, the following hypothesis was developed:

- *Hypothesis 8: Positive attitudes have a positive effect on behavioral intention and negative attitudes have a negative effect on behavioral intention.*

§4 Methods

§4.1 Research strategy

To conceptualize and operationalize concepts for this study, widely available literature was utilized on the topics of stimuli, responses to stimuli, evaluative outcomes, and behavioral intention (Bleijenbergh, 2016). Different theoretical frameworks were utilized to hypothesize the relationships between these different topics, including customer experience, bottom-up and top-down factors, new media and the theory of reasoned action (Bleijenbergh, 2016). In conclusion, the research approach taken within this research case is theoretically driven and deductive, using widely available literature to develop empirically measurable concepts (Bleijenbergh, 2016).

§4.2 Research design

§4.2.1 Methods of data collection

The research design that was utilized for this study is a one-factor, between-subjects experimental design (Field, 2018; Hair, Black, Babin, Anderson, 2018).

The research includes one study with two components (Hair et al., 2018). Two types of research methods were utilized for data collection (Field, 2018; Hair et al., 2018). To start with, the first component of the study is eye-tracking. An experiment with eye-tracking software was utilized to measure the concepts of offering-related stimuli (fun appeals and fear appeals as content) and responses to stimuli (visual attention and cognitive evaluation). Finally, the second component of the study is a survey. A survey was utilized to measure the concepts of evaluative outcomes (attitudes), behavioral change (behavioral intention), the customer characteristic "sensation-seeking" and physical activity engagement.

§4.2.1.1 Eye-tracking experiment

Previous research has measured responses to stimuli utilizing self-report measures. However, multiple problems impair the measurement of sensorial responses and cognitive responses with such self-report measures (Cacioppo et al., 2018; Evans & Stanovich, 2013; Otterbring et al., 2016). To start with, stimuli can be unconscious (Cacioppo et al., 2018). Unconscious stimuli can influence responses without consumer perception and before consumer perception (Cacioppo et al., 2018). Additionally, consumers might not be aware of the existence of responses, or the effect that stimuli have on these responses (Cacioppo et al., 2018). In conclusion, consumers might unconsciously experience stimuli, responses and the effect that stimuli have on responses (Cacioppo et al., 2018). Finally, the level of information processing may evoke biases that affect self-report measures (Evans & Stanovich, 2013; Otterbring et al., 2016).

Fox et al. (2019) discuss a method for the measurement of responses to stimuli that seeks to depart from the problems observed with self-report measures: eye-tracking experiments (Fox et al., 2019; Otterbring et al., 2016). Eye-tracking provides more accurate predictions of realistic consumer responses to stimuli (Cacioppo et al., 2018; Evans & Stanovich, 2013; Fox et al., 2019; Menon et al., 2016; Otterbring et al., 2016). Nevertheless, previous research indicates a lack of research into the utilization of eye-tracking in measuring the effectiveness of social marketing campaigns (Fox et al., 2019; Harz et al., 2021; Menon et al., 2016). Finally, the afore-mentioned method for measurement of responses to stimuli can be utilized within new forms of media (Fox et al., 2019; Otterbring et al., 2016).

Furthermore, previous research demonstrates measurement methods to measure visual attention and cognitive evaluation (Otterbring et al., 2016; Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Sütterlin et al., 2008; Van Reijmersdal et al., 2020). The measurement methods utilize measuring fixation. Fixations are pauses between saccades where the eyes are not moving and are staring at one point (Pieters et al., 1999). Saccades are periods when the eyes are moving from one point to another (Pieters et al., 1999).

§4.2.1.2 Survey

The goal of this study is to utilize existing and well-developed scales to collect data from a sufficient number of respondents (Vennix, 2016). The same amount of eye-tracking participants must be utilized in a survey for analysis purposes (Vennix, 2016). Therefore, utilizing a survey method is appropriate for this research case (Vennix, 2016). Furthermore, data that is collected by a survey can be statistically processed. Survey data output has a quantitative format (Vennix, 2016). Additionally, research results from sampled data opportunize the researcher to generalize data results to a larger population (Vennix, 2016).

§4.2.2 Eye-tracking content

§4.2.2.1 Instagram context

The increasing importance of social media indicates the importance of studying the concepts of sensory cues and visual attention in a digital environment.

Instagram is a social media platform that represents experience creation through the utilization of visual-level and auditory-level content (videos, photos) (Colicev, Malshe, Pauwels, & O'Connor, 2018). Additionally, advertisements are demonstrated in between appreciated content (Colicev et al., 2018; Hughes et al., 2019; Li, Larimo, & Leonidou, 2021; Wedel, & Kannan, 2016). The demonstration of advertisements in between appreciated content assists in solving problems related to information overload and distraction issues (Colicev et al., 2018; Hughes et al., 2019; Li et al., 2021; Wedel, & Kannan, 2016). Furthermore, the utilization of hedonic content in Instagram's low-involvement environment has a positive influence on awareness (Hughes et al., 2019). Therefore, Instagram demonstrates the importance of studying the effectiveness of a social marketing campaign with the topic of physical activity. In conclusion, the social media platform Instagram was utilized as a context for both conditions(fun appeals, and fear appeals). Moreover, both conditions were separately demonstrated as an advertisement within an Instagram feed. To explain the lay-out of the images, the image created the feeling that consumers were scrolling

to their Instagram feed and ceased when the advertisement was demonstrated in between appreciated content. Therefore, participants observed an image with one of the two conditions in between appreciated posts. Finally, the Instagram account from which the post was uploaded, is the account of the Rijksinstituut voor Volksgezondheid en Milieu (RIVM). The RIVM is the government division that has developed a roadmap towards healthier lifestyles amongst Dutch residents (RIVM, n.d.). Therefore, the RIVM represents the government perspective taken in this research case.

§4.2.2.2 Design of content

The content was designed to study the influence of sensory cues on visual attention and cognitive evaluation. Simmonds et al. (2020, p. 1059) indicate that "biologically relevant stimuli" could be utilized to study the influence of sensory cues on visual attention and cognitive evaluation (Simmonds et al., 2020, p. 1059). "Biologically relevant stimuli" include fun appeals and fear appeals (Simmonds et al., 2020, p. 1059). Therefore, to represent the two conditions (fun appeals and fear appeals), two visual campaigns were developed. To start with, campaign one demonstrated a visual representation (picture) of a fun appeal (see Appendix 3A). Finally, campaign two demonstrated a visual representation (picture) of a fear appeal (see Appendix 3B). Both visual representations (pictures) were taken by the researcher and solely differed on the conditions. To start with, campaign one demonstrated a man holding a soccer ball representing a fun physical activity. Finally, campaign two demonstrated a man experiencing a heart attack representing the health risks of physical inactivity. In both campaigns the condition was demonstrated in the same spot.

Finally, social media has been shortening the amount of attention consumers spend on content (Yoganathan et al., 2019). Previous research has demonstrated that such attentional resources (attention-span) affect the amount of fixations, sequence of fixations and advertisement-element fixation duration of consumers (Van Reijmersdal et al., 2012). Moreover, the shortening of the consumer attention-span is observable in consumer comprehension of campaign stories (Van Reijmersdal et al., 2012). Consumers spend most attentional resources on information that assists in understanding the story (Chan, Lowe, & Petrovici, 2016; Hernandez, Wang, Sheng, Kalliny, & Minor, 2017; Van Reijmersdal et al., 2012). Additionally, the Dutch government often utilizes quotes in their visual representations that represent the topic of the social marketing campaign (Puur rookvrij, n.d.; Rookvrije Generatie, n.d.). Quotes which can be considered information central to the story (Klein, Czaplicki, Berman, Emery, & Schillo, 2020). Therefore, to represent the Dutch

government's social marketing campaigns, a quote was added to the picture to represent the topic of physical activity (Klein et al., 2020). The utilized quote was identical in both visual representations. The quotes that were demonstrated were the following: "Live an exercising life." and "@wisetoexercise". In conclusion, the RIVM has posted a visual, social marketing campaign on their Instagram to stimulate physical activity.

§4.2.2.3 Pre-test

A pre-test was conducted to verify whether the two conditions were experienced correctly (Field, 2018). Additionally, a one-way ANOVA was conducted to analyze the data obtained within the pre-test (Field, 2018). To start with, fourteen adolescents were enquired to participate in the pre-test (Field, 2018). A participant solely observed one of the two conditions (Field, 2018). Therefore, seven participants observed the fun appeal condition and seven participants observed the fear appeal condition (Field, 2018). Finally, the participants were enquired to answer three questions (see Appendix 4A). The three questions were rated on a 5-point Likert-scale. To start with, participants were enquired to rate the condition on whether they are of opinion that the condition is a fun appeal or a fear appeal (Patino, Kaltcheva, & Smith, 2012; Zemack-Rugar, & Rabino, 2019). For an overview of the results see Appendix 4B. The descriptives indicate that the participants observed the fun appeal condition as a fun appeal (M = 4,14) and the fear appeal condition as a fear appeal (M = 1,57). Additionally, a significant difference was observed between indicating that the two conditions are significantly different ($F(1, 12) = 60{,}750$; $p = 0{,}000$; $p < 0{,}001$). Second, participants were enquired to rate the condition on whether they are of opinion that the condition is visually attractive (Patino et al., 2012; Zemack-Rugar, & Rabino, 2019). The descriptives indicate that the participants observed both images as partially visually attractive (M*Fun* = 3,43; M*Fear* = 3,71). Additionally, a one-way ANOVA indicates that there is no significant difference in visual attractiveness ($F(1, 12) = 0{,}375$; $p = 0{,}552$). Finally, participants were enquired to rate the condition on whether they are of opinion that the condition depicts real-life situations (Patino et al., 2012; Zemack-Rugar, & Rabino, 2019). The descriptives indicate that the participants observed both images to depict real-life situations (M*Fun* = 4,57; M*Fear* = 4,29). Additionally, a one-way ANOVA indicates that there is no significant difference in the depiction of real-life situations ($F(1, 12) = 1{,}091$; $p = 0{,}317$). In conclusion, the visual representations were experienced correctly, differ significantly and solely differed on the conditions.

§4.2.3 Procedure of eye-tracking experiment

To start with, participants were enquired to participate in the eye-tracking experiment. Participants were enquired to utilize the researcher's Ipad in a physical environment or were enquired to open a website Url linked to Qualtrics on a participant's owned device. Thereafter, participants were enquired to participate in an online survey. For an overview of the eye-tracking experiment structure see Appendix 2.

Furthermore, the software that was utilized for the eye-tracking experiment was GazeRecorder (https://app.gazerecorder.com). GazeRecorder is an online eye-tracking tool that can be utilized for different types of experiments, including experiments with photos, advertisements, videos, visual stores, testing packaging and shelf testing (Mahadas, Semkewyc, Suresh, & Hung, 2021). Subsequently, two experiments were created. Experiment 1 contained the fun appeal visual representation and experiment 2 contained the fear appeal visual representation. Separate website Urls were created for experiment 1 and experiment 2. Finally, GazeRecorder collected data on the number of fixations, time to first view and fixation duration for individual participants (Mahadas et al., 2021).

Thereafter, adolescents were enquired to participate in the experiment and survey. Participants were targeted via the internet and physically at Radboud University and could utilize a website Url to the survey tool Qualtrics (https://fmru.az1.qualtrics.com/). When the Qualtrics survey was opened, participants were introduced to the topic and were enquired whether they were aged 18-25 years (see Appendix 2A). Subsequently, participants were enquired to read a consent form and consent to participate in the study (see Appendix 2B). If a participant did consent to participate in the study the participant proceeded to an instruction form (see Appendix 2C) and if a participant did not consent to participate in the study the participant proceeded to the end of the study. Thereupon, participants were enquired to read an instruction form within the Qualtrics survey before commencing the eye-tracking experiment. The instruction form included a sequence of steps the participant was enquired to follow the website Url to the eye-tracking experiment. Ergo, the instruction form was a necessity for multiple reasons. To start with, the GazeRecorder eye-tracking software was tested. These tests demonstrated that the best results were obtained when a participant's camera was located at eye height, located in the top middle of the device and when the device was kept still. The results were included in the instruction form. Finally, participants were enquired to participate in a survey subsequent to the eye-tracking experiment. In conclusion, the instruction form included a sequence of steps a participant had to take preparatory to the eye-tracking experiment. To start with, participants were enquired to conduct the experiment

utilizing a device where the camera was in the top middle, to place the device's camera at eye height and keep the device still and on a steady base. Additionally, participants were notified that the experiment would start when they opened the website Url to the eye-tracking experiment, that the participants should not close the Qualtrics survey software and that the participant had to return to the Qualtrics survey software subsequent to finishing the eye-tracking experiment. There participants could utilize the demonstrated unique six digit code to proceed to the survey questions.

