

“LED There Be Light” – A Quantitative Study of LED Perimeter Advertising Recall

Abstract: The market for sponsorship and sports marketing is growing steadily. At the same time new technology and new display solutions in perimeter advertising have increased the price and opportunities of exposure. Literature review on research concerning perimeter advertising has shown a knowledge gap between the technological development and academic studies. Though the use of LED perimeter advertising is widely practiced, no current studies exists on its effectiveness. This thesis combines existing theories regarding perimeter advertising and theories regarding the new attributes of LED perimeter advertising in order to bridge that gap.

The thesis sets out to investigate which factors affect cognitive impact of LED perimeter advertising. Cognitive impact is measured on advertising recall, on both aided recall and unaided recall. Three studies were performed that respectively investigate target characteristics through a field experiment, exposure characteristics through the use of an expert panel and effects of repetition on recall through a laboratory experiment. The field study was performed on two separate games on the qualification tournament for the FIFA World Cup. Results indicate that the importance of being able to interrupt first-hand tasks (the game) was of great importance in order to achieve cognitive impact. The exposure characteristics in Study 2 revealed that brands with high brand relatedness and animation effects was best adapted to break through the first-hand task. The importance of interruption made it further relevant to examine repetition and its effects on recall and attitude. Study 3 showed that increased repetition potentially could increase recall. Partial effects on attitude showed that repetition might induce a lower liking of the medium. This was also conclusive with findings in Study 1. Overall conclusions of the study stated that recall of LED perimeter advertising could be increased by the use of attributes such as brand relatedness, movement and use of repetition in order to interrupt first-hand tasks.

Further studies regarding the potential negative effects on advertisers when LED perimeter advertising becomes too interruptive are suggested. A medium level of intrusiveness is thus recommended. Overall low results of recollection does however suggest that current LED perimeter advertisers would benefit from being more intrusive, which would result in higher cognitive impact.

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1. Introduction

Since the birth of advertising, companies have been competing for the attention of consumers. New technology and media vehicles for advertising are constantly evolving and never have people been exposed to as many advertising messages as today (Dahlqvist & Linde, 2009). Inventions in several areas designed to simplify the lives of people are quickly adapted for commercial purposes by companies that want to be seen or heard. One of these areas is the application of LED (Light-emitting diode) technology in society. Applications for LED range from areas as diverse as aviation lightning, automotive lightning, traffic signals, general lightning and advertising. LEDs have allowed new text, video displays and sensors to be developed, which is currently applied in several advanced communication technologies (Pimputkar et al., 2009). The adoption of LED technology for advertising signage has been acknowledged by researchers in outdoor advertisement and covered in several recent studies (e.g. Burke, 2002). Recent developments in LED display systems have lead to more advanced, flexible and affordable solution, and its adoption in new areas and industries is increasing. Another fast growing industry that has been quick to adapt LED technology signage is the market for sports marketing and sponsorship. Despite that, the fast technological development and widespread application area of LED has left sport marketing researchers behind, making it an unexplored field.

1.1 Background

Despite the ongoing troubled economic times, sport has continued to thrive, with major events appearing to become more popular than ever. Within the economy of sports, sponsorships and media rights emerge as the main engines of growth, putting the traditional dominance of entrance fees and gate revenues under pressure (Pwc, 2011). The popularity of sponsorship is expected a continued growth at a staggering rate of almost 70% between 2006 and 2015 (Statista, 2013). While investments in sponsorship have been steadily rising over the last twenty years, advertising expenditures, on the other hand, have decreased over the same period as compared to other communication instruments (Flemming & Christensen, 2003). Both phenomena are not to be considered independent. Companies are not striving to communicate less today; rather they desire to communicate more effectively by being more relevant. Perimeter advertising – broadly defined for the purpose of this study as commercial stimuli displayed at the site of an event (Deimel, 1993) – is considered the furthest reaching communication instrument for sponsors. At the FIFA World Cup in South Africa 2010 the

cumulated audience of 3,2 billion spectators, or 46.4 per cent of the global population, was exposed to the perimeter boards (FIFA, 2010). Perimeter advertising presents several advantages over classic advertising and has been studied extensively in sports marketing (e.g Walliser, 1997). Since perimeter advertising is connected to real events it is often perceived as more credible by the audience. It also has the advantage of being viewed in a confined space where viewers are involuntarily exposed to the commercial stimuli of the sponsor. The only choice the audience has is to attend or not attend the event. Furthermore, since consumers often spend extended time in front of sports, these ads can receive prolonged or repeated exposure even though they are often in the background and thus more likely to break through the media clutter (Turley & Shannon, 2009). However, the actual effectiveness of perimeter advertising has also been questioned in several studies and criticized. (Levin et al, 2001; Nebenzahl & Hornik, 1985; Franzen, 1994). Perimeter messages usually do not transmit large amounts of information to the audience. In many cases, messages are limited to the name of the brand or the company (Derbaix & Gregory, 2004). Perimeter advertising is thus said to communicate only through *advertising fragments*, which can consist of a logo or other kind of pictorial element, or more rarely a short slogan (Pham & Vanhuele, 1997). This limitation makes the space more suitable for known brand with high brand awareness since there is little time and space to inform customers or transfer brand connections (Pham & Vanhuele, 1997). Perimeter advertising is also characterized by its peripheral role in the environment, where spectators are likely to be more involved in the event than in the advertising stimuli (D'Ydewalle & Tamsin, 1993). Perimeter advertising is thus displayed in specific conditions of exposure, so-called dual-task situations, in which the spectators' primary attention focuses on something other than the messages, which take the role of secondary tasks (Shapiro et al., 1997). Secondary tasks achieve a minimum level of attention that increases only when the primary task is interrupted, or the secondary task can attract the attention of the target through the use of color, movement or novelty (Herrmann et al., 2011).

