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Device it Matter?

A Study of How the Choice of Device Impacts Advertising Effectiveness

Mobile devices have taken a central role in our society, as smartphones and tablets are incorporated in more parts of people's lives than ever before. This impacts advertisers, as the device through which they reach their target audience is shifting. However, many marketing practitioners do not discriminate between their mobile and PC advertising strategies. Device (does) it matter? Current research would not suggest it does, given that the message and the medium stays unchanged. The purpose of this study was to challenge this view of devices. With little prior research existing on the impact of devices on advertising effectiveness, a theoretical background was developed consisting of a combination of well-established marketing theories and cutting edge research from related areas. Together these theories contradicted the notion that mobile and PC devices shared the same impact on ad effectiveness. A quantitative experiment on social media ads was conducted with 490 respondents. The results revealed that mobile devices generated higher levels of awareness than PC devices. They also indicated that mobile devices were perceived as less intrusive and generated higher ad attitude levels when seen in a social setting, while the PC devices performed better on both measures in a private setting.

Keywords; Impact of Devices, Social Media, Advertising Effectiveness, Awareness, Ad Attitude

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Ourselves, we did it!

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1. Introduction

The popularity of mobile devices and the increased usage of social media have made both the mobile and social media ad spend an important part the global digital ad spend total. The two categories are both expected to see further growth in the years to come, making them highly relevant to study. Mobile devices differ from PC devices in many ways, and considering the complexity of human beings; it is not unthinkable that these differences may impact how advertising messages are perceived. Due to its modern nature and ability to blend into its surroundings, this study uses social media advertising to investigate how the device, mobile or PC, impacts advertising effectiveness. Answering this question would lay a foundation to what best practices marketers should use depending on the type of device their message is to be delivered through. So, "device it" matter where you advertise?

1.1 Research Importance in Figures

In 2014 the global digital advertising spend reached 142 billion USD and is expected to witness further growth in the coming years. The increase in digital advertising spend was a result of the high growth numbers generated by mobile devices and social formats. In 2014 the ad spend on mobile increased by 72% and reached 21% of the total global digital ad spend, largely due to its most prominent actors, Facebook and Twitter. The social media advertising spend grew by an impressive 58.6%. In the social media ad spend segment, mobile devices stood for 60% of the impressions, which makes it possible to conclude that the majority of the global digital ad spend growth came from social formats on mobile devices (Magna Global, 2014; Bloomberg, 2014). The growth rates are predicted to stay high in the coming years, in 2015 Magna Global (2014) estimates the ad spend on mobile devices will reach 64,25 billion USD. These facts suggest that it is crucial for today's advertisers to understand the effects, and master the usage of, mobile devices and social formats.

1.2 Problem Area

As the digital marketing sphere has evolved, the competition has intensified. Efficient marketing that reaches through the clutter has become increasingly challenging and costly to produce. Best marketing practices are hard to achieve as the practitioners can choose between an infinite number of choices. Research is conducted continuously to guide marketing professionals to informed decisions. However, quick changes in the market, such as the enhanced status of mobile advertising have left gaps in the current body of research. Most marketing practitioners simply adapt ads made

for PCs directly to fit to mobile screens through apps or mobile websites. However, as there is an uncertainty in how ads are perceived on mobile devices compared to PC devices, it is unclear if this constitutes the best practice. By studying the impact of devices, practitioners can be guided in how to optimize their ads.

The majority of today's and most likely tomorrow's growth can be derived from social formats on mobile devices. Therefore this study uses social media advertising to assess what differences in ad effectiveness can be explained by the choice of device. It was never relevant to analyze for instance banner ads, as its growth has experienced stagnation in the last couple of years, and its importance is expected to be reduced even further in the future. (Magna Global, 2014) In comparison to banner ads social media advertising is closer to the new generation of creative advertisements that fits the message into the context where it is to be shown (i.e. native advertising).

1.3 Research Background

Today's media landscape, and digital ad practices in particular, are changing more rapidly than ever. However the fundamental ideas used for the measuring of its effectiveness have not. The ultimate goal is still to place potential consumers in a funnel that leads them from awareness to purchase (Lavidge & Steiner, 1961). Researchers such as Smit & Meurs (2006) have measured advertising attitude and found links from increased ad attitude to brand attitude and ultimately more sales. The increased clutter of advertising has raised the importance of advertising awareness. Measuring recall and recognition is becoming more important for practitioners in order to assess whether advertising messages reach acceptable awareness levels (McDonald, 2000; Romaniuk & Wight, 2008).

When studying the effects of mobile and PC devices there are theoretical links to hand proximity research. Researchers have found that placing hands near stimuli enhances how people process attribute based and detailed information (Adam et al., 2012; Reed et al 2006; Abrams et al., 2008). This theory has its basis in evolution, and the advantages of being able to look at stimulus proximal to our hands with great scrutiny to assess its applicability.

Brasel & Gips (2014) concluded that touchscreen interfaces can increase the perceived ownership of the device and also increase "the endowment effect", which refers to the habit of overvaluing the

held device, which in turn leads to higher product evaluations when browsing from such a device (Brasel & Gips 2014; Franciosi et al., 1996)

1.4 Research Gap

Considering the growing importance of mobile devices in advertising, the research is lagging behind. The theoretical background presented above has its basis in other research areas than marketing, and not much effort has been done to connect it to advertising prior to this study. Anne Roggeveen at Babson College is currently working on bridging this particular research gap by applying the theories of hand proximity when analyzing differences in advertising effectiveness between devices. In preparing for this paper the authors had the opportunity consult with the expertise of Roggeveen who is yet to publish her findings. As Roggeveen's focus lies on research of hand proximity her results circles around recall and recognition (awareness) effects, which is an important advertising effectiveness pillar. The findings in this paper will be published prior to Roggeveen's more extensive study; however, together the papers will shed light on an area that has been completely dark until now.

According to Lavidge & Steiner (1961) the "hierarchy of effects" starts with awareness and trickles down to purchase. How "affective" advertisement is crucial in order to push people towards a purchase. Therefore the effects the devices, mobile and PC, has on attitude towards identical advertising messages should also be studied. The analysis of this affective dimension is a relevant contribution to the current body of literature.

Today's advertising community is moving towards increased creativity when advertising. Expressions such as "native" or "in-feed" advertising are on the lips of most industry professionals. Social media advertising embeds its advertisement to fit its environment and can thus be a useful proxy for this modern type of advertisement. Even though these new forms of advertising are likely to take over from e.g. banners, no research has yet been conducted on how devices affect their effectiveness. This paper is the first to explore how the choice of device affects social media advertising, both in terms of awareness and attitude.

To summarize there is not much research on the effect of devices on advertising effectiveness. This goes for digital advertising in general, even though one paper is in the making, but for social media advertising in particular.

1.5 Purpose

The overall aim of this thesis is to answer how the device; PC versus mobile devices, impacts social media advertisement effectiveness and to shed light on this unexplored area of research within marketing. Ultimately the goal is to find if and how advertisers should alter their practices in regards to the device used.

This boils down to the following research question:
What impact does the choice of device have on social media advertising effectiveness?

1.6 Research Contribution

This thesis aims to contribute to academia while producing tangible managerial implications. Academically the thesis will contribute to filling the gaps mentioned in the "research gap" segment. First of all, the paper will contribute to establishing what relationship the choice of device has on awareness based on hand proximity theory. This particular gap will also be helped to fill by Roggeveen at Babson College when her paper is ready to be published. This study also investigates what effect the device may have on the attitude the ad generates, which is a unique knowledge contribution. Most importantly, however, is the fact that this study is the first of its kind to study how the choice of device affects social media advertising effectiveness. In contrast to the research on the ad effects of the context and medium (Dahlén, 2008) this study focuses on the "vehicle", the device. In other words the medium and content stays unchanged when testing advertising between the devices. As a result of the subject being uncharted territory, the theoretical development of the hypotheses in this paper links old with cutting edge research and psychology with marketing research. This will also be helpful for future researchers to have access to.

Social media advertising embeds its advertising, which is congruent with a major trend shift within advertising, where the message is fitted to its surroundings rather than disrupting its target audience. This paper is thus in a better position to generate results that can alter the best practices of the

modern advertising industry than papers basing their research on pop-up and banner ads. The managerial contribution of this paper lies in producing research that marketing executives can use when deciding how best to advertise on mobile and PC devices. It answers the question of whether or not it is rational to transfer the established best practices from PC devices onto the exploding mobile market.

1.7 Definitions

Native Advertising: Online advertising adapted to the platform or website it is presented on.

Hand Proximity: The distance between the hand and the stimuli.

Intrusiveness: Behavior, appearances or acts that is perceived as disturbing or intrudes on individuals' personal life.

Mobile Devices: Refers to all portable devices that are able to connect to the Internet with touch as the only mean for text input and navigation. Smartphones and tablets are mobile devices.

PC Devices: All personal computers, desktops and laptops. They use mouse/touchpad and keyboard as primary means of text input and navigation.

Social Desirability: People's willingness to be perceived positively.

Holistic based approach: Or "theme based approach". Communication that focuses on the whole, rather that specific attributes.

Attribute based approach: Communication that focuses on specific attributes and details.

Social Media Advertising definitions: Since the area of research is fairly new there are no clear definitions of social media terms. The following terms definitions are used in this study (illustrated in appendix 1):

In-feed Advertising: Advertising in social networking community users' feeds. The ad is posted together with posts from sources the user follows.

In-feed Advertising Message: The actual advertising message posted in the feed of the social network users.

Social Media Advertising: In this study social media advertising refers to in-feed social media advertising. In-feed ads are what separate social media ads from e.g. banner ads. In-feed social media ads are *native ads* in the sense that its form matches the environment in which it is posted.

1.8 Delimitations

To maximize the quality of the paper in regards to resources and with respect to deadlines some constraints were applied to the study.

Firstly the study is restricted to the Swedish market. Our respondents are Swedish and were randomly chosen by Nepa AB. As some of the theory the hypotheses are based on, e.g. hand proximity comes from neuroscience it does not seem farfetched to expect the results apply to other locations. However, the affective level of advertising effectiveness may change depending on the setting. Thus, it is recommend that readers keep in mind the results are based on a Swedish population.

The paper is delimited to social media advertising. Other types of advertising on other types of sites, for instance banner ads on news sites are not studied. Within social media advertising a choice was made to focus on Facebook, and no other social media site. The rationale behind was based on the deep penetration of Facebook in Sweden. There are 5 million Facebook users in Sweden (Statista, 2015). Among the different options there are when it comes to Facebook advertising, in-feed advertising was chosen because of its compatibility with both mobile and PC devices, as well as its congruency with the growing trend of native advertising. No embedded motion picture ads were included as stimuli. Due to restrictions in resources only one ad was tested, a fast food ad. This meant that other product categories were not represented in the study.

There are many types of mobile and PC devices. However, in this study the analysis does not cover different models of mobile or PC devices. What separate these two groups from each other is that the mobile device can be used while moving, as it is portable, and that the hand touches the screen for navigation purposes. Through this definition, tablets are not separated from smartphones; they are both considered to be mobile devices. This also goes for laptops and desktop computers that are considered to be PC devices. There is a clear difference between these groups and theory exists that makes a distinction between them. Adding more dimensions, such as brands or models of mobile and PC devices would mean less clear distinctions between the groups an exponential increase of cells to our current eight cell study.

2. Theory

This section lays the theoretical foundation for the hypotheses and subsequently the analysis of the study. First measures of advertising effectiveness are depicted, followed by theory that is relevant for the comparison of ad effects between the devices. Psychological effects of using different devices and general social media advertising theory are also brought forward.

2.1 Measuring the effects of advertising

In this section measures that are used when assessing the relative performance of adverts on mobile versus PC devices are described. There is not only one accepted way of measuring the effectiveness of advertising; in fact the literature brings forwards countless approaches as to how it can be done. In this paper the effects of advertisements are analyzed based on the Hierarchy of Effects model presented by Lavidge & Steiner (1961). This model consists of three phases that depict the stages of advertising effectiveness from exposure to purchase. The phases are, and thus the model is, relevant also for the modern type of communication this thesis focuses on. The three phases are the: cognitive (awareness/knowledge), affective (liking/preference) and conative (conviction/purchase). According to the authors the customer goes through all of these steps before buying, when the advertised product is completely unknown to them.
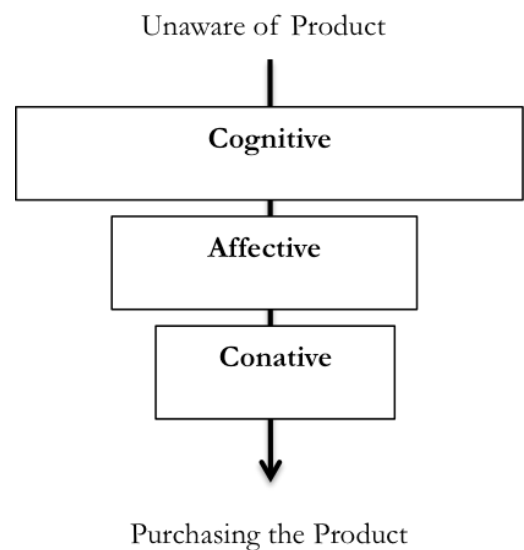
Figure 1 – The Hierarchy of Effects Model

In the cognitive phase, recall and recognition is crucial as it tells us to which extent people remember an ad after having been exposed to it. Without recall and recognition the target audience has no awareness or knowledge of the product. When it comes to memory there is more than one process that should be taken into account. Firstly, information has to be stored in the memory, which is rather complex. Secondly, the stored information has to be retrieved at some point in order to be useful (Romaniuk & Wight, 2008). When understanding how information is retrieved one must know that our memory in fact consists of a network of associations (Anderson & Bower, 2014). For instance if given an industry, e.g. "fast food", one will likely retrieve information such as

"McDonald's" or "Burger King". This information is stored, however, it is not retrieved without a nearly connected cue. Therefore it is common, when aiming to measure advertising awareness, to give respondents a category, and then ask the person to fill in brand names for instance. (McDonald, 2000; Romaniuk & Wight, 2008) In the model from Lavidge & Steiner (1961), the "Hierarchy of Effects" refers to how in each step, from awareness to purchase, people drop out of the funnel. By measuring recall and recognition of advertising, it is measured how well it does when it comes to creating awareness and knowledge, which is the first step in getting people to purchase the product.