Finally, participants were demonstrated with a website Url to the eye-tracking experiment (see Appendix 2D). GazeRecorder enquired the participant to commence the experiment and calibrate the eye-tracking software. Thereupon, participants were demonstrated with one of the two visual representations. Previous research has indicated the demonstration of a visual representation for 10 seconds (Chan et al., 2016; Hernandez et al., 2017; Klein et al., 2020). Subsequently, participants received a unique six digit code. To ensure that a code was utilized only once, quotas were utilized in the Qualtrics survey software. When a participant read the instruction form, they were demonstrated with a specific GazeRecorder website Url. Subsequent to finishing the eye-tracking the participant was redirect to a unique six digit code. Every participant received a dissimilar website Url to GazeRecorder. The researcher created 80 additional Qualtrics surveys of which each contained a unique six digit code. The quota ensured that participants could utilize a link to GazeRecorder only once. Finally, the data that was obtained through the utilization of GazeRecorder was linked to an individual participant and their survey data by utilizing unique six digit codes.

§4.2.4 Structure of questionnaire

The eye-tracking experiment was utilized to measure the concepts of offering-related stimuli (fun appeals and fear appeals as content) and responses to stimuli (visual attention, and cognitive evaluation). Additionally, the survey was utilized to measure the concepts of evaluative outcomes (attitudes), behavioral change (behavioral intention), the customer characteristic "sensation-seeking" and physical activity engagement.

To start with, subsequently to finishing the eye-tracking experiment, consumers were introduced to the survey (see Appendix 5A). Furthermore, the survey questions were divided into four dissimilar parts. For an overview of the survey questions see Appendix 5B. The first part of the survey measured the concept of attitudes (Ajzen, & Driver, 1992; Huang, Li, Huang, & Zhou, 2021; Rahman, & Norman, 2016). The second part of the survey measured

the concept of behavioral intention (Ajzen, & Driver, 1992; Huang et al., 2021; Rahman, & Norman, 2016). The third part of the survey measured the concept of sensation-seeking (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). The fourth part of the survey measured the socio-demographics, including the concepts of age and physical activity engagement. Finally, participants were thanked for their engagement in the study, were promised that the data will not be shared and were promised that the data will be omitted after the study finishes (see Appendix 5C).

§4.3 Participants

The target audience were adolescents aged 18-25 years. Data from Centraal Bureau voor statistiek (2019; 2021a) demonstrates that obesity is becoming an increasing problem among adolescents aged 18-25 years (Centraal Bureau voor de Statistiek, 2019; Centraal Bureau voor de Statistiek, 2021a). The amount of Dutch adolescents aged 18-25 years with obesity has increased from 15,6% in 2000 (Centraal Bureau voor de Statistiek, 2019) to 25,3% in 2019/2020 (Centraal Bureau voor de Statistiek, 2021a). Obesity is indicated to be a long-term risk factor cardiovascular diseases, diabetes, and cancer (Pengpid et al., 2015).

Moreover, physical inactivity is indicated to be a cause for obesity (Cairns, & Stead, 2009). Physical inactivity is commencing to be a problem amongst adolescents aged 18-25 years. Technological development and digitalization have accelerated social changes, including a more sedentary lifestyle amongst adolescents (Cairns, & Stead, 2009; Moreno-Llamas et al., 2020). In conclusion, it was relevant to study adolescents aged 18-25 years. Adolescents aged 18-25 years appear to have an increasing risk for obesity, including long-term risks (Pengpid et al., 2015; Zhang et al., 2014).

However, it is impossible to reach the entire target audience worldwide, in the limited time frame available for this research (Vennix, 2016). Therefore, for this research case convenience sampling was utilized (Vennix, 2016). Research results from sampled data create the opportunity for this study to be generalized to a larger population (Vennix, 2016). The most accessible adolescents aged 18-25 years were students studying at Radboud University and adolescents close to the researcher (friends, colleagues) (Vennix, 2016). In conclusion, this has affected the generalizability of the results (Vennix, 2016).

§4.3.1 Sample size

A sample size of 68 participants was indicated to be sufficient for the measurement of medium and large effect sizes (Field, 2018). In this research, two conditions were manipulated and studied (Field, 2018). The independent variable offering-related stimuli distinguished two levels of thematic content: fear appeals and fun appeals (Field, 2018). Subsequently, a regression analysis including two conditions requires a minimum sample size to measure large effect sizes and medium effect sizes (Field, 2018). To start with, the measurement of large effect sizes requires a minimum number of 31 participants. Finally, the measurement of medium effect sizes requires a minimum number of 68 participants when two conditions are involved (Field, 2018). In conclusion, a minimum number of 68 participants were required.

Ergo, the experiment and survey acquired a total of 116 participants (see Appendix 6A). To start with, 37 participants did not 100% complete the survey. Furthermore, 5 participants were not aged 18-25 years. Moreover, 1 participant did not consent. Finally, 5 participants participated in the eye-tracking experiment of which the eye-tracking data was not usable. The eye-tracking data indicated that the participants did not observe the screen or observed a corner of the screen. The five participants utilized the QR code. One participant utilized a laptop and four participants utilized a phone. Subsequently, the afore-mentioned participants were omitted. In conclusion, 68 participants were utilized in data analysis.

Table 4.1. Descriptive socio-demographic variables

Variable	Item		
Age (in years)		Mean	**21,9 years**
Appeal	Fun appeal	34 (50,0%)	
	Fear appeal	34 (50,0%)	
		Total (N)	**68** (100,0%)
Used Device	Phone	20 (29,4%)	
	Tablet	33 (48,5%)	
	Laptop	15 (22,1%)	
		Total (N)	**68** (100,0%)
Physical activity frequency	At least five times per week	12 (17,6%)	
	At least once per week	45 (66,2%)	
	At least once per two weeks	6 (8,8%)	
	At least once per month	5 (7,4%)	
	Never	0 (0,0%)	
		Total (N)	**68** (100,0%)
Physical activity duration	1 = 0-30 minutes	6 (8,8%)	
	2 = 30-60 minutes	30 (44,1%)	
	3 = 60-90 minutes	17 (25,0%)	
	4 = 90-120 minutes	11 (16,2%)	
	5 = 120+ minutes	4 (5,9%)	
	6 = I do not engage in physical activity	0 (0,0%)	
		Total (N)	**68** (100,0%)

§4.4 Measurement

§4.4.1 Operationalizations

See Appendix 1.

§4.4.1.1 Eye-tracking measures

Dissimilar measuring methods were utilized to measure the concepts of visual attention and cognitive evaluation. To start with, visual attention was measured utilizing two dissimilar measuring methods. The first measuring method is time to first fixation (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). Time to first fixation indicates the amount of seconds it took for a participant to fixate on an advertisement-element for the first time (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). The second measuring method is amount of fixations per advertising-element (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). The amount of fixations per advertisement element indicates how often a participant has stopped and looked an advertisement element, representing the capture of a participant's attention (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). The afore-mentioned measurement methods measured visual attention utilizing dissimilar scales (Chen et al., 2021; Pieters et al., 1999; Pieters et al., 2010;

Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). The time to first fixation was measured in seconds (Pieters et al., 1999; Pieters et al., 2010; Van Reijmersdal et al., 2020). In contrast, the amount of fixations were measured in whole numbers (Pieters et al., 1999; Pieters et al., 2010; Van Reijmersdal et al., 2020). Therefore, visual attention was split into two variables. The first variable included the item "time to first fixation" and the second variable included the item "amount of fixations" per advertising-element.

Furthermore, cognitive evaluation was measured utilizing advertisement-element gaze duration (Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). Advertisement-element gaze duration indicates the amount of time a participant fixated on an advertisement-element (Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). The amount of time a participant fixated on an advertisement-element demonstrates the level of retention for that specific advertisement-element and indicates the amount of time a participant spends to evaluate the advertisement-element (Pieters et al., 1999; Pieters et al., 2010; Pieters, & Wedel, 2004; Van Reijmersdal et al., 2020). In conclusion, visual attention was measured utilizing the time to first fixation and amount of fixations per advertising-element. Finally, cognitive evaluation was measured utilizing the advertisement-element gaze duration. Subsequently, measurement was utilized on both the fun appeals condition and the fear appeals condition.

§4.4.1.2 Survey measures

Dissimilar existing scales were utilized to measure the concepts of attitudes, behavioral intention, sensation-seeking. Furthermore, socio-demographics were measured, including the concepts of age and physical activity engagement.

To start with, well-developed scales exist for the measurement of attitudes (Ajzen, & Driver, 1992; Huang et al., 2021; Rahman, & Norman, 2016). Attitudes are often measured utilizing a 5 point likert-scale, or a 7 point likert-scale including adjective pairs (Ajzen, & Driver, 1992; Huang et al., 2021; Rahman, & Norman, 2016). Furthermore, Ajzen and Driver (1992) have tested their developed attitudes scale (8 adjective pairs) on leisure activities, including physical activity (Cronbach's alpha .91) (Ajzen, & Driver, 1992). In conclusion, to measure the concept of attitudes, the attitude scale developed and tested by Ajzen and Driver (1992) is utilized. Thereupon, eight questions were utilized where participants scored adjective pairs (unpleasant - pleasant) on a 5 point scale.

Furthermore, well-developed scales exist for the measurement of behavioral intention (Ajzen, & Driver, 1992; Huang et al., 2021; Rahman, & Norman, 2016). Behavioral intention

is often measured utilizing either a 5 point likert-scale, or a 7 point likert-scale. Furthermore, Ajzen and Driver (1992) have tested their developed behavioral intention scale on leisure activities, including physical activity (Cronbach's alpha .91) (Ajzen, & Driver, 1992). It is indicated to utilize specific time frames for the enhancement of participant expression opportunities (Ajzen, & Driver, 1992). Moreover, specific time frames are accessible. The recommendation for physical activity is to engage in at least 30 minutes of moderate activity on at least 5 days per week (Blair, 2007). In conclusion, to measure the concept of behavioral intention, the behavioral intention scale developed and tested by Ajzen and Driver (1992) is utilized. Thereupon, two questions were utilized where participants scored the questions on a 5 point likert-scale, ranging from “strongly agree” (5) to “strongly disagree” (1).

Moreover, well-developed, large measurement scales were developed for measuring the consumer contingency sensation-seeking that contained 22 to 40 items (Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). However, the items in these large measurement scales contain two answer categories (“or” questions). Therefore, a participant is either considered to be a sensation-seeker or not a sensation-seeker. Hoyle et al. (2002) have utilized the large sensation-seeking scales to develop the “brief sensation-seeking scale” (Cronbach's alpha .76) (Hoyle et al., 2002, p. 405). In conclusion, to measure the concept of sensation-seeking, the “brief sensation-seeking scale” developed and tested by Hoyle et al. (2002) is utilized. Thereupon, eight questions were utilized where participants scored the questions on a 5 point likert-scale (Hoyle et al., 2002, p. 405).

Finally, socio-demographics were measured, including the concepts of age and physical activity engagement. To start with, participants were enquired for their age, to verify that the right target audience was reached. Subsequently, two questions were enquired to gain insights into how physically active the participants are. The data obtained with regard to physical activity was utilized to study participant physical activity engagement. To start with, participants were enquired about how often they engage in physical activity (Courneya, & McAuley, 1994; Magaraggia et al., 2014; Tzetzis, Avgerinos, Vernadakis, & Kioumourtzoglou, 2001). This question was scored on a 5 point scale, ranging from “at least 5 times per week” to “never”. Additionally, participants were enquired about the mean amount of time (in minutes) they engage in physical activity (Courneya, & McAuley, 1994; Magaraggia et al., 2014; Tzetzis et al., 2001). This question was scored on a 5 point scale, ranging from “0-30 minutes” to “120+ minutes”, including a sixth option “I do not engage in physical activity”.

§4.4.1.3 Control variables

In addition to measuring the concepts of attitudes, behavioral intention, sensation-seeking and socio-demographics, the concept of used devices was measured as a control variable. The study was spread in an online survey. Therefore, participants were able to utilize different devices, including mobile phones, tablets and laptops. Previous research indicates that the utilization of different devices could have an effect on the visual attention measures and cognitive evaluation measures, including their outcomes (Chen et al., 2003; Lumpapun, & Nuttanont, 2017; Vennix, 2016). To start with, devices differ in screen-size (Chen et al., 2003; Lumpapun, & Nuttanont, 2017). Mobile phones have the smallest screen-sizes, laptops have the largest screen-sizes and tablet screen-sizes are in-between mobile phones and laptops (Chen et al., 2003; Lumpapun, & Nuttanont, 2017). Furthermore, when screen-size decreases, the resolution decreases (Chen et al., 2003). Moreover, when resolution decreases, the quality of the image decreases and information with regard to color, shapes and text are lost (Chen et al., 2003). Subsequently, the perceptibility of the image will decrease (Chen et al., 2003). Finally, smaller screen-sizes have an effect on attentional resources (Lumpapun, & Nuttanont, 2017). Moreover, when the screen-size decreases, the selection of advertising-elements will cause increasingly more attentional resources to be utilized (Lumpapun, & Nuttanont, 2017). Thereupon, when utilized attentional resources increase, the available attentional resources will decrease (Lumpapun, & Nuttanont, 2017).

Subsequently, the used device is a variable that could influence results (Vennix, 2016). To start with, the used device has an effect of perceptibility of the image (Chen et al., 2003). Finally, the used device has an effect on the availability of attentional resources (Lumpapun, & Nuttanont, 2017). Therefore, the used device is a variable that should be controlled for (Vennix, 2016). Utilizing the used device as a control variable is crucial since it ensures that the effects of appeal on visual attention and cognitive evaluation and the effects of visual attention and cognitive evaluation on attitudes are solely caused by the conditions (Vennix, 2016). Thereupon, participants were enquired about what device they utilized to participate in the study. This question was scored on a 3 point scale, including mobile phone, tablet and laptop.

