

Don't make me think: The impact of involvement, mobile ad's design and execution on consumer engagement

Master Thesis in Marketing

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ABSTRACT

Visual stimuli like advertising design and contextual placement have their individual impact on the consumer attitude and the behaviour formation. However, often consumer preferences play the vital role in the decision-making process. With the aim of manipulating consumer preferences and beliefs about the advertising and the product, subjects were exposed to a simple mobile banner advertisement that contained either a text message and a picture or only a text message. Half of the respondents saw the banner in a content-complementing mobile environment, while the other half of the respondents saw the ad in a mobile environment not related to the content. The effect of visual stimuli and contextual placement over consumer attitude has been validated. The study finds that the impact is further amplified for consumers who are involved with the advertised product, which challenges theories in marketing. Past research conceptualizes that peripheral stimuli like pictorial elements do not trigger cognition while high involvement and perceived product relevance are associated with increased motivation for cognitive processing of the advertising merits. The findings in this study are helpful as they provide marketers with several important implications for boosting the effectiveness of decisions in advertising.

Keywords: banner advertising, mobile applications, involvement, image, targeted ads, peripheral cues

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A. INTRODUCTION

According to a recent report by the global GSM Association, the mobile industry has been growing rapidly in the last 10 years to reach 3.6 billion subscribers in 2014, or half of the population on the earth. A further 30% increase in the number of subscribers is expected by 2020, boosting the mobile penetration rate to 60% globally, with 80-82% in Europe and North America (*The Mobile Economy 2015, GSMA*). The growth in usage and penetration is foreseen to power a greater demand for mobile services and applications, which would respectively create opportunities for marketers to enlarge their customer base by heavily advertising in the mobile channel. According to a March 2015 report on mobile advertising trends 2013-2018 of the market research company IDC, the mobile app advertising revenue grew by 70% between 2013 and 2014 outpacing mobile web and desktop web advertising. By 2018 the revenue is forecasted to triple, thus leaving mobile web and desktop web advertising in the past of the digital advertising industry. With 80% of the user's mobile time spent on applications (Flurry Analytics 2014), mobile applications are a great business model for growth.

Because of the commercial and strategic benefits of mobile advertising, marketers allocate millions of marketing dollars in researching and testing the most effective configuration of design and content which to make potential customers inclined to interact. A previous research provides hints on advertising executional elements with significant impact on the consumer's perception/consumer perception. Mitchell and Olson (1981) find that visual stimuli placed in an advertisement are able to evoke consumer response, as Mitchell (1986) later proves that "positively charged" photographs have a positive effect on consumer attitudes towards the brand and the ad. Conducting research on how web banner ads impact on the consumer's direct response, Baltas (2003) examines the contribution of creative factors such as banner size, animation, message length and logos to the banner effectiveness. Goldfarb and Tucker (2011) further add that the ad placement and visibility within a website also play an important role in modelling consumer memorability. Contextual advertisements are found to increase consumer favourable attitude toward the ad and thus to facilitate recall and recognition (Norris & Colman 1992), brand evaluation (Shen and Chen 2007), and product judgement (Herr 1989). To improve effectiveness and profitability, the mobile ads are further customized according to the user's past behaviour like browsing and search history, experience with, preferences and perceptions towards the advertised product (Sherman and Deighton 2001; Lambrecht and Tucker 2013). The more engaged the

customers are with the product and the higher their perception on the added value is, the more inclined they are to respond to the advertising (Sarvary, Stephen and Bart 2014).

Although there are many publications on this topic, optimization of mobile advertisements still seems to challenge the business. As cited by Sarvary, Stephen and Bart (2014), a survey of global marketing executives reveals that nearly half of the respondents do not feel confident of the effectiveness of their mobile advertising and consider reassessment of the performance of this marketing channel. The underperformance can be partly explained by the “spray-and-pray” mentality of companies, defined by Patel, Schneider, and Surana (2013) as the inability to capitalize on mobile advertising by neglecting the real factors that determine the ad effectiveness. Others claim that it’s all about the size. A disadvantage of the “baby banners” is their small size making them hard to notice, remember and recall (The Economist, 2014). Even noticeable variance across campaigns is not seen to have any significant impact on the campaign effectiveness (Sarvary, Stephen and Bart 2014). Another explanation suggested by the authors is the nature of the advertised products and the consumer perceptions. Advertising tends to be more effective for products which are perceived by the consumer as practical (further called “utilitarian” in the study) and usually selected after prior evaluation of the outcome of their purchase (defined as “high-involvement” by the authors).

Yet research is limited because it views advertising primarily as memory cues which trigger recall of previous experience to induce behavioural response (Mitchell 1986; Wrights 1973; Olson and Mitchell 1975). Any peripheral elements like pictures, colours and format are included to improve memorability and not to evoke an action. Advertising is suggested to work without triggering cognition just for few product categories like mobile apps and music (Sarvary, Stephen and Bart 2014). So, then how much is investing in mobile ad’s design and execution worth? Is putting just a picture in an advertisement enough to make customers engage without event thinking? Previous research does not adequately address the question whether and to what extent product involvement is relevant to products not requiring any cognitive processing of previously stored information either. Are the customer’s preferences and experience always the real game-changer in the decision-making process regardless of the advertised product? These questions signal a significant gap in the literature and the practice as to what should be the right balance of elements, which must not be underestimated in the process of engaging with the consumer. This study adds to previous research in three ways. First, it validates the impact of the two visual elements in the advertising execution, the

image and the contextual placement, and strongly recommends their usage for more successful customer acquisition. Second, it confirms that involvement with the product does play a vital role in the consumer decision-making process, even when the product and its attributes don't trigger cognition. Third, it challenges theories and proposes that visual stimuli should be used in advertising targeting consumers with high involvement with the advertised product. Visual stimuli are seen to amplify the effect of the perceived relevance. Proving that product relevance is as important as design reveals as well important managerial implications for marketers as to how to maximize mobile advertising effectiveness.

The premise of this study is that marketing-controlled factors and customer product perceptions interact and impact on the customer's attitude and willingness to follow and answer to a mobile advertising. To explore this proposition, this study examines the behavioural response triggered by a banner which advertises a mobile application. Choosing to download a certain mobile app does not provoke any evaluative thinking in the consumer mind.

The objectives of the study are to provide understanding and further guidance into:

- what in-app placement of the mobile ad will work better to engage customers into purchase or banner click-through;
- how non-cognitive, visual stimuli present in a mobile ad change the attitude towards the ad and the advertised product, and facilitate the decision-making process;
- how the level of involvement with the product, translated into customer preferences and perceptions, influence the attitude towards the mobile ad and the willingness to interact, in the case of mobile apps in particular

For the purpose of the study, a mobile banner ad is designed which advertises and encourages the download of a mobile health application, the latter targeting users interested in tracking and improving their sport lifestyle. The banner ad is tested in two different mobile environments – one sharing content similar to that of the health app and another one having content not related to the application.

Testing the two peripheral cues results in 2x2 treatment matrix:

Table 1:2x2 Treatment Matrix

		Content	
		Complement the Content	Don't complement the Content
Image	Contain Image	- Image ✓ - Content ✓	- Image ✓ - Content ✗
	Don't contain Image	- Image ✗ - Content ✓	- Image ✗ - Content ✗

Respondents in the study are asked to evaluate the banner ad against multiple criteria. Questions are designed to assess respondents' beliefs about the advertising and the advertised product along with their perception of relevance and level of engagement with the product. Two types of involvement are analysed in this study - involvement with the health application and involvement with actual downloading of the app.

To preview the results, it is first confirmed that the presence of visual stimuli like an image on a banner advertisement results indeed in more favourable attitude towards the ad compared to advertisements containing only text. The analysis provides an interesting additional insight which is in support of previous research. The positive impact of the image on the attitude towards the advertisement is further transferred in the chain to the attitude towards the advertised product. Second, the study validates that consumers who have seen the banner ad in an environment sharing similar content tend to respond positively to the ad. Moreover, consumers having high involvement with the product tend to respond more favourably to the health app if the banner ad which advertises it is seen in a complementary environment. Finally, in line with past research, the study shows that a more favourable attitude toward the banner will evoke more favourable intention to download the health application, as the strength of the relationship is further amplified for consumers who find the health application relevant to their needs, essential to their lifestyle or having value to them. Similarly, the effect of the attitude towards the banner on the attitude towards the health application is stronger and directionally positive for respondents who are more likely to perceive the health application as relevant and valuable to them.

The findings from this study are helpful as they provide several important implications for advertisers and marketers. First, the study strongly encourages attention on executional elements when creating an advertisement, especially when novel products are first launched to the market. Including an image in an advertisement not only works upon

attracting the consumer's attention, but also benefits the consumer's perception towards the advertisement and the advertised product. Just like the perception towards the presence of an image, sharing similar content also brings only advantages to the advertised product. Second, advertisers and marketers are highly recommended not to underestimate the value of the personal relevance of a product to the consumer's response. On one hand, identifying and targeting consumers with high involvement bring benefits in the short term as the likelihood of them engaging with the product is higher. On the other hand, the strategy of creating involvement pays off in a longer run e.g. when promoting a new product to the line, launching a new campaign to educate on your old product, etc..