There are several ways to measure advertising awareness, the most common one being "top-of-mind awareness". This is an unprompted measure, where respondents are asked if they recall being exposed to an ad without any cue to help them remember. There are prompted measures as well, where the brands are presented again, followed by a question on whether or not they recognize it having seen it before (Romaniuk & Wight, 2008). Some researchers claim that a focus on top-of-mind awareness, and unprompted measures, do not produce the best advertising awareness evaluation. If someone does not recall being exposed to an advert without any cues helping her to remember, it does not mean the advertisement had no effect. If some cues are added, and the subject remembers the advert, the advert will have had an effect, the only difference being more was needed to retrieve the information (Heath & Nairn, 2005).

Advertising likeability/preference focuses on the consumer's sentiment towards the brand through the advertisement. This phase is the affective phase. Marketers have established the importance of ad attitude through its link to: Increased awareness and processing among consumers, more people liking the message, which spills over to the brand, and ultimately to sales. In the long run measuring brand attitude is useful as it provides a measure of the total effect of past campaigns and practices of the brand. Ad attitude focuses on the specific ad in question. There are many categories that can be considered important when producing high ad attitude, the ad can be; entertaining, relevant, clear, stimulating, empathetic or irritating, where the latter should be minimized to maximize attitude (Smit & Meurs, 2006; Lavidge & Steiner, 1961).

Another interesting evaluation aspect of advertising efficiency is based on the actions the respondents are most likely to take after the ad exposure. This goes under the conative phase. These questions can be focused on social actions such as: whether or not he/she will share it in social

networks or personally recommend it to someone. They can also concern if the respondent is likely to buy or try the product. Many marketers see these "action based questions" as particularly interesting as it has a clear connection to the entity's bottom line (Reichheld, 2003; Lavidge & Steiner, 1961).

2.2 Hand Proximity

2.2.1 Hand proximity and Physical orientation

Many researchers have found that positioning the hands near the stimulus enhances how people process visual cues. It has been proven that the effects are relevant for one hand, both hands and moving hands proximal to stimuli (Adam et al., 2012; Reed et al, 2006; Abrams et al., 2008). Enhanced processing has a positive effect on the memory, which makes it relevant to take into consideration. Tseng & Bridgeman (2011) found that no matter where the hands are placed on the screen showing the stimuli, hand proximity would affect the subject.

Many have studied the idea that physical orientation can affect mental activity. For instance Stepper & Strack (1993) found that an upright body position, which is associated with pride and self-confidence, can made people feel greater pride in their achievements. The notion that hand proximity to an object can have important implications on the how the object is perceived has its base in neuroscience. Abrams et al. (2008) investigated how hand position affected the visual attention. They found that items near individual's hands would be visually analyzed more carefully than items further away from the hands. As a result of the greater attention placed on near hand objects participants in the experiment needed more time when shifting focus between items on the screen when their hands were close to the screen. Congruent with evolution-based theory items near the hands receive more attention. Near hand items are soon to be touched and/or manipulated which makes it important for people to accurately assess whether the item is of good or bad nature, how it can be manipulated, and if it must be avoided.

The position of hands does not only affect the visual attention of an item, it also has an impact on visual learning and memory. In a study by Davoli & Brockmole (2012) they asked participants to learn a pattern of letters that were incorporated into several pictures they were being exposed to. The participants placed their hands at different lengths from the screen with the stimulus, while the

distance from the head to the screen was held constant. The pattern of letters was unchanged throughout the experiment. However, the colors varied between the pictures. The authors found that participants with hands that were proximal to the screen had more difficulties finding the overall pattern (theme) when the colors shifted. As established in the previous paragraph hands proximal to the screen leads to a more careful analysis and a stronger detail orientation. This may explain participants with hands proximal to the screen in this experiment found it more difficult to ignore the shifting colors and focus on the overall holistic pattern (theme). (Davoli & Brockmole, 2012). Thus, whether people use a "detail oriented" or a "holistic" approach to analyze and make sense of cues, is influenced by hand proximity.

2.2.2 Cognitive Processing - Implications for Advertising Messages

In marketing terms the holistic or detailed oriented focus are best described as: "Data Driven Processing" (DDP) or "Conceptually Driven Processing" (CDP). (Meyers-Levy, 1988) The DDP is a Bottom-up strategy where the focus lays on what is observed, while the CDP is top-down strategy that builds upon current knowledge (Bobrow & Norman 1975). CDP connects new information with the existing schematic knowledge one possesses in order to make sense of a stimulus. Humans have schematic knowledge about almost everything, which is very practical for us to have. For instance, when reading a book, the author may have left out that the "mysterious black car" has four wheels since he/she expects the reader will assume it does. In other words the reader is expected to process the received information with what she already knows. The information processing strategies, DDP and CDP, are not mutually exclusive and are often used together. They can be seen as extremes on a spectrum, where people's position varies depending on their personality and the task they are taking on. Thus a better way of putting it is: those who are relatively more DDP-oriented will base their understanding more on the observed details while CDP-oriented people will rely more heavily on existing knowledge. CDP is advantageous in the sense that less observation is needed as the current knowledge helps the subject paint a picture of the situation. However, there is a risk that some important information is missed with a lower attention to detail. (Meyers-Levy 1988).

Tying the previous paragraph together with the theories on the effects of hand proximity the following connection was found:

Hand Proximity	Analytic Approach	Processing Type
Hand proximal to stimuli	Detail orientation when analyzing	Data Driven Processing
Hands distant to stimuli	Holistic approach when analyzing	Conceptually Driven Processing

Table 1 – Hand Proximity and Processing

This poses a question for the marketer, a question that is taken on in this thesis. It poses the question if the communication efforts should resemble each other on different devices if the user's hand proximity differs between them. Hands close to a stimulus would according to the theory be most efficient with detail and attribute based communication. Hands distant to the stimuli would because of the CDP suit conceptual, theme based, messages that builds on existing knowledge, and/or that may be more cognitively demanding, e.g. asking the recipient to make their own connections and see patterns (Davoli & Brockmole, 2012; Meyers-Levy, 1988).

Hand Proximity	Processing Type	Suitable for
Hand proximal to stimuli	Data Driven Processing	Attribute based ads, attribute specific details
Hands distant to stimuli	Conceptually Driven Processing	Theme based ads, overall communication themes, building on existing knowledge, more cognitively demanding (e.g. pattern related schema).

Table 2 – Hand Proximity and Communication Type

Detail oriented message on a computer screen will not be processed by the receiver to the same extent as a conceptual message would, and vice versa (Meyers-Levy, 1988; Bobrow & Norman, 1975). Additionally, if the type of advertising matches the cognitive processing method that is evoked it will catch the customer's attention more efficiently (Jain et al., 2006). The theoretical explanation to this could among other theories be linked to Higgins' theory of regulatory fit (2005). The regulatory fit explains the importance of having match between someone's ultimate goals and

the means used to attain that goal. If that match exists, the study shows an increased level of engagement. This occurs because information can be processed in an easier way if the mindset of the consumer is aligned to the processing type. In a study by Motyka et al. (2014), they take it one step further, claiming that the perceived value of a decision is enhanced if the decision is reached in ways that suit one's processing preferences. The study also showed that apart from better evaluation, it affected consumer behavior as well. Putting it into the context of hand proximity, the best results can be expected when an advert is matched to the processing method that is evoked by the hand proximity.

Thus if marketers were to use the information on how people tend to process information depending on their hand proximity, smartphone messages would include more detail while communication presented on a computer screen would have more conceptual messages. That builds on the existing knowledge of the intended message recipient.

2.2.3 Device Ownership

Brasel & Gips (2014) recognized the fact that computers that are used with a mouse have lost market share in favor for laptops with touchpad and touchscreen tablets. As the usage of touch devices are growing rapidly and thus the user experience with touch interface in online situations is becoming more important. Brasel & Gips (2014) conducted two studies in how touchscreen interfaces can increase the perceived ownership of the device and also increase "the endowment effect". The endowment effect refers to results of a study conducted by Franciosi et al. (1996), it is the effect that leads to consumer's habit of overvaluing items that they own. It leads to a gap between what they want to pay for an item and what they accept to part from the item when they own it. Brasel & Gips (2014) found that with touch devices and the fact that an individual own the device interact with the importance of how products are evaluated. Products viewed online can be evaluated higher if the consumer use a touch device they own, compared to using a traditional computer.

2.3 Social Media Advertising

Advertising that uses social media as the medium is "social media advertising". Increased usage of social media has increased the advertising spending on the medium. This has resulted in more research being conducted in this area. (Khang et al., 2012)

Taylor et al. (2011) showed that advertising on social media could indeed be effective. However, if the social platform or network is too cluttered with advertising the members might leave it. They also found that consumers preferred advertising that contained a message that was entertaining or had information value. People are becoming more and more resistant towards advertising as they are being flooded with messages, particularly from traditional advertising sources. Because of this, marketers in the digital age often use a more holistic approach, where they aim to build on customer relationships and be more creative (Wright et al., 2010). On social platforms the term "Social advertising" embodies this approach. This form of social media advertising targets the social network of users who have interacted with a certain brand. For instance, on Facebook, a brand can reach out to your friends based on your interaction with that particular brand. Your network will be reached by an advertising message (A) together with an identifier of yourself, e.g. name and/or picture (B), and the interaction you have had with the brand, e.g. like and/or share (C). (Tucker, 2012) This advertising approach differs from traditional "attribute based" approach used when advertising in traditional channels that directly encourage people to buy a product or service. Social media has opened the door for two-way communication between the marketer and the consumer, and according to Wright et al. (2010) it is important to communicate as much as possible with the customer in order to create real value for them.

Native advertising is online advertising that adapts to the platform or website it is presented on (Grensing-Propahal, 2014). The nature of the native ads can vary, however, generally it is presented in between or beside other content, editorial or other. This study will focus on "in-feed ads", which is ads that are inserted between other content, and sometimes resembles other editorial or personal content, making the sender of the marketing message stand out less.

In the section describing hand proximity two processing types were brought forward, Data Driven Processing (DDP) and Conceptually Driven Processing (CDP). Attribute based advertising suited DDP best, and theme based ads suited CDP best, and when matched correctly they produce better

effects on recall and recognition. Thus it is relevant to assess what type of advertising in-feed social media ads classifies as. According to hand proximity theory, hands distant to a stimuli suited theme based ads, that connects to prior knowledge someone possesses and/or that requires abilities to see patterns. Social media advertising has some of these traits. In-feed adverts connect to its target audience by associating themselves to people's network and by targeted ads based on their activities and patterns on Facebook (Wright et al., 2010). One could argue that in-feed social media advertising generally is more holistic or theme based than traditional banner ads. However, as people scroll through a feed with an ad it does not necessarily demand much cognitive activity, or connecting thoughts to other knowledge. Thus, generally speaking the ad is not to be considered as very theme based. The actual advertising message posted in the feed is detail and attribute based as it focuses on a product or service. Price, brand, color and other specific information are all attribute based and is thus benefitted from DDP. To conclude, in-feed social media is more attribute based than theme based even though it has some holistic traits.

2.4 Privacy

As people spend more time on and integrate their lives with the Internet, concerns about the spread of personal information is becoming more important. Associated with these privacy concerns is the word personalization. Today advertisers can customize ads based on information gathered through tracking what users have previously been looking at or purchased. In social media advertising, personalized ads incorporate information from the target audience and create adverts that are customized to their profile. Even though this is something that can enrich the user experience, the use of personal information can lead to privacy concerns. Respecting the privacy, and communicating that people have control over their privacy is as important as creating personalized and relevant advertisement.

This issue is described by Sutanto et al. (2013) as the Personalization-Privacy paradox. They used gratification theory and information boundary theory to understand what impact privacy has on gratification and personalization. Information boundary theory refers to the psychological efforts individuals go through to control the amount of private information that is projected towards other parties, for instance companies or other people. The idea is that consumers make their own personal spaces of information that they are more or less willing to share with others. The boundaries for what one is willing to disclose is clearly defined by each and every one of us. When another person

or firm oversteps the boundary lines, individuals will feel like their privacy is intruded on (Petronio, 1991).

Relating to this study, Tucker (2014) sought to find how the likelihood of users wanting to click on online advertising changed when their perceptions of control of their personal information was altered. The experiment examined how the ad effectiveness was changed when the degree of personalization in the ad text was altered. During the experiment the users got more information and control over what was personally identifiable from the advertisers. The more personalized the advert was, the higher click-through rate it received, as long as the user felt that they controlled how much of their information was disclosed.

2.4.1 Intrusiveness

Intrusiveness is a term that refers to actions or behaviors that are disturbing or interrupting to people. The term implies that something or someone is intruding on someone's personal life without consent. Bauer & Greyser (1968) were two of the first researchers to mention intrusiveness in an advertising context. They found that even if advertising that tends to disturb the consumer is desirable in order to get their attention, the intrusiveness it may cause is one of the greater reasons for advertising annoyance. Annoyance can in turn lead to ad avoidance (MacKenzie & Lutz, 1989) (Krugman, 1983).