The usage of LED perimeter advertising as a display instrument in sporting events has however upended many of these truths. Technology has made the adaptation of messages possible and provided advertiser with more options in terms of animation effects, repetition and timing of ads. The increased space that moving text provides has also made it possible for advertisers to extend messages and not only involve brand name or short slogans. LED signage offers brands the vehicle to produce creative messages and animations for delivery across the entire perimeter of the playing area, making it more informative to consumers who

are not familiar with the brand before (Josefin Rydhede, Interview, 3 October 2013). The possibilities of showing more animated messages and thus compete with the cognitive attention of spectators with movement, color and interesting messages would also give the medium an upper hand to static signs.

The evolution of arena marketing has come in three different shapes: static signs, rolling signs and LED systems. Rolling signs made it possible for arena owners to fit up to 10 more advertiser in each game (Josefin Rydhede, Interview, 3 October 2013). The adoption of LED systems at arenas has increased the number of advertisers even more. The industry has been able to move over to selling more customized solutions today, where each sponsor can tailor message, time and space more individually.

On the other hand, the exposure medium comes at a cost for advertisers. An advertising message on LED is on average shown at 20 seconds at the time for a single advertiser on approximately 120 meter. The total exposure time for each advertiser per game is around 5 minutes in comparison this to a static format where you buy 6-meter wide signs that are exposed for 90 minutes. The price difference of the two exposure types is also significant. The cost of investing in static sign of 6 meter during 90 minutes of all home games (15) for one season costs 50 000 SEK/year. In comparison, a sponsor package of LED-exposures, where advertisers are visible for 4,5 minutes each home game, costs 200 000 SEK/year¹. The question is then, does the effectiveness of LED perimeter advertising justify a price that is four times higher and renders you only 5% of the total game in exposure time?

1.2 Problem Area

Though the effectiveness of static perimeter advertising is a well-researched subject, no recent studies have investigated it in its present form. To our knowledge, there exists no published study that has investigated LED perimeter advertising. We have therefore identified a need for new recommendations of how LED perimeter advertising works. Particularly when considering that many of the downsides with perimeter advertising have been upended by the use of LED signs, such as its limited message space and static design in a complex cognitive environment. It is also a highly relevant topic as the market for sponsorship and sport-connected advertising is growing increasingly. In a time where mega-sporting events has

¹ Example from exposure costs of Stockholm team AIK and Tele2 Arena.

become a highly covered exposure situation that involves multibillion dollar deals. As the prices of perimeter advertising increase, so will advertisers' demand for appropriate measurement and more accurate evaluation of sponsorship outcomes. Theories suggest that perimeter advertising has new characteristics that have changed the conditions of prior research. These new characteristics would also entitle new managerial recommendations on how to use the medium. This also raises issues regarding if the new setting is optimal for advertisers and how LED perimeter advertising works differently on the cognitive perception of spectators from static.

1.3 Purpose of the Study

The main purpose of this study is to explore the effectiveness of LED perimeter advertising by investigating the cognitive perception of spectators (through recall). The study aims to investigate what factors affect recall of LED perimeter advertising by investigating *target characteristics* of those exposed to LED perimeter advertising, and by investigating *exposure characteristics*. This will be done through two separate studies to provide a full revision of the medium. Apart from identifying and mapping what factors affect recall, the study also aims to advise on how to achieve optimal effect of LED perimeter advertising by looking at ways to increase awareness and recall in a third experimental study.

Target characteristics capture the different features of individuals, and are in this thesis measured through six perimeters; *knowledge, attitude towards the game, satisfaction, involvement, attitude towards perimeter advertising* and *sports interest*. Exposure characteristics defined as the characteristics of the ads are measured on four perimeters; *animation, color, heuristics (level of fit)* and *message clarity*. The thesis consists of three research questions that will be answered through three studies. Each question aims to cover one part of how the new characteristics of LED technology have affected perception and recall. The first two questions aims to define which characteristics affect recall.

- 1) *What factors of target characteristics affect recall of LED perimeter advertising?*
- 2) *What factors of exposure characteristics result in high recall of LED perimeter advertising?*

The third and subordinate research question aims to answer how advertisers can lever with the medium to increase recall.

3) How can advertisers increase recall of LED perimeter advertising?

By combining theories regarding static perimeter advertising and research on cognitive perceptions, this thesis hopes to bridge the gap in sports marketing between technological advances and academic research.

1.4 Intended Knowledge Contribution

The use of LED technology and more adaptable digital display solutions is a well-established phenomenon. The ambition with this study is to start pave the way of academia in a medium that will become the standard in a near future. By investigating the special traits of LED perimeter advertising and connect it to earlier research on static billboards in sport event, this thesis aims to give an updated view of the subject. This research does not only expect to contribute to the world of academia by updating prior studies of static perimeter advertising. It also intends to suggest managerial implications by providing both advertisers and media space retailers with deeper insights into what factor seems to affects spectator recall and how to increase cognitive perception and thus recall.