The remainder of the article is organized as follows: chapter "Background, Literature & Theoretical Model" provides detailed explanation on the research background, the study's relevance and the hypothesized assumptions. Chapter "Methodology" contains details on the research design, construct measurements and data collection; the rest of the chapter is focused on interpreting the results of the analysis in the light of the study's limitations, clarifying their implications and recommending potential areas for future research.

B. BACKGROUND, LITERATURE & THEORETICAL MODEL

1. IN-APP ADVERTISING: THE FUTURE OF THE MOBILE ADVERTISING

One of the fastest-growing advertising formats, advertising on mobile devices, is forecasted to almost double in spending between 2016 and 2019, reaching nearly \$200 bln globally or slightly over 70% of digital ad spending and 25% of total ad spending (Global Mobile Landscape 2015, eMarketer). Mobile capabilities allow for gathering and tracking information about the user's location, shopping habits and preferences and thus enable companies to identify their customers and define the most efficient (re)targeting and segmentation strategy at the lowest cost (Ingram 2012). Mobile advertising means vary from text messaging, WAP sites, interactive voice responses to mobile applications and mobile ads (Shankar 2009).

Mobile advertising that encourages download of an application is one of the most widespread means accounting for a large share of the global mobile ad spending. This type of advertisement does not only possess the aforementioned capabilities, but also allows for easily estimating the ad effectiveness by tracking the number of downloads or clicks. The

“call to action” ad aims at directing the potential users straight to an online store, which permits tracking platforms to easily connect the “purchase” to the marketing ad channel. In terms of placement, advertising within an app is the most preferred by the business as it delivers the highest and ongoing profit streams and works well in acquiring and retaining customers. According to the IDC, the highest earning type of in-app ad is the static banner ads.

Hence, in order to provide more relevant and applicable recommendations to the business, this study focuses on measuring the effectiveness of a static mobile banner ad which provokes consumers to download a mobile application. Though majority of mobile time is spent on gaming or social apps, industry analysis proves a growing interest and usage of health-related mobile applications (Flurry Analytics 2014). Therefore, the advertised app, designed for this study, claims to improve consumer health and wellbeing. There are nearly 100 thousand health apps available on app stores and their number is growing exponentially, which is triggered by the increased consumer interest. In 2012, over 80% of the smartphone users downloaded at least one of those apps. The purpose, that these mobile applications serve the consumer, varies. For example, 19% of the mobile users use a health app for managing their eating habits, while 35% use an app for tracking their progress when exercising (Mobile Health 2012). The advertised mobile application, tested in this study, promises to improve one’s health by tracking health metrics during a run. Findings from this study will be relevant to the business and will also provide some practical tips concerning health app development.

2. WITH THE RISE COME THE CHALLENGES: HOW TO OVERCOME THE BANNER BLINDNESS

With its first appearance in HotWired.com in 1994 banner advertising became a popular advertising format. As most banner ads had the same shape and size, users soon became able to recognize through their peripheral vision anything on the screen looking like a banner ad and got used to avoiding it with their eyes (Drèze and Hussherr 2003, Benway 1999, Janiszewski 1998). The phenomenon known as “Banner blindness” is one of the vital issues in the mobile advertising industry seen also as one of the reasons for drops in click-through rates (Pagendarm and Schaumburg 2001)

However, even not inducing immediate follow up action like a click some banner ads will still have tangible impact on the user's purchase intent in a longer run. Creating awareness by exposing users to advertisements works well on their ability to recall and recognize later the brand or the product (Drèze and Hussherr 2003; Briggs and Hollis 1997). Although triggering recall is seen by researchers as more important than inducing single click-through, marketers still prefer to use click-through rate as a measure for advertising effectiveness and justification of their marketing budget. Yet, both parties share the same objectives - creating a banner ad which can grab user attention and induce a change in consumer behavioural intent. But how can one change the consumer's behaviour if the consumer is "blind"?

First, the concept of the behavioural response should be scrutinized and broken into components along with their role in shaping one's behaviour. In early 70's O'Brien confirms the relationship between attitude and behaviour in the context of the awareness-attitude-intention-purchase sequence. Ajzen later conceptualizes in his theory of planned behaviour that attitude determines purchase intention (1985). Consumers who strongly hold favourable attitudes are more inclined to make a committed decision (Smith and Swinyard's 1982). Hence, the first component to be taken into consideration and studied is the consumer's attitude. However, attitude is proven by past research to be conditional on beliefs which consumers develop when they get exposed to stimuli. On one hand, the stimuli may evoke memories of previous experience or knowledge (Ajzen 1985; Petty and Cacioppo 1983; Pollay and Mittal 1993). The nature of the experience, positive or negative, defines whether the attitude will be positive or negative. On the other hand, the stimuli may drive the formation of a momentary belief. The previous experience or knowledge, which the consumer will recall about the object, may come from an advertisement about the object which the consumer has seen (Mitchel and Olson 1981). According to the classical conditioning approach to attitude formation (Staats 1967 - 1969), when a neutral stimulus such as fictitious brand name is paired with a negatively or positively evaluated stimulus such as a picture, it gets associated with the feelings evoked by the picture. Applied in the context of mobile advertising, consumer beliefs regarding mobile advertising will impact on the attitude towards the ad and consequently induce a behavioural intent in the consumer to react to the advertisement. Hence, one can alter consumer attitude towards a product and influence consumer intention by simply changing the beliefs towards the ad.

Second, beliefs and stimuli should be differentiated in terms of their ability to trigger response in consumers who are “banner blind” (i.e. less inclined to notice an advertisement). Depending on the way the advertising stimuli are processed and perceived by the consumer, attitude, and respectively response, to the ad can have two dimensions – cognitive and emotional (Petty and Cacioppo, 1983; Shimp 1981). By consciously processing the executional element of the ad consumers evaluate the message, its content and relevance. Structuring ads, for instance by emphasizing certain product attributes, can impact on consumer beliefs and evaluation of the advertising and the advertised object in such a manner that can let consumers think more about the positive consequences of consuming the advertised object. That lets them develop a favourable attitude and makes them more likely to engage in trial or repeat purchase. Alternatively, the ads are seen to arouse emotional response when pleasant stimuli (as known as “peripheral cues”) such as scenery and characters are available, but the executional elements are not consciously processed (Cho 2003; Michel and Olson 1981).

In their “dual loop” theory of the advertising effect Percy and Rossiter (1978; 1980) postulate that visual imagery can alter consumer attitude towards a product and also serves as an unconditioned stimulus translated to the brand or the product. In ad-related context, positively evaluated visual content can create even stronger beliefs about the advertised object and elicit more positive brand attitudes compared to verbal content (Mitchel and Olson 1981, Mitchell 1979). For example, a brand associated with a positively evaluated image such as a kitten or a sunset is perceived more favourably than a brand associated with neutral abstract painting. A pictorial element attracting more attention to itself tends to attract more attention to the rest of the elements of the advertisement like message and product and not only the brand (Pieters and Wedel, 2004). Moreover, due to the presence of an image customers are more inclined to spend time on the advertisement and less inclined to zapping (Teixeira, Wedel, and Pieters 2012), which results in a positive effect on the behavioural response (Gross and Thomson 2007).

Another peripheral stimulus is the environment in which the ad is seen (Danaher and Mullarkey 2003). The webpage’s overload of stimuli may adversely impact on the attitude towards the ad, and consequently the response to the ad. Therefore the complex webpage background encumbered with items, colors and animations is suggested to have negative influence on the attitude towards the ad and the purchase intention (Stevenson, Bruner and Kumar 2000). This is in line with earlier findings that simplicity and efficiency increase the

click-through intent (Hofacker and Murphy 1998). However, an advertisement seen to complement the webpage on which it is placed is found to induce a favourable attitude change towards the ad (Goldfarb and Tucker 2011).

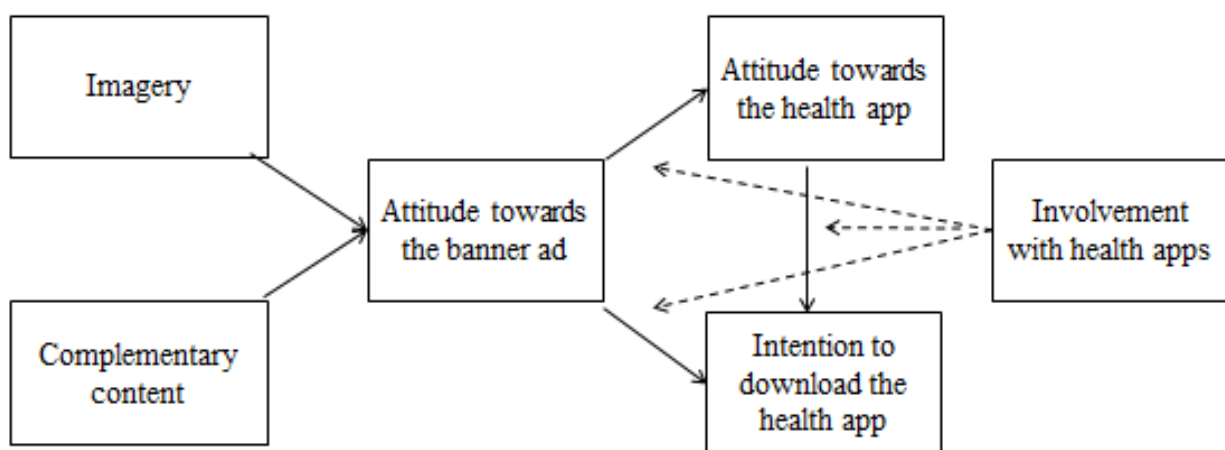
What stimuli will attract consumers' attention and pull them out of the state of banner ignorance depends, however, to a large extent on consumers' motivation to get involved, i.e. the level of involvement. Zaichkowsky (1985) defines involvement as "a person's perceived relevance of the object based on inherent needs, values, and interests". Theorists differentiate three main types of involvement – with a product (Howard and Sheth 1969); with a purchase decision (Clarke and Belk 1978); and with an advertisement (Krugman 1977). However, involvement with the product does not necessarily trigger involvement with the advertisement. The presence of peripheral stimuli like an image may get consumers involved with the advertising and motivate them to follow the advertisement and to engage with the advertised products. Likewise, consumers having high involvement with the advertised product may find themselves scrutinizing the advertisement and neglecting it due to concerns related to its reliability and trustworthiness (Zaichkowsky 1994).