§4.4.2 Methods for data analysis

The analysis of the data included multiple steps (Field, 2018). To start with, the data collected by GazeRecorder was coded into three variables, visual attention (time to first fixation and amount of fixations) and cognitive evaluation (fixation duration). Subsequently,

the unique six digit codes were utilized to merge a participant's eye-tracking data to a participant's survey data.

Additionally, SPSS Statistics was utilized to analyze descriptive information of the data, including descriptives of socio-demographics, missing data, outliers and the assumptions with regard to skewness and kurtosis (Field, 2018). Thereupon, the data was cleaned and prepared (Field, 2018). Data cleaning and preparation indicate the existence of influential outliers that can have practical and substantive impacts on the results (Hair et al., 2018; Sharda et al., 2018).

Finally, SmartPLS was used to measure reliability, validity, hypothesis and assumptions. SmartPLS utilizes partial least squares structural equation modeling (PLS-SEM) (Hair et al., 2018). Subsequently, PLS-SEM includes three phases relevant to the afore-mentioned process. To start with, a measurement model and a structural model have to be specified. Furthermore, the measurement model has to be assessed utilizing validity and reliability measures. Finally, the structural model has to be assessed, including hypothesis and assumptions.

§4.5 Research ethics

There are ethical implications that are essential to discuss. To start with, participants have the right to know what data will be collected, why data is collected and how this data is collected and utilized (Martin, & Murphy, 2017). To manage to afore-mentioned ethical implications, the study will commence with an introduction text that explains why the data is collected. Subsequently, the participants will have to read a consent form including how data is collected, what data is collected and how the data is utilized (Martin, & Murphy, 2017). Additionally, participants were informed that the data will be deleted after the thesis is finished. Participants cannot proceed without consent (Martin, & Murphy, 2017). If a participant does not consent they are sent to the end of the survey and cannot participate.

Furthermore, the results of this research will be uploaded to a digital repository owned and managed by Radboud University. The afore-mentioned ethical implication is twofold (Martin, & Murphy, 2017; Puntoni, Reczek, Giesler, & Botti, 2021). To start with, results with regard to participant data will be uploaded to the repository (Martin, & Murphy, 2017). To manage to afore-mentioned ethical implication, no data was collected that can be traced back to any individual participant (Martin, & Murphy, 2017). Moreover, no data was utilized in the results that can be traced back to any individual participant (Martin, & Murphy, 2017). Subsequently, participants were informed with regard to this ethical implication in the

consent form. Finally, people that have access to this repository can utilize the outcomes of this research to exploit consumers (Puntoni et al., 2021). This is an ethical implication that the researcher cannot solve, it is a requirement laid on the researcher by Radboud University.

§5 Results

To analyze the data SPSS and SmartPLS were utilized. SPSS was utilized to gain insights into the descriptives and normality assumption. Subsequently, SmartPLS 3 was utilized to study the measurement model and structural model, including reliability, validity, hypothesis and assumptions. The software package SmartPLS 3 provides the tools for a PLS-SEM analysis of the data. PLS-SEM is a combination of the measurement techniques analysis of total variance and partial least squares (Hair et al., 2018). In addition to the PLS-SEM measurement techniques, the bootstrapping values have to be specified. A 10.000 subsamples bootstrapping procedure was utilized (Hair et al., 2018). The afore-mentioned bootstrapping procedure provides robust t-statistics (Van Pinxteren, Wetzels, Rüger, Pluymaekers, & Wetzels, 2019).

§5.1 Data preparation

§5.1.1 Missing data and extremes

To start with, 68 respondents were utilized in data analysis. Descriptive statistics analysis was performed in SPSS Statistics. The descriptive statistics indicated there was no missing data (see Appendix 6A). The N-statistic indicated 68 participants for each indicator. Finally, the descriptive statistics indicated no extreme values (see Appendix 6A, Table A6.1). The Minimum and Maximum statistics indicate expected ranges for indicators where scales were utilized. Subsequently, the eye-tracking experiment variables do not indicate values <0 and >10 seconds.

§5.1.2 Normality assumption

The descriptive statistics are utilized to indicate problems with regard to the normality assumption. No problems are indicated with regard to normality if the skewness is within a range of -2 / 2 and if the kurtosis is within a range of -7 / 7 (Byrne, 2009; Hair, Black, Babin, & Anderson, 2010). The descriptive statistics indicate that there is one indicator that demonstrates high positive skewness (>2) and high positive kurtosis (>7): “FirstViewAOI1” values (see Appendix 6A, Table A6.1). The indicator “FirstViewAOI1” demonstrates a skewness of 3,915(>2) and a kurtosis of 20,463(>7). Subsequently, the afore-mentioned

indicator was subjected to the computation of new variables utilizing a square root measure ((Byrne, 2009; Hair et al., 2018). Thereupon, the level of skewness and the level of kurtosis were successfully lowered to acceptable ranges for the three indicators (see Appendix 6A, Table A6.2).

§5.2 Evaluation of measurement model

The evaluation of the measurement model included four steps: internal reliability, construct reliability, convergent validity and discriminant validity.

To start with, internal reliability was measured utilizing composite reliability values. Composite validity values were composed for constructs containing more than one indicator. The threshold for composite reliability values is >.600 (Dash, & Paul, 2021). Furthermore, construct reliability was measured utilizing Cronbach's Alpha values. Cronbach's Alpha values were composed for each construct. The threshold for Cronbach's Alpha is >.700. Additionally, convergent validity was measured utilizing average variance explained (AVE) values. AVE values were composed for each construct. The threshold for AVE values is >.500. Finally, discriminant validity was measured utilizing Heterotrait-Monotrait (HTMT) ratio of correlations. Hair et al. (2018) define HTMT as: "the mean value of the indicator correlations across constructs". The threshold for HTMT values is <.850.

Thereupon, six Sensation-Seeking indicators did not exceed the composite reliability threshold (< 0,600) and had a negative effect on the construct AVE (< 0,500) (see Appendix 6B). Therefore, the afore-mentioned indicators were sequentially omitted: SensSeeking6, SensSeeking3, SensSeeking5, SensSeeking4, SensSeeking1, SensSeeking2. In addition, the construct Physical Activity was split into the construct "Physical Activity Engagement" and "Amount of Physical Activity Engagement". It was observed that the construct Physical Activity had a negative Cronbach's Alpha (-0,772) (see Appendix 6B). The afore-mentioned indicates that the indicators measure different dimensions or different constructs. Additionally, the composite reliability value did not exceed the threshold (0,164 < 0,700).

Subsequently, acceptable validity and reliability was achieved (see Table 5.1 and Appendix 6B). To start with, internal reliability was established. The composite reliability values for all indicators ranged from 0,643 to 0,954, exceeding the >0,600 threshold (see Appendix 6B, Table A6.19). Furthermore, construct reliability was established. The Cronbach's Alpha values for all constructs ranged from 0,716 to 0,879, exceeding the >0,700 threshold (see Appendix 6B, Table A6.20). Additionally, convergent validity was established. The AVE values for all constructs ranged from 0,541 to 0,893, exceeding the >0,500

threshold (see Appendix 6B, Table A6.20). Finally, discriminant validity was established. The HTMT values for and between all constructs did not exceed the <0,850 threshold (see Appendix 6B, Table A6.21).

Table 5.1. Factor loadings, composite reliability and average variance extracted of the constructs and their items.

Components and manifest variables	Loading (t-value)
Attitude	***CR: 0,903, AVE: 0,541***
Engaging in physical activity is foolish - wise	0,758 (8,332)*****
Engaging in physical activity is unenjoyable - enjoyable	0,710 (7,240)*****
Engaging in physical activity is harmful - beneficial	0,705 (5,956)*****
Engaging in physical activity is unpleasant - pleasant	0,845 (14,105)*****
Engaging in physical activity is bad - good	0,724 (5,983)*****
Engaging in physical activity is unattractive - attractive	0,643 (6,782)*****
Engaging in physical activity is useless - useful	0,745 (6,799)*****
Engaging in physical activity is undesirable - desirable	0,733 (12.856)*****
Behavioral intention	***CR: 0,943, AVE: 0,893***
I plan to engage in physical activity this upcoming week	0,954 (78,240)*****
will try to engage in physical activity this upcoming week.	0,936 (42,387)*****
Sensation-seeking	***CR: 0,875, AVE: 0,778***
I like wild parties	0,900 (11,943)*****
I would love to have new and exciting experiences, even if they are illegal	0,863 (7,930)*****

Notes: CR: Composite reliability; AVE: Average variance extracted; * p < 0,01

§5.3 Evaluation of structural model

The evaluation of the structural model included six steps: Goodness-of-Fit, Collinearity among predictor constructs, Coefficient of determination, Effect size, Blindfolding, Size and significance of path coefficients (Hair et al., 2018; Henseler, Hubona, & Ray, 2016).

§5.3.1 Goodness-of-fit

The GoF Index was utilized to measure model fit. Tenenhaus, Vinzi, Chatelin, & Lauro (2005) indicate that the Goodness-of-Fit (GoF) Index is a more appropriate evaluation measure for Goodness-of-Fit (Tenenhaus et al., 2005; Wetzels, Odekerken-Schröder Gaby, & Van Oppen, 2009). A GoF of 0,1 is indicated to be the small threshold, 0,25 to be the medium threshold and 0,36 to be the large threshold (Tenenhaus et al., 2005; Wetzels et al., 2009). Subsequently, the model evaluation measure GoF Index establishes Goodness-of-Fit (Tenenhaus et al., 2005; Wetzels et al., 2009). The GoF Index for this model is 0,41 (see Appendix 6C, Table A6.22), indicating the threshold for a large GoF Index is exceeded (0,41 > 0,36) (Tenenhaus et al., 2005; Wetzels et al., 2009).

§5.3.2 Collinearity among predictor constructs

Furthermore, the level of collinearity was measured (Hair et al., 2018). An appropriate measure for collinearity are VIF values among predictor constructs (Hair et al., 2018). The threshold for VIF values is <5 (Hair et al., 2018). Subsequently, the collinearity measure was established. No problems with collinearity were observed, all VIF values were <5 complying with the threshold (see Appendix 6C, Table A23).

§5.3.3 Coefficient of determination

Moreover, the coefficient of determination was measured (Hair et al., 2018). The coefficient of determination indicates the predictive power of the model (Hair et al., 2018). An appropriate measure for the coefficient of determination is the R^2 (Hair et al., 2018). The threshold for the R^2 is <0,10 (Hair et al., 2018). To extend on the afore-mentioned threshold, values of >0,75 are substantial, values of >0,50 are moderate and values of >0,25 are weak (Hair et al., 2018, p. 780). However, it is dependent on the research context whether the values are considered "satisfactory" (Hair et al., 2018, p. 780). Hair et al. (2018, p. 780) indicate that a threshold of >0.10 or lower is satisfactory depending on the research context (Hair et al., 2018).

Subsequently, Amount of fixations, Attitude to Physical Activity and Behavioral Intention indicate weak predictive power (>0,25). Furthermore, Cognitive Evaluation and Visual Attention indicate satisfactory predictive power (+/- 0,10). Finally, SmartPLS did not measure the predictive power of Appeal, Sensation-Seeking, Physical Activity Engagement and Age (see Appendix 6C, Table A6.24).

§5.3.4 Effect size

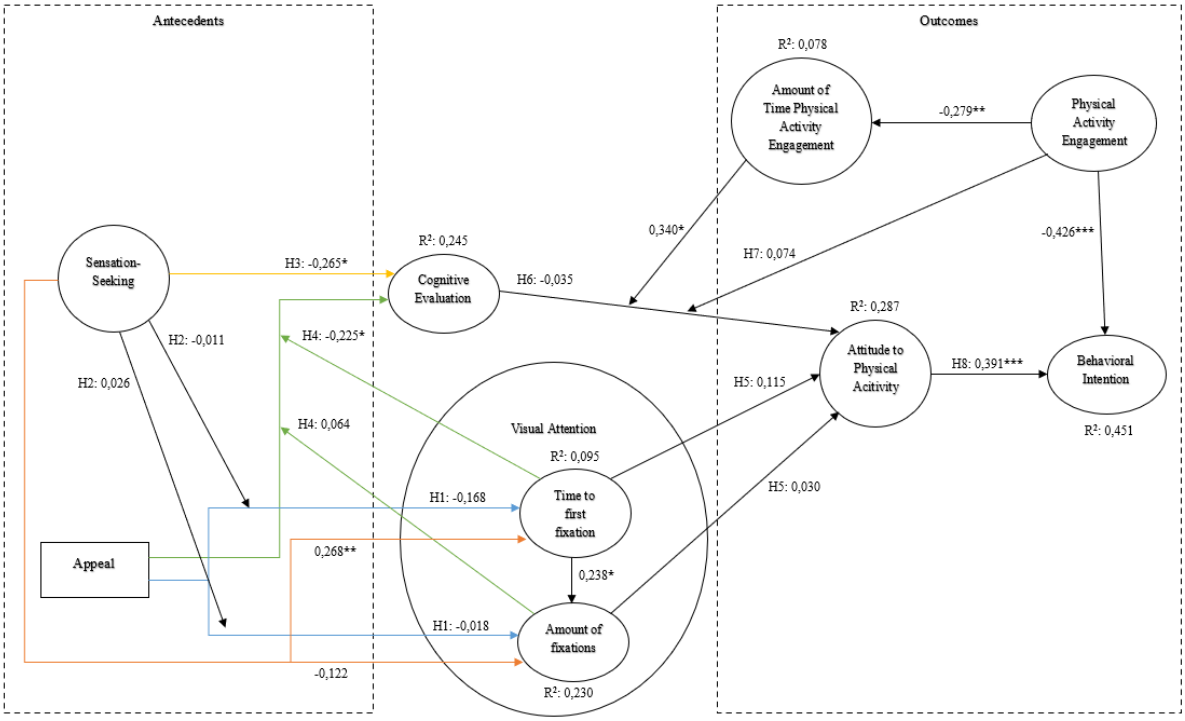
Additionally, effect sizes were measured (Hair et al., 2018). Hair et al. (2018) describe effect sizes as: "the effect size represents the change in the R^2 value when a specified exogenous construct is omitted from the model" (Hair et al., 2018, p. 780). An appropriate measure for the coefficient of determination is the f^2 (Hair et al., 2018). The threshold for the R^2 is >0,02 (Hair et al., 2018). To extend on the afore-mentioned threshold, values of >0,35 are large effects, values of >0,15 are moderate effects, values of >0,02 are small effects and values of <0,02 indicate no effect (Hair et al., 2018, p. 780).