This thesis aims to fill the knowledge gap in sports marketing between static perimeter board effectiveness and new LED display technology. The same evolution from analog to digital has already been studied in the fields of outdoor- and in-store marketing (e.g. Burke, 2002). Theory suggests that LED perimeter advertising does behave differently than static perimeter advertising and is therefore in need of updated recommendations. The actualization of this subject is further induced by the price increase for advertisers, a supposedly better effectiveness that has not been proven.

1.5 Definitions & Clarifications

The area of research in this thesis includes some definitions and concepts that the reader may not be familiar with. This section provides a few clarifications of the terminology as it has been used in this thesis.

Static perimeter advertising: Advertisement boards displayed in a sport arena along the perimeters of the sports field.

LED perimeter advertising: LED display screens displayed along the perimeter of a sports field to generate moving messages showed along whole sides of fields (see Appendix 1).

Light-emitting diode (LED): Are semiconductor devices that produce visible light when an electrical current is passed through them.

Target characteristics: The special traits of the target for a specific advertisement.

Exposure characteristics: The special traits of the exposure for a specific advertisement.

1.6 Delimitations

This thesis has some delimitations due to restrictions in resources and time. When researching recall of LED perimeter advertising we have chosen to investigate perimeter advertising in football games. This, due to the fact that football is a sport with high national interest and is fairly standardized in time and execution. We have also limited this thesis to investigate recall only for people watching the game TV broadcasted and not at the arena, as this is where the majority of the target group for perimeter advertising is reached. Due to the actuality of the FIFA World Cup 2014 in Brazil we chose to use the qualifying games played in October 2013 as the objective of our studies. In order to use known brands we were limited to use those games where Sweden played as the study was carried out in Sweden. This restricted us to choose games from Sweden's' qualifying group. The timing of the games resulted in a study on Sweden vs. Austria (October the 11th) and Sweden vs. Germany (October the 15th). These limitations mean that our results will primarily be generalizable for football exposure situations, primary in connection to mega sporting events. The data collection was set out to capture how people often consume TV broadcasts of football. Responses were therefore collected both through an online survey that was sent to people who watched the games at home, and as a paper version that was handed out on bars that showed the games. Due to restricted resources no other environments or situations was measured.

1.7 Thesis Outline

This thesis consists of three research questions. Each question intends to be answered by a separate study, performed in a chronological order. The outline of this thesis will follow that order. Thus, it will start with a chapter concerning the relevant theory and generation of the

hypothesis that will help answer the research questions. Thereafter follows a disclosure of the overall methodology used in this thesis. The next chapter presents Study 1 that examines target characteristics. Study 1 is followed by the chapter on Study 2 that identifies the exposure characteristics from the games of study 1. Lastly comes the chapter of Study 3 and the laboratory experiment. Each chapter of the studies contains a presentation of its respective methodology, results and discussion. The thesis is concluded with a chapter dedicated to a general discussion of managerial implications, critique and directions for further research.

2. THEORY AND HYPOTHESIS GENERATION

To answer the research questions regarding what characteristics affects recall of LED perimeter advertising and how advertisers can increase recall, several theoretical fields had to be explored. This chapter will first explain the general theory behind recall, how it is used and what it measures. Next, it will present theories regarding static perimeter advertising and other cognitive theories to complement the new features of LED perimeter advertising, in order to formulate hypothesis to answer the research question.

2.1 Recall

Advertising recall is a widely acknowledged tool to measure explicit memory. Explicit memory measurements reflect conscious recollection of the past. When evaluating direct cognitive impact of advertising as in this thesis, explicit memory testing it to be preferred. Recall tests the effectiveness of advertising by confirming whether or not the information from the ad has been processed into long-term memory. This area has interested researchers in psychology, advertising and marketing since early 20th century (Strong, 1912). While debate concerning the relative merits of memorization measurements continues, the most influential findings have developed as a result of the Advertising Research Foundation's (ARF) 1956 study of Printed Advertising Rating Methods (PARM) (Bagozzi & Silk, 1983). After studying the data from the 1956 article, Lucas (1960) concluded that recall could be considered a highly accurate measure of memory.

Recall can be measured on two levels, *aided* and *unaided recall* (Bovee et al., 1995). Aided recall is where subjects are provided with the name of the company or product and then asked about the ad. Unaided recall, on the other hand, implies that the subjects must identify the ads they remember freely without indications. Unaided recall measures free memorization and often results in lower scores than aided recall (Berkman & Gilson, 1987). Aided recall captures recognition factors, an important outcome that advertisers often seek. It is therefore good to use both measurements when assessing advertising memorization (Lardinoit et al., 2001). Recall as a measure of advertising efficiency has been used in a number of other contexts as well, including print advertisements (cf. Bagozzi & Silk, 1983), television commercials (Schlinger et al., 1983; du Plessis, 1994), outdoor- ads (Donthu et al., 1993) and radio commercials (Anderson, 1985). During the literature research on earlier studies of perimeter advertising effectiveness, the authors of this thesis also found recall to be the most

common approach when measuring the cognitive impact of exposure (e.g. Levin et al., 2001; Braun-LaTour & LaTour, 2004). This thesis measures recall through aided and unaided memorization tasks in order to capture both recognition effects and free recall.