3. CONCEPTUALIZING IN-APP BANNER AD EFFECTIVENESS

3.1. CONCEPTUAL MODEL

By applying the insights from past research, a conceptual model in Figure 1 is built to determine how involvement, advertising design and execution interact to reverse banner blindness and influence consumer attitude and response.

Figure 1: Conceptual Model



3.2. IMAGERY AS A PERIPHERAL CUE AFFECTING ATTITUDE TOWARDS THE BANNER AD

Hansen's (1997) ELAM model shows that peripherally processed information has a positive effect on the attitude towards the ad as peripheral processing can be triggered by cues such as pleasant pictures, attractive endorsers, celebrity endorsers, appealing food to expert sources, etc. (Petty and Cacioppo, 1984). Mitchell's (1986) research on this topic provides further evidence of the positive effect of using imagery in an ad on the consumer attitude towards the ad. This is later explained by the fact that imagery is sensory information which is "stored" in the consumer active memory and thus has greater influence over shaping one's attitude (MacInnis and Price 1987; Babin and Burns 1997). Poor et al. (2013) test and further reveal that using images containing other consumers' photos would not only result in favourable attitude towards the ad, but would even improve the entire experience. Based on the research, the following hypothesis is tested:

***H1:** Mobile banner ads which contain images of consumers will have a positive effect on attitude towards the banner ad.*

3.3. COMPLEMENTARY CONTENT AS A PERIPHERAL CUE AFFECTING ATTITUDE TOWARDS THE BANNER AD

Goldfarb and Tucker (2011) evaluate the extent to which the website environment with a banner ad influences the consumer's purchase intent and confirm that "targeted" ad campaigns designed to complement the website content have an incremental positive effect compared to the base effect of ad exposure. This is in line with previous findings which show that context favourably impacts on consumer perceptions towards the ad and the advertised product (Moore, Stammerjohan and Coulter 2005). A well fitted advertisement is perceived as more useful and interesting (Aaker and Brown 1972; Chaiken and Stangor 1987; Choi and Rifon 2002), while congruent positioning results in enhanced, more positive response (Shamdasani, Stanaland, and Tan 2001; Till and Busler 2000). Moreover, the relevance of the advertised object to the website content is seen to be positively and directly related to the behavioural intent (Choi and Rifon 2002) as targeted ads blend into the content and work upon the increase of the purchase intent (Russell 2002). Based on the empirical conclusions of past research, it is hypothesized that:

H2a: A complementary banner ad will have a positive effect on the attitude towards the banner as compared to a non-complementary banner ad.

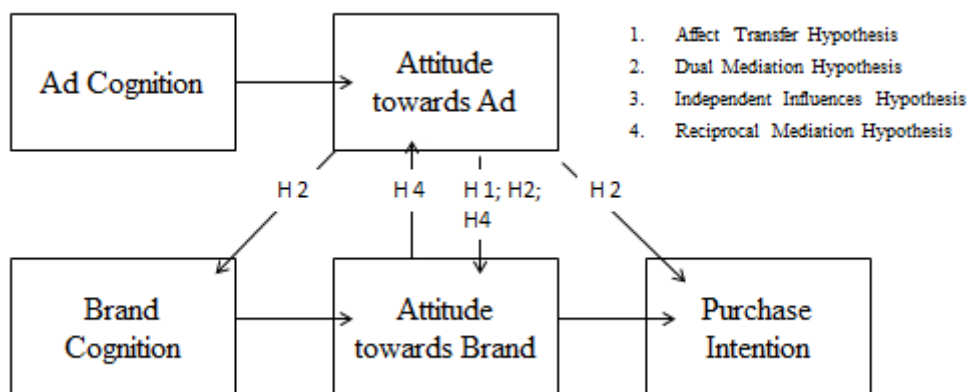
H2b: A complementary banner ad will have a positive effect on the attitude towards the advertised object as compared to a non-complementary banner ad.

H2c: A complementary banner ad will have a positive effect on the likelihood of engaging with the banner as compared to a non-complementary banner ad.

3.4. THE EFFECT OF ATTITUDE TOWARDS THE BANNER AD ON BOTH THE ATTITUDE TOWARDS THE ADVERTISED HEALTH APP AND THE BEHAVIOURAL INTENT

Challenging Fishbein’s basic proposition that product beliefs shape attitude, theorists claim that attitude towards the ad (A_{ad}) has a mediational effect on the relationship between the advertising message and the consumer attitude towards the brand (Shimp 1981; Mitchell and Olson 1981; Lutz, MacKenzie, and Belch 1983; MacKenzie and Spreng 1992). In their study Brown and Stayman (1992) provide some theoretical background to this relation by reviewing the four most tested models of A_{ad} as proposed first by Lutz, MacKenzie and Belch (1983).

Figure 2: Models Of Attitude Towards The Advertisement (“Ad Attitude”)



Three of the models in Figure 2 suggest an indirect impact of the ad attitude upon the purchase intention, while the Independent Influence Hypothesis clearly shows a direct effect. According to research, a positive response to the advertisement has a positive effect on the ad attitude (Beckmann et al. 2008). Such positive attitude has the highest propensity for forming positive behaviour (Shimp, 1981; Lutz, MacKenzie and Belch, 1983; Batra and Ray 1986).

The current study aims at examining the attitude towards a health application instead of a brand. Hence, past research would imply the validity of the following hypotheses as well:

H3a: *A more positive attitude towards the mobile banner ad will have a more positive impact on the attitude towards the app.*

H3b: *A more positive attitude towards the mobile banner ad will result in higher likelihood of clicking and downloading the advertised health app.*

H4: *A more positive attitude towards the health app will result in higher likelihood of clicking and downloading the advertised health app.*

3.5. THE (INTERACTION) EFFECT OF INVOLVEMENT WITH HEALTH APPS

By clicking on a banner ad users voluntarily expose themselves to the advertisement. Familiarity with and commitment to the brand, as well as perceived importance and relevance of the product and the product attributes (Howard and Sheth 1969; Zaichkowsky 1986; Rosbergen, Pieters, and Wedel 1997), make consumers more likely to pay attention to the advertisement (Pieters & Wedel, 2004) and scrutinize cognitive- instead of peripheral-related merits of the ad (Petty and Cacioppo 1981; Sarvary, Stephen and Bart 2014). Users who are highly involved with a product are more likely to pay attention to an ad, spend more time processing it, and eventually click on a banner ad compared to users with low product involvement (Cho 2003; Bloch at al. 1986; Houston 1979; Celsi and Olson 1988). In fact, involvement is seen to be a moderator in the relationship of attitude towards the ad and attitude towards the advertised product and the click-through intent (Muehling and Laczniak 1988; Yoo, Kim and Stout 2004). High product involvement not only leads to high click-through rate, but can result in favorable attitude towards the banner advertisement, the advertised product and the brand (Briggs and Hollis 1997; Cho and Leckenby 2000). Accordingly, it is hypothesized that:

H5a: *Product involvement has a moderating role in the relationship between attitude towards the banner ad and the behavioural intent.*

H5b: *Product involvement has a moderating role in the relationship between attitude towards the banner ad and the attitude towards the advertised health app.*

H5c: *Product involvement has a moderating role in the relationship between attitude towards the advertised health app and the behavioural intent.*

C. METHODOLOGY

1. RESEARCH DESIGN

The objective of the study is to examine the impact of imagery, complementary content and product involvement upon the user's attitude towards a banner ad, attitude towards the advertised health app and the click-through intent. Hence, causal research is utilized to test and identify relationships between the aforementioned variables.

Data collection is done through conducting a randomized controlled online experiment (Kohavi et al 2008). Between-subject design is applied, which implies that a respondent, also known as a "subject", participates only once in a treatment and is randomly assigned to that particular treatment.