As the Internet evolved, advertisers sought to force potential consumers to view ads. Early in the Internet era Reed (1999) analyzed pop-up ads (ads that pop up on the user's screen and demands action to get rid of). These ads were considered highly intrusive and in many cases perceived as even more intrusive than ads in traditional media. The reason for this was, according to Reed, the fact that people who are online are pursuing a goal, and pop-ups prevent them from reaching their goal. Reed meant that individuals are likely to from negative attitudes towards pop-up ads and will feel that the ads are unwelcome. Li et al. (2002) aimed at measuring the intrusiveness of advertising. They took it one step further by measuring intrusiveness in situations where advertising could not be averted as easily as in magazines or other traditional media. In line with Reed (1999) findings, they noted that pop-up ads are more intrusive than ads in traditional media. They also found that intrusiveness leads irritation, less chance of positive attitudes and higher degrees of ad avoidance.

Troung & Simmons (2010) recognized that advertising in digital media could lead to lower added value than in traditional media, mainly because of the high levels of intrusiveness that comes with digital media advertising. The authors noticed that "push" strategies within digital media was becoming less and less effective. Based on Rowley's (2004) research on the importance of innovation and development in digital marketing. Troung & Simmons claimed that traditional push advertising was more bound to its design, as it had to appeal to as many people as possible, and no real opportunity for quick feedback was given. Whereas digital advertising on the Internet allows communication that is not so linear, a free flow of feedback and information, which makes advertising less push driven, and more pull driven. Pulling in this context refers to building a community centered around the brand. In these communities people with similar interests meet, which gives the brand more value without being intrusive (Cova et al., 2007).

The study by Troung & Simmons (2010) compared push and pull strategies between mobile and PC devices, as well as tested the strategies within the devices. They found that pushed digital advertising was mostly viewed as unwanted and intrusive, which led to lower brand evaluation and negative brand associations. The authors also found that pull strategies would be something to pursue for the future, and is more compatible with digital advertising, since it is both less intrusive and generates higher levels of engagement. Ads viewed on mobile devices were considered to be more intrusiveness and generated low attitude, while ads viewed on PC devices were perceived as neutral. As stated above, most push ads were considered intrusive; nevertheless, on mobile devices any ad format was seen as intrusive if the user had not explicitly given them the permission to reach out to them. Additionally, the small size of the screen was seen as an obstacle for viewing ads.

Doorn & Hoekstra (2013) examined the pros and cons of customizing adverts to individuals. They found that if a website is using a high degree of personalized ads, for instance through the usage of personal identification, or using transactional data to customize the ads, individuals felt like the ad was intrusive. It also led to lower purchase intentions. However, the purchase intentions increased when the congruency between the ad and what the customer was searching for was high. Doorn & Hoekstra (2013) suggested that companies must try to find an equilibrium between the degree of personalization and fit to the customers goals in order to avoid unnecessary feelings of intrusiveness that might lead to lower purchase intentions.

2.5 Social effects

People check and are aware of their social surroundings, which can have a direct effect on behaviors and thoughts both consciously and subconsciously. When understanding why the presence of others has an effect on people "social desirability" is instrumental, this term has been put under scrutiny by many researchers. In 1959 Goffman, who was a pioneer in the subject, described the phenomenon as people's willingness to be perceived positively. He compared social interacting people to actors on the stage of a theatre, playing roles that vary depending on their audience (Goffman, 1959).

How much people will focus on conveying a certain impression to others will depend on their motivation. The content of what someone will aim at portraying on the other hand stems from several factors. First, someone's "self-concept" is central. The self-concept consists of selective attributes people value in themselves and choose to display. However, they are only displayed when someone believes they can do it without falling through and their ethical values, for instance concerning lying about themselves, allow it. Secondly, the "desired identity" is important, as people's behaviors will be impacted by what and who they want to be. Thirdly, the "role" someone has in their social context will constrain how they choose to portray themselves, which Leary et al. (1990) defines as "role constraint". Also "Target values", the values someone believes others find important, has an effect on people. Finally people are affected by how others view them today and how they may view them in the future. To summarize people will act in certain ways when surrounded by others in order to generate favorable impressions (Leary et al, 1990).

Research has established that a person can be affected by a social context even when the subject is not interacting with others (Huguet et al., 1999). It has further been proven that social contexts can impact the effect advertising has on people. Puntoni & Tavassoli (2007) specifically studied the effect of other people being present on advertising memory. They found that when advertising spoke to "social desirability" it performed better when viewed with others and vice versa for neutral messages. Words used to play on social desirability were e.g. "beauty" and "charm". The key takeaway point from this study is that the sheer presence of other can affect advertising memory.

The effect the presence of others can have on advertising effectiveness can alternatively be explained by the "third person effect". This is when people believe that mass communicated media has a greater effect on others than on themselves. This often results in conscious efforts not to be

influenced by such messages (Davison, 1983). Other research supports the idea that people often view themselves as more intelligent, objective and less likely to act biased than others (Pronin et al., 2004). Festinger (1954) found, through the "social comparison theory" that people generally compared "downwards", seeing themselves as generally better than others. Zhang & Daugherty (2009) proved that the third person effect also applies concerning the influence of social media networks as well. In fact they found that the third person effect was even stronger for social media than for traditional media.

3. Theoretical Summary and Hypothesis Development

This section presents condensed versions of the relevant theory in the last section, and draws connections between them through logical reasoning, in order to develop hypotheses.

3.1 The Advertising Funnel

This paper has its basis in a wide body of literature from research areas that are not solely classified as marketing. The reason as to why the theory section is made up of a mixture of theories from related areas is because the idea of studying the impact of devices is very novel. For instance, hand proximity theory has its basis in neuroscience, and the Third Person Effect concerns messages from mass communicated media, which is based on psychology. These are two examples of theories used when carving out hypotheses in this paper. In order to help marketing professionals understand and organize our hypotheses and findings these theories were classified through the usage of a well-established marketing model, namely, The Hierarchy of Effects model from Lavidge and Sterner (1961). The Hierarchy of Effects model consists of three main phases, the; cognitive, affective and conative phase. The above-mentioned body of literature from related areas produced hypotheses that were fitted into the cognitive and affective phase. However, no theory suggested conative effects, and thus it was not included in the hypotheses.
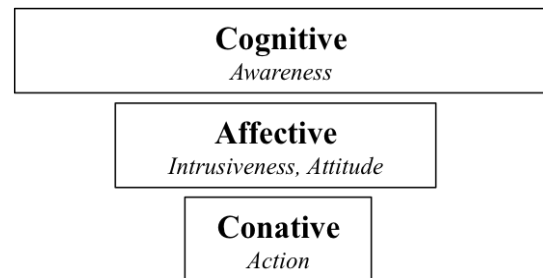
Figure 2 – The Hierarchy of Effects model and connection to theory

Metaphorically the Hierarchy of Effects model is a funnel that starts in the cognitive phase where ads first have to catch the attention and be processed by its target audience. Without the awareness of the brand the other stages are irrelevant. How the device, mobile or PC, affects the cognitive phase is mainly based on theories concerning the effects of hand proximity. According to Lavidge & Steiner (1961), different actions can be taken depending on where your funnel needs improvement. For an unknown brand, such as the one that will be tested in this paper the cognitive phase (awareness) is crucial. The following step in the funnel involves the affective dimension; the attitude and preferences that are generated by ads. When marketing a product, in the long run, brand attitude becomes an ever more important measure, as it is an intangible asset with a value that is affected by individual ad campaigns. As this study will impose a first encounter between the target audience and

a fictional brand, the ad attitude was the main focus. In addition, this also benefitted the translation of some of the theory from related areas since they focus on reactions to "stimulus", and the stimulus in this marketing setting is "the ad". Thus hypothesizing on ad attitude helps the red thread of the study. How the choice of device will impact the affective phase is mainly based on literature of; privacy, intrusiveness, endowment and social effects. Intrusiveness is a particularly important factor when explaining how people perceive ads on different devices. These two initial phases impact the conative phase. (Lavidge & Steiner, 1961).

3.2 Mobile versus PC devices

3.2.1 Cognitive Phase

Abrams et al. (2008) found, that items near hands are analyzed more carefully. This is congruent with evolution-based theory stressing the importance of the ability to evaluate cues near our hands in more detail. Davoli & Brockmole (2012) reached the same conclusion while adding a new dimension to the phenomenon. They found that having hands proximal to a stimulus inhibited pattern recognition abilities. The findings showed that cognitively demanding tasks might benefit from hands being distant to a stimulus. Translating this to marketing literature terms, hands proximal to a stimulus benefits Data Driven Processing (Meyers-Levy, 1988), and thus fits best when processing attribute based (specific) information. Hands distant to the screen suit more Conceptually Driven Processing which works better with theme based communication. Connecting to Davoli & Brockmole (2012) one could say hands distant to a stimulus suit better when more cognitive capabilities are required. A match between the processing type (DDP or CDP) and the communication type (e.g. holistic or attribute based) has a positive impact on awareness since more attention will be given. This relationship between the theories above and the usage of device, mobile or PC, can be summarized as seen below in table 3.

Hand Proximity	Device	Processing Type	Suitable for
Hand proximal to stimuli	Mobile device	Data Driven Processing	Attribute based ads, attribute specific details
Hands distant to stimuli	PC device	Conceptually Driven Processing	Theme based ads, overall communication themes, building on existing knowledge, more cognitively demanding (e.g. pattern related schema).

Table 3 – Summary of Hand Proximity

In order to produce hypotheses based on hand proximity theory, it is first needed to assess the nature of social media advertising. As depicted in section 2.3; in-feed advertising takes a more holistic approach than for instance traditional banners used on other websites. However, the degree to which it is theme based and requires its audience to connect to prior gathered knowledge or recognize patterns is low. Also, the actual message is attribute based, as it often focuses on features of the product/service. Thus, even though in-feed social media advertising has some holistic traits, theory suggests it is fairer to classify it as attribute based (see section 2.3). This suggested that social media advertising benefit from Data Driven Processing, which is evoked when hands are proximal to a stimulus. Thus we hypothesize that awareness levels will be higher for mobile devices than for PC devices.

H1.1: *Higher awareness will be generated on mobile devices than on PC devices for social media ads.*

The relationship between awareness and hand proximity for social media ads is depicted in the figure below (Figure 3). The relationship is not exact, however, it shows how the theory suggests the two axes relate to each other.
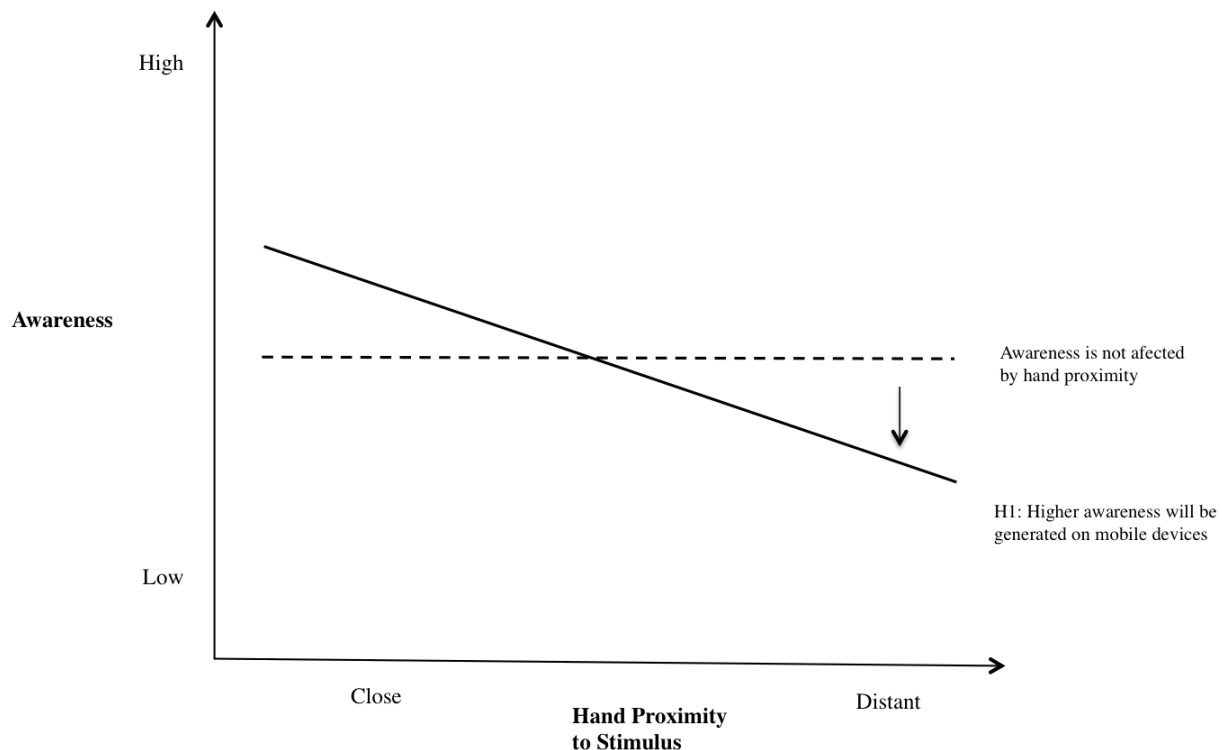

Figure 3 - The relationship between Awareness and Hand Proximity

3.2.2 Affectiveness

In relation to this study, the privacy issue influences the affective phase of digital advertising. It is assumed that the findings of Li et al. (2002), to some extent can be applied to ad intrusiveness in social media feeds. Their study found that pop-up ads are highly intrusive. Ads in social media feeds are somewhat similar to both pop-up ads and traditional ads in magazines, as the individual cannot fully evade the ads coming up in the feed, but neither has to take more action than to keep scrolling to get rid of it. Troung & Simmons (2010) found that mobile advertising overall was considered to be more intrusive than ads viewed on PC, and also that ads viewed on mobile devices were viewed as negative in terms of attitude. The fact that mobile advertising generally is less wanted and the obstacle of a smaller screen size suggests that mobile devices will have a higher level of intrusiveness. Thus it is hypothesized:

> *H1.2* *Social media ads viewed on mobile devices will be perceived as more intrusive than if seen on PC devices.*
>
> *H1.3:* *Social media ads viewed on mobile devices will generate lower ad attitude than if seen on PC devices.*

3.2.3 Stress testing the ad effect of the device

The level of awareness (cognitive phase) and the attitude it generates (affective phase) will determine the success of a campaign. The effect of mobile and PC devices on social media advertising is partly answered through the first set of hypotheses. However, to further understand what influence the choice of device has some important additions to the study are added. From the literature, it has been found that intrusiveness is an important factor when studying the effectiveness of devices. Considering the important connection between intrusiveness and the affective phase the first alteration aimed to focus on this dimension (Doorn & Hoekstra 2013). Thus two ad types were created, one that aimed to be highly personalized, and one generic. Theoretically this set of ads would help us determine the importance of the device given the degree of personalization. Secondly theory supports the social setting has an important effect on how people take in an advertising message. Due to this emphasized importance two settings were created, one social and one private, to test the effect of devices on ads in these different settings.