Subsequently, effect sizes range from 0,000 to 0,288. The smallest effect size observed is Appeal to Amount of fixations (0,000) (see Appendix 6C, Table A6.25). The

largest effect size observed is Physical Activity Engagement to Behavioral Intention (0,288) (see Appendix 6C, Table A6.25).

§5.3.5 Size and significance of path coefficients

Figure 5.1. Structural model results



Thereupon, the significance of path coefficients (βeta coefficient) demonstrate whether the hypothesized effects are indicated by the structural model results. To start with, the results indicate that H1 is statistically insignificant for the item time to first fixation (β = -0,168; $p > 0,05$; R^2 = 0,095) and the item amount of fixations (β = -0,018; $p > 0,05$; R^2 = 0,230). In addition to H1, the results indicate that H2 is insignificant for the item time to first fixation (β = -0,011; $p > 0,05$; R^2 = 0,095) and the item amount of fixations (β = 0,026; $p > 0,05$; R^2 = 0,230). The afore-mentioned insignificant results indicate that appeal does not have a significant direct or moderated effect on visual attention. However, the structural model results indicate that sensation-seeking has a direct statistically significant effect on visual attention for the item time to first fixation (β = 0,268; $p < 0,01$; R^2 = 0,095). In contrast, the results indicate that sensation-seeking has a direct insignificant effect on visual attention for the item amount of fixations (β = -0,122; $p > 0,05$; R^2 = 0,230).

Furthermore, the results indicate that H3 is statistically significant (β = -0,213; $p < 0,05$; R^2 = 0,189). Prior to analysis, a dummy variable was created where the fun appeal was coded as 0 and the fear appeal was coded as 1. Subsequently, the Simple Slope Plot in Figure

5.2 illustrates the moderation effect. The illustration demonstrates that cognitive evaluation is higher for the fun appeal (M = 2,50) than for the fear appeal (M = 1,65) when visual attention is high (+1 SD). Additionally, the illustration demonstrates that cognitive evaluation is higher for the fear appeal (M = 2,84) than the fun appeal (M = 2,30) when visual attention is low (-1 SD). Finally, the illustration demonstrates that cognitive evaluation is higher for the fun appeal (M = 2,41) than for the fear appeal (M = 2,25) when visual attention is at its mean. In addition to H3, the results indicate that H4 is statistically significant (β = -0,265; $p < 0,05$; R^2 = 0,189). However, the afore-mentioned negative significant result (β = -0,265; $p < 0,05$; R^2 = 0,189) indicates that an increase in sensation-seeking will decrease cognitive evaluation. On the contrary, a positive statistically significant effect was hypothesized

Moreover, the results indicate that H5 is statistically insignificant for the item time to first fixation (β = 0,115; $p > 0,05$; R^2 = 0,287) and the item amount of fixations (β = 0,030; $p > 0,05$; R^2 = 0,287). In addition to H5, additional analysis provided a statistically significant effect of the item time to first fixation on the item the amount of fixations (β = 0,238; $p < 0,05$; R^2 = 0,230).

Subsequently, the results indicate that H6 is statistically insignificant (β = -0,035; $p > 0,05$; R^2 = 0,287). In addition to H6, the results indicate that H7 is statistically insignificant (β = 0,074; $p > 0,05$; R^2 = 0,287). In contrast, the structural model results do indicate a significant moderation effect of the Amount of Time Physical Activity Engagement (β = 0,340; $p < 0,05$; R^2 = 0,287) alternatively to the insignificant moderation effect of Physical Activity Engagement (β = 0,074; $p > 0,05$; R^2 = 0,287). Furthermore, the Simple Slope Plot in Figure 5.3 illustrates the moderation effect. The illustration demonstrates that attitude to physical activity is higher for high cognitive evaluation (M = 4,14) than for low cognitive evaluation (M = 3,83) when Amount of Time Physical Activity Engagement is high (+1 SD). Finally, the illustration demonstrates that attitude to physical activity is higher for low cognitive evaluation (M = 4,31) than for high cognitive evaluation (M = 3,93) when Amount of Time Physical Activity Engagement is low (-1 SD). Additionally, the structural model results indicate a significant direct effect from Physical Activity Engagement to the Amount of Time Physical Activity Engagement (β = -0,279; $p < 0,01$; R^2 = 0,078).

Thereupon, the results indicate that H8 is statistically significant (β = 0,391; $p < 0,001$; R^2 = 0,451). The afore-mentioned statistical significant result demonstrates that an increase in attitude toward physical activity will increase behavioral intention. In addition to H10, the structural model results indicate a significant direct effect of Physical Activity Engagement to Behavioral Intention (β = -0,426; $p < 0,001$; R^2 = 0,451). The afore-

mentioned statistical significant result demonstrates that an increase in Physical Activity Engagement will decrease behavioral intention.

Finally, the results indicate statistically insignificant effect of used device on time to first fixation ($\beta = -0{,}031$; $p > 0{,}05$; $R^2 = 0{,}095$) and cognitive evaluation ($\beta = 0{,}202$; $p > 0{,}05$; $R^2 = 0{,}245$). In contrast, the results indicate a statistically significant negative effect of the used device on the amount of fixations ($\beta = -0{,}407$; $p < 0{,}001$; $R^2 = 0{,}230$).

Figure 5.2. Results of simple slopes analysis of the interaction between appeal and visual attention on cognitive evaluation.

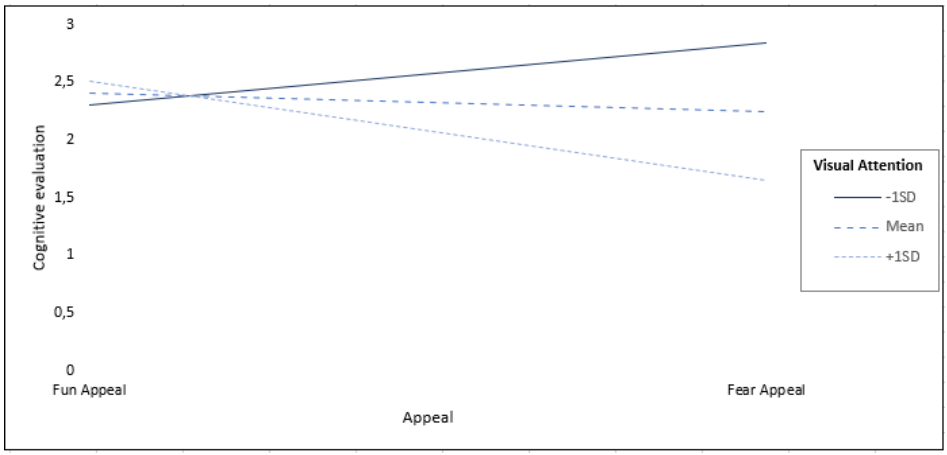
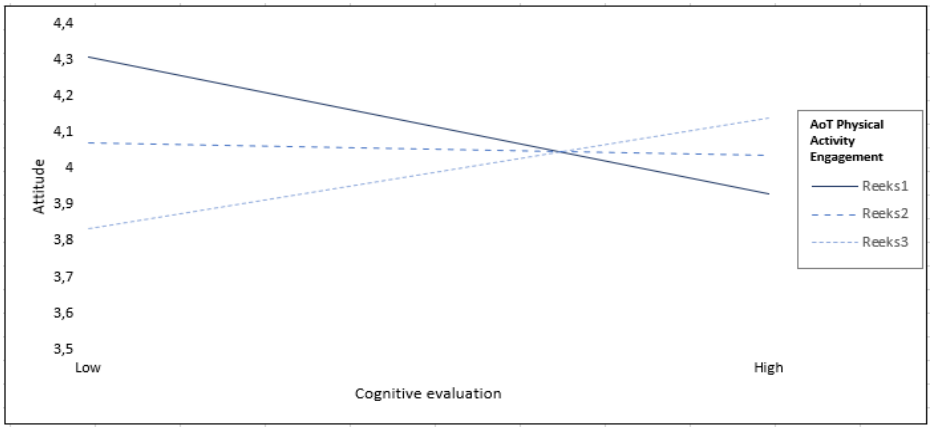


Figure 5.3. Results of simple slopes analysis of the interaction between cognitive evaluation and amount of time physical activity on attitudes toward physical activity.



§6 Conclusion and discussion

§6.1 Discussion

The study and results provide insights into the antecedents and outcomes of visual attention and cognitive evaluation. Concretely, the study and results provide insights into how

fun appeals and fear appeals affect visual attention and how this translates to behavioral intention. The key findings are highlighted in Figure 5.1, Figure 5.2 and Figure 5.3.

To start with, the results provide no support for an effect of appeal on visual attention. Additionally, the results provide no support for a moderating role of sensation-seeking on the effect of appeal on visual attention. However, the results provide support for a direct effect of sensation-seeking on visual attention. In addition, the results provide support for a moderating role of visual attention on the effect of appeal on cognitive evaluation. When visual attention is high, cognitive evaluation is significantly higher for the fun appeal than for the fear appeal. Finally, when visual attention is low, cognitive evaluation is higher for the fear appeal than for the fun appeal.

Additionally, the results provide support for an effect of sensation-seeking on cognitive evaluation. The results indicate a negative effect of sensation-seeking on cognitive evaluation. However, a positive effect was expected. The afore-mentioned indicate that an increase in sensation-seeking will decrease cognitive evaluation, when the expectation was that an increase in sensation-seeking will increase cognitive evaluation. Moreover, the afore-mentioned results are complementary to the negative effect of sensation-seeking on visual attention. Previous research provides support for a direct negative effect of sensation-seeking on visual attention and cognitive evaluation. To elaborate on the afore-mentioned, previous research indicates that consumers that score high on sensation-seeking prefer higher-level sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). Subsequently, consumers that score low on sensation-seeking prefer lower-level sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). Furthermore, this has an effect of consumer preferences towards the complexity of visual images (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976). Consumers that score high on sensation-seeking prefer complex visualizations. Subsequently, consumers that score low on sensation-seeking prefer simple visualizations (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976).

Moreover, the results provide no support for an effect of visual attention on attitudes to physical activity or an effect of cognitive evaluation on attitudes to physical activity. Additionally, the results indicate a positive significant effect of the item time to first fixation on the item amount of fixations. The afore-mentioned indicates that if time to first fixation on an advertising-element increases, the amount of fixation on an advertising-element increases.

Furthermore, results provide no support for a moderating role of physical activity engagement on the effect of cognitive evaluation on attitudes toward physical activity. However, additional analysis provides support for a moderating role of amount of time physical activity engagement on the effect of cognitive evaluation on attitudes toward physical activity. When the duration of physical activity engagement is high, attitude toward physical activity is increasingly more positive for high cognitive evaluation than for low cognitive evaluation. Finally, when the duration of physical activity engagement is low, attitude toward physical activity is increasingly more positive for low cognitive evaluation than for high cognitive evaluation. Additionally, additional analysis provides support for an effect of physical activity engagement on the amount of time physical activity engagement. The afore-mentioned results indicate that an increase in frequency of physical activity engagement will decrease the amount of time physical activity engagement. In conclusion, if adolescent engagement in physical activity more frequently, the duration of the physical activity engagement will decrease. There is little previous research that can provide support for the above-mentioned effects (Courneya, & McAuley, 1994; Magaraggia et al., 2014; Tzetzis et al., 2001). There are three previous research studies that are conceptualizing three determinants for physical activity: frequency, intensity and duration (Courneya, & McAuley, 1994; Magaraggia et al., 2014; Tzetzis et al., 2001). However, the above-mentioned research studies are discrepant to the supported structural model results (Courneya, & McAuley, 1994; Magaraggia et al., 2014). Magaraggia et al. (2014) indicate an insignificant effect of physical activity engagement frequency on physical activity engagement duration (Magaraggia et al., 2014). Furthermore, Courneya, & McAuley (1994) indicate a significant effect of physical activity engagement frequency and physical activity engagement duration on attitudes and behavioral intention (Courneya, & McAuley, 1994).