2. MANIPULATIONS

In order to measure the impact of imagery and complementary content, for the purpose of the study a mobile banner ad is designed to advertise a mobile application which targets users interested in tracking and improving their sport lifestyle. Testing the two peripheral cues has resulted in a 2x2 treatment matrix in Table 2:

Table 2: 2x2 Treatment Matrix

		Content	
		Complement the Content	Don't complement the Content
Image	Contain Image	- Image ✓ - Content ✓	- Image ✓ - Content ✗
	Don't contain Image	- Image ✗ - Content ✓	- Image ✗ - Content ✗

Although according to IDC's research the highest earning type of in-app ads is the static banner ad, an animated banner ad is chosen to be the object of the study as academic findings prove it to be a better alternative (Yoo et al. 2004; Cho 2003). It is believed that animated banner ads are better at grabbing the user's attention due to the integrated motion effect and thus result in higher effectiveness in eliciting behavioral response (Heo, Sundar, and Chaturvedi 2001; Reeves and Nass 1996; Cho, Lee and Tharp 2001). Hence, the banner ad is designed to be dynamic and to comprise 2 sliders, which create the illusion of motion like most of the animated banner ads (Kalyanaraman and Oliver 2001). To further increase

visibility and attention-grabbing, the banner ad flashes when the page is loaded and continues to slide throughout the exposure time. The first slider contains only the brand and the logo and is followed by a second slider containing the brand and two text boxes “Available in App Store” and “Click here/ Download now”. As noted by Hofacker and Murphy (1998), banner ads containing a “Click here” action-loaded message along with a short headline are seen to “match the hedonic mode” of the users, thus making the latter more likely to respond without much cognitive efforts from their side.

Two variations of the banner ad are created, both containing the aforementioned peripheral cues, the only difference being the presence of imagery as the examined object of this study. The banner containing the image is presented in Figure 3. The banner containing the basic elements only is presented in Figure 4

Figure 3: Sliding Banner #1 - Containing The Brand, A Short Headline Text Message And A Picture Of Two Running Persons

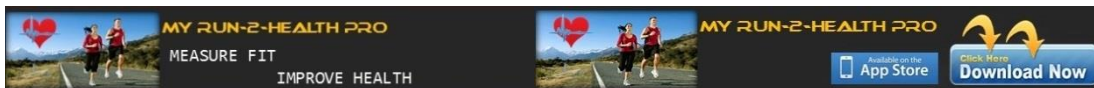


Figure 4: Sliding Banner #2 - Containing Only The Brand And A Short Headline Text Message



It is hypothesized that banner ads seen in contextually complemented environment like a mobile application do have impact on the user's attitude. Hence, the two banner ads above are placed in two different environments each - one supporting the hypothesis, the other being to the contrary. Visually replicated the 2x2 matrix is presented in Table 3.

Table 3: 2x2 Treatment Matrix - Screenshots Of The Tested Interface

		Content	
		Complement the Content [Calories Counter]	Don't complement the Content [Weather Forecast]
Image	Contain Image		
	Don't contain Image		

With regards to the background, both environments are simplified in terms of colors, fonts and graphic images and designed to share similar background. The goal is to minimize

the effect of any other visual stimuli, which contribute to a complex background that may lead to a negative effect on the user's attitude (Stevenson, Bruner and Kumar 2000; Bruner and Kumar 2000). The design of the background environment follows Dreze and Zufryden's 1998 approach. Instead of multicolour patterns, the design consists of 3 main colours – grey, blue and white – which guarantees to a large extent that shades along with the user's experience remain the same regardless of the device and the operation system. Based on Berlyne's 1960 research extended into mobile advertising environment, a complex banner ad placed in a relatively simpler context would increase the user's motivation to look and further explore the ad.

In order to increase visibility, the banner ad is placed at each of the available pages accessible on the mobile enabled website. Furthermore, the banner is always placed at the top of the screen, between the menu and the rest of the content on the page. This is consistent with the findings that banner ads are expected to be seen at the top of the page (Bernard 2001) as there they attract attention and generate more clicks than at the bottom (Murphy 1996; Heo and Sundar 2000), and should not be visually isolated by the rest of the content. The reason being, users tend to look at the top of the page to seek the most important information located there (like navigation menus, headlines, titles, etc.)

The current design is a result of a pre-test among 10 respondents, who shared feedback regarding the overall design and functionality. Based on their feedback, the quality of the graphic images, navigation, content and banner ad visibility were improved.

3. SAMPLING & PRE-TEST

Primary data is collected through the distribution of a questionnaire, created on the "Qualtrics" platform (see D. Appendix/1. Questionnaire, Table 12). An intro section asks respondents to click on a link placed below the introductory text message. The message itself explains that respondents will be redirected to a mobile-enabled website replicating the design of the new mobile application. They're encouraged to navigate throughout the website "for as long as they wish, and click wherever they want to explore what's behind". To go back from the website to the survey, they need to click on the menu button "Survey" which they see at the top right corner of the web page. Encouraging respondents to browse instead of performing goal-oriented tasks is proven by previous research to increase the recall and effectiveness of the banner ad (Danaher and Mullarkey 2003; Pagendam and Schaumburg

2001). Goal-oriented activities are indicated to require cognitive processing efforts and thus lead to reduced attention to peripheral cues.

The intro section is programmed to randomly show one out of the four treatments, and default setting of the platform takes care respondents to be relatively equally distributed across the four treatments, which allows for balanced cross-treatment comparison and measurement. Since the goal of the research is to collect a sample of respondents who pay attention to banner ads and respectively to the examined one, two logical rules are incorporated into the questionnaire to exclude respondents who do not notice the advertisement and do not remember the banner ad. First, this ensures that only relevant to the research results are preserved and second, it allows for easy tracking and quick identification when the sufficient sample size is reached. The rest of the questions are designed to assess the respondent's attitude towards the banner ad and the advertised health app and their intention to click and download the health app.

The questionnaire is pre-tested to ensure all questions are clear and understandable. There are no changes implemented due to the lack of negative feedback.

4. CONSTRUCT MEASUREMENT

Attitude towards the banner ad. According to the theory of reasoned action by Fishbein, attitude towards the ad is a product of 1) beliefs about the ad and 2) overall evaluation of these ads. The proposed mode is as follows:

$$A = \sum_{i=1}^n b_i e_i,$$

, where

A = person's attitude towards the object, in this case the banner ad

b = beliefs about the object's attributes

e = evaluation of the attributes.

Both beliefs and evaluation are assessed by seven items (see Appendix D.1, Table 12), measured on a 1-to-7 Likert scale (Olney, Holbrook and Batra 1991; Edwards, Lee and Li 2002). To test items' reliability to this study, a Cronbach's alpha test is run among the seven items with regards to both beliefs and evaluation. The value for both, belief-measuring

items ($\alpha=0.90$) and evaluation-measuring items ($\alpha=0.87$), is higher than the acceptable level of 0.70 (Cronbach, 1951), which confirms the reliability of the items to the construct.

The products of an item's belief and evaluation are further aggregated to estimate the attitude towards the banner ad on individual level. For example, one of the items measures to what extent the ad keeps the respondent's attention. By answering the question related to the beliefs, respondents are encouraged to share how they usually feel when they see a banner ad on the mobile display, i.e. to share their beliefs about the advertising. By answering the next question, respondents give their evaluation of the actual feeling in the moment they see the banner ad. The scores from both questions are multiplied to estimate the respondent's attitude towards the ad's ability to keep their attention. The same approach is followed to estimate the respondent's attitude towards the remaining six items. Summing up the total scores of all seven items is suggested by past research to provide relatively good prediction of the overall attitude towards the web banner. The final score per respondent is later adjusted to 7-point scale for meaningful interpretation of the results.

Attitude towards the advertised health app. Similar to the attitude towards the banner ad, attitude toward the health app is measured by three items on the 1-to-7 Likert scale (Burton et al. 1998) and coded respectively as an ordinal variable. The overall evaluation of the health apps is measured by the items stated in Table 12 (see Appendix D.1). Examples of those include evaluation of the extent to which the app fits the respondent's needs and the added value against a real coach. Before aggregating and adjusting the attitude's scores per item as done for the attitude towards the banner ad, Cronbach's alpha test is conducted. Values are slightly above 0.7, which proves good consistency of the sample data.

Behavioural intent. The behavioural intent is measured through the statements I would definitely / I would consider or I would not download the mobile app advertised in the banner ad (Cook, Kerr and Moore 2002), and coded as an ordinal variable. The question is present in Table 12 in the Appendix. A control question is placed at the beginning of the questionnaire, asking respondents whether they clicked on the banner ad or not. The reason being, the "I would" question measures the probability of one clicking on the ad, which may not be the true action in a real environment. As long as respondents answer in the control question that they have clicked on the banner ad, it is more likely that their intention is closer to their real life behaviour (Godfarb and Tucker 2011). To examine the interchangeability of the two, the control question later named "click-through intent" and the behavioural intent

are both tested as dependent variables, with results being compared and analysed in the next chapter.

Imagery. Whether the banner ad consists of an image or not is measured by the question asking respondents to select which of the two banners they see. The independent variable is coded as categorical and comprised of two levels – with an image and without an image.

Complementary content. Whether the banner ad is seen in complementary content or not is tested by a question asking the respondent what the mobile app is about. Four options are provided: News & Magazine; Fitness advisor; Weather forecast; Calories counter. The answers of the respondents who select “News & Magazine” and finish the survey are merged with the answers of the respondents who select “Weather forecast” due to the similarity of the two options and the potential confusion this could have caused. The same approach is followed for the respondents who have selected “Fitness advisor” and “Calories counter”. Since this eventually comes to two levels – complementary content and contextually different content – the independent variable is coded as categorical.