3.3 Effect of Highly Personalized Ads

There is no theory that suggests the level of personalization in the ad will affect the ad awareness between devices. As this paper strictly focuses on differences between devices, theory suggesting personalized messages generate higher awareness would not contribute to developing hypotheses on inter-device differences. However due to the extensive literature on intrusiveness and ad attitude (affectiveness) between different devices, hypotheses are developed.

Social media advertising is more personalized and encourages communication and/or response, which can be viewed as pull advertising, rather than push. Therefore it is assumed that the intrusive effects in this study will not only come from the disturbing and delaying moment of the ad, the level of personalization in the ads will also have an impact.
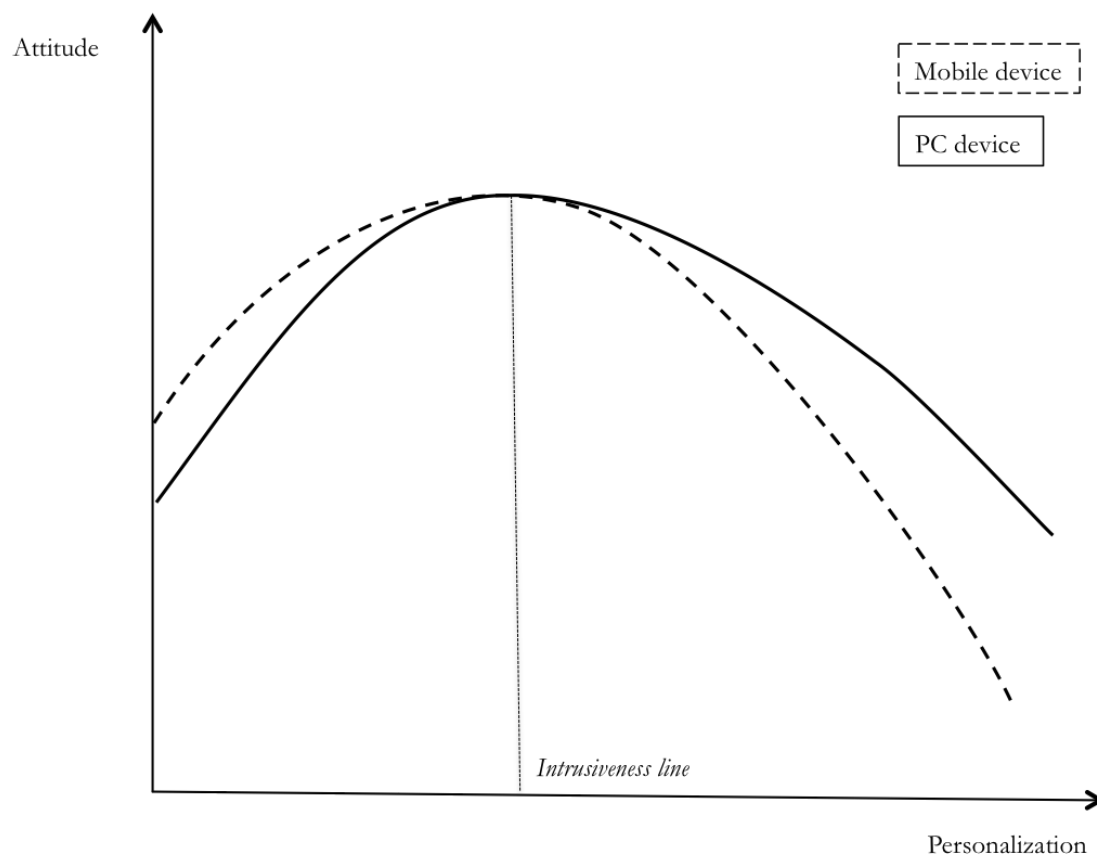

Figure 4 - The relationship between Ad attitude and Personalization

The model above (Figure 4) was created based on theory from Troung & Simmons (2010), Doorn & Hoekstra (2013) and Brasel & Gips (2014). It was created from combining theories that could be

directly linked to the relationship between personalization and attitude. The model does not represent a precise measurement of ad personalization and ad attitude; it should be seen as an illustrative model of the relationship between them. The relationship between attitude and personalization for social media advertising is represented with the dotted line for mobile devices and the solid line for PC devices. The picture illustrates how personalized advertising is perceived as slightly more positive when seen on mobile devices compared to PC devices. However, as personalization becomes intense the negative effects of perceived intrusiveness are stronger for mobile devices than PC devices. In turn, this has a negative effect on ad attitude. Thus, it can be expected that mobile devices will be perceived as more intrusive and will generate lower attitudes if the ad is highly personalized. For the generic ads it was assumed that the differences between the devices resemble the hypotheses; H1.2 and H1.3, where mobile devices are expected to generate higher level of intrusiveness and lower attitude levels. However, with highly personalized ads, the increased perceived intrusiveness will affect the mobile devices more heavily. Therefore, the difference between the mobile and the PC devices in perceived intrusiveness and attitude will be more intense with highly personalized ads than for generic ads.

> *H2.1* *For highly personalized social media ads, the difference in perceived intrusiveness between the devices will be greater than for generic ads. Mobile devices being more intrusive than PC devices.*

> *H2.2* *For highly personalized social media ads, the difference in generated ad attitude between the devices will be greater than for generic ads. Mobile devices generating lower ad attitude than PC devices.*

3.4 Social Effects

How people act is influenced by how they see themselves; "self-concept", who they want to be; "desired identity" and their current roles in their social context; "role constraints". (Leary et al., 1990) These terms all affect how people behave in order to be perceived positively. Researchers such as Puntoni & Tavassoli (2007) researched the effect social presence has on semantic memory (awareness) depending on the how socially desirable the message was. No theory does however suggest that the relationship in generated awareness between mobile devices and PC devices would be affected by social settings. As this study focuses on the differences caused by devices, no hypothesis was developed on differences in how awareness is impacted by social settings.

For the affective phase however, the literature allows us to hypothesize. In our society, independent thoughts, and people who make up their own mind, are valued. Davison (1983) introduced the Third Person Effect (TPE), suggesting that people believe others are more prone to be affected by mass communication media than themselves. Connecting this to advertising, a mass communicated commercial message, people will believe it has a stronger effect on people around them, than on themselves. Zhang & Daugherty (2009) found that social media also has a TPE effect, and that it in fact is stronger than in traditional media. The reason why also lays in the "social comparison theory" that claims people tend to think of themselves as slightly better, in most ways, than the people around them (Festinger, 1954). When placing advertising on social media, it can be expected that the TPE to be particularly high. The reason is that social media is a mass communicated media created by the people in someone's surroundings. This suggests social media advertising is very susceptible to the TPE. According to Davidson (1983) it is not unusual for people fight the influences from the mass communicated media as a result of the TPE. Connecting this to Leary et al.'s paper (1990) on what influences how people behave in social settings, physically being surrounded by people is likely to prime the TPE effect. Thus, being exposed to the advertisement in a social context will have a negative impact on the advertising effectiveness.

According to the TPE some people will actively avoid being influenced by mass media messages (Davidson, 1983). Even though, being in a social setting might trigger this reaction, the ability of the surrounding to see the stimulus in question should also have an impact. Leary et al.'s (1990) description of people being affected by their "self-concept", "desired identity" and "role constraints" show how their behavior will alter due to social presence. Now, if an ad is shown and others around the subject can see the ad it can have a negative impact on these dimensions. The ad might for instance not be congruent with the subject's desired identity or self-concept. As digital ads, and social media ads in particular are calibrated to match people's own preferences or their friends' activities, these ads become more personal. Thus, it is hypothesized that in a social setting, the more people around the subject that can see the ad, the stronger the negative effect will be. The smaller screen size of mobile devices shields the user from other people being able to view content, which is not the case for PC devices. As content is less visible to others on mobile devices than on PC devices, the mobile device should perform better in a social setting, generating low levels of intrusiveness and high ad attitude. According theories mentioned in section 2.4.1, however, mobile

devices are expected to be perceived as more intrusive and show more negative attitude towards the ad in a private setting (Troung & Simmons, 2010). Thus, it is hypothesized:

H3.1: Social media ads will be perceived as less intrusive on mobile devices than on PC devices in social settings, and more intrusive in private settings.

H3.2: Social media ads will generate higher ad attitude on mobile devices than on PC devices in social settings, and lower ad attitude in private settings.

3.5 Hypotheses List

H1: Total impact	**H1.1**	Higher awareness will be generated on mobile devices than on PC devices for social media ads.
	H1.2	Social media ads viewed on mobile devices will be perceived as more intrusive than if seen on PC devices.
	H1.3	Social media ads viewed on mobile devices will generate lower ad attitude than if seen on PC devices.
H2: Personalized and generic ads impact	**H2.1**	For highly personalized social media ads, the difference in perceived intrusiveness between the devices will be greater than for generic ads. Mobile devices being more intrusive than PC devices.
	H2.2	For highly personalized social media ads, the difference in generated ad attitude between the devices will be greater than for generic ads. Mobile devices generating lower ad attitude than PC devices.
H3: Social settings impact	**H3.1**	Social media ads will be perceived as less intrusive on mobile devices than on PC devices in social settings, and more intrusive in private settings.
	H3.2	Social media ads will generate higher ad attitude on mobile devices than on PC devices in social settings, and lower ad attitude in private settings.

Table 4 - Hypotheses List

4. Methodology

This section's purpose is to explain all the necessary methodological decisions that were to be made in order to examine the hypotheses and subsequently, answer the research question. It covers; how the topic was chosen, the research design, the chosen variables and how the pretests were conducted. It also accounts for the data analysis process and the validity and reliability of the study.

4.1 Choosing Topic

Today practitioners advertise very similarly on mobile and PC devices, however, if there are differences in how ads are perceived between the devices, the industry's best practices should evolve. Coming across the following quote from Facebook's Advertising Research Manager Rob Creekmore it became clear that research in this area could contribute with important knowledge to marketing practitioners: "*People are spending more time than ever before on their mobile devices and on Facebook on mobile. We want to understand that better. We also want to understand how can we make advertisers more effective, and ultimately to make the consumer experience better*" (Adweek, 2014).

The increased popularity of mobile devices has made it an important platform for the advertising industry. The global mobile advertising spend grew rapidly in 2014 (up 72% from 2013), much as a result of the global social media advertising growth (up 58.6%). Experts expect the advertising spend for both mobile and social media will increase in the coming years, making it a highly relevant territory to study (Magna Global, 2014). Even though these figures suggest that a lot of research should be directed towards studying the effects of mobile advertising, and social media advertising on mobile devices in particular, not much/nothing has been conducted. Through an initial interview with Johnny Johansson, Partner Manager at Facebook, in Dublin, the importance of this research area became even clearer. To conclude summary, this particular topic was chosen for its potential to shed light on an uncharted research area with the potential of having immediate practical implications for marketing managers.

4.2 Scientific Approach and Overall Research Design

The theoretical frameworks and the research depicted in the theory section laid the foundation for the hypotheses and the research question. Thus, this study is of a deductive nature. To evaluate the hypotheses, a quantitative approach was chosen where data was gathered and analyzed in order to

explain and generalize the results (Bryman & Bell, 2011). The conducted survey had predetermined questions and scenarios that did not change throughout the experiment; hence the survey of the study has a closed approach (Jacobsen, 2002).

In this study, the cause and effect was investigated when the independent variables were altered, this means the study is concerned with causality. Building on this, the empirical part of the study used an experimental design approach, as it is the primary method for causal research (Malhotra, 2010). The respondents were provided with a digital survey that they were to complete individually. The first part of the survey featured a feed from a social media platform, which consisted of several posts including an advertising message. Subsequently, the respondents were asked to answer questions based on the exposure. Since the individuals reacted to the ad exposure in direct connection to it, the probability of generating causal results was high (Bryman & Bell, 2011).

The respondents randomly received one of eight variations of the survey. The eight variations were a consequence of the three binary independent variables; the device, social context and the ad type (see table 5).