2.2 Captive Setting & Dual-Task Situation

Perimeter advertising is exposed under special conditions, and characterized by figuring in a *captive setting* where spectators' attention is held for a longer period of time. This makes it in theory very attractive for exposing advertising messages to consumers. However, this situation is of high cognitive complexity. Perimeter advertising has to compete for the attention of consumers with a number of stimuli (Turley et al., 2000). Spectators are likely to be a lot more focused on the event than in the advertising stimuli (D'Ydewalle & Tamsin, 1993). Perimeter advertising is thus exposed in a so-called *dual-task situation*, in which the spectators' primary attention focuses on something other than the messages. The game or the sporting event is the first-hand task for consumers and perimeter exposure take the role of secondary-task (Shapiro et al., 1997). As a secondary-task, perimeter advertising will only get viewers attention when the primary-task can be interrupted by the use of color, movement or novelty (Herrmann et al., 2011). In a study by Wright (1981) it was concluded that the emotional circumstances of the spectators could affect how susceptible they are to noticing a secondary tasks. He found that consumers' ability to process a sponsored event is influenced by their motivation, ability and opportunity (Batra & Ray, 1996; MacInnis & Jarowski, 1989). Hence, these factors should also affect their ability to process secondary stimuli. Motivation to process information is often referred to as *involvement* with the information object (e.g. Celsi & Olson, 1988; Petty et al., 1983). Consistent with these theories it is suggested that the perceived involvement during a game will influence the ability to process the event, and thus the perimeter advertising stimuli. Felt involvement with a sponsored event have the attributes of adding both intensity and directional properties to the event in focus (Mitchell, 1991), i.e. the more involved a person is with, say a soccer game, the more intense that persons processing of the game will be. The opposite effect can be expected from uninvolved spectators, who would direct little attention to the event as a whole. As involvement increases, more overall attention is devoted to the event and the embedded stimuli of sponsorship exposure. It is also widely acknowledged that heightened exhilaration and adrenaline also increases peoples perceptive senses, a legacy from early surviving instincts (Finlay, 1982). As LED perimeter advertising has better cognitive prerequisites for interrupting first-hand tasks

than static perimeter advertising, i.e. since it uses color, movement and animation to a much higher extent, this should hold also for recall of LED perimeter advertising. We therefore hypothesize that:

H_{1,1}: People who recall LED perimeter advertising feel more involved with the game

However, a too strong involvement of the first-hand task might have negative impact on the processing of a secondary task, as individuals are less likely to switch focus from the game at hand. It has been found that a strong sports interest, together with a certain perceived importance of an event, negatively influences sponsor recall (Duffy, 1962). Furthermore, the cognitive capacity of humans is limited; when too much information is processed people automatically block out some impressions that are considered less important (Mårtensson, 1997). The fact that LED perimeter advertising has better attributes than static advertising to break in and interrupt the first-hand task might inhibit this effect, however the effect of fan based selective viewing is considered strong (Burnkrant & Sawyer, 1983). Thus, the same effect can be expected for recall of LED perimeter advertising, which leads us to hypothesize that:

H_{1,2}: People who recall LED perimeter advertising will have a lower sports interest

2.3 Credibility & Feelings Transfer

Perimeter advertising has the advantage over classic advertising to be connected to real life events (Flemming & Christensen, 2003). This is perhaps the most important distinction between regular display advertising and perimeter advertising. Whereas outdoor- advertising presents brand in a fictitious setting, perimeter board messages are highly linked to an event and real context, which adds extra credibility. The specific atmosphere in a football match is often one of excitement, close identification with a particular team and perhaps thereby a predisposition to accept influence (Bennet, 1999). A number of empirical studies have suggested that reactions to a stimulus depend crucially on the context in which exposure occurs (eg. Harrison, 1977; Sears et al., 1991). Hence, an advertising message that is shown in general surroundings that evoke pleasant emotions should lead to increased attention and acceptance for the stimulus (Saegert et al., 1973). These theories of emotional transfer should also be relevant for LED perimeter advertising. We therefore hypothesize that:

H_{1,3}: People who recall LED perimeter advertising will have a more positive attitude towards the game

Watching a football match and supporting a team enables fans to affiliate with the team and other fans with which they share perceptions. This can generate positive emotions towards the team and the fan group; its norms and images. A team connected to an advertiser's products through sponsorship stimuli can also affect the attractiveness of that product to the team's followers (Sears et al., 1991). To connect advertising stimuli to a positive and credible environment (a game), with promoters (players) that are appreciated and highly persuasive communicators, should thus affect the outcome. This implies that satisfaction with a particular game and player performance would affect how positive people are to sponsor related messages (Bennet, 1999). A problem with perimeter advertising exposure is the lack of control over the situation and the limited target selection possibilities (Erdogan & Kitchen, 1998). Advertisers cannot control the outcome of the game nor the timing of messages. However, with LED perimeter advertising there is a new opportunity for advertisers to adapt the message and frequency more than before. The attention and acceptance of advertising stimuli is however still dependent on the satisfaction of the connected activity. The hypothesis is therefore:

H_{1,4} People who recall LED perimeter advertising will be more satisfied with the game