Involvement with health apps. Involvement with health apps is derived from five questions in Table 12 in the Appendix. The first question in the table relates to the users’ perceptions towards the health apps, asking them to assess the relevance, the value and the importance of the app to their lifestyle (Zaichkowsky, 1985). The other four questions focus on examining the user’s beliefs with regards to the actual download and usage of health apps (Mittal 1989). This results in seven items, each measured on a 1-to-7 Likert scale. Cronbach’s alpha is run among the seven items to test their reliability regarding the construct. The value of 0.75 is higher than the acceptable level of 0.70 (Cronbach, 1951). Since the value is just slightly higher, a second test is run on six items, excluding the item from one question. Whether the health apps on the market are all different or all alike does not seem to directly relate to the actual usage or the other users’ perceptions. The Cronbach’s alpha from the second test is 0.89, which gives the choice of excluding the item in the follow-up analysis.

In order to examine the effect of involvement with health apps, an explanatory factor analysis is first performed. The analysis defines the possible factors each of the six items loads on and determines the factors’ scores that are later used as explanatory variables in the main regression model. To identify the number of possible factors, principal component analysis is run. The output presented in Table 13 (see Appendix D.2) shows that the first

component explains 66% of the variance. The second component explains 16% of the variance. Combined, both components explain up to 82% of the variance. Although standard deviation for component 3 is still above 1, the third component manages to explain barely 8% of the variance and the percentage declines further with the increase of the number of the components. Hence, one can conclude that 2 is the optimal number of components. The next step of the analysis is deciding on the type of rotation applied to the data – orthogonal or oblique. To solve this, a correlation matrix is created (see Table 14, Appendix D.2). Moderate to high correlation among some of the factors (above 0.50) suggests applying oblique rotation (most popular being “promax”) to the data in order to reveal a simple structure and make the pattern of loadings more pronounced (Gorsuch, 1983). As seen in Table 15, Appendix D.2, a factor analysis is then performed to determine the item loadings. The null hypothesis that two factors are sufficient for the analysis is not rejected (p value < .05). While items coded as “relevant”, “valuable” and “essential” load on Factor 2, items coded as “choiceimportant” and “concernedchoice” load on Factor 1. The sixth item “beneficial” is a complex factor which loads somewhat on Factor 1. Since it is accepted to have at least one complex variable (Thurstone, 1947), “beneficial” is assigned to Factor 1. For the purpose of the study and on the basis of the nature of the item, Factor 1 is later renamed “Download Involvement” as it concerns the user’s involvement with downloading the health app. Factor 2 is renamed “Product Involvement” since it relates to the actual health application and the user’s perceptions towards it. The derived factor scores for purchase and product involvement are later implemented in the main regression model as explanatory variables.

5. DATA ANALYSIS

5.1. DATA SAMPLE

The total number of respondents who filled the questionnaire is 318. Results show that the recall of the banner ads is low. More than one third of the respondents do not notice and remember what the advertising is about. This behaviour is expected and in support of past research findings stating that consumers tend to subconsciously ignore banner ads, i.e. tend to be “banner blind”. As the current research focuses on respondents who notice the ad, 37% of the respondents are removed from the sample. Selecting only the survey results with all questions completed led to a final sample size of 165 respondents.

As explained in the previous section, complete answers in which the mobile enabled web site was identified as “Fitness advisor” (n=18) are merged with answers identifying it as “Calories counter” (n=65). The same is applied for “News & Magazine” (n=6) and “Weather forecast” (n=76). Replicating the 2x2 treatment matrix, the sample size distribution looks as follows:

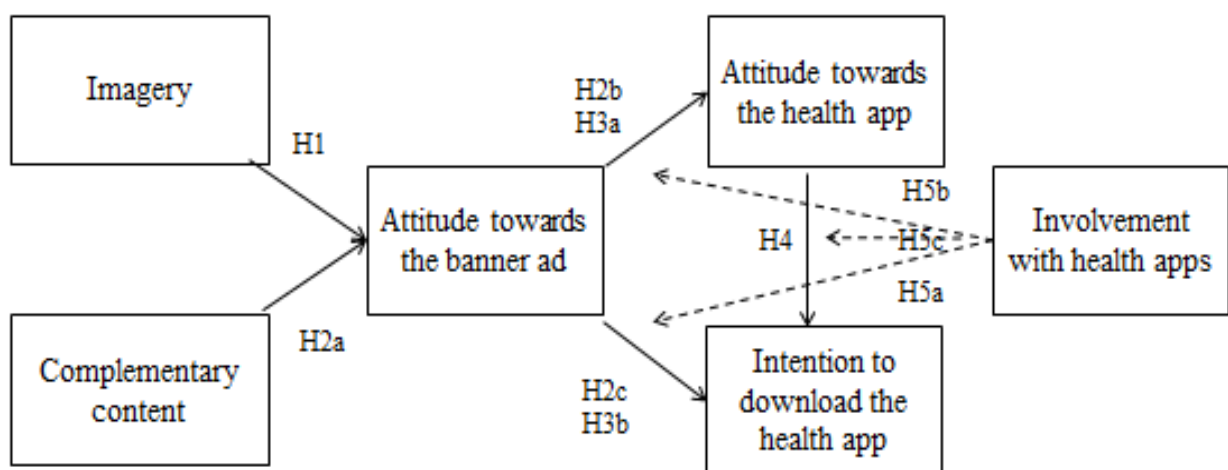
Table 4: Treatment Matrix: Sample Size Distribution

	Calories counter	Weather forecast
Contains Imagery	47 respondents	40 respondents
Does not contain imagery	36 respondents	42 respondents

5.2. RESULTS

Figure 5 presents the hypotheses which are conceptualized and tested in this study. The results from the analysis for each hypothesis are explained in detail in the next sections.

Figure 5: Conceptual Model With Hypotheses



THE EFFECT OF IMAGERY AND COMPLEMENTARY CONTENT ON ATTITUDE TOWARDS THE BANNER AD

H1 & H2a: To examine the effect of imagery and complementary content on the attitude towards the banner ad, an independent t-test is run on a sample of 165 respondents to determine whether there is a statistically significant difference in the attitude towards the banner ad based on the treatment type. Results are presented in Table 5. Comparison of the means of the two samples, namely respondents who saw a banner ad with an image versus respondents who saw a banner ad without an image, shows that the first group of respondents has significantly more favourable attitude towards the banner advertisement. The results are similar when comparing the means of respondents who saw a complementary ad and respondents who saw a non-complementary ad. Either having an image or seen in an environment sharing similar context, the banner advertisement triggers more positive attitude in the consumer compared to a banner add not containing an image or not having a complementary content. Important to notice is that the mean values of the attitude in both samples is below 4, which is the mean value of the measurement scale. This suggests consumer's slight dissatisfaction with the banner advertisement. The objective of the study, however, is analysing the change in the attitude rather than the degree of the ad's favourability. Hence, the results from the study still lend support to the hypothesized relationship between the imagery and content cues on the one hand and the attitude towards the banner ad on the other.

Table 5: Independent T-Test To Measure Significant Difference Between Attitude Towards The Banner Ad Of Two Samples | H1 & H2a

Attitude towards the Banner Ad				
Mean	3.35	2.39	3.16	2.65
	Contain Image	Don't contain Image	Complement Context	Don't Complement Context
Stat Dev	1.00	0.96	1.08	1.05
t value	6.29*		3.06*	
Critical value	1.98		1.98	

* The difference between the sample means is significant when the estimated t value is larger than the critical value.

To validate the statistical significance of the results and further analyse the interaction effect between imagery and content on the attitude formation, two-way ANOVA analysis is conducted. Results in Table 6 confirm the impact of both the image and the content. The p-value for Imagery is 0.000*** which indicates that the presence of an image in the banner ad is associated with attitude different from the attitude triggered by a banner ad, which does not contain an image. The strength of the attitude is validated to also vary between respondents who saw the ad in an environment sharing similar content and respondents who saw the ad in completely unrelated environment ($p=0.005^{**}$). The interaction effect between both Imagery and Content, however, is insignificant ($p>0.05$), implying that the relationship between Content and Attitude is not dependent on the presence of an image and vice versa.

Table 6: ANOVA Analysis | H1, H2a & H2b

Parameter	H1 & H2a:	H2b (One-way ANOVA):	H2b (Two-way ANOVA)
	Attitude towards banner ad	Attitude towards health app	
	p-value	p-value	p-value
Independent Variables			
Imagery	0.000***		0.000***
Content	0,005 **	0,067	0,119
Interaction Variables			
Imagery*Content	0.459		0.135

* $p < .10$.; ** $p < .05$.; *** $p < .01$

To identify which cue induces more favourable attitude towards the banner, Tukey HSD test is run to compare the samples (see Table 7). The difference between the means of treatment A and treatment C is insignificant, as well as the difference between the means of treatment B and treatment D. The results of the analysis suggest that both cues, the imagery and the content, trigger relatively same strength of attitudinal response.