Subsequently, the results provide support for an effect of attitude toward physical activity on behavioral intention. The afore-mentioned results indicate that an increasingly positive attitude toward physical activity will increase behavioral intention to engage in an increasing frequency of physical activity. Furthermore, additional analysis provides support for an effect of physical activity engagement on behavioral intention. The afore-mentioned results indicate that an increase in physical activity engagement will decrease behavioral intention to engage in an increasing frequency of physical activity. Previous research indicates that current attitudes have an effect on behavioral intention (Ajzen, & Driver, 1992; Braunsberger et al., 2005; Simmonds et al., 2020; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal et al., 2012; Sheppard et al., 1988). Furthermore, previous research indicates a

significant effect of physical activity engagement frequency on behavioral intention (Courneya, & McAuley, 1994).

Finally, indicate a negative effect of the used device on the amount of fixations. The afore-mentioned effect indicates that if the screen-size increases, the amount of fixations on an advertisement-element decreases. Ergo, this effect is filtered.

§6.2 Conclusion

The key findings provide insights into how fun appeals and fear appeals affect visual attention and how this translates to behavioral intention. Furthermore, the key findings provide insights into a broader spectrum of antecedents and outcomes of visual attention and cognitive evaluation. To answer the research question: "*How do fun appeals and fear appeals in a social media context affect visual attention and cognitive evaluation and how does this translate to behavioral intention?*". To start with, visual attention has a moderating role on the effect of appeal on cognitive evaluation. When visual attention is high, cognitive evaluation is significantly higher for the fun appeal than for the fear appeal. Finally, when visual attention is low, cognitive evaluation is higher for the fear appeal than for the fun appeal. Furthermore, an increase in sensation-seeking will decrease visual attention and will decrease cognitive evaluation. Moreover, if adolescent engagement in physical activity increases, the duration of the physical activity engagement will decrease. Subsequently, when the duration of physical activity engagement is high, attitude toward physical activity is increasingly more positive for high cognitive evaluation than for low cognitive evaluation. Furthermore, when the duration of physical activity engagement is low, attitude toward physical activity is increasingly more positive for low cognitive evaluation than for high cognitive evaluation. Finally, an increasingly positive attitude toward physical activity will increase behavioral intention to engage in an increasing amount of physical activity. Additionally, an increase in frequency of physical activity engagement will decrease behavioral intention to engage in an increasing amount of physical activity.

In conclusion, the structural model results provide support for hypothesized effects and unexpected effects. Therefore, the key findings provide insights into a broader spectrum of antecedents and outcomes of visual attention and cognitive evaluation.

§6.3 Theoretical implications

At the present moment, research that studies attention attraction and cognitive evaluation in social marketing from a government perspective is scarce (Goldberg 1995;

Luck, 1974). In addition, Goldberg (1995) indicates that previous research is challenged by channel problems, including challenges in attracting attention and stimulating cognitive evaluation (Ballings et al., 2018; Hughes et al., 2019; Pieters et al., 1999; Varadarajan, & Menon, 1988). The afore-mentioned highlights the cruciality to study attention attraction and cognitive evaluation in social marketing from a government perspective and in a social media context. Subsequently, the key findings of this research provide insights into a broader spectrum of antecedents and outcomes of visual attention and cognitive evaluation in social marketing from a government perspective and in a social media context.

To start with, current discrepancies in traditional marketing cause a barrier that stops research into biologically relevant stimuli from extending into social marketing research (Bolton et al., 2014; Pieters et al., 1999; Pieters et al., 2010; Simmonds et al., 2020). In contrast, this research has studied the effects of biologically relevant stimuli on visual attention and cognitive evaluation in social marketing from a government perspective in a social media context. Ergo, this research contributes to the extension of the research into biologically relevant stimuli in social marketing research in a social media context. In addition, the key findings advance academic knowledge of the effects of biologically relevant stimuli on attention and cognitive evaluation with regard to social marketing in a social media context. One of the key findings is that the results do not support that fun appeals and fear appeals have an effect on attention attraction. However, the results indicate that visual attention has a moderating role in the effect of appeals on cognitive evaluation. When visual attention is high (low), cognitive evaluation is significantly higher (lower) for the fun appeal than for the fear appeal. In conclusion, this research contributes to existing academic literature on the effects of biologically relevant stimuli on visual attention and cognitive evaluation in social marketing from a government perspective in a social media context. The key findings demonstrate that biologically relevant stimuli are a crucial antecedent of cognitive evaluation when the effect of appeals on cognitive evaluation is moderated by visual attention.

Furthermore, the effects of customer contingencies on visual attention and cognitive evaluation are understudied as a result of the recency of future implications (Becker, & Jaakkola, 2020). This research has put into effect the call for future research into the effects of customer contingencies on visual attention and cognitive evaluation. Ergo, the effects of sensation-seeking on visual attention and cognitive evaluation were studied in social marketing from a government perspective in a social media context. Therupon, this contributes to the advancement of academic knowledge on the effects of the customer

contingency sensation-seeking on visual attention and cognitive evaluation. In addition, the key findings indicate that the customer contingency sensation-seeking has a direct and negative effect on visual attention and cognitive evaluation. This effect can be explained by the preferences that are associated with sensation-seeking. Previous research indicates that consumers that score high (low) on sensation-seeking prefer higher-level (lower-level) sensory stimulation and arousal (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992). The afore-mentioned has an effect of consumer preferences towards the complexity of visual images (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976). Consumers that score high (low) on sensation-seeking prefer complex (simple) visualizations (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976). To embroider on the effects of sensation-seeking, the key findings support that sensation-seeking has a moderating role on the effect of fun appeals and fear appeals on cognitive evaluation. When visual attention is high, cognitive evaluation is significantly higher for the fun appeal than for the fear appeal. Subsequently, when visual attention is low, cognitive evaluation is higher for the fear appeal than for the fun appeal. In conclusion, this research contributes to existing academic literature on the effects of the customer contingency sensation-seeking on visual attention and cognitive evaluation in social marketing from a government perspective in a social media context. The key findings demonstrate that sensation-seeking is a crucial antecedent of visual attention and cognitive evaluation.

Finally, research into the utilization of eye-tracking to measure the effectiveness of social marketing in a social media context is scarce (Fox et al., 2019; Harz et al., 2021; Menon et al., 2016). This research has utilized eye-tracking to measure the concepts of visual attention and cognitive evaluation. The key findings demonstrate that eye-tracking is a reliable measurement tool to measure visual attention and cognitive evaluation. In addition to the key findings, this research demonstrates that eye-tracking can be utilized on dissimilar devices and in dissimilar locations when proper instructions are provided. In conclusion, this research contributes to existing academic literature on the utilization of eye-tracking as a method to measure the concepts of visual attention and cognitive evaluation.

§6.4 Managerial implications

The government seeks to utilize social marketing in the pursual of a social goal (Goldberg, 1995; Peattie, & Peattie, 2009). Changes in the marketing environment influence how and through which touchpoints adolescents aged 18-25 years can be reached (Heil et al.,

2010; Onishi, & Manchanda, 2012; Wedel, & Kannan, 2016). Challenges in attracting attention and stimulating cognitive evaluation cause ineffective communication (Braunsberger et al., 2005; Van Reijmersdal et al., 2012). This research studied the effects that biologically relevant stimuli and customer contingencies have on obtaining and retaining attention and stimulating cognitive evaluation is crucial in developing an effective social marketing campaign. Ergo, this research contributes to practical problems by providing means to develop an effective social marketing campaign in social media context.

To start with, when visual attention is high, cognitive evaluation is significantly higher for the fun appeal than for the fear appeal. Subsequently, when visual attention is low, cognitive evaluation is higher for the fear appeal than for the fun appeal. Ergo, the level of visual attention has an effect on the kind of biologically relevant stimuli that have a stronger effect on stimulating cognitive evaluation. In contrast, the key findings do not support an effect of appeal on visual attention. Thereupon, this research cannot provide insights into whether the fun appeal or the fear appeal had a stronger effect on visual attention. In contrast, previous research does provide insights into the strength of this effect. Hastings et al. (2004) demonstrate that repetition of a fear appeal causes attention wear-out. Hence, this is one of the challenges that cause ineffective communication (Pieters et al., 1999). Subsequently, it is indicated that alternative biological relevant stimuli should be considered, including fun appeals (Hastings et al., 2004). In conclusion, when developing a social marketing campaign the government should utilize fun appeals. Furthermore, an increase in sensation-seeking will decrease visual attention and cognitive evaluation. Ergo, when developing a social marketing campaign in a social media context, the customer contingency sensation-seeking has a crucial effect on attracting attention and stimulating cognitive evaluation. However, it is complex to target consumers on the customer contingency sensation-seeking. Sensation-seeking is a personality trait that is measured through self-report measures (Iyer et al., 2019; Martin et al., 2005; Steenkamp, & Baumgartner, 1992). Subsequently, the government cannot measure the level of sensation-seeking across the entire adolescent population (Vennix, 2016). In contrast, the government could test if segmentation options provided by social media platforms are accurate predictors of sensation-seeking (Wedel, & Kannan, 2016). In conclusion, the government could test the predictive accuracy of segmentation options provided by social media platforms or the government should accept that it is impossible to have an effect on the entire adolescent population.

In addition to segmentation challenges for sensation-seeking, there are segmentation challenges for duration of physical activity engagement and frequency of physical activity

(Courneya, & McAuley, 1994; Magaraggia et al., 2014). Duration and frequency of physical activity engagement demonstrate the level of physical activity that adolescents are involved with. In line with the above-discussed, the government could test the predictive accuracy of segmentation options provided by social media platforms or accept that it is impossible to have an effect on the entire adolescent population.

The key findings demonstrate that when the duration of physical activity engagement is high, attitude toward physical activity is increasingly more positive for high cognitive evaluation than for low cognitive evaluation. Ergo, when the duration of physical activity engagement is low, attitude toward physical activity is increasingly more positive for low cognitive evaluation than for high cognitive evaluation. Therefore, when the government develops a social marketing campaign with regard to increasing physical activity among adolescents, the government should consider decisions with regard to the afore-mentioned fun appeal, fear appeal and sensation-seeking. When the government develops a campaign with lower cognitive evaluation, the government should target adolescents with higher duration of physical activity engagement. In contrast, when the government develops a campaign with higher cognitive evaluation, the government should target adolescents with lower duration of physical activity engagement.

Moreover, when physical activity frequency increases, behavioral intention to change decreases. Subsequently, when physical activity frequency decreases, behavioral intention to change increases. Therefore, when the government develops a social marketing campaign with regard to increasing physical activity among adolescents, the government should target adolescents with lower physical activity frequency.

Finally, when attitude toward physical activity increases so does behavioral intention. Subsequently, to increase behavioral intention, the government should be able to effectively attract visual attention. A high level of visual attention will positively influence the effect of fun appeals on cognitive evaluation. Ergo, if adolescents score high on duration of physical activity engagement, a high level of cognitive evaluation will have a positive effect on attitude to physical attention. Therefore, it is crucial to take into account the above discussed managerial implications. In conclusion, to achieve a social goal the government should consider antecedents and outcomes in the development of a social marketing campaign.

§6.5 Limitations and further research

The two studies conducted provide rich insights into antecedents and outcomes of visual attention and cognitive evaluation. However, there are limitations to this research. To

start with, there was a limited amount of time to conduct the two studies. Therefore, a smaller number of participants was reached to participate in this study. Larger numbers of participants indicate greater generalization to the target group. Furthermore, the participants that were reached were students at Radboud University te Nijmegen. The afore-mentioned is indicates convenience sampling (Vennix, 2016). Subsequently, future research should aim to increase the number of participants and randomization to increase the accuracy of generalization to the target group (Vennix, 2016). Additionally, time limitations provided no ability to study more than two types of appeals. Therefore, further research should aim to study more types of appeals and their effects on visual attention and cognitive evaluation. Thereupon, time limitations provided no ability to study more than one customer contingency. Therefore, further research should aim to study more types of customer contingencies and their effects on visual attention and cognitive evaluation.

Moreover, the utilization of social media was not measured in this study. However, few participants indicated little or no utilization of Instagram or other social media platforms when asked to participate in the study. In addition, gender was not measured in this study. The utilization of social media (Li et al., 2021) and gender (Iyer et al., 2019) could have important implications for the measured effects. There could be effects in the model that were not accounted for by control variables (Vennix, 2016). Therefore, future research should aim to measure whether participants utilize a social media platform, the amount of time participants spend on a social media platform and participant gender. Subsequently, future research should aim to measure social media utilization and gender as control variables.

Furthermore, the results indicated a negative effect of sensation-seeking on visual attention and cognitive evaluation. Previous research indicates the afore-mentioned negative effect can be explained by image complexity (Galloway, 2009; Iyer et al., 2019). Therefore, future research should aim to study the role of image complexity in the relationship of sensation-seeking on visual attention and cognitive evaluation.