In a study conducted 2012 by Novus on account for the Swedish media institution “*Sveriges Annonsörer*”, the Swedish populations' attitude towards advertising was investigated. It was found that the type of advertising that people appreciated the most was sponsorship and exposure in sports events (Sveriges Annonsörer, 2012). They found that sponsorship perimeter advertising is relatively unobtrusive. In difference to other types of advertising, such as TV and radio, perimeter advertising doesn't interrupt people while they are consuming something else. Sponsorship can therefore appear to potential customers as less overtly “commercial” than conventional advertising (Bennet, 1999). For recall of LED perimeter advertising to occur, there first has to be a *process of perception*, i.e. people must first notice the ad. Perception processes occurs in steps of *perceptual attention* and *perceptual thresholds* (Nordfält, 2011). Perceptual attention implies stimuli; in the case of LED perimeter advertising it is the exposure of a message board. This has to catch the attention of the consumer before an impression can be made. Perceptual thresholds refer to the subconscious processes that help consumers to sort among the numerous visual impressions they are exposed to, and to decide which is important. Implying that in order for memorization to occur, it is not just enough for LED perimeter advertising to be exposed to

spectators or processed, it also has to be considered by individuals as an important stimuli. Studies of advertising effectiveness in several areas, including outdoor advertising billboards, has found that attitudes towards the medium itself do affect recall of the ads (Donthu et al., 1993). In order for consumers to be encouraged to look at advertising, they should preferably have an opinion. Consumers are more likely to attend to stimuli that they appreciate (Mehta, 2000). We therefore hypothesize that:

H_{1.5a}: People who recall LED perimeter advertising will have a positive attitude towards perimeter advertising

What separates LED perimeter advertising from static perimeter advertising is foremost the animation possibilities that digital lightning has provided. Redirecting spectators' attention from a first-hand task (a game) to a secondary (perimeter advertising) is done through animation, movement and color (Herrmann et al., 2011). LED perimeter advertising should therefore have better capabilities of interrupting viewers than traditional perimeter advertising. In the report by Sveriges Annonsörer (2012) it was also found that distracting and interfering elements in advertisement is a strong reason to why consumers dislike some types of advertising more than others. In the same way that positive feelings towards a medium can provoke a greater attention to the message, negative feelings has been proven to have a similar effect (Aaker & Bruzzone, 1985). Negative feelings towards a medium suggest that the spectator have been interrupted by the stimuli and thus developed negative emotions. In that case we would expect that people who dislike LED perimeter advertising also have high recall. The connected hypothesis is as follows:

H_{1.5b}: People who recall LED perimeter advertising will also have a negative attitude towards perimeter advertising

2.4 Advertising Fragments

Perimeter advertising offers very limited communication opportunities. In order for messages to be large enough and clear for spectators to notice, very few elements can be included on the boards. This type of communication can be defined as *advertising fragments* (Pham & Vanhueele, 1997). Although the messages are ideal at generating dramatic levels of exposure, the effectiveness of advertising fragments has been questioned (e.g. Welling, 1986; Nebenzahl & Hornik, 1985). The effectiveness of advertising stimuli has however shown to be stronger in some situations. The "extended reactivation hypothesis" refers to the

possibility that fragments who only mention a brand name (e.g. "Marlboro") do not just activate this brand in memory but also make the brand's core associations or meaning (e.g. "masculinity/ruggedness") more accessible (Pham & Vanhuele, 1997). According to the extended reactivation hypothesis, the primary effect of exposure to advertising fragments is not to create new memory traces of this exposure, but to revive existing memory traces and increase the salience of previously learned association. LED perimeter advertising gives advertisers more room to communicate, which indicates better opportunities to educate spectators of new brand characteristics. The question is how strong the communication capabilities of LED technology really are. Due to the theories of extended reactivation, the authors still expect to see an effect of higher recall for brands that consumers know since before. We therefore hypothesize that:

H_{1,6}: Known brands receive higher recall of LED perimeter advertising

Due to the limitations of static perimeter advertising, in terms of space and creativity, communication is made through a very limited copy. LED technology has made it possible to alternate messages and get more information through to spectators. Thanks to the use of rolling messages, more text can be included whilst still keeping it large enough to be visible for cameras. There is however still limits to what LED perimeter advertising can show, and the reduced time each advertiser is given has limited the medium in another way. When designing a LED perimeter advertising message, advertisers face a trade-off between having a clear and readable message and communicating more. If the communication is clear and acute it will be easier for spectators to see and process. Research regarding advertising fragments has shown that the effect of exposure can be low even for known brands, if the message is hard to process by viewers (Keller, 1987). If the message is unclear, hard to read or too long the communication is lost. Designing messages that are cognitively easy to read and decipher therefore seem to affect how well consumers can process advertising fragments. We therefore hypothesize that:

H_{2,1}: Brands with clearly communicated messages are recalled more

2.5 Brand Heuristics & Relatedness

It has been shown that sponsor identification is not driven solely by the strength of the sponsor-event associations in memory. Consumers often seem to infer the sponsor's identity through some constructive processes (Johar & Pham, 1999). These constructive processes are

to a large extent based on the *brand-event relatedness*. I.e. recall of sponsors is not only based on actual recollection, but also on the mere probability of that company being a sponsor. This indicates that the heuristics of a brand can affect the recall of advertisements in a sport context. Research on the *representativeness heuristic* (e.g. Kahneman & Tversky, 1973) indicates that judgments about the probability that an object belongs to a certain population often are based on the similarity between the attributes of the object and salient characteristics of the population (e.g. Glass & Waterman, 1988). This effect was observed in a study of sponsorship recall for the Euro 2000 football competition where “football” related brands such as Nike (sports wear) and Carling (beer) who were not sponsors were identified more frequently than actual sponsors: MasterCard, JVC and Fuji (Johar et al., 2006). The evaluation was often based more on people’s tendency to connect the brand heuristic to the heuristics of the event. In this thesis we expect that the effect of brand-event relatedness will affect recall, and that brands that have a stronger relatedness to the event will have higher remembrance. We therefore hypothesize that:

H_{2.2}: Brands with strong heuristic to the event are recalled more

2.6 Movement & Animation Effects

Cognitive research on movement, color and its visual affect can be applied to explain some of the effects that LED perimeter advertising have on spectators. The visual perception can be divided into two types of vision: *direct vision* and *peripheral vision*. Direct vision is the small part of the total vision field that the eye can actually focus on. The peripheral vision covers the rest of the visual field, where colors and contours are only vaguely perceived. The direct vision is automatically set to react to movement in the peripheral vision field and direct attention to that (Smythies, 1996). The effects of color on recall and recognition have interested researchers and psychologists in all times (e.g. Guilford, 1934; Wilson, 1966). Relevant theories to this study foremost suggest that the effect of color on attention and recall depend on the contrast between the background color and of the text (Fernandez & Rosen, 2000). It is also proven that colors, which are in strong contrasts to the overall environment of exposure, attract more attention and perception, as they are considered more intrusive (Meyers-Levy & Peracchio, 1995).

Little research has been made on movement and color of perimeter advertising, however recent studies in retail and in-store signing has been done (e.g. Johansson, 2010). Studies

showed that moving signs in stores received both higher attention and recall. In the field of colors and their effect on purchase behavior, it has been proven that contrasting colors on signing increases likeliness for consumers to buy that particular product (Woodside & Waddle, 1971). LED perimeter advertising has an advantage over static perimeter advertising since advertisers can add animated features to their messages to better compete with the complex cognitive environment of a football game. One could therefore expect that signs that are perceived as more animated (perceived as higher use of movement and color) will be among the most recalled ads. The hypothesis is therefore that:

H_{2,3}: Brands that use more movement, color (are more animated) are recalled more

2.7 Repetition & Attitude

The relationship between repetition of a message and memorization has been known for a long time. Several studies in sports marketing have looked at the relationship between repetition and recall and shown that the longer spectators are exposed to perimeter boards, the better they recall the brands. Depending on the study, duration of exposure is defined as amount of television viewing of sports events (i.e. Sandler & Shani, 1988), or duration of appearance of perimeter advertising stimuli on television (i.e. Schumann, 1987).

A relationship between repetition and attitude has also been found. A substantial body of empirical literature supports the proposition that the repeated exposure of an individual to a stimulus can affect that person's familiarity with and liking for the stimulus. Researchers have found that the relationship between exposure and liking takes the shape of an inverted U due to *wearing out effects*. Indicating that people respond most positively to exposures in the intermediate frequency region (Berlyne, 1997; Harrison, 1977) and liking decreases after a high number of impressions. The same relationship has also been found in the relationship between repetition and recall. Repeated exposure to a stimulus will at first increase recall but will eventually lead to learning, as the observer starts to expect the message. Once “learning” (i.e. perceptual recognition and recall) has arisen further repetition will result in confirmed expectations as the message is “taken for granted”. The message ceases to be meaningful as it is crowded out by other unexpected and more interesting stimuli (Borstein, 1989).

No present study has yet investigated repetition effects of perimeter advertising. This is natural due to the fact that there hasn't been a repetition aspect of the medium before. Static

perimeter boards of an advertiser has been exposed during the whole duration of a game, where as LED perimeter advertising is displayed on an average of five minutes total in a game. Each exposure sequence (brand) is shown for approximately 20 second at a time and is then replaced with another message. Theories regarding repetition and its affect on recall and attitude indicate that this exposure situation might not be optimal for advertisers. By increasing repetition and showing the same brand repeatedly for a longer period of time, each advertiser can potentially receive higher recall. However, too much repetition can give an opposite affect as wearing out effects might inhibit attention and attitude. It is therefore important to mediate between increasing repetition without inducing wearing out effects. We therefor hypothesizes that:

H_{3,1}: A medium repetition of message will affect recall positively

If at the same time high repetition causes a wearing out effect that in turn affect recall negatively, the following hypothesis should also hold for the use of repetition:

H_{3,2}: A high repetition of message will affect recall negatively

Wearing out effects of high repetition may also affect attitude towards recall negatively. Thus we hypothesize that:

H_{3,3}: High repetition will affect attitudes towards message negatively

2.8 Hypothesis Summary:

Hypothesis:	Variables tested:	Tested in:
H1.1	Target characteristics	Study 1
H1.2		
H1.3		
H1.4		
H1.5a		
H1.5b		
H1.6		
H2.1	Exposure characteristics	Study 2
H2.3		
H2.3		
H3.1	Repetition effects	Study 3
H3.2		
H3.3		

Table 1 - Hypothesis summary

3. METHODOLOGY

This chapter will provide an explanation of the research methods used in this thesis. The chapter goes through the initial work where a topic was identified and then moves on to discuss the scientific approach and the general research design. The chapter ends with a discussion of the reliability and validity of the study.