Table 7: Tukey HSD Test To Measure Significant Difference Between Attitude Towards The Banner Ad Of Four Samples

Attitude towards the banner ad					
		Contain Image (A)	Don't Contain Image (B)	Complement Context (C)	Don't Complement Context (D)
	Mean	<i>p-value</i>	<i>p-value</i>	<i>p-value</i>	<i>p-value</i>
Contain Image (A)	3.35		0,001**	0,582	0,001**
Don't Contain Image (B)	2.39	0,001**		0,001**	0,430
Complement Context (C)	3.16	0,582	0,001**		0,009**
Don't Complement Context (D)	2.65	0,001**	0,430	0,009**	

*p < .10.; **p < .05.; ***p < .01

H2b: To examine the impact of the environment on the attitude towards the advertised health application, a similar approach is followed as described in the previous section. The mean values of the attitude towards the health application are compared between the two treatment groups – respondents who saw the advertising in an environment having a complementary content, and respondents who saw the advertising in an environment having unrelated content. The results from the independent t-test in Table 8 show that the difference between the means is insignificant ($1.77 < 1.98$). One-way ANOVA is run to test the validity of the results from the t-test (see Table 6). The p-value for Content is larger than 0.05, confirming that the context doesnot evoke a change in one's behaviour. Hence, the hypothesis that a complementary banner ad will have a positive effect on the attitude towards the advertised object as compared to a non-complementary banner ad is not supported by the results in this study.

Table 8: Independent T-Test To Measure Significant Difference Between Attitude Towards The Health Application Of Two Samples | H2b

Attitude towards the Health Application				
Mean	3.41	2.66	3.19	2.92
	Contain Image	Don't contain Image	Complement Context	Don't Complement Context
Stat Dev	0.84	0.92	1.04	0.84
t value	5.45*		1.77	
Critical value	1.98		1.98	

* The difference between the sample means is significant when the estimated t value is larger than the critical value.

To check for an interaction effect between imagery and content, a second ANOVA is conducted (see Table 6). The p-value of 0.135 does not provide evidence for the existence of such. The impact of the context is not seen to be moderated by the presence of an image and is still seen to be insignificant upon the attitude. However, the analysis provides additional insights on the relationship between the presence of an image and the attitude towards the health application. The direction of this relationship is examined via a t-test (see Table 8), showing that respondents who saw a banner ad containing an image have more favourable attitude compared to respondents who saw a banner ad containing only the text message. Although this relationship is not hypothesised in this study, the insight suggests an interesting avenue for future research with practical implications for the mobile advertising business.

H2c: The behavioural intent is measured through two constructs - the intent to download the health app and the act of clicking on the banner ad. Both constructs are tested to verify whether a complementary banner ad will have a positive effect on the likelihood of engaging with the banner, compared to a non-complementary banner ad. As the intent is an ordinal variable and the complementary content is a categorical variable, the nonparametric Mann–Whitney U test for large samples ($n > 20$) is conducted (see Table 9). The test examines whether the distribution of the values for attitude towards the health application are nonidentical between the two treatment groups - respondents who saw the advertising in an

environment having a complementary content, and respondents who saw the advertising in an environment having unrelated content. As the z-score is lower than the critical value and the p-value is higher than the .05 significance level, the null hypothesis stating that the two treatment groups are identical cannot be rejected. In contrast to the hypothesised relationship, the intention to download the advertised health application is not dependent on the relevancy of the environment in which the banner advertising appears.

To test the second construct, the click on the banner advertisement, Pearson's chi-square test is run. The test evaluates how likely is that there is a difference between the respondents who clicked on the banner ad and the respondents who did not click on the banner ad, which is triggered by the complementary content of the environment. The results in Table 9 show that the chi-square statistic of 0.149 is less than the critical value of 3.84 ($p=0.05$ and $df=1$) and the p-value is higher than the .05 significance level, which implies that there is no statistically significant association between both, the content and the click on the banner ad. This is in line with the previous conclusions from the analysis of the respondent's intention to download the health application. Though it is hypothesised that the content of the environment has an effect on the behavioural intent, the study fails to establish relationship. Hypothesis H2c is not supported.

THE MEDIATING EFFECT OF ATTITUDE TOWARDS THE BANNER AD

H3a: Logistic regression analysis is conducted to examine the relationship between the attitude towards the banner ad and the attitude towards the advertised health application. The output of the analysis is presented in Table 9. Although the attitude towards the banner ad explains 12% of the variability in the attitude towards the health app, the impact of the independent variable is statistically significant and directionally positive. One unit increase in the attitude towards the banner ad will result in 0.45 unit increase in the dependent variable. These findings are in line with the hypothesis stating that a more positive attitude towards the mobile banner ad will have a more positive impact on the attitude towards the application.

Previous analyses validate the positive impact of the image and the complementary content on the respondent's attitude. Hence, both, Imagery and Content are included as control variables in a second regression analysis (see Table 10). Although the model fit slightly improves ($R^2=14\%$), the impact of the attitude towards the banner slightly worsens, with its coefficient dropping to 0.36. The control variables along with their interaction effect

are statistically insignificant to the model. Overall, the analysis does not provide any additional insights. However, the results still lend support to the initial hypothesis.

H3b: To test whether the attitude towards the banner ad will have a positive impact on the two constructs measuring the behavioural intent – the intention to download the app and the click on the banner, two regression analysis are conducted. The results are presented in Table 9. While the attitude explains hardly 7% of the variability in the respondent's intention to download the app, it also explains larger percentage ($R^2=20\%$) of the variability in the respondent's act of clicking on the banner ad. In both models the attitude is statistically significant and its impact on the response variable has positive direction. More favourable attitude towards the banner advertising will result in higher likelihood of clicking on the banner on one hand, and in more definite intention of downloading the application on the other hand.

To validate the results and investigate for additional insights not hypothesised in the current study, two extra regression analyses are conducted, in which Imagery and Content are included as control variables (see Table 10). Although both control variables are statistically insignificant, the fit and the attitude's impact in both models improve. The results still provide evidence in support of hypothesis H3b which claims a positive relationship exists between the attitude towards the banner and the behavioural intent.

H4: The effect of attitude towards the health application on the behavioural intent is examined via a regression analysis and the output is presented in Table 9. Although the attitude explains very low percentage of the variability in the predicted variable, its impact on the behavioural intent is statistically significant. Like in the conclusions for hypothesis H3b and in line with hypothesis H4, a more favourable attitude towards the health app will lead to higher likelihood in clicking on the banner and more explicit intention of downloading the application.

The conclusions from hypothesis H3a, H3b and H4 confirm a relationship between the three variables – attitude towards the banner ad, attitude towards the health app and behavioural intent. Moreover, the current study provides support to past research by validating that attitude towards the banner ad mediates the relationship between attitude towards the health application and the behavioural intent.

Table 9: Regression Analysis | H2c, H3a, H3b & H4

Parameter	H2c:		H3a:	H3b:		H4:	
	Intention to download health app	Click on banner ad	Attitude towards health app	Intention to download health app	Click on banner ad	Intention to download health app	Click on banner ad
	p-value	p-value	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
Intercept			1.733 (0.000***)		-3.55 (0.065)		-2.270 (0.000***)
Independent Variables							
Attitude towards banner ad			0.453 (0.000***)	0.490 (0.000***)	1.187 (0.000***)		
Attitude towards health app						0.554 (0.000***)	0.708 (0.000***)
Content	0.833	0.699					
<i>z-score</i> (critical value = 1.96)	0.206						
<i>chi-square stat</i> (critical value = 3.84)		0.149					
<i>R-squared</i>			12%	7%	20%	4%	7%

*p < .10.; **p < .05.; ***p < .01.

Table 10: Regression Analysis Including Control Variables | H3a, H3b & H5b

Parameter	H3a: Attitude towards health app	H3b: Intention to download health app	Click on banner ad	H5b: Attitude towards health app
	Coefficient	Coefficient	Coefficient	Coefficient
Intercept	1.836 (0.000***)		-3.648 (0.000***)	2.346 (0.000***)
Independent Variables				
Attitude towards banner ad	0.361 (0.000***)	0.561 (0.000***)	1.209 (0.000***)	0.135 (0.020*)
Product Involvement		-	-	-0.083 (0.543)
Involvement with app download		-	-	0.063 (0.643)
Control Variable				
Imagery	0.242 (0.189)	0.441 (0.063)	0.883 (0.093)	0.355 (0.002**)
Content	-0.115 (0.528)	0.787 (0.596)	-0.835 (0.158)	0.127 (0.231)
Interactions				
Imagery X Content	0.327 (0.192)	1.311 (0.660)	-0.161 (0.831)	
AttAd X Prod Involvement		-	-	0.152 (0.003**)
AttAd X Involvement with app download				0.064 (0.202)
Imagery X Prod Involvement				0.128 (0.335)
Content X Prod Involvement				0.375 (0.001**)
Imagery X Involvement with app download				0.209 (0.072)
Content X Involvement with app download				-0.015 (0.884)
<i>R-squared</i>	14%	8%	24%	31%

*p < .10.; **p < .05.; ***p < .01.

THE MODERATING EFFECT OF INVOLVEMENT

H5a: The hypothesis suggests that involvement with health apps moderates the relationship between the attitude towards the banner which advertises the application and the intention to download the application. Involvement is measured via two constructs - involvement with the product and involvement with the act of downloading the product. Both constructs along with their interaction effects are included in the regression analysis. Although the model fit is relatively weak ($R^2=12\%$), the results in Table 11 confirm the relationship. The impact is validated to be statistically significant for one of the involvement constructs. The p-values for Product Involvement and the interaction effect with the attitude are less than the 0.05 significance level. A more favourable attitude toward the banner will evoke more favourable intention to download the health application, with the strength of the relationship being further amplified for consumers who find the health application relevant to their needs, essential to their lifestyle or having value to them.