	Highly Personalized Ads		Generic Ads	
	Social Setting	Private Setting	Social Setting	Private Setting
Mobile Device	A	B	C	D
PC Device	E	F	G	H

Table 5- Study Cells

4.3 Preparatory work

4.3.1 Selecting Social Medium and Product Category

The study was conducted, and the data was collected, in Sweden. Facebook was chosen as the social media platform in which the ad was presented because of its deep penetration in the Swedish market. Most Swedes are used to the Facebook interface, and that ads appear in their feeds (Statista, 2015), even though the extent to which it is obvious the content in question is sponsored varies (Helft, 2013).

In order to conduct the experiment, a product category for the ad had to be chosen that was compatible with social media ads. The product category had to appeal to a large crowd, of all ages and both genders. It was also crucial that it could be put in a personalized context. Moreover, the most advertised and liked brands on Facebook were scrutinized to make sure the brands of chosen category were active on Facebook. The product category; fast food, was chosen, as it applied to all of the above-mentioned criteria. McDonalds, KFC and Starbucks were all among the top 10 brands with the largest audience on Facebook (Socialbakers, 2015). Also, it is also a low involvement category, which was favorable in our case, as high involvement products have a more complex buying process.

4.3.2 Ad Design

A fictional fast food brand was created in order to avoid skewed results. The advertised fictional hamburger brand was named the "Burger Shack". The logotype of the brand and its ad was created in fonts and colors that did not resemble any well-established fast food brands or their communication. A generic advertising text was chosen in order to make sure the offer did not cause any bias. As the chosen ad was to be presented as a native ad within a Facebook feed, all aspects in terms of picture size, text amount, fonts and etc. were customized to the Facebook interface. The Facebook feed was made with generic posts from made up characters. The posts were selected to represent a typical feed and included a birthday wish, a news link, an event invitation, a status update and the created ad. As the experiment was to be carried out using both mobile and PC devices, one Facebook feed for each device was developed. The feeds contained the same content, however, the layouts differed between them, as they were customized according to the Facebook interface for mobile and PC devices respectively. The mobile feed thus contains slightly less displayed information, is narrower in size and has a comparatively larger font size than the PC version.

4.3.3 Selecting Independent Variables

The study's main objective was to investigate the effect of mobile and PC devices on social media advertising effectiveness. Thus, the independent variable "device" was self-explanatory. In order to develop more nuanced findings that were useful to practitioners; additional circumstances were important to investigate. For every independent variable that was added, the number of cells in the study would double. Because of limited data gathering capabilities a choice was made to restrict the number of cells to eight in order to guarantee a minimum of 30 observations per cell. The natural

first step was to investigate different types of ads on the basis of relevant theory. An independent variable; "ad type" was introduced to the study with two variations; one "highly personalized" ad and one "generic" ad. The highly personalized ad consisted of the generic ad image with a personal text above it claiming it was posted based on the subject's preferences.

After weighing the potential contribution, to the current body of literature, of different independent variables against each other, a choice was made. This choice was to include the effect of social settings on how ads are perceived on different devices. The independent variable, "social setting", was given in the scenario the respondents were exposed to at the start of the survey. The social setting was either "social" or "private".

4.3.3 Selecting Data Gathering Method

In order to isolate the effects of the study it was decided to not conduct the experiment directly in individuals' real Facebook feeds. Thus, the authentic Facebook feeds were exchanged for a fictional feed. The study was conducted through an electronic survey containing several manipulations and questions on their effects. The pretests were conducted using Qualtrics for both creating the surveys and response gathering. The pretest surveys were sent out to university students electronically. For the main study, Nepa AB gathered data electronically. Both surveys were conducted in Swedish.

4.3.4 Preparatory Tests

The purpose of the two pretests was to approve the manipulations of the study through analyzing their effects, and to make sure the survey was understandable. Each pretest consisted of a survey followed by a focus group interview discussing specific items in the survey. The pretest questionnaires were designed to resemble the intended final main study. They consisted of an introductory text explaining what social setting and device respondents had been assigned, followed by the Facebook feed with an ad. Subsequently, 19 questions concerning the ad, and how the respondents had been exposed to it, were posed. A meta-data check was incorporated into the questionnaire to understand which device the respondents used. The pretests used a 2x2 cell design, with two independent variables. The ad was altered between two ad types, the highly personalized and generic. According to theory the highly personalized ad would be perceived as more intrusive than the generic ad. The other independent variable was the social context, where the respondents were asked to picture themselves in either a social or private setting. Theory suggested that being situated in a social setting would have a negative impact on the ad attitude. Hence, differences with

high significance levels between social settings for ad attitude and between ad types for perceived intrusiveness, would suggest that the manipulations worked.

The pretest had four cells because of its purpose, to ensure: (a) respondents had seen the social setting scenario, and it having an effect on ad attitude (b) the difference between the highly

	Highly Personalized Ads	Generic Ads
Social Setting	A	B
Private Setting	C	D

Table 6 – Preparatory Study Cells

personalized and the generic ad was large enough to generate differences in perceived intrusiveness and (c) respondents understood the questions of the survey. At this stage the priority was not to study the effectiveness differences caused by the devices. The pretest questionnaires were designed in Swedish to make the shown Facebook feeds resemble the Swedish respondents real feeds.

4.3.5 Preparatory Test 1

Qualtrics was used to produce the questionnaire. It was mainly sent out to students and had 67 respondents. The results showed clear tendencies of the highly personalized ad being perceived as more intrusive than the generic ad, even though the differences produced low levels of significance. Differences between the social settings did not generate any difference in ad attitude unlike what theory suggested.

From the focus group of survey respondents it was found that the introductory scenario, which included the social setting, came too early and was thus often skipped. It was also noted that many respondents had not seen the ad. Some claimed it might have been because of the many other posts that were included in the fictional feed. Additionally, people who were assigned the highly personalized ad had, in many cases, not noticed the text that made the ad "personalized". According to the focus groups all questions that followed the manipulation stage were understandable. The manner in which the participants scrolled the feed was also analyzed in order to make sure no posts raised questions or took too much attention. With no access to eye tracking technology, the mobile device was used for this analysis, as only one post could fill the screen at once. No abnormalities were found, and the ad seemed to receive less or equal amounts of attention as other posts. This supported what was concluded in the theory section; that the social media ad is attribute based, and does not require much cognitively demanding processing.

4.3.6 Preparatory Test 2

Qualtrics was used to gather data for pretest 2 from 63 respondents, mainly consisting of students. Pretest 2 used the same survey design. However, some important changes were made on the background of pretest 1 and the focus group discussions. The scenario text was placed after an introductory text where the authors presented themselves. This resulted in fewer people missing the scenario. The Facebook feed was shortened in order to give the ad a larger percentage of the feed. After the first set of questions concerning recall and recognition the ad was displayed again, this time in close up, in order to allow respondents who had missed the ad to fill out the rest of the questionnaire. Also, the personalized text above the highly personalized ad was enlarged.

Pretest 2 showed a higher level of intrusiveness for the highly personalized ads (M=3,80) than for generic ads (M=3,31) with higher level of significance than in pretest 1 (p=0,085). Results from different social settings showed low ad attitude being generated when ads were seen in a social setting (M=3,55) compared to a private setting (M=4,19). This difference generated a high level of significance (p=0,044). See appendix 2 for pretest tables. Through the control question it was found that the social setting had been read and understood to a higher extent than on the prior pretest. From focus group it was made clear that a negligible portion of people did not see or understand the scenario placing them in social or private setting. Respondents who received a highly personalized ad claimed they did not miss the accompanying text.

4.3.7 Pretest Results and Indications

The main take away point from the pretests was the manipulation analysis. The ad types, highly personalized and generic, generated differences with adequate significance levels for perceived intrusiveness. The social setting generated lower ad attitude than the private setting with high levels of significance. As a result of these figures and the feedback from the focus group discussions depicted above no further changes were made in the manipulations (independent variables) for the main study.

40% of the respondents answered the survey using a mobile device, which enabled an initial analysis of differences between the devices. Some differences were clear; for all of the attitude measures, the mobile device scored lower than the PC device. Additionally, the mobile devices received higher levels of perceived intrusiveness on 4/5 measures. The number of respondents was too low to

create acceptable significance levels, however, results indicated that there might be differences between how advertising is perceived between the devices.

4.4 Main Study

4.4.1 General Survey Design

The main study was carried out electronically through Nepa AB from the 16th to the 21st of April 2015. Their panel received the survey by email and accessed it via their mobile or PC device. The experiment consisted of a manipulation followed by a set of questions concerning what they had been exposed to. As Nepa AB mainly sends out its surveys to Swedish natives it was recommended to produce the survey to in Swedish in order to maximize the comprehension among the respondents.

After having been exposed to the manipulation consisting of a given scenario accompanied by a Facebook feed, the respondents were first asked to respond to awareness (recall and recognition) questions concerning the ad in the feed. After having answered to these questions they were exposed to the advert again before answering 14 additional questions or statement. For the majority of the questions (or statements) a seven point semantic or Likert scales was used. At each extreme of the scale there were two bipolar alternatives and the respondents were asked to fill in the alternative that best represented their opinions. The questions and statements in the study had been used in previous research. As Söderlund (2005) recommends the scales had low values to the left, with alternatives such as "Bad" and "I don't agree at all" and high values to the right, with alternatives like "Good" and "I completely agree". Multi-item scales or related questions were used in order to produce a high internal validity, which improves the reliability of the study. A Cronbach's alpha test was executed on the multi-item scales in order to measure their internal validity (Söderlund, 2005; Malhotra, 2010).

In order to make sure that the respondents had been properly primed they were asked control questions about the scenarios they were assigned. Respondents were asked to provide an answer to what social setting and device they were primed with. This was followed by questions on what social setting and device they actually used when taking the survey. As Söderlund (2005) recommends, questions of demographic character were asked in the end of the survey.

4.4.2 Independent Variables

The study consisted of three independent variables; the device: "mobile"/"PC device", the social context: "social"/"private", and ad type "highly personalized"/"generic". As depicted in the image below this generated in the study having eight cells. The exact stimuli, or combination of independent variables, respondents were exposed to was completely randomized in order to make the eight cells more comparable. (Söderlund, 2010).

	Highly Personalized Ads		Generic Ads	
	Social Setting	Private Setting	Social Setting	Private Setting
Mobile Device	A	B	C	D
PC Device	E	F	G	H

Table 7 – Study Cells

The manipulation was executed in three steps. (a) First respondents were primed by a text depicting a scenario where he/she was placed in a social or in a private context ("at home" or in a "café"). In the scenario they were also using their mobile device or their personal computer ("mobile"/"PC Device"). The respondents who were placed in a scenario where they used a mobile phone also received instructions to open the survey on their smartphone, and vice versa, in order to match the interface of the feed to with the device. In the second step (b), the respondents were subjected to the Facebook feed containing a personalized or a generic ad. In the final step (c) they were exposed to a close up on the same ad while the rest of the feed was blurred (see Appendix 3).

4.4.3 Dependent Variables

Awareness

Awareness was analyzed with two measures. First through the unprompted measure "recall", by asking respondents to; *"name the brand, for which you have just seen ad"*. After submitting the answer to this question the respondents were to; *"tick the name of the brand, for which you have just seen ad"*. Among the logotypes to choose from was the fictional brand from the Facebook feed, together with three other unknown brands in the same industry. The aim of this question was to measure the level of ad recognition (Dahlén, 2008; Romaniuk & Wight, 2008). Recognition is the wider measure as it takes into account all the respondents who recognized the brand, which also includes those who recalled it

without the help of cues. As recognition takes broader effects into consideration many claim it is a more candid awareness measure (Heath & Nairn, 2005). In addition, this measure does not involve any judgement of how to classify partly misspelled responses. In this study only correctly spelled responses were counted in the recall variable. For both of these measures responses were coded as "1" if correct and "0" if incorrect (Dahlén, 2008).

Ad & Brand Attitude

For both ad and brand attitude a statement was provided to the respondents who were asked to identify their level of agreement with it, on a seven point semantic scale, based on three sets of bipolar labels. For ad attitude the statement was: *"What is your overall opinion of the advertisement"*, with the bipolar labels; "good"/"bad", "pleasant"/"unpleasant", "favorable"/"unfavorable" (Dahlén, 2008). With a Cronbach's alpha of 0,867 these were bundled to one measure: "Ad attitude". For brand attitude the statement was: *"What is your overall opinion of the brand"*, with the bipolar labels; "good"/"bad", "negative"/"positive" and "satisfactory"/"unsatisfactory" (Dahlén, 2008). With a Cronbach's alpha of 0,958 the measure "Brand Attitude" was created.

As mentioned previously much of the theory this study is based on has not been studied within marketing prior to this study. Thus, when using hand proximity theory that deals with proximity to a stimulus in a marketing context, the stimulus becomes "the ad". Likewise, for the Third Person Effect that involves mass communicated messages; the message becomes "the ad" in a marketing context. Since this is the first study of its kind it benefitted the red thread of the thesis to focus on the first step when translating the theories from related areas into marketing terms, by focusing on the ad (stimulus) instead of the brand. Thus, ad attitude was preferred to brand attitude in the hypotheses. In addition, brand attitude is an important measure over time, as an asset, when it can be separated from a specific campaign. However, since this was the first and only time respondents would see the brand in question, ad attitude was more interesting, it being the only link between the respondent and the brand.

Behavioral Intentions

The behavioral intentions were measured by letting respondents answer three questions through choosing their level of agreement on a seven-point scale with two bipolar alternatives. These questions depict different potential actions, ranging from visiting the advertisers website to buying

the product. The questions where the following: *"How likely are you to buy the good/service in the advertisement?"*, *"How likely are you to try the product in the advertisement?"* and *"How likely are you to visit the associated website of the advertisement?".* The bipolar labels used to classify the level of agreement on the Likert scale were: "Likely/Unlikely" (Sundar & Sriram, 2004). The Cronbach's Alpha was of 0,926 and thus the three measures were combined to: "Behavioral Intentions".