3.1 Initial Work and Choice of Topic

The inspiration to write about perimeter advertising was given by a strong interest in advertising around mega-sports events and the money invested in sponsoring investments. It became clear to the authors that very little quantitative research had been done lately in this research area, especially regarding the new technology in LED perimeter advertising.

After an extensive research in libraries and databases, the lack of recent quantitative academic studies regarding LED perimeter advertising and its effects as an advertising medium was apparent, and the authors concluded that there was a gap to fill. We discussed the possible choices of topics in the area of interest with associate Professor Patric Andersson from Department of Marketing and Strategy at the Stockholm School of Economics, who confirmed that there was an interest for quantitative research in the chosen field. Since perimeter advertising includes a large scope of different perimeters, we narrowed it down to investigate how target and exposure characteristics affect recall. Further we wanted to investigate whether the recall could be increased.

The experiments performed in this thesis are influenced by previous studies performed on static perimeter advertising (e.g. Pham & Vanhuele, 1997). The use of recall theories and recognition is a well-used measurement in earlier research, increasing the comparability of this study on LED perimeter advertising to earlier research. Thus, these theories were examined in order to get a better understanding of the topic, which helped the authors to define the problem area, research question and the overall aim of the study.

3.2 Scientific Approach and General Research Design

Since the hypotheses are developed based on existing knowledge and theory, and are tested in an authentic environment, this study has adopted a deductive research approach (Bryman & Bell, 2011). The study examined takes on a casual nature as the authors wants to find a cause-

and-effect-relationship between the dependent variable recall and affecting characteristics. By using experiments this could be done in a controlled setting. To test the hypotheses, a quantitative approach was deemed to best suit the purpose of this thesis because the larger the samples of data from individuals are, the more generalizable the results become. The thesis consists of three research questions that examine effect on recall of target characteristics, exposure characteristics and repetition respectively. Each question is to be answered through three different studies.

Study 1 is a so-called field experiment, which implies that the hypotheses are tested in an authentic environment (Malhotra, 2007). This type of research method was used since it would provide us the most realistic setting of how a football game is consumed, and thus the most realistic setting to test how recall is perceived. Study 2 was conducted by using an expert panel that with an objective view have evaluated the exposure characteristics that could affect recall. Lastly, Study 3 is a laboratory experiment conducted to investigate how advertisers can increase recall through the use of repetition, and how attitude is affected by repetition. This study will complement the findings in Study 1 & 2.

Söderlund (2010) makes a discrepancy between a field experiment and a laboratory experiment, where the first occur in a real-life setting whereas the latter are conducted in an artificial setting. Laboratory experiments can therefore be criticized because they relate to artificial situations that have been created by the researcher (Söderlund 2010), and would only provide an indication of whether the results would work in practice or not. Hence, our research will use both designs.

3.3 Data Quality

When conducting research it's of high importance to have an appropriate data quality (Bryman & Bell, 2011). The two most important issues to consider are therefore reliability and validity.

3.3.1 Reliability

Reliability refers to the extent to which a scale produces consistent results, if the same measurement is conducted repeated times (Malhotra, 2007). In quantitative research, this is of particular importance and can be evaluated in terms of *stability over time*, *internal reliability* and *inter observer consistency* (Bryman & Bell, 2011).

Stability over time refers to “how a measure can be considered stable over time” (Bryman & Bell, 2011). This was confirmed in this thesis by testing the questionnaires in all three experiments in pre-studies, as well as collecting data through two different football games on different days (in Study 1), as well as carrying out the laboratory study during two days (in Study 3). In the pre-studies, it was tested and confirmed that respondents understood the questions used in the questionnaire, in the way they were intended to. In Study 1, due to our experimental design of having two different football games indicating a similar effect at different times, we feel certain that the measures and questions are stable over time.

Internal reliability concerns multiple-indicator measures, and refers to whether or not respondents’ answers correlate correctly across various questions (Bryman & Bell, 2011). The more random errors the measures include, the lower the reliability. To increase the reliability of our study, books and articles were reviewed with the intention to find already established questions to use that investigate the variables included in our questionnaires. We found several alternative formulations for the relevant measures, and we chose the ones that suited the purpose of our study best and also were the easiest to understand for the respondents. Since we performed the experiment with a Swedish-speaking sample, we tried to find existing Swedish versions of the questions, and in the cases we couldn’t find any we carefully translated the questions from English to Swedish. By using well established tested multi-item measurements, internal reliability should be very high (Söderlund 2005). To further test the internal reliability, a Chronbach’s alphas accepted over 0.7 were calculated (Malhotra, 2004).

Inter observer consistency refers to such activities as the recoding of observations, or the transition of data into categories. To avoid subjective errors in this phase, one person entered the data and translated it into categories in a spreadsheet. Secondly, the other person double-checked the recoding and made sure that the data were interpreted correctly. Further, the *inter observed consistency* should be considered as high, since 15 individuals participated in Study 2 as an expert panel with the aim to give an objective measure of the exposure characteristics. Consistency and reliability of the characteristics would have been much lower if the authors themselves had judged the exposure characteristics. Hence, we have all reasons to believe that we have high inter observer consistency.

Overall, all possible measures have been taken in order to assure high reliability by the authors in this thesis and overall reliability should to be considered high. The questions and measures used in our research have to a large extent been used in previous research and Chronbach’s alphas have proven the internal reliability. In addition, we have completed pre-tests for all our three studies. The studies have also been performed on two very similar games and used the same brands and LED perimeter advertising messages. The field experiment in Study 1 was carried out at two different games at different days and observed the same effect in terms of recall, showing consistency over time between the reliability of the measures.