Since the behavioural intent is measured by the act of clicking on the banner as well, a second regression analysis is run to test the hypothesis. Though the model fit is better ($R^2=21\%$), the model misses to establish any relationship between the involvement constructs and the dependent variable, and fails to contribute with any insights concerning the hypothesised interaction effect.

H5b: To examine whether involvement has a moderating effect on the relationship between attitude towards the banner and attitude towards the health application, another regression analysis is run and the output is presented in Table 11. The predictor variables explain 47% of the variability in the response variable, which suggests a relatively good fit of the model. Two independent variables are statistically significant for the model, the attitude towards the banner ad ($p=0.000***$) and the interaction effect between the attitude and the product involvement ($p=0.003**$). The effect of the attitude towards the banner upon the attitude towards the health application is stronger and directionally positive for respondents who are more likely to perceive the health application as relevant and valuable to them. Although involvement with the act of downloading the application is insignificant to the model, the outcome of the analysis still lends support to hypothesis H5b.

Imagery and Content are later added to the model as control variables to identify if any interaction effect with involvement is observed. The results in Table 10 show that the model fit slightly weakens due to the increased number of variables. However, the analysis still

confirms the moderating effect observed in Table 11 and adds one more interesting finding. The interaction effect between Content and Product Involvement is statistically significant ($p=0.001^{**}$). This implies that respondents who usually find health applications relevant and important for their lifestyle form a more favourable attitude towards the advertised health app if the banner which advertises it is seen in an environment related to health and wellbeing.

H5c: Involvement is examined to have a moderating role in the relationship between attitude towards the advertised health app and the behavioural intent as well. As in the analysis for hypothesis H5a, two constructs are tested – the act of clicking on the banner and the intention to download the application. The outcome of the analysis is seen in Table 11. The impact of Product Involvement on the intention to download the app is statistically significant ($p=0.04^{**}$), suggesting that respondents who find health apps relevant are more likely to download the app. However, the interaction effect between the Product Involvement and the Attitude towards the banner is insignificant. Moreover, the model fit is also relatively weak ($R^2=7\%$) to produce reliable results. Hence, the model missed to validate the hypothesised moderating effect. Like the first model, the second model does not fit the data very well and fails to prove any moderating effect. The independent variables explain hardly 9% of the variability in the act of clicking on the banner advertisement, with only Attitude towards the health application being seen to have a statistically significant impact on the dependent variable ($p=0.023^{**}$). Hypothesis H5c is not supported in this study.

Table 11: Regression Analysis | H5a, H5b & H5c

Parameter	H5a:		H5b:		H5c:	
	Intention to download health app	Click on banner ad	Attitude towards health app	Intention to download health app	Click on banner ad	
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Intercept		-3.462 (0.000***)	2.216 (0.000***)		-1.927 (0.011*)	
Independent Variables						
Attitude towards banner ad	0.486 (0.000***)	1.147 (0.000***)	0.266 (0.000***)			
Attitude towards health app				0.728 (0.122)	0.555 (0.023*)	
Product Involvement	0.215 (0.001**)	-0.348 (0.579)	0.060 (0.669)	0.381 (0.044*)	-0.555 (0.361)	
Involvement with app download	0.382 (0.057)	-0.518 (0.387)	0.040 (0.784)	0.689 (0.436)	-0.738 (0.181)	
Interactions						
AttAd X Prod Involvement	1.51 (0.010*)	0.183 (0.418)	0.148 (0,003*)	1.184 (0.284)	0.277 (0.184)	
AttAd X Involvement with app download	1.176 (0.308)	0.258 (0.215)	0.092 (0.067)	0.943 (0.733)	0.355 (0.081)	
<i>R-squared</i>	12%	21%	47%	7%	9%	

*p < .10.; **p < .05.; ***p < .01

6. CONCLUSION

6.1. DISCUSSION

This study applies the theory of planned behavior by Ajzen and the elaboration likelihood theory by Petty and Cacioppo in order to explore how design, placement and relevance impact on consumers' engagement with banner advertisements in mobile app environment.

The results demonstrate that the presence of visual stimuli like an image on a banner advertisement leads to a more favorable attitude towards the ad compared to advertisements containing only text. The finding is in line with past research which suggests that pictorial elements are more likely to attract consumer attention and influence consumer motivation to spend time looking on and evaluating the remaining of the advertisement (Pieters and Wedel, 2004; Teixeira, Wedel, and Pieters 2012). The analysis provides an interesting additional insight which confirms previous theories that the positive impact of the image on the attitude towards the advertisement could be further transferred in the chain to the attitude towards the advertised product. As explained in the classical conditioning theory (Staats 1967), pairing an image that evokes positive response with a product that has an unknown brand would benefit the brand. The validity of the insight is further confirmed by past research on this topic. In late 1989 Johnson and Eagly state that attitude toward a novel brand is more likely to be affected by the attitude toward the ad, compared to the attitude towards a familiar brand.

As expected, the outcome of the analysis provides also evidences of the importance of the ad's placement. Consumers who have seen the banner ad in an environment sharing similar content, tend to respond positively to the ad. It is interesting to notice, that analysis on which of the two cues, the image or the content, induce more favourable attitude towards the banner advertising, suggests that both cues trigger relatively same strength of attitudinal response. Although it's been hypothesized that "targeted" ads will evoke favorable attitude to the advertised health application and consumer's intention to engage, the study fails to establish such relationship.

The study validates theories related to the attitude. The results are in line with the four models as summarized by Brown and Stayman (1992). The ad attitude has positive impact on both, the attitude toward the product and the behavioral intent to engage with it. A more favourable attitude towards the mobile banner ad will lead to more favourable attitude towards the application and behavioural intent. The latter is measured as both, the likelihood of clicking on the banner and the intention for downloading the application. Moreover, a

more favourable attitude towards the health app will lead to higher likelihood in clicking on the banner and more explicit intention for downloading the application. Hence, the study provides support to past research by validating that attitude towards the banner ad mediates the relationship between attitude towards the health application and the behavioural intent. As previous analysis validate the positive impact of the image and the complementary content on respondent's attitude, the presence of an image and a complementary content are added as control variables to the models. Although the model fit improves, including the two variables does not bring any additional insights to the study.

Besides design and placement, the perceived relevance of the product is also examined in this study. The factor analysis distinguishes two types of involvement – involvement with the health application and involvement with actual act of downloading the app. Both are hypothesized to have a moderating effect on the relationships between the attitude towards the health application and towards the banner ad, and the behavioural intent. The study finds that a more favourable attitude toward the banner will evoke more favourable intention to download the health application, as the strength of the relationship is further amplified for consumers who find the health application relevant to their needs, essential to their lifestyle or having value to them. Similarly, the effect of the attitude towards the banner on the attitude towards the health application is stronger and directionally positive for respondents who are more likely to perceive the health application as relevant and valuable to them. Moreover, consumers who usually find health applications relevant and important for their lifestyle form more favourable attitude towards advertised health app, if the banner which advertises it is seen in an environment related to health and wellbeing. The latter is in line with the research of Shamdasani, Stanaland and Tan (2001), which examines the relationship between ad-to-context congruity and confirms the interaction effect between involvement and a contextually relevant conditions. Although involvement with downloading the apps is insignificant to the models, the outcome of the analysis still lends support to the initial hypothesis.

The moderating effect of involvement is further tested against the relationship between the attitude towards the advertised health application and the behavioural intent. Due to the relatively weak fit of the models and the statistical insignificance of the variables measuring the interaction effects, the study fails to prove the initial hypotheses.

6.2. IMPLICATIONS

This study differs from other research in this area in that it explores the complexity of both, extrinsic motivators, such as the executional elements of an advertisement, and intrinsic motivators such as the personal involvement with the advertised product. Moreover, it aims to understand the consumer engagement in the mobile app environment, an industry seeing rapid growth in terms of investments and usage in the last years. Hence, the study provides several important implications to advertisers and marketers.

First, it strongly encourages attention on the executional elements when creating an advertisement. Even though the size of mobile banner ads can be a challenger, there are elements which must be prioritized for testing. By only including an image in the ad, marketers would successfully cover the first step in engaging with the consumer, which is attracting their attention. What's more, the presence of an image would further benefit the consumer's perception of the advertisement and the advertised product, which would result in higher click-through-rate and eventually generate revenue for the business. This is an important insight to be considered when introducing a new, novel brand on the market. Another influential executional element is the environment, in which consumers encounter the banner advertisement. Contextually targeted ads are proven to evoke more positive response. Similarly to the perception of the presence of an image, the sharing of similar content brings only advantages to the advertised product.

Second, advertisers and marketers are highly recommended not to underestimate the value of the personal relevance of a product to the consumer's response. Consumers with high involvement tend to respond more favorably to the advertisement, as well as to the product itself, especially when the advertising is seen in an environment sharing content similar with the product. This would have two main implications. On one hand, identifying and targeting consumers with high involvement bring benefits in short term, as the likelihood of those engaging with the product is higher. On the other hand, the strategy of creating involvement pays off in a longer run, for example, when promoting a new product to the line, when launching a new campaign to educate on an old product.