Perceived Intrusiveness

To assess the level of intrusiveness statements from Doorn & Hoekstra (2013) were used. Respondents used a seven point Likert scale to rate how well the statement matched their opinions. In the original list there are ten statements used. However, due to translation and efficiency the list was shortened to five. These were; *"The offer is intrusive"*, *"The offer is uncomfortable"*, *"The offer is annoying"*, *"The offer gives me an uneasy feeling"* and *"The supplier knows a lot about me".* The bipolar labels on all of these statements where: "I completely agree"/"I don't agree at all". After testing the variables with the data collected, there was an issue with the reliability between the questions. As a result of this, the two last questions, *"The offer gives me an uneasy feeling"* and *"The supplier knows a lot about me"* were eliminated. The new index consisted of three questions with a Cronbach's Alpha of 0,937, thus the measure: "Perceived Intrusiveness" was established.

4.4.4 Quantitative Data Sampling

Nepa AB's panel provided the study with 490 unique respondents. 291 (59%) of the respondents managed to use the same device as they were instructed to use. In order to avoid any bias caused by mismatched interfaces appearing on the devices, only these 291 respondents were approved. The 291 respondents were scrutinized further, and those who had chosen the same response for all of the survey's questions were deleted from the dataset. Finally 275 unique cases were analyzed. These respondents were evenly distributed in age, ranging from 18 to 66. 44% of them were female and 56% were male. As Nepa AB's panel is national the responses were gathered from all over Sweden.

4.4.5 Manipulation Check

41% of the total amounts of respondents were dropped from the study, as they did not use the device that was described in the scenario. Thus, 100% of the respondents from the analyzed dataset lived up to this criterion.

The social setting the respondents were placed in was recalled by a large majority of the respondents. To make sure there was a difference between the social settings; social and private, the ad attitude between them was compared. In line with theory, the findings indicated that social media ads generated lower ad attitude when seen in a social setting. Using an independent sample t-test, ad attitude means were compared between the two groups; those primed with a social scenario (M=3.64) and those who primed with a private scenario (M=3.92). The difference had a significance level of p=0.094. As the respondents from the two social setting scenarios generated ad attitude differences between them with adequate significance levels, the social setting scenario passed the manipulation check.

Ad attitude by social setting

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Social	3,64	0,28	135	0,094
Private	3,92		134	0,094

Table 8 – Ad attitude by Social Setting

Two out of three manipulations were accepted. However, the "ad type" manipulation was rejected. As depicted in section 4.4.3 both a highly personalized and a generic ad was created. In pretest 2 the highly personalized ad was perceived as more intrusive than the generic ad with a high level of significance. Therefore it was decided to not make any further "ad type" changes before the main study. However, when analyzing the responses from the main study the difference in perceived intrusiveness between the ad

	Social Setting	Private Setting
Mobile Device	A	B
PC Device	C	D

Table 9 – Updated Study Cells

types did not reach a high level of significance (p=0.39). This indicated the two ad types did not manipulate the respondents. Thus the independent variable "ad type" did not pass the manipulation check. As a result of this, the eight cells of the study turned into four cells. The two remaining independent variables were the device and the social setting (See table 9).

It would have been possible to create more extreme differences between the highly personalized and generic ad. This would have created larger differences between the ad types, which would have allowed the study to keep its eight cells for further analysis. However, as this study is the first in its

kind it was important not to create unrealistic scenarios. The benefit from using ads that were realistic in a social media scenario outweighed the risk of losing an independent variable that would have been interesting to analyze.

4.4.6 Reliability

The study's reliability indicates if its precision is satisfactory. If the same results are found repeatedly when the same measurements are tested, the reliability and precision is high (Söderlund, 2005). This is more important in a quantitative study than in qualitative studies (Bryman & Bell, 2011), and thus it is crucial to consider in this study. The terms "stability over time" and "internal reliability" are of importance when discussing reliability.

The stability over time refers directly to what is described above; to what extent the measurement is stable over time. In other words, if the study is conducted repeatedly, it measures if the same results and thus the same conclusions will be reached every time (Bryman & Bell 2011). To be completely certain about the stability over time, the main study should be done more than once. However, the scope of this study did not allow that.

Internal reliability refers to the indicator that respondents give for their overall score of a measurement, to check if it is consistent and reliable (Bryman & Bell 2011). To have a high internal reliability, it is important to use measurements that fit together with each other. Internal reliability is thus best achieved with already well-established multi-item measurements (Söderlund, 2005), which is used in this study. Moreover, the Cronbach's alpha was measured to guarantee internal consistency. All measures in this paper produce a Cronbach's alpha value of at least 0,867. This indicates internal consistency and high reliability.

4.4.7 Validity

Validity tells researchers if the study measures the right things or if it has measurement errors. Validity consists of both internal and external validity.

Internal validity

The internal validity concerns whether or not the study measures what is intended to be measured. It looks at if variations in the independent variables cause variation in the dependent variables (Bryman & Bell, 2011). In other words it scrutinizes the extent to which the independent variables, rather

than external factors, are the cause for the examined effects. In this study manipulation checks was used to make sure the independent variables had any effect. The surveys that were sent out to respondents were identical except for the independent variables that were controlled. Thus the changes could be isolated in the dependent variables and derived from what independent variable had been altered. As mentioned in section 4.3.2, a fictional brand was used to exclude effects that may come from the recognition of established brands. This study also used well-established measures and dimensions for the questionnaire. The multi-item measurements used a seven-point semantic or Likert scale, which increases the validity (Bryman & Bell, 2011). The independent variables used in this study have been used in prior research and have shown to influence the dependent variables. Based on the above, the authors of this study consider the internal validity to be high.

External validity

The external validity refers whether or not the cause-and-effect relationship in the study can be used and generalized to fit in other contexts, for other products/services and to larger populations (Jacobsen, 2002). This study is conducted in a laboratory setting, which may, according to Bryman & Bell (2011) lead to lower levels of generalizability compared to real life settings. In this study, one single Facebook feed was used, which is not representable for how each individual's Facebook feed actually looks and feels like. However, Facebook is a well-known social network platform that is familiar to most people, which makes the laboratory setting more life like. To find a sample that was representable for a larger population the research company Nepa AB was used for data gathering. They have panelists that are situated all over Sweden and represent different ages, occupations and genders. Thus, the results generated from the sample, has a high level of generalizability across demographic groups. However, all respondents are Swedish, which makes the sample generalizable to the Swedish market, but not necessarily to other markets. The ad in the study is for a fast food brand, however, the findings are not only applicable for that industry. The study has made efforts to not be bound by the specific stimulus by making the shown product in the ad as generic as possible, and thus, it could be applied to other industries, (Jacobsen, 2002).

5. Results

In this section the results and analysis for the hypotheses are presented. Results for hypotheses 2.1 - 2.2 are not analyzed since the bipolar independent variable "ad type" (highly personalized/generic) did not pass the manipulation check. In the end of the section the findings are summarized.

5.1 Device impact

The hypotheses are tested by conducting mean comparison analysis via independent sample t-tests, were significance levels of $p < 0.10$ were accepted.

H.1.1 Higher awareness will be generated on mobile devices than on PC devices for social media ads.
This segment investigates if the device people are reached by the message through influences the level of awareness of social media ads.

To measure awareness both ad recall and recognition were measured. Ad recall was tested first. The results are presented in table 10. The mean difference between mobile (M=0,39) and PC (M=0,34) was not approved at a significance level of (p=0,38). The relationship between the means were however in line with the hypothesis, mobile devices reaching higher recall levels than the PC devices, even though no conclusion can be drawn from it.

Recall				
	Mean (0-1)	Mean difference	N	Sig. 2-tailed
Mobile	0,39	0,05	100	0,380
PC	0,34		175	0,385

Table 10 – Recall by Device

In the second awareness test the level of recognition was studied. The recognition variable was measured through having respondents pick the brand logo they had been exposed to among a set of similar brand logos. Table 11 presents the results from the analysis. The ad was recognized more frequently when seen on mobile devices. 58% of the respondents using mobile devices recognized the brand while only 44% of the respondents using PC devices recognized it. The mean difference reached a significance level of p=0,025. Connecting this to Heath & Nairn (2005), if someone does not recall being exposed to an ad without any cues, the ad may still have an impact on them. If respondents recognize the ad after a cue, the ad will still have had an impact on their awareness

level. Thus, recognition takes a larger awareness effect into consideration. To conclude, when awareness was measured through recognition, the study showed significance levels that supported that mobile devices generated higher levels of awareness than PC devices. Thus the hypothesis was partly accepted.

Recognition

	Mean (0-1)	Mean difference	N	Sig. 2-tailed
Mobile	0,58	0,14	100	0,025
PC	0,44		175	0,025

Table 11 – Recognition by Device

H1.1 - PARTLY ACCEPTED

_____

H1.2 Social media ads viewed on mobile devices will be perceived as more intrusive than if seen on PC devices.

The levels of perceived intrusiveness between ads viewed on PC and mobile devices was measured using the intrusiveness measure, derived in the method section 4.4.3. A one samples independent t-test was conducted. The results showed that ads on PC devices were perceived as slightly more intrusive (M=3,73) than those viewed on mobile devices (M=3,51). However the significance levels exceeded p=0,35; resulting in the hypothesis not being approved.

Intrusiveness by device

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Mobile	3,51	0,22	100	0,357
PC	3,73		175	0,350

Table 12 – Intrusiveness by Device

H1.2 - NOT APPROVED

_____

H1.3: Social media ads viewed mobile devices will generate lower ad attitude than if seen on PC devices.

The level of ad attitude was measured using the ad attitude index, explained in the method section 4.4.3. In order to compare the attitude levels of ads between PC and mobile devices a one samples independent t-test was conducted. The results showed small tendencies towards PC devices generating higher ad attitude (M=3,80) than mobile devices (M=3,74). However the results do not

produce adequate significance levels, with lowest levels reaching p=0,68. Thus, hypothesis H1.3 was not approved.

Ad attitude by device

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Mobile	3,74		100	0,691
PC	3,80	0,06	175	0,680

Table 13 – Ad attitude by Device

H1.3 - NOT APPROVED

5.2 Social media advertising in social and private settings

This section investigates how the device, mobile or PC, influences the attitude towards the ad, depending on the social setting. The hypotheses are tested by conducting mean comparison analysis via independent sample t-tests, as well as one mediation analysis. Significance levels of p <0.10 were accepted.

H3.1 Social media ads will be perceived as less intrusive on mobile devices than on PC devices in social settings, and more intrusive in private settings.

To test hypothesis H3.1, mean values of perceived intrusiveness were compared between devices through independent samples t-tests, for social and private settings.

Social Setting

Ads seen on PC devices were considered to be more intrusive (M=3.97) than those seen on mobile devices (M=3.17) in a social setting. This relationship had a significance level of p=0.021.

Intrusiveness, *Social setting*

	Mean	Mean difference	N	Sig. 2-tailed
Mobile	3,17		51	0,021
PC	3,97	0,80	85	0,019

Table 14 – Intrusiveness by Device, Social Setting

Private Setting

In a private setting the relationship was reversed. Advertising displayed on mobiles device was considered to be more intrusive (M=3.88) than when seen on PC devices (M=3.48). The significance reached an adequate level (p=0,099).

Intrusiveness, *Private setting*

	Mean	Mean difference	N	Sig. 2-tailed
Mobile	3,87		49	0,099
PC	3,48	0,39	85	0,098

Table 15 - Intrusiveness by Device, Private Setting

To conclude, social media ads was perceived as less intrusive when viewed on mobile devices compared to PC devices in social settings. Contrarily, in private settings, ads viewed on mobile devices were considered to be more intrusive than ads seen on PC devices. Thus hypothesis H3.1 was accepted.

H3.1 - ACCEPTED

H3.2 Social media ads will generate higher ad attitude on mobile devices than on PC devices in social settings, and lower ad attitude in private settings.

To test hypothesis H3.2, mean values of ad attitude were compared between devices through independent samples t-tests, for social and private settings.

Social Setting

In a social setting mobile devices generated higher levels of attitude (M=3.70) than PC devices (M=3.61). This difference produces a low level of significance (p=0,72).

Ad attitude, *Social setting*

	Mean	Mean difference	N	Sig. 2-tailed
Mobile	3,70		51	0,722
PC	3,60	0,10	85	0,707

Table 16 – Ad attitude by Device, Social Setting

Private Setting

In a private setting mobile devices generated lower levels of attitude (M=3.77) than PC devices (M=4.00). However, this measure produced a low level of significance (p=0,314).