Finally, future research should aim to explicate the three determinants of physical activity engagement (Courneya, & McAuley, 1994; Magaraggia et al., 2014) and their direct effects and moderating roles on attitude toward physical activity and behavioral intention.

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Appendices

Appendix 1: Operationalizations

Table A1. Operationalizations.

Construct	Definition	Original item	Adapted item	Source
Appeal	"Biologically relevant stimuli" include the utilization of fun appeals and fear appeals (Simmonds et al., 2020, p. 1059).	*Fun appeal*	*Fun appeal AOI1*	Simmonds, Bogomolova, Kennedy, Nenycz-Thiel, & Bellman, (2020)
		Fear appeal	*Fear appeal AOI1*	Simmonds, Bogomolova, Kennedy, Nenycz-Thiel, & Bellman, (2020)
Visual Attention	Sensorial responses consider sensations (Keiningham, et al., 2020; Lemon, & Verhoef, 2016). Stimuli that are visually sensed attract visual attention (Pieters, & Wedel, 2004; Simmonds et al., 2020)	*Time to first fixation*	*Time to first fixation AOI1*	Pieters, & Wedel, (2004)
		Amount of fixations	*Amount of fixations AOI1*	Pieters, & Wedel, (2004)
Cognitive Evaluation	Cognitive responses consider thinking, or thoughts (Keiningham, et al., 2020; Lemon, & Verhoef, 2016), including cognitive evaluation (Braunsberger, Buckler, & Ortinau, 2005; Simmonds et al., 2020; Stafford, 2000; Van Noort et al., 2012; Van Reijmersdal et al., 2012).	*Dwell time*	*Dwell time AOI1*	Pieters, & Wedel, (2004)
Attitude	Attitudes are formed by evaluations of decisions, which can be positive and negative (Ajzen, & Driver, 1992; Sheppard et al., 1988)	*"Participating in leisure activity X* is:"* ****Multiple types of leisure activities were measured with the same question (e.g. spending time at the beach, outdoor, outdoor jogging or running, mountain climbing, boating, and biking.***	Engaging in physical activity is:	Ajzen, & Driver, (1992)
		foolish-wise	*foolish-wise*	Ajzen, & Driver, (1992)
		enjoyable-unenjoyable	*enjoyable-unenjoyable*	Ajzen, & Driver, (1992)
		harmful-beneficial	*harmful-beneficial*	Ajzen, & Driver, (1992)
		unpleasant-pleasant	*unpleasant-pleasant*	Ajzen, & Driver, (1992)
		good-bad	*good-bad*	Ajzen, & Driver, (1992)
		attractive-unattractive	*attractive-unattractive*	Ajzen, & Driver, (1992)
		useless-useful	*useless-useful*	Ajzen, & Driver, (1992)
		desirable-undesirable	*desirable-undesirable*	Ajzen, & Driver, (1992)
Behavioral Intention	Behavioral intention is the intention to exercise a behavior in the (near) future (Ajzen, & Driver, 1992; Sheppard et al., 1988). Behavioral intention to change behavior is the intention to make a different decision to exercise behavior (Ajzen, & Driver, 1992; Sheppard et al., 1988).	*"I plan to engage in this activity in the next 12 months."*	I plan to engage in physical activity this upcoming week.	Ajzen, & Driver, (1992)
		"I will try to engage in this activity in the next 12 months."	I will try to engage in physical activity this upcoming week.	Ajzen, & Driver, (1992)

Sensation-seeking	Sensation-seeking is the level of sensory stimulation, and arousal that are associated with activities, and experiences (Galloway, 2009; Iyer et al., 2019; Martin et al., 2005; Mittelstaedt et al., 1976; Steenkamp, & Baumgartner, 1992).	*"I would like to explore strange places."*	"I would like to explore strange places."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I would like to take off on a trip with no pre-planned routes or timetables."	"I would like to take off on a trip with no pre-planned routes or timetables."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I get restless when I spend too much time at home."	"I get restless when I spend too much time at home."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I prefer friends who are excitingly unpredictable."	"I prefer friends who are excitingly unpredictable."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I like to do frightening things."	"I like to do frightening things."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I would like to try bungee jumping."	"I would like to try bungee jumping."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I like wild parties."	"I like wild parties."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
		"I would love to have new and exciting experiences, even if they are illegal."	"I would love to have new and exciting experiences, even if they are illegal."	Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, (2002)
Physical Activity Engagement	Physical activity engagement is conceptualized as the frequency, intensity and duration of exercise (Courneya, & McAuley, 1994; Magaraggia, Dimmock, & Jackson, 2014; Tzetzis et al., 2001).	*"measuring frequency as the total number of physical activity sessions in the last 4 weeks."*	How often do you engage in physical activity?	(Courneya, & McAuley, 1994)
		"measuring duration as the average number of continuous minutes of physical activity per session."	When you engage in physical activity, what is the mean amount of time you engage in that physical activity?	(Courneya, & McAuley, 1994)

Appendix 2: Structure eye-tracking experiment

Appendix 2A: General introduction

Dear participant,

Thank you for taking the time to participate in this experiment.

This experiment is conducted for the purposes of my Master Thesis.

If you are interested in the results of this Master Thesis, you can contact me through the following email: anique.vanrijn@ru.nl

Are you between 18 - 25 years old?

- Yes → Continue to consent form
- No → End of survey

Appendix 2B: Consent form

The instruction form, and website Url will be provided in the survey software Qualtrics, followed by the survey questions.

Page 1: ***Consent form***

Purpose:

The purpose of this research study is to investigate how content on social media influences consumer responses, attitudes that consumers form, and whether this changes consumer behavior for benefits of social marketing.

Equipment:

- GazeRecorder as a software to measure eye-tracking.
- Qualtrics Survey Software to answer survey questions

Procedure:

As part of the study, you will first be asked to open the GazeRecorder eye-tracking software. When you press the start button, the experiment will start. GazeRecorder will start by calibrating your eye movements. After calibration is complete, you will be exposed to an image, and the eye-tracking software will follow the movements of your eyes whilst you look at the image.

Finally, after completing the eye-tracking experiment, you are asked to complete additional survey questions with regard to the image.

Please confirm the following:

- I understand that eye-tracking will track my eye movements.

- I confirm that I do not have any mental, physical, or health-related problems, or reasons that should stop me from participating in this eye-tracking experiment.
- 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 the study, you will be asked to do the following:

- Thoroughly read the instruction form with regard to device requirements, and placements.
- Open the link to the GazeRecorder eye-tracking software, and press 'start'.
- Let GazeRecorder calibrate your eye-movements.
- Be exposed to the image for 2 minutes using the GazeRecorder eye-tracking software. The eye-tracking software will measure the movements of your eyes whilst you look at the image.
- Complete a short survey with regard to the image, after finishing the eye-tracking experiment.

The total time required to complete the study should be approximately 15 minutes, including reading the instruction form, calibration, eye-tracking experiment, and survey.

Health risks

The image you will be shown might include shocking content. We do not expect that this content will cause any harm, or discomfort. However, if you experience feelings of discomfort, or distress as a result of your participation in this experiment, please let the researcher know. The researcher can then provide appropriate assistance if necessary.

Confidentiality:

Your participation in the study (eye-tracking experiment, and survey) is entirely voluntary. If you do not want to complete the experiment, or feel uncomfortable answering any of the survey questions, you can stop at any point, at any time. When there are any questions, feel free to contact the researcher, and the researcher will answer your questions.

Your data will be treated confidentially, and will be used solely for this research project. After the research project is finished, your data will be terminated.

Additionally, the research results will be used to write a thesis that will be uploaded to a digital repository owned by Radboud University. However, your privacy is assumed to be most important, no personal identification can be done through these results.

Contact and questions

If you have any questions, or you wish to contact the research for any other reasons with regard to this study, you can contact the researcher through the following email:

anique.vanrijn@ru.nl

Statement of Consent:

I have read, and understood all of the above information. I have asked all my questions, and expressed all of my concerns, and issues with regard to the experiment, and survey. All of my questions, concerns, and issues have been dealt with to my satisfaction. I consent to participate in this study.

Consent button in Qualtrics

Thank you for participating in this study!

Appendix 2C: Instruction form

Page 2

Welcome to the first phase of the experiment: the eye-tracking experiment.
This first phase of the experiment will take approximately 5-7 minutes.

For this experiment it is important to take the following steps:

- Step 1: Find a quiet place to participate in the experiment.
- Step 2: Use a device where the camera is positioned in the top middle.
- Step 3: Place the camera of the device on eye height.
- Step 4: Keep the device still and on a fixed base during the experiment.

Did you follow the steps?

- Yes → Move to the next page, with the next step.
- No → Unable to continue.

Appendix 2D: Eye-tracking experiment

Page 3

The experiment will start when you open the website Url below.
Please do not close this window, and return after finishing the eye-tracking experiment.
After you have finished the experiment, you will be sent to a page where you will receive a code. Please enter the code you receive to continue.

What will happen if I open the Url? You will be sent to an online eye-tracking software. This software will track your eye movements while you look at an image.
When the experiment starts, imagine you are scrolling through your Instagram feed.
The following Url will send you to the eye-tracking experiment:
Website Url to experiment 1 OR Website Url to experiment 2

Did you finish the eye-tracking experiment?

- Yes → Move to the next phase, where the survey will start.
- No → Unable to continue.

Appendix 3: Visual representation appeal

Appendix 3A: Fun appeal

Figure A3.1. Fun Appeal.

Appendix 3B: Fear appeal

Figure A3.2. Fear Appeal.

Appendix 4: Pre-test visual representation appeal

Appendix 4A: Pre-test questions

To start with, the visual representation of either the fun appeal or the fear appeal was presented.

Question 1: I think this image has a:

- 1= Fear appeal
- 2 =
- 3 = Neither a fun appeal, nor a fear appeal
- 4 =
- 5 = Fun appeal

Question 2: I think this image is visually attractive.

- 1= Strongly disagree
- 2 = Disagree
- 3 = Neither agree, nor disagree
- 4 = Agree
- 5 = Strongly agree

Question 3: I think this image depicts real-life situations.

- 1= Strongly disagree
- 2 = Disagree
- 3 = Neither agree, nor disagree
- 4 = Agree
- 5 = Strongly agree

Appeal	Item	N	Minimum	Maximum	Mean	Std. Deviation
Fun Appeal	I think this image has a: fear appeal – fun appeal	7	3	5	4,14	0,690
	I think this image is visually attractive.	7	1	4	3,43	1,134
	I think this image depicts real-life situations.	7	4	5	4,57	0,535
	Valid N (listwise)	7				
Fear Appeal	I think this image has a: fear appeal – fun appeal	7	1	2	1,57	0,535
	I think this image is visually attractive.	7	3	4	3,71	0,488
	I think this image depicts real-life situations.	7	4	5	4,29	0,488
	Valid N (listwise)	7				

Appendix 4B: Pre-test results

Table A4.1. Descriptive statistics.

Table A4.2. ANOVA results utilizing appeal as factor criterion.

Appeal		Sum of Squares	df	Mean Square	F	Sig.
I think this image has a: fear appeal – fun appeal	Between Groups	23,143	1	23,143	60,750	,000
	Within Groups	4,571	12	0,381		
	Total	27,714	13			
I think this image is visually attractive.	Between Groups	0,286	1	0,286	0,375	,552
	Within Groups	9,143	12	0,762		
	Total	9,429	13			
I think this image depicts real-life situations.	Between Groups	0,286	1	0,286	1,091	,317
	Within Groups	3,143	12	0,262		
	Total	3,429	13			

Appendix 5: Structure survey

Appendix 5A: Introduction survey

Page 4

Welcome to the second phase of the experiment: the survey.

The survey consists of four parts, and will take approximately 5-8 minutes.

The survey will start when you click to the next page.

Appendix 5B: Survey

Page 5 (Attitudes)

Question 1: Engaging in physical activity is:

- Answer category 1:
    - Very foolish
    - Foolish
    - Neither wise, nor foolish
    - Wise
    - Very wise

- Answer category 2:
    - Very unenjoyable
    - Unenjoyable
    - Neither enjoyable, nor unenjoyable
    - Enjoyable
    - Very enjoyable

- Answer category 3:
    - Very harmful
    - Harmful
    - Neither beneficial, nor harmful
    - Beneficial
    - Very beneficial

- Answer category 4:
    - Very unpleasant
    - Unpleasant
    - Neither pleasant, nor unpleasant
    - Pleasant
    - Very pleasant

- Answer category 5:
    - Very bad
    - Bad
    - Neither good, nor bad
    - Good
    - Very good

- Answer category 6:
    - Very unattractive
    - Unattractive
    - Neither attractive, nor unattractive
    - Attractive
    - Very attractive

- Answer category 7:
    - Very useless
    - Useless
    - Neither useful, nor useless
    - Useful
    - Very useful

- Answer category 8:
    - Very undesirable
    - Undesirable
    - Neither desirable, nor undesirable
    - Desirable
    - Very desirable

Page 6 (Behavioral intention)

Question 2: I plan to engage in physical activity this upcoming week.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 3: will try to engage in physical activity this upcoming week.