6.3. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The outcome of the analysis should be interpreted in light of the limitations of the study. With regards to the sampling and survey set-up, the study faces a couple of challenges. The

relatively small sample size of 165 respondents questions the validity of the results and brings concerns over the match between the actual consumers and the study participants. Hence, a recommended approach would be identification of the characteristics of the consumer's persona and pre-segmenting a pool of respondents which meets the pre-defined profile criteria. A next step would be determining an appropriate sample size based on the total amount of targeted consumers. If the objective is to launch a health application in the Netherlands which has population of 16.8 million people, then the estimated sample size should be approximately 400 respondents, with margin of error of 5% and confidence level of 95% (Krejcie and Morgan 1970, see Table 16 in Appendix D.2). If the objective is to test the design of a banner advertisement placed within a selected mobile application, then the sample size will be calculated on the basis of the number of total visitors of that application.

Another limitation of the study is the survey execution from a technical perspective. Since the object of the analysis is a banner ad in a mobile application, respondents are required to fill in the survey only via phone. Though the platform on which the survey is built provides user-friendly interface for mobile users, the mobile experience compared to the standard desktop one may differ and may impact on the respondent's decision to engage and complete the questionnaire. Sample size results show that 30% of the respondents who started the survey did not complete it till the end. To make the interaction and testing easier, a mobile web page rather than a mobile application is designed. Although in general both interfaces look alike, the view of the mobile web page tend to be slightly smaller and contains distractive elements such as the browser's address bar. The study misses to track other external factors potentially hampering the survey experience, like site speed load and usability per mobile device (e.g. Android vs iOS), browser or screen size.

From a design and site functionality perspective, the mobile environment which respondents are asked to evaluate does not provide complete experience as some sections are not further developed and remained static. The limited "freedom" to interact can potentially evoke in the respondents adverse feeling and beliefs towards the mobile environment which will be transferred to the object of the analysis – the banner advertisement. The study misses to investigate and establish such relation. Elements of the mobile environment, such as "product" type, text, theme, font, colours, structure and interface are not tested in advance either, which does not allow for isolating their impact on the consumer attitude.

There are several avenues for future research. With regards to the hypotheses tested in this study, a few are not supported in the analysis. Due to the relatively weak fit of the model,

the relationship between the banner placement and the consumer attitude towards the product is not established. According to past research “targeted” ads would evoke favourable attitude to the advertised health application and consumer’s intention to engage. Similarly, the model fails to provide any insights into the moderating role of the involvement between attitude towards the banner ad and the attitude towards the advertised health app and between attitude towards the advertised health app and the behavioural intent.

More comprehensive research is required not only to validate theorists’ findings, but also to identify the underlying factors influencing consumer’s beliefs. The objective of the study is analysing the change in the attitude rather than the degree of the ad’s favourability. The latter is seen to be relatively low in the study. For example, the highest mean value of the attitude among the treatment groups is 3.41 points out of 7 points. Hence, along with an improved accuracy of the sample size, exploration of external factors and their interaction effect is recommended, such as executional elements of the environment, feelings evoked by the environment, current mood, past interactions and usage of similar products which has shaped certain expectations.

With regards to the nature of the advertised product, the study focuses on testing a banner which advertises a health application. The assumption of Sarvary, Stephen and Bart (2014) states that advertisements for mobile applications are processed without cognition and the relevance of the product is not that vital to forming the consumer belief. The outcome of the analysis argues against the claim of the theorists, thus creating an opportunity for further research on this topic. On one hand, it opens questions about the environment. The banner ad is seen in two environments - a weather forecast app and a health-related app. With the market for mobile apps booming in the last years, their variety in terms of content and usability increases rapidly. An interesting area to research will be first, understanding the different dimensions (e.g. utilitarian vs hedonic; the very product vs content in the app vs usage of the app vs usage of the product) and levels of strength of the involvement, and second, correlating the latter with the different types of mobile application (e.g. games vs education vs business vs entertainment vs social). On the other hand, the analysis also opens questions about the type of mobile app being advertised. In the current study, the object is a health application. Currently, Google Play only classifies up to 33 types of mobile applications. However, generating sufficient number of combinations “involvement x advertised mobile app x mobile app environment” will produce just partial insights on the level of cognition. A more important point will be identifying the elements which trigger

cognitive processing and the actual moment when it's triggered. Leveraging click-stream data along with insights from surveys, reviews, customer feedback and online user-testing sessions (Goward 2013) will provide further details on the consumer funnel journey. And that is information which would allow for prioritization and optimization of high-potential, high-importance parts of the experience.

7. REFERENCES

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D. APPENDIX

1. QUESTIONNAIRE

Table 12: Questions And Items Per Measurement Construct

Construct	Items	Coefficient Alpha
Attitude towards the Banner Ad	[Beliefs] How do you usually feel when you see a banner ad popping in a mobile application you are just using? <input type="checkbox"/> Does not keep my attention (1) ... Keeps my attention (7) <input type="checkbox"/> Not informative (1) ... Informative (7) <input type="checkbox"/> Distracting (1) ... Not distracting (7) <input type="checkbox"/> Intrusive (1) ... Not intrusive (7) <input type="checkbox"/> Irritating (1) ... Not irritating (7) <input type="checkbox"/> Does not make me curious (1) ... Makes me curious (7) <input type="checkbox"/> Not useful (1) ... Useful (7)	0.90
	[Evaluation] What about the banner ad you just saw? What were your overall feeling and impression after noticing it? <input type="checkbox"/> Does not keep my attention (1) ... Keeps my attention (7) <input type="checkbox"/> Not informative (1) ... Informative (7) <input type="checkbox"/> Distracting (1) ... Not distracting (7) <input type="checkbox"/> Intrusive (1) ... Not intrusive (7) <input type="checkbox"/> Irritating (1) ... Not irritating (7) <input type="checkbox"/> Does not make me curious (1) ... Makes me curious (7) <input type="checkbox"/> Not useful (1) ... Useful (7)	0.87
Attitude towards the Health Application	[Beliefs] Read the following statements and indicate on the scale from 1 to 7 how much you agree or disagree with them (1 = “fully disagree,” and 7 = “fully agree”). <input type="checkbox"/> Downloading sport apps tracking my health habits makes me feel good <input type="checkbox"/> In general, sport apps, which track health, have poor quality and don't meet my needs <input type="checkbox"/> I prefer sport apps tracking my health instead of real life trainer/coach	0.72
	[Evaluation] Now think about the mobile application advertised in the banner ad you saw? How do you rate the following statements (1 = “fully disagree,” and 7 = “fully agree”) <input type="checkbox"/> I don't think it will fit my sport needs <input type="checkbox"/> Comparing it to a personal trainer I find it may have more value	0.71

- I will feel good, if I download it

Involvement

Would you say that in general, you find mobile apps which measure health indicators during sport:

0.75

- Irrelevant to your needs (1) ... Relevant to your needs (7)
 Not having value to you (1) ... Having value to you (7)
 Not essential to your lifestyle (1) ... Essential to your lifestyle (7)

When choosing from the variety of types and brands of sport health apps available on the market, would you say that:

- I would not care at all as to which one I download (1) ... I would care a great deal as to which one I download (7)

What do you think about the various types and brands of port health apps available on the market?

- They are all alike (1) ... They are all very different (7)

How important would it be to you to make the right choice when downloading sport health mobile app?

- Not important at all (1) ... Extremely important (7)

When choosing which sport health mobile app to download, would you be concerned about the benefit from using the app?

- Not at all concerned (1) ... Extremely concerned (7)

**Behavioral
Response: Intention
to download the
application**

Please chose one of the following statements - If I could, ...

- I would definitely download the mobile app advertised in the banner ad
 I would consider downloading the mobile app advertised in the banner ad
 I would not download the mobile app advertised in the banner ad

2. ADDITIONAL TABLES

Table 13: Principal Component Analysis

	Importance of components:					
	Comp.1	Comp.2	Comp.3	Comp.4	Comp.5	Comp.6
Standard deviation	2,96813	1,46957	1,02234	0,89211	0,70295	0,17311
Proportion of Variance	0,66067	0,16196	0,07838	0,05968	0,03706	0,00225
Cumulative Proportion	0,66067	0,82263	0,90101	0,96070	0,99775	1,00000

Table 14: Items Measuring Involvement With Health Apps (Correlation Matrix)

	Relevant	Valuable	Essential	ConcernedChoice	ChoiceImportant	Beneficial
Relevant	1	0,715	0,606	0,525	0,521	0,649
Valuable	0,715	1	0,516	0,571	0,552	0,567
Essential	0,606	0,516	1	0,322	0,323	0,354
ConcernedChoice	0,525	0,571	0,322	1	0,987	0,700
ChoiceImportant	0,521	0,552	0,323	0,987	1	0,688
Beneficial	0,649	0,567	0,354	0,700	0,688	1

Table 15: Factor Analysis

	Factor 1	Factor 2	p-value
Relevant	-0,119	1,033	0.0358
Valuable	0,158	0,659	
Essential	-0,117	0,705	
ConcernedChoice	1,038		
ChoiceImportant	1,031		
Beneficial	0,446	0,409	

Table 16: Determining Sample Size From A Given Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size.; *S* is sample size; Source: Krejcie, R.V. & Morgan, D.W. (1970)