Ad attitude, *Private setting*

	Mean	Mean difference	N	Sig. 2-tailed
Mobile	3,77		49	0,312
		0,23		
PC	4,00		85	0,314

Table 17 - Ad attitude by Device, Private Setting

To summarize, mobile devices are perceived as less intrusive than PC devices in social settings, while ads are perceived as more intrusive on PC devices in private settings. This measure generated high levels of significance. The ad attitude measure shows the same relationship. However for ad attitude, the relationship could not fully be explained because of low significance levels. When analyzing the private setting the relationship in ad attitude between the devices were also reversed compared to the social setting. Put differently, ad attitude was higher for mobile devices in the social setting while PC devices delivered higher attitude in private settings. These results however, did not provide a high significance level.
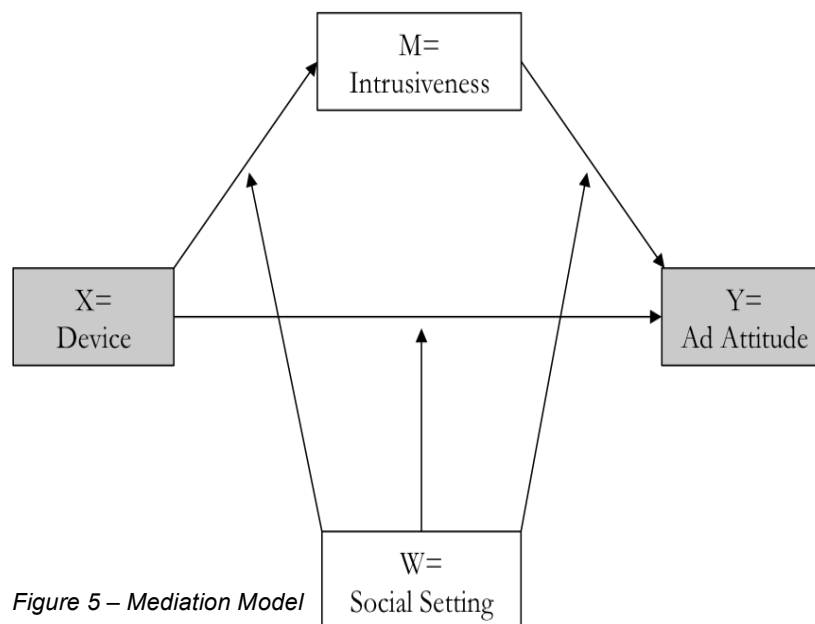
Figure 5 – Mediation Model

To further investigate the devices' impact on ad attitude depending on the social setting, a mediation analysis was conducted. The moderated mediation analysis shows if the level of intrusiveness is a mediator to ad attitude. If it is a mediator, it can be used to explain the difference in ad attitude between devices in the different social settings.

Using Hayes' (2013) bootstrapping macro Process for SPSS (Model 59, 5000 bootstrapping samples), a mediation analysis was performed. Model 59 includes a moderator to the mediation

analysis. This moderator was taken into account for all paths of the model (see figure 5). "Device" was used as the independent variable, "Intrusiveness" as the mediator, and "ad attitude" as the dependent variable. "Social setting" was the moderator of the analysis. The results displayed a significant effect at a 90% confidence interval for a mediating effect of intrusiveness on ad attitude in a social setting (indirect effect= -.2369, LLCI -.4406, ULCI -.0889). However, no significance level was reached in the private setting (indirect effect= .0963, LLCI -.0303, ULCI .2555). The direct effects between device and ad attitude did not give any level of significance in social settings (direct effect= -.0,1447, LLCI -.2311, ULCI .5204) nor did it give any significant effects in private settings (direct effect= 0,1000, LLCI -.2777, ULCI .4777).

Moderated Mediation			
Total indirect effect and 90% confidence interval			
	Effect	LLCI	ULCI
Social setting	-0,2369	-0,4406	-0,0889
Private setting	0,0963	-0,0303	0,2555
Total direct effect and 90% confidence interval			
	Effect	LLCI	ULCI
Social setting	0,1447	-0,2311	0,5204
Private setting	0,1000	-0,2777	0,4777

Table 18 – Mediation Model, Direct/Indirect Effects

The independent variable "Device" interacted with the moderator "Social setting" towards the mediator "Personalization" (Path a3, see appendix 4) with a significance level of p=0,0127. However interaction path for the moderator towards "ad attitude" did not reach a high level of significance (Path c3, see appendix 4). Thus, the moderator has a significant effect on the intrusiveness generated by different devices. This means that the social setting will affect the level of intrusiveness in accordance with hypothesis H3.1 and through the level of intrusiveness a lower/higher ad attitude will be generated.

The mediation analysis puts forward that the device will have an indirect effect on ad attitude in line with what was suggested in 3.2. Altogether, this concludes that social media advertising will generate higher ad attitude on mobile devices than on PC devices in social settings, in private settings there are tendencies pointing towards the reversed relationship. Thus suggesting partial support for H3.2.

5.3 Summary of results

H1: Total impact	**H1.1**	**PARTLY ACCEPTED**	Higher awareness will be generated on mobile devices than on PC devices for social media ads.
	H1.2	**NOT APPROVED**	Social media ads viewed on mobile devices will be perceived as more intrusive than if seen on PC devices.
	H1.3	**NOT APPROVED**	Social media ads viewed on mobile devices will generate lower ad attitude than if seen on PC devices.
H2: Personalized and generic ads impact	**H2.1**	**NOT TESTED**	For highly personalized social media ads, the difference in perceived intrusiveness between the devices will be greater than for generic ads. Mobile devices being more intrusive than PC devices.
	H2.2	**NOT TESTED**	For highly personalized social media ads, the difference in generated ad attitude between the devices will be greater than for generic ads. Mobile devices generating lower ad attitude than PC devices.
H3: Social settings impact	**H3.1**	**ACCEPTED**	Social media ads will be perceived as less intrusive on mobile devices than on PC devices in social settings, and more intrusive in private settings.
	H3.2	**PARTLY APPROVED**	Social media ads will generate higher ad attitude on mobile devices than on PC devices in social settings, and lower ad attitude in private settings.

Table 19 - Summary of Results

6. Discussion

In this section, the results of the study are discussed through their academic and practical implications. A criticism towards the study and proposals for future research are presented.

6.1 Device Impact

6.1.1 Choice of Device and Ad Awareness

The difference between devices in ad awareness is derived from hand proximity theory. Abrams et al., (2008) found that increased attention was placed on stimuli placed close to ones hands. Evolution based theory suggested that this would have been beneficial for our ancestors. Connecting it to attribute based marketing (Meyers-Levy, 1988) this study found that social media advertising generated higher levels of awareness on mobile devices than on PC devices. The pre test pointed in the same direction, however, in the main study the hypothesis was accepted. Through an independent sample t-test, the differences between the devices produced high levels of significance. As Lavidge & Sterner (1961) illustrate in the hierarchy of effects model, awareness is vital. When companies aim to guide its target audience to purchase their products the first step is to create awareness and knowledge about their brand. Without it the other phases in Lavidge & Sterner's (1961) funnel will not take place. Thus if the choice of device affects awareness, it can have a distinctive effect on the success of a campaign.

From assessing in-feed social media ads, it was made clear that its traits were mainly attribute based, as they do not demand much complex cognitive processing or connecting to other knowledge, for people to make sense of it. In the pretest people generally scrolled through the feed quickly giving the ad less or equal amounts of time as other posts, which suggested less cognitively demanding processing (Davoli & Brockmole, 2012; Meyers-Levy, 1988). Thus, the first contribution of this study was the defining of in-feed social media advertising as attribute based. This definition allows social media advertising to be connected to a large body of existing marketing literature. This is increasingly important as social media advertising and related ad practices are growing in popularity. As Abrams et al. (2008) found, hands proximal to stimulus increases a subject's attention to it, and detail focus. In marketing terms this phenomenon is called data driven processing, as opposed to conceptually driven processing, which triggers more holistic/theme based attention (Myers-Levy, 2008). Matching the stimuli type (e.g. holistic or attribute based) with the matching processing type

(DDP and CPD) has a positive impact on processing and attention (Higgins, 2005; Jain, 2006). This paper creates a unique link between theories, suggesting that; hands proximal to a stimuli, encourages data driven processing, which suits better attribute-based ads. Matching the attribute based ad with hands proximal to the stimuli should thus have a positive impact on the attention it is given and thereby the awareness. After having categorized social media ads as attribute based; the results of the study showed that awareness indeed increased when viewed on mobile devices (hands proximal to a stimulus) in line with theory. This was mainly picked up by the recognition measure.

Connecting Davoli & Brockmole (2012) who based their theories of hand proximity effects on evolution theories (Abrams et al., 2008), to advertising on different devices, helps lay an important piece to the puzzle of advertising effectiveness. This is unchartered territory that may alter the best practices of marketers in time, as mobile devices increase in popularity and other extensive studies are conducted.

6.1.2 Choice of Device, Intrusiveness and Ad Attitude

The difference in intrusiveness and ad attitude between the devices did not achieve a high level of significance. When comparing intrusiveness and ad attitude between mobile and PC devices in the dataset from pretest 2, no high significance levels were found either. Thus, the reality of the effects of devices on social media ads might not be as clear-cut as hypothesized. This paper suggests that other parameters are likely to matter when assessing the differences in ad effectiveness between devices, such as in what social setting the ad is seen in.

6.2 Choice of device and Social settings

Theory of how people behave in the presence of others laid the foundation for the hypothesis development on how it would affect social media ads on mobile and PC devices respectively. The existing body of research had mainly consisted of comparing ads in different social settings and had not focused on aspects of devices.

Through an independent samples t-test it was found that there indeed is a difference in how ads are perceived in social settings. The ads shown in social settings produced lower attitudes in comparison to the same ads shown to people in private settings. The aim of this study however was to look at differences in how the device could affect the social media advertising. As content is less visible to

others on mobile devices than on PC devices, the mobile device should perform better in a social setting, which entails; high ad attitude and low levels of intrusiveness. However mobile devices were expected to be perceived as more intrusive and generate more negative attitudes towards the ad in a private setting (Troung & Simmons, 2010).

The results were indeed interesting. As for the intrusiveness dimension, the results showed that the assumptions were correct. Using one samples t-tests the results revealed that ads shown on PC devices were considered as more intrusive than ads seen on mobile devices in a social setting. Contrarily, ads shown on mobile devices in private settings were considered as more intrusive than PC devices. For ad attitude, the same relationship was generated where ads seen on PCs received lower attitude scores in social settings compared to ads seen on mobile devices, and vice versa. However, these results came with low significance levels. To shed light on why the ad attitude did not provide adequate significance levels, a mediation analysis was conducted. The social setting was the moderator while intrusiveness was the mediator. When intrusiveness was working as a mediator for the impact of the device on ad attitude, in different social settings, there was an indirect effect between the device and attitude towards the ad.

The significance level was satisfactory in social settings, but not in private settings. When analyzing the paths of the mediation analysis, it was found that the social moderator was interacting with significance between the device and the level of intrusiveness. Thus a conclusion that can be made is that the device and social setting interacts with the level of intrusiveness, which in turn gives a lower or higher attitude towards the ad. There is clearly a connection between social setting and choice of device on how ads are perceived. What is particularly interesting is the total reversed relationship that is at hand here, where social setting interacts with device in a way that has not been studied earlier.

Connecting these results to Troung & Simmons (2010), ads seen on mobile devices are more intrusive and show more negative attitudes towards the ad. Nevertheless as the social setting changes, the conditions also change, which fills a research gap. Ads on one particular device are not simply better or worse for ad attitude. In fact social setting changes so much that the relationship suddenly is reversed, which must be considered a rather dramatic effect. The underlying mechanism is most probably that PC devices reveal more about the person using it, as the screen size does not

allow users to shield themselves from others eyes, putting them in a context that might not be in line with their desired identity as Leary et al (1990) depicted. As people lose control of what others see on their screen, they also lose control over who they are in the eyes of others. Connecting this to information boundary theory; when people lose control of what private information is disclosed they will feel like their privacy is intruded on (Petronio, 1991). This can in turn increase the level of intrusiveness. Since the level of intrusiveness is shown in this study to be a mediator to ad attitude, the attitude towards the ad will be lowered.

Finding that social setting impact which device should be used to maximize ad attitude fills an important research gap. This connection has not been studied before and should be scrutinized further.

6.3 General Discussion

Considering the growth in usage of mobile devices, understanding the qualities they bring, in relation to PC devices, becomes ever more crucial. From a business perspective, a deeper understanding can lead to a thicker bottom line. This boiled down to our research question:

What impact does the choice of device have on social media advertising effectiveness?

Mobile devices generate higher levels of awareness than PC devices for social media ads. This has an important effect on how successful a campaign ends up being, since potential customers cannot buy what they are unaware of. The awareness differences are not accompanied by any general attitudinal difference between the devices. Awareness, intrusiveness and attitude differences generated by the devices were stress tested through studying differences caused by whether or not the subject was placed in a social setting. It was found that in a social setting social media ads were more efficient on mobile devices than on PC devices. Ads seen on mobile devices in social settings were both less intrusive and produced higher levels of ad attitude. However, in a private setting the reverse relationship applied.

The current body of literature suggests that ads on mobile devices are perceived as more intrusive and generate lower levels of attitude. This study provides an important theoretical contribution as it

shows that advertising on mobile devices can provide more effective results than PC's, in the right setting. Not only does social media ads on mobile devices have a positive effect on awareness, in a social setting it seems to be more appreciated too. The findings of the study are both useful to practitioners and can be developed further in future research. However, the section in which the hypotheses were developed is also useful for future research. It includes the theoretical models that were created when developing the hypotheses for highly personalized and generic ads, which might be useful outside the boundaries of this study.

These findings were all based on social media ads. The choice of an advertising medium that is modern, and follows the trend of adapting the ad to the content where it is posted was crucial. Studying social media ads make our findings more useful for practitioners as their marketing activities are more likely to resemble these than ads of a more disruptive nature.