- Strongly disagree
- Disagree
- Neither agree, nor disagree

- Agree
- Strongly agree

Page 7 (Sensation-seeking)

Question 4: I would like to explore strange places.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 5: I would like to take off on a trip with no pre-planned routes or timetables.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 6: I get restless when I spend too much time at home.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 7: I prefer friends who are excitingly unpredictable.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 8: I like to do frightening things.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 9: I would like to try bungee jumping.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 10: I like wild parties.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Question 11: I would love to have new and exciting experiences, even if they are illegal.

- Strongly disagree
- Disagree
- Neither agree, nor disagree
- Agree
- Strongly agree

Page 8 (Socio-demographics)

Question 12: What is your age?

- Slider ranged from 18 to 25.

Question 13: How often do you engage in physical activity?

- At least five times per week
- At least once per week
- At least once per two weeks
- At least once per month
- Never

Question 14: When you engage in physical activity, what is the mean amount of time you engage in that physical activity?

- 0-30 minutes
- 30-60 minutes
- 60-90 minutes
- 90-120 minutes
- 120+ minutes
- I do not engage in physical activity

Appendix 5C: Ending survey

You have reached the end of the experiment

Thank you for participating in this experiment about physical activity!

The data that is collected will solely be used for this study, and will be deleted after the study is finished.

Appendix 6: Results

Appendix 6A: Data preparation

Descriptives

Table A6.1. Descriptive statistics.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Progress	68	100	100	100,00	,000	.	.	.	.
First View AOI1	68	,010	7,280	,68471	1,081629	3,915	,291	20,463	,574
Dwell time AOI1	68	,510	8,730	2,52647	1,460207	1,616	,291	4,446	,574
Amount of fixations AOI1	68	1,000	12,000	5,00000	2,101883	1,322	,291	2,558	,574
Q1: Attitudes C1	68	2,000	5,000	4,38235	,733615	-,980	,291	,434	,574
Q1: Attitudes C2	68	1,000	5,000	3,94118	,928526	-1,149	,291	1,752	,574
Q1: Attitudes C3	68	1,000	5,000	4,23529	,848487	-1,383	,291	2,639	,574
Q1: Attitudes C4	68	1,000	5,000	3,86765	,808618	-,973	,291	1,850	,574
Q1: Attitudes C5	68	1,000	5,000	4,27941	,709122	-1,497	,291	5,487	,574
Q1: Attitudes C6	68	2,000	5,000	3,79412	,783388	,000	,291	-,651	,574
Q1: Attitudes C7	68	1,000	5,000	4,20588	,820608	-1,070	,291	1,903	,574
Q1: Attitudes C8	68	2,000	5,000	3,77941	,878356	-,228	,291	-,647	,574
BehavIntent1	68	2,000	5,000	4,14706	,950486	-1,055	,291	,316	,574
BehavIntent2	68	2,000	5,000	4,26471	,725190	-,695	,291	,114	,574
SensSeeking1	68	2,000	5,000	3,92647	,851972	-,901	,291	,602	,574
SensSeeking2	68	1,000	5,000	3,45588	1,138654	-,544	,291	-,566	,574
SensSeeking3	68	1,000	5,000	3,38235	1,246241	-,438	,291	-,881	,574
SensSeeking4	68	1,000	5,000	3,01471	,969577	,071	,291	-,430	,574
SensSeeking5	68	1,000	5,000	2,80882	1,200216	,328	,291	-,890	,574
SensSeeking6	68	1,000	5,000	2,92647	1,489427	-,010	,291	-1,509	,574
SensSeeking7	68	1,000	5,000	3,20588	1,310791	-,271	,291	-1,208	,574
SensSeeking8	68	1,000	5,000	2,97059	1,233495	-,188	,291	-1,004	,574
AGE	68	18,000	25,000	21,85294	1,846859	-,115	,291	-,657	,574
Used device	68	1,000	3,000	1,92647	,718958	,110	,291	-1,022	,574
Q76_4_TEXT	0								
PhyActEng	68	1,000	4,000	2,05882	,750768	,993	,291	1,526	,574
AmTimePhyAct	68	1,000	5,000	2,66176	1,045392	,564	,291	-,316	,574
Valid N (listwise)	0								

Table A6.2. Descriptive statistics FirstViewAOI1_SQRT.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FirstViewAOI1_SQRT	68	0,10	2,70	0,6740	0,48364	1,562	0,291	3,587.	,574.
Valid N (listwise)	0								

Missing data and extremes

/// 116 participants in total.

// 37 participants did not 100% complete the experiment and/or the survey. These respondents were omitted.

// 5 participants were not aged between 18-25 years. These participants were omitted.

// 1 participant did not consent. This participant was omitted.

// 5 participants participated in the eye-tracking experiment of which the eye-tracking data was not usable. This data indicated that the participants did not observe the screen or a corner of the screen. All five participants utilized the QR code. One participant utilized a laptop and four participants utilized a phone. These participants were omitted.

/// 68 participants were utilized in data analysis.

// 34 Fun appeals

// 34 Fear appeals

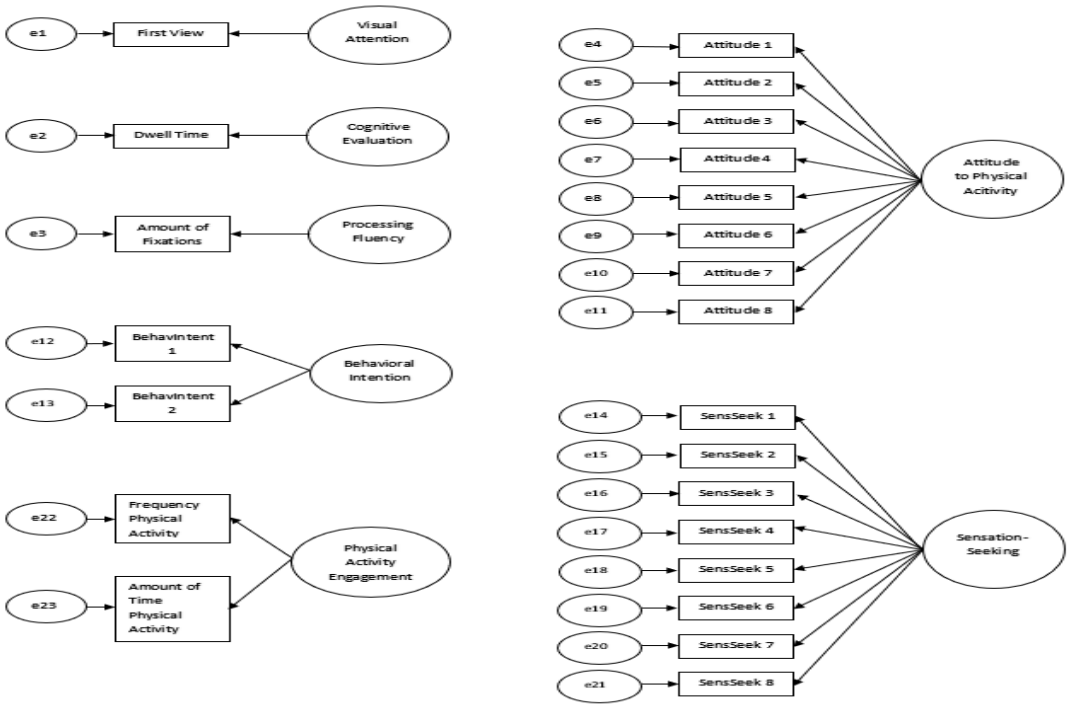
Normality assumption

/// Furthermore, the descriptive statistics are utilized to indicate problems with regard to the normality assumption. To start with, Hair et al. (2010) indicate there are no problems with regard to normality if the skewness is within a range of -2 / 2. Finally, Hair et al. (2010) indicates there are no problems with regard to normality if the kurtosis is within a range of -7 / 7. Additionally, Table X indicates there are three indicators that demonstrate high positive skewness (>2) and high positive kurtosis (>7). To start with, the indicator "FirstViewAOI1" demonstrates a skewness of 3,915(>2) and a kurtosis of 20,463(>7). Furthermore, the indicator "DwellTimeAOI2" demonstrates a skewness of 3,016(>2) and a kurtosis of 11,196(>7). Finally, the indicator "DwellTimeAOI3" demonstrates a skewness of 3,016(>2) and a kurtosis of 11,196(>7). Subsequently, the above-mentioned indicators were subjected to the computation of new variables utilizing a square root measure. Thereupon, the level of skewness and the level of kurtosis were successfully lowered to acceptable ranges for the three indicators (see table Y).

Appendix 6B: Evaluation of measurement model

Initial measurement model

Figure A6.1. Initial measurement model.



Construct reliability and validity

Table A6.3. Initial internal reliability (composite reliability).

	Appeal	Visual Attention	Cognitive Evaluation	Attitude	Behavioral Intention	Sensation-Seeking	Physical Activity	Age
AppealNr. 1	1,000							
Amount of Fixations		-0,343						
Time First Fixation		0,994						
Dwell Time			1,000					
Attitude1				0,758				
Attitude2				0,710				
Attitude3				0,705				
Attitude4				0,845				
Attitude5				0,724				
Attitude6				0,643				
Attitude7				0,745				
Attitude8				0,735				
BehavIntent 1					0,954			
BehavIntent 2					0,936			
SensSeeking 1						0,584		
SensSeeking 2						0,610		
SensSeeking 3						0,415		
SensSeeking 4						0,546		
SensSeeking 5						0,511		
SensSeeking 6						0,355		
SensSeeking 7						0,679		
SensSeeking 8						0,812		
PhysActEng							0,952	
AmTimePhys Act							0,560	

Table A6.4. Initial construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Appeal	1,000	1,000	1,000	1,000
Visual Attention	-0,622	1,936	0,321	0,553
Cognitive Evaluation	1,000	1,000	1,000	1,000
Attitude	0,879	0,892	0,903	0,541
Behavioral Intention	0,881	0,898	0,943	0,893
Sensation-Seeking	0,740	0,799	0,793	0,336
Physical Activity	-0,772	0,722	0,164	0,610
Age	1,000	1,000	1,000	1,000

// Visual Attention was split into two seperate variables

WHY? A negative Cronbach's Alpha (-0,622) indicates that the two indicators measure different dimensions; Composite reliability 0,321 < 0,600.

Table A6.5. Internal reliability (composite reliability).

	Cognitive Evaluation
Amount of Fixations	-0,000
Dwell Time	0,963

Table A6.6. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Cognitive Evaluation	0,426	-1,241	0,463	0,463

Visual attention split into: time to first fixation & amount of fixations.

// Physical activity was split into two seperate variables

WHY? A negative Cronbach's Alpha (-0,772) indicates that the two indicators measure different dimensions; Composite reliability 0,164 < 0,600. Split into: Physical Activity Engagement & Amount of Time Physical Activity Engagement

// Omitted SensSeeking 6!

WHY? Composite Reliability indicator 0,355 < 0,600; AVE Sensation Seeking 0,336 < 0,500. The indicator SensSeeking6 was omitted. The composite reliability value did not exceed the threshold (0,355 < 0,600). Additionally, the construct Sensation-Seeking had an AVE that did not exceed the threshold (0,336 < 0,500).

Table A6.7. Internal reliability (composite reliability).

	Sensation Seeking
SensSeeking 1	0,582
SensSeeking 2	0,611
SensSeeking 3	0,411
SensSeeking 4	0,542
SensSeeking 5	0,495
SensSeeking 7	0,685
SensSeeking 8	0,818

Table A6.8. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Sensation-Seeking	0,724	0,791	0,794	0,365

// Deleted SensSeeking 3!

WHY? Composite Reliability indicator 0,411 < 0,600; AVE Sensation Seeking 0,365 < 0,500. The indicator SensSeeking3 was omitted. The composite reliability value did not exceed the threshold (0,411 < 0,600). Additionally, the construct Sensation-Seeking had an AVE that did not exceed the threshold (0,365 < 0,500).

Table A6.9. Internal reliability (composite reliability).

	Sensation Seeking
SensSeeking 1	0,580
SensSeeking 2	0,611
SensSeeking 4	0,544
SensSeeking 5	0,500
SensSeeking 7	0,677
SensSeeking 8	0,826

Table A6.10. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Sensation-Seeking	0,708	0,771	0,795	0,399

// Deleted SensSeeking 5!

WHY? Composite Reliability indicator 0,500 < 0,600; AVE Sensation Seeking 0,399 < 0,500. The indicator SensSeeking5 was omitted. The composite reliability value did not exceed the threshold (0,500 < 0,600). Furthermore, the construct Sensation-Seeking had an AVE that did not exceed the threshold (0,399 < 0,500).

Table A6.11. Internal reliability (composite reliability).

	Sensation Seeking
SensSeeking 1	0,584
SensSeeking 2	0,600
SensSeeking 4	0,540
SensSeeking 7	0,692
SensSeeking 8	0,842

Table A6.12. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Sensation-Seeking	0,688	0,748	0,790	0,436

// Deleted SensSeeking 4!