Connecting these findings to the title: *Device it matter*? Yes, the two devices can generate different marketing results. The following model illustrates the findings of the study:

Hierarchy of Device Model

Research Area		Hierarchy of Effects Model		Optimal Choice of Device
Hand Proximity Effects	〉	**Cognitive** *Awareness*	〉	Mobile Devices
Social Setting Effects	〉	**Affective** *Intrusiveness, Attitude*	〉	Social setting→ Mobile Devices Private setting→ PC devices
		Conative *Action*		
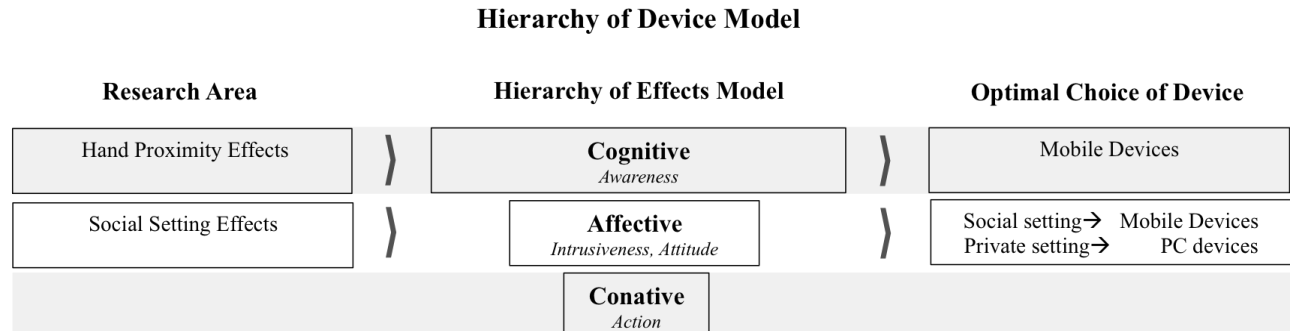
Figure 6 – Summarizing Model

6.4 Managerial Implications

Today, many advertising platforms let advertisers choose what device to target, which enables them to exploit the insights and findings of this study. Google for instance, the world's largest advertiser, allows its customers to choose whether they want to target desktop and laptop or android and iOS devices (Google, 2015). In order to boil down the findings into tangible practical implications the findings were discussed in an interview with Marie-Louise Dahl, Senior Key Account manager at Google who focuses on "Large Customer Sales" from the European head office in Dublin, Ireland.

According to Marie-Louise Dahl research and findings on mobile devices are generally highly important for Google. *"The internet penetration is growing rapidly through mobile devices, especially in developing countries, making them a priority on a global scale".*

Social media ads on mobile devices generate higher levels of awareness than PC devices. Consider a company that through market research finds that they score well in attitude, however, only a low percentage of their target market are aware of their existence. In this case, using mobile targeting will give them more awareness for the same advertising budget. This is only the case if the advertising platform charges the same price for all devices. Thus, managerial implications are also relevant for executives on platforms selling ad space as they can enable price discrimination based on device targeting. Google, however, would according to Marie-Louise Dahl not change their pricing model as a result of the findings in this study. *"We use bidding, and thus the prices for targeting mobile devices would only increase if more advertisers target mobile devices".* Consequently, for marketing practitioners using Google's advertising products, there is an opportunity that could be exploited. If mobile device targeting is currently underpriced due to imperfect information on its effects on awareness, advertisers aiming to enhance this dimension of advertising effectiveness should bid on mobile ad targeting before the information becomes common knowledge on the market.

Another device related strategy for the advertiser in the example above, may be to target other applications or social media platforms that focus on mobile devices. They could for instance create an account on the mobile-based platform Instagram and work on establishing a following, alternatively pay for ad space in the medium. Instagram, released the following statement suggesting they are seeing trends that support our findings: *"We launched ads on Instagram last year and our first partners saw impressive ads performance, including increased awareness and a high rate of ad recall."* (Instagram, 2015).

The impact of social settings on how ads are perceived on mobile and PC devices is also relevant for strategic decision making. If a company is targeting potential customers who are likely to be in a social setting, they should primarily push their ads on mobile devices. Imagine an advertiser targeting people within a high tax bracket, in inner cities. This segment is likely to work in offices, thus between 9:00 and 19:00 on weekdays, the advertiser should push ads on mobile devices more

intensively. During evenings and weekends, ads via PC can receive a higher priority. Another example is to use Wi-Fi networks. When a target audience connects to Wi-Fi in public locations, advertisers should push their messages on mobile devices. On for instance Google products, customers can apply both time targeting and location targeting on different devices to implement these changes. Through "negative location targeting" an advertiser could choose not to show ads on PC devices at for instance crowded airports (Dahl, 2015).

The commercial opportunities associated with the results of this study are tangible. When having crafted a message, choosing the right devices to go with it may lead to increased future earnings and a higher brand value. The technology is already at hand, the question that remains is who will use it to reach new advertising effectiveness heights.

6.5 Criticism of the study

This study was mainly limited by time, resources and to some extent money. What could really have enhanced this study would have been the usage of more lifelike scenarios, integrating the manipulations in the respondent's own Facebook feed or a similar interactive scenario. Furthermore, the personalization would have been desirable to test in an environment where "real personalization" is possible, thus actually customizing ads towards an individual, including the individual's name, transaction data or other attributes that will make the subject perceive the ad as truly personalized.

In this study a survey was used for the collecting of data. There are of course risks with gathering data through surveys, mainly concerning the quality of the answers, but also the comprehension questions. The pretests produced results that suggested that all manipulations would work as anticipated. However, when analyzing the data from the main study, it was clear that the highly personalized ad and the generic ad did not work as hoped for. The manipulation did not trigger any significant differences in perceived intrusiveness between the ad types, which resulted an entire block of hypotheses being removed from the study.

As the study's main objective was to compare the advertising effectiveness between devices, it was of great importance that respondents, who received manipulations for mobile devices, also answered

the survey through a mobile device and vice versa. However, this was not the case, almost 40% of the respondent had to be removed before analyzing the results as they did not answer the survey on the correct device. The sample size could possibly have been larger if a more efficient method was used to make the respondents open the survey with the right device, instead of simply asking them to follow the instructions.

6.6 Future research

As mobile devices take a bigger part of people's lives, research dedicated to advertising on mobile devices will receive more attention. As the theoretical gaps are many, researchers will soon start to fill them. What should be studied in the near future is listed below.

The independent variable of testing both a "highly personal" and "generic" ad fell through in this study. However, the hypothesis development, connecting mobile ads with intrusiveness and attitude towards the ad is highly relevant and can be built upon. There could be an opportunity to find the equilibrium where a certain degree of personalization generates the maximum amount of attitude, without personalization leaning over and become intrusive. In this study it was found that such a relationship exists, as described in figure 4.

Even though the importance of social media will increase, it is crucial to study the effects of devices on advertising, even outside the boundaries of social media. This research must be done continuously, as the competitive landscape and technology is ever changing. For instance, much research was done in the early 2000's on advertising through text messages (SMS), research that has already become obsolete. With trends changing quickly in the use of technology, there is a need to make sure research does not lag behind.

New technology, such as tablets and "hybrid laptops"; computers that enable touch input as well as keyboard and mouse, some of them that also have a screen that is detachable, are growing in popularity. Extensive studies and comparisons between these devices would mean important contributions to the current theory. Having established differences in advertising between PCs and mobile devices, there is still a question concerning how to tackle these hybrid devices.

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8. Appendix

Appendix 1: Social Media Advertising

Appendix 2: Pretest tables

Intrusiveness by ad type (Pretest 1)

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Personalized	3,27	0,36	35	0,114
Generic	2,91		30	0,114

Ad attitude by social setting (Pretest 1)

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Social	3,41	0,29	31	0,333
Private	3,70		34	0,328

Intrusiveness by ad type (Pretest 2)

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Personalized	3,80	0,49	33	0,085
Generic	3,31		31	0,085

Ad attitude by social setting (Pretest 2)

	Mean (1-7)	Mean difference	N	Sig. 2-tailed
Social	3,55	0,64	31	0,042
Private	4,19		33	0,044

Appendix 3: Main Survey

(Introduktionstext)
Hej! Vi är två studenter på Handelshögskolan i Stockholm som jobbar på vår masteruppsats. Resultaten från denna enkät kommer endast att användas i detta syfte och den ta bara cirka 2 minuter att fylla i. Vänligen svara på alla frågor även om de låter snarlika. Det finns inga rätt eller fel svar. Alla svar kommer att hanteras anonymt. Tack!

---page break---

(Manipulation 1, scenarios)
Dessa 4 introduktionstexter ska slumpas bland respondenterna.

1- Social Café
2-Not Social, Hemma
A-Mobile
B-PC Device

1A
Tänk dig följande scenario:
-Du är på ett café med många människor kring dig
-Du sitter med din smartphone
-Du sitter på ditt favoritcafé och scrollar i ditt Facebook-flöde med din smartphone. Det flöde du möts av visas på nästa sida. Titta igenom flödet och klicka dig vidare.

2A
Tänk dig följande scenario:
-Du är ensam hemma
-Du sitter med din smartphone
-Du sitter ensam hemma och scrollar i ditt Facebook-flöde med din smartphone. Det flöde du möts av visas på nästa sida. Titta igenom flödet och klicka dig vidare.

1B
Tänk dig följande scenario:
-Du är på ett café med många människor kring dig
-Du sitter med din dator
-Du sitter på ditt favoritcafé och scrollar i ditt Facebook-flöde med din dator. Det flöde du möts av visas på nästa sida. Titta igenom flödet och klicka dig vidare.

2B
Tänk dig följande scenario:
-Du är ensam hemma
-Du sitter med din dator
-Du sitter ensam hemma och scrollar i ditt Facebook-flöde med din dator. Det flöde du möts av visas på nästa sida. Titta igenom flödet och klicka dig vidare.

---page break---
(Manipulation 2)
Dessa 4 flöden ska slumpas bland respondenterna för att få fyra lika stora grupper.

Bilderna B ska sitta ihop med scenariona B och delas med jämnt antal respondenter mellan dem
Bilderna A ska sitta ihop med scenariona A och delas med jämnt antal respondenter mellan dem
Bilderna B är anpassade för dator och A är anpassade för mobil, önskvärt för oss vore om de som får scenarion A svarar via mobil i så hög utsträckning som möjligt. Således blir det 8 olika grupper.

Bild B variation 1

Bild B variation 2

Bild A variation 1

Bild A variation 2

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(Minne och Igenkänning)

- Vad heter varumärket vars annons du precis såg?

- Klicka på det varumärke vars annons du precis såg. *(Bilderna nedan är alternativen de kan välja mellan)*

Bild: MinneoIgenkänning1-4

(Exponering nr2)

"Detta var annonsen som låg i Facebook-flödet. Titta noggrant igenom annonsen igen". *Här visas annonsen igen.*

Variation 1 Close Up (Gäller både A och B)

Variation 2 Close Up (Gäller både A och B)

---page break---

(Attitude)

Vad är din helhetsuppfattning om annonsen du precis såg? *7-gradig skala*:
- o Dålig/Bra
- o Otrevlig/Trevlig
- o Ofördelaktig/Fördelaktig

Vad är din helhetsuppfattning av varumärket du precis såg? *7-gradig skala*:
- o Dålig/Bra
- o Negativ/Positiv
- o Otillfredsställande/Tillfredsställande

(Köpbeteende)
- Hur sannolikt är det att du köper den annonserade produkten? *7-gradig skala* (Osannolikt/Sannolikt)
- Hur sannolikt är det att du provar den annonserade produkten? *7-gradig skala* (Osannolikt/Sannolikt)
- Hur sannolikt är det att du besöker den annonserade produktens sida? *7-gradig skala*
- (Osannolikt/Sannolikt)

(Intrusiveness)
- Svara på frågorna nedan. 7-gradig skala: "Instämmer inte alls"/"instämmer helt"- på alla
  - o Jag tycker att detta erbjudande är påträngande. *7-gradig skala*
  - o Jag tycker att detta erbjudande är obekvämt. *7-gradig skala*
  - o Jag tycker att detta erbjudande är störande. 7-gradig skala
  - o Leverantören vet mycket om mig. *7-gradig skala*
  - o Jag upplever användandet av personuppgifter som obehagligt i detta erbjudande. *7-gradig skala:*

---page break---

(Social)
- Var det fler personer i rummet när du svarade på enkäten?
  - o Ja/Nej
- Hur stort intryck tar du av annonsen? 7-gradig skala
  - o Mycket Litet Intryck/ Mycket Stort Intryck
- Hur stort intryck tror du andra tar av annonsen? 7-gradig skala
  - o Mycket Litet Intryck/ Mycket Stort Intryck

Vid starten av denna enkät läste du ett scenario i vilket du scrollade i ditt facebook-flöde.
Klicka i de påståenden som stämmer överens med det scenariot du läste.
- Du var på café
- Du var hemma
- Du använde en smartphone
- Du använde en dator

(Övriga frågor)

- Ålder
- Kön
- Vad använde du för typ av enhet för att fylla i enkäten?
  - o Mobil Enhet (Mobiltelefon/tablet)
  - o Dator
- Vet du vad syftet med denna enkät är?
- Om du svarade ja på föregående fråga, skriv vad du tror syftet är i rutan nedan.

Appendix 4 – Mediation analysis

Moderated mediation

Outcome Personalization

R	R-sq	P
0,1665	0,0277	0,0608

Path	Beta	std error	t	p	LLCI	ULCI
a1	1,9891	0,7309	2,7215	0,0069	0,7826	3,1956
a2	1,8721	0,7301	2,3694	0,0185	0,5679	3,1763
a3	-1,167	0,4652	-2,5084	0,0127	-1,935	-0,339

Outcome Ad Attitude

R	R-sq	P
0,399	0,1592	0,00

Path	Beta	std error	t	p	LLCI	ULCI
b1	-0,2971	0,1293	-2,2981	0,0224	-0,5105	-0,0837
c1	0,1894	0,5095	0,3717	0,7104	-0,6517	1,0304
b2	0,009	0,0855	0,1048	0,9167	-0,1322	0,1501
c2	0,3055	0,6201	0,4926	0,6227	-0,7182	1,3291
c3	-0,0447	0,3227	-0,1385	0,8900	-0,5775	0,4881

Moderated mediation model 58