WHY? Composite Reliability indicator 0,540 < 0,600; AVE Sensation Seeking 0,436 < 0,500; Crohnbach's Alpha Sensation Seeking 0,688 < 0,700. The indicator SensSeeking4 was omitted. The composite reliability value did not exceed the threshold (0,540 < 0,600). Furthermore, the construct Sensation-Seeking had an AVE that did not exceed the threshold (0,436 < 0,500) and a Cronbach's Alpha that did not exceed the threshold (0,688 < 0,700).

Table A6.13. Internal reliability (composite reliability).

	Sensation Seeking
SensSeeking 1	0,569
SensSeeking 2	0,588
SensSeeking 7	0,707
SensSeeking 8	0,861

Table A6.14. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Sensation-Seeking	0,630	0,707	0,780	0,478

// Deleted SensSeeking 1!

WHY? Composite Reliability indicator 0,569 < 0,600; AVE Sensation Seeking 0,478 < 0,500; Crohnbach's Alpha Sensation Seeking 0,630 < 0,700. The indicator SensSeeking1 was omitted. The composite reliability value did not exceed the threshold (0,569 < 0,600). Furthermore, the construct Sensation-Seeking had an AVE that did not exceed the threshold (0,478 < 0,500) and a Cronbach's Alpha that did not exceed the threshold (0,630 < 0,700).

Table A6.15. Internal reliability (composite reliability).

	Sensation Seeking
SensSeeking 2	0,596
SensSeeking 7	0,761
SensSeeking 8	0,886

Table A6.16. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Sensation-Seeking	0,624	0,714	0,797	0,573

// Deleted SensSeeking 2!

WHY? Composite Reliability indicator 0,596 < 0,600; Crohnbach's Alpha Sensation Seeking 0,624 < 0,700. The indicator SensSeeking1 was omitted. The composite reliability value did not exceed the threshold (0,596 < 0,600). Furthermore, the construct Sensation-Seeking had a Cronbach's Alpha that did not exceed the threshold (0,624 < 0,700).

Table A6.17. Internal reliability (composite reliability).

	Sensation Seeking
SensSeeking 7	0,808
SensSeeking 8	0,940

Table A6.18. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Sensation-Seeking	0,716	0,867	0,868	0,768

Final measurement model

Table A6.19. Internal reliability (composite reliability).

	Appeal	**Visual Attention**	**Amount of Fixations**	**Cognitive Evaluation**	**Attitude**	**Behavioral Intention**	**Sensation-Seeking**	**Physical Activity Engagement**	**Amount of Time Physical Activity Engagement**	**Age**
AppealNr. 1	1,000									
Time to First View		1,000								
Amount of Fixations			1,000							
Dwell Time				1,000						
Attitude1					0,758					
Attitude2					0,710					
Attitude3					0,705					

Attitude4	0,845				
Attitude5	0,724				
Attitude6	0,643				
Attitude7	0,745				
Attitude8	0,735				
BehavIntent 1		0,954			
BehavIntent 2		0,936			
SensSeeking 7			0,900		
SensSeeking 8			0,863		
PhysActEng				1,000	
AmTimePhysAct					1,000

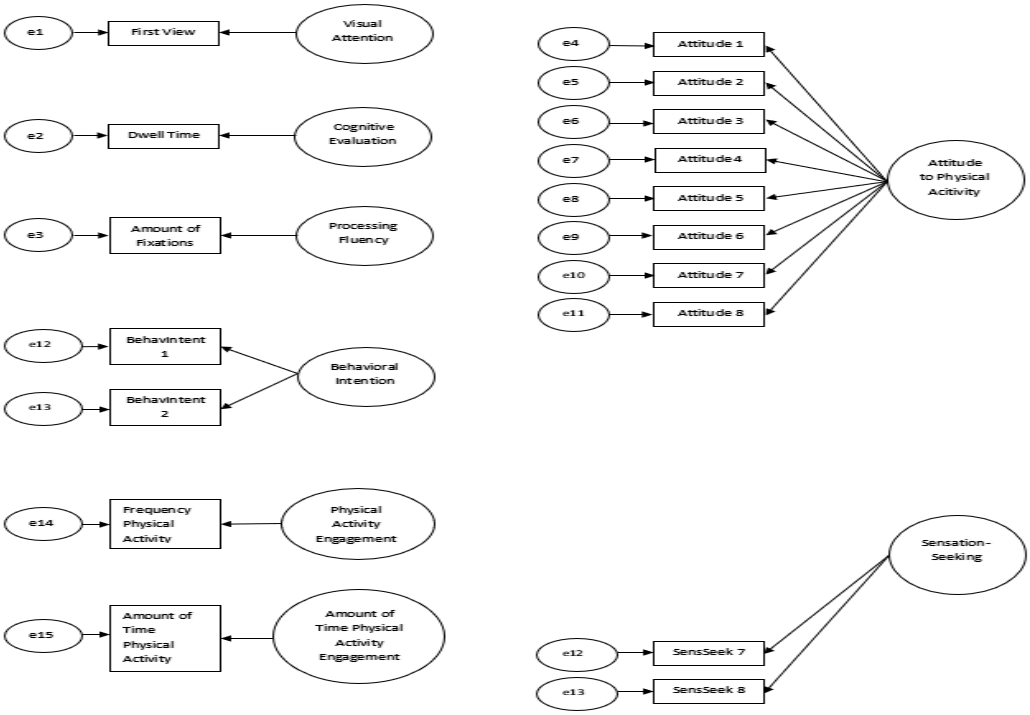
Table A6.20. Construct reliability and validity.

	Cronbach's Alpha	Rho A	Composite Reliability	AVE
Appeal	1,000	1,000	1,000	1,000
Time to first fixation	1,000	1,000	1,000	1,000
Amount of fixations	1,000	1,000	1,000	1,000
Cognitive evaluation	1,000	1,000	1,000	1,000
Attitude	0,879	0,892	0,903	0,541
Behavioral Intention	0,881	0,898	0,943	0,893
Sensation-Seeking	0,716	0,727	0,875	0,778
Physical Activity Engagement	1,000	1,000	1,000	1,000
Amount of Time Physical Activity Engagement	1,000	1,000	1,000	1,000
Age	1,000	1,000	1,000	1,000

Table A6.21. Discriminant validity (HTMT).

	Appeal	Time to first fixation	Amount of fixations	Cognitive Evaluation	Attitude	Behavioral Intention	Sensation-Seeking	Physical Activity Engagement	Amount of Time Physical Activity Engagement	Age
Appeal										
Time to first fixation	0,149									
Amount of fixations	0,070	0,181								
Cognitive Evaluation	0,061	0,204	0,199							
Attitude	0,147	0,179	0,144	0,084						
Behavioral Intention	0,099	0,088	0,313	0,112	0,522					
Sensation-Seeking	0,159	0,299	0,036	0,339	0,165	0,148				
Physical Activity Engagement	0,039	0,020	0,189	0,081	0,214	0,570	0,095			
Amount of Time Physical Activity Engagement	0,071	0,000	0,054	0,134	0,111	0,240	0,092	0,279		
Age	0,160	0,088	0,027	0,155	0,173	0,055	0,122	0,015	0,057	

Figure A6.2. Final measurement model.



Appendix 6C: Evaluation of structural model

Goodness-of-Fit

Table A6.22. Calculation GoF-Index

GoF-Index calculation:	
Mean construct communality	**Attitude:** (0,758*0,758) + (0,710*0,710) + (0,705*0,705) + (0,845*0,845) + (0,724*0,724) + (0,643*0,643) + (0,745*0,745) + (0,735*0,735) = 4,322589 4,322589 / 8 = 0,540324 **Behavioral intention:** (0,954*0,954) + (0,936*0,936) = 1,786212 1,786212 / 2 = 0,893106 **Sensation-seeking:** (0,900*0,900) + (0,863*0,863) = 1,554769 1,554769 / 2 = 0,777385 **Mean construct communality:** 0,540324 + 0,893106 + 0,777385 = 2,210814 2,210814 / 3 = 0,736938
Mean R^2	0,230 + 0,078 + 0,287 + 0,451 + 0,245 + 0,095 = 1,386 1,386 / 6 = 0,231
Mean construct communality x Mean R^2	0,736938 x 0,231 = 0,170233
GoF-Index:	$\sqrt{0,170233} = 0,412593$

Collinearity among predictor constructs

Table A6.23. Collinearity (VIF values).

	Appeal	Time to first fixation	Amount of fixations	Cognitive Evaluation	Attitude	Behavioral Intention	Sensation -Seeking	Physical Activity Engagement	Amount of Time Physical Activity Engagement	Age	Used Device
Appeal		1,006	1,042	1,042							
Time to first fixation			1,202	1,279	1,204						
Amount of fixations				1,304	1,326						
Cognitive Evaluation					1,555						
Attitude						1,088					
Behavioral Intention											
Sensation-Seeking		1,005	1,156	1,178	1,316	1,018					
Physical Activity Engagement					1,217	1,103			1,000		
Amount of Time Physical Activity Engagement					1,219	1,103					
Age					1,161	1,051					
Used Device		1,031	1,039	1,299							

Coefficient of determination

Figure A6.3. R^2 SmartPLS output.

	R Square	R Square A...
Amount of Fixations	0.274	0.216
Amount of Time Physical Activity Engagement	0.078	0.064
Attitude to Physical Activity	0.306	0.155
Behavioral Intention	0.451	0.407
Cognitive Evaluation AOI1	0.189	0.110
Visual Attention AOI1	0.095	0.037

Table A6.24. Coefficient of determination (R^2).

	R Square	R Square Adjusted
Time to first fixation	0,095	0,037
Amount of fixations	0,230	0,154
Cognitive Evaluation	0,245	0,143
Attitude	0,287	0,147
Behavioral Intention	0,451	0,407
Amount of Time Physical Activity Engagement	0,078	0,064

Effect size

Table A6.25. Effect Size (f^2).

	Appeal	Time to first fixation	Amount of fixations	Cognitive Evaluation	Attitude	Behavioral Intention	Sensation-Seeking	Physical Activity Engagement	Amount of Time Physical Activity Engagement	Age
Appeal		0,031	0,000	0,003						
Time to first fixation			0,061	0,026	0,015					
Amount of fixations				0,067	0,001					
Cognitive Evaluation					0,001					
Attitude						0,256				
Behavioral Intention										
Sensation-Seeking		0,079	0,017	0,079	0,000	0,019				
Physical Activity Engagement					0,043	0,288			0,084	
Amount of Time Physical Activity Engagement					0,020	0,023				
Age					0,044	0,001				
Used device		0,001	0,207	0,042						

Size and significance of path coefficients

Table A6.26. Size and significance of path coefficients.

	Beta (β)	Sample Mean (M)	Standard Deviation	T Statistics	P Values
Appeal → Time to first fixation	-0,168	-0,163	0,118	1,428	0,153
Appeal → Amount of fixations	-0,018	-0,023	0,111	0,161	0,872
Appeal → Sensation-Seeking → Time to first fixation	-0,011	-0,007	0,106	0,099	0,921
Appeal → Sensation-Seeking → Amount of fixations	0,026	0,014	0,130	0,198	0,843
Time to first fixation → Amount of fixations	0,238	0,235	0,114	2,076	0,038
Sensation-Seeking → Time to first fixation	0,268	0,273	0,103	2,600	0,009
Sensation-Seeking → Amount of fixations	-0,122	-0,135	0,129	0,946	0,344
Sensation-Seeking → Cognitive Evaluation	-0,265	-0,279	0,126	2,103	0,036
Appeal → Time to first fixation → Cognitive Evaluation	-0,225	-0,224	0,105	2,148	0,032
Appeal → Amount of fixations → Cognitive Evaluation	0,064	0,049	0,163	0,393	0,694
Time to first fixation → Attitudes to Physical Activity	0,155	0,100	0,153	0,750	0,453
Amount of fixations → Attitudes to Physical Activity	0,030	0,006	0,129	0,237	0,813
Cognitive evaluation → Attitudes to Physical Activity	-0,035	-0.030	0,139	0,249	0,803
Cognitive Evaluation → Physical Activity Engagement → Attitudes to Physical Activity	0,074	0,057	0,233	0,316	0,752
Cognitive Evaluation → Amount of Time Physical Activity Engagement → Attitudes to Physical Activity	0,340	0,354	0,144	2,372	0,018
Physical Activity Engagement → Amount of Time Physical Activity Engagement	-0,279	0,278	0,105	2,665	0,008

Attitudes to Physical Activity → Behavioral Intention	0,391	0,407	0,096	4,082	0,000
Age → Attitude to Physical Activity	-0,192	-0,180	0,132	1,457	0,145
Age → Behavioral Intention	0,028	0,028	0,091	0,311	0,755
Used Device → Time to first fixations	-0,031	-0,034	0,121	0,255	0,799
Used Device → Amount of fixations	-0,407	-0,402	0,098	4,137	0,000
Used Device → Cognitive Evaluation	0,202	0,205	0,119	1,700	0,089
Physical Activity Engagement → Attitudes to Physical Activity	-0,199	-0,201	0,171	1,166	0,244
Physical Activity Engagement → Behavioral Intention	-0,426	-0,405	0,119	3,575	0,000
Amount of Time Physical Activity Engagement → Attitudes to Physical Activity	-0,133	-0,093	0,196	0,679	0,497
Amount of Time Physical Activity Engagement → Behavioral Intention	0,118	0,114	0,105	1,128	0,259