3.3.2 Validity

Validity can be divided into internal validity and external validity. Internal validity aims to explain whether the observed effects on consumers’ responses are caused by the independent variables rather than by external factors (Bryman & Bell, 2011). External validity, on the other hand, aims to explain whether the results of an experiment can be further generalized (Söderlund, 2005; Malhotra & Birks, 2007).

In order to ensure high *internal validity*, it’s important to minimize the influence of the external factors during an experiment (Bryman & Bell, 2011). In this thesis we have aimed to assure high internal validity in our results, especially in Study 3. The high internal validity in this study came from the fact that it was performed in a controlled setting where we could give the exact same information in advance to all respondents. In addition, Study 3 was carried out during two following days at Stockholm School of Economics as well as at KTH Royal Institute of Technology. In all three studies the questionnaires were kept as short as possible, which further increases the internal validity since longer surveys tend to result in more indifferent answer alternatives from respondents (Malhotra & Birks, 2007). In addition, all respondents were in each study chosen randomly to further increase the internal validity.

External validity “refers to whether the cause-and-effect relationship found in the experiment can be generalized beyond the experiment situation” (Malhotra & Birks, 2007). The external validity in Study 1 is deemed high since the study was carried out as a field experiment. Furthermore, a large sample was acquired in Study 1, with a total of 233 respondents ranging from 18-61 years of age, and with a gender distribution of 71.7% male and 26.6% female. The sample size (in particular female respondents) as well as the geographical spread of the

respondents could be extended to ensure an even higher external validity. This was however hard to avoid due to a skewed population (more men were present at the data collection sites).

Given the discussion above, and the fact that the results in this thesis have been generated through both a field experiment, conducted both online and in real life, as well as a laboratory experiment, the overall reliability and validity of the thesis should be satisfactory and appropriate.

4. Study 1 – Field Experiment

This chapter explains all parts directly related to the field experiment: “Study 1”. The chapter starts with a presentation of the research design, method of the study including pre-study and the selection of variables and questionnaire used. The chapter ends with a discussion regarding the results and how they relate to the thesis’ purpose and hypotheses.

4.1 Experiment Design Study 1

To be able to measure individual’s recall from perimeter advertising in the most appropriate way, the authors found it necessary to carry out the study in an authentic environment of how a football game is consumed. It was therefore decided up on early in the process that the study should be carried out as a field experiment.

The research design was to capture people watching a whole, televised football game. Respondents should be collected both at home and in a social setting (bar), in order to research the most common ways of consuming sports and football. After individuals had watched a whole football game for 90 minutes in the natural setting, they were followed up immediately after the game by a survey. By letting the respondents answer the survey immediately, we limited possible time-lapse errors that could occur otherwise and mislead the research results (Sundman & Bradburn, 1973; Mathioweti, 1988).

The dependent factor of investigation in this thesis is spectator recall. Recall was measured on two different levels – *Aided recall* and *Unaided recall*. The two types of recalled were gathered through alternation of the recall question. Half of the respondents were given a survey with an aided recall task, and the second group was given survey with an unaided recall task. Apart from that question the rest of the surveys were identical. The aided and unaided surveys were in turn distributed between online responses and bar responses. The same procedure was performed for two games, resulting in the total response sample used in the analysis of Study 1. The total valid response sample consisted of 233 individuals, game 1 consisted of 141 respondents; 78 aided recall and 63 unaided recall. Game 2 consisted of 92 respondents; 44 aided recall and 48 unaided recall. The distribution between bar and online was approximately equal in both games for aided and aided recall.

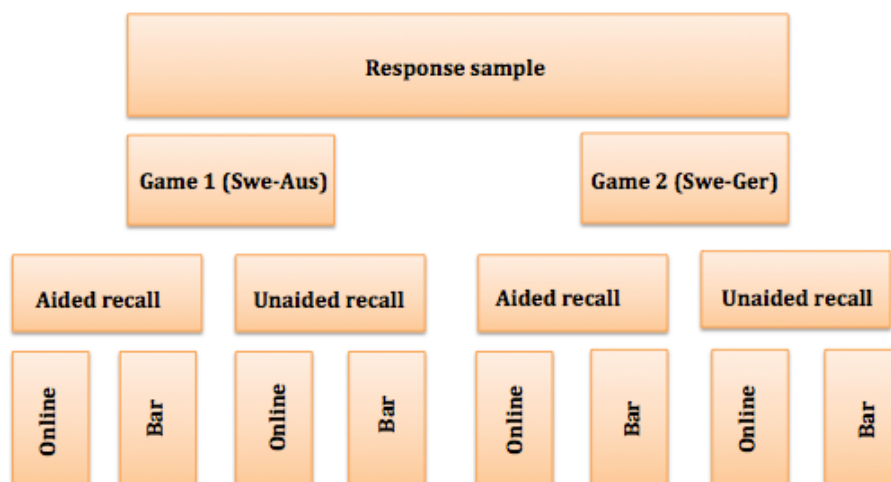


Figure 1. Response sample

4.2 Preparatory Work

Before executing Study 1, the following preparatory work was done in order to answer the first research question: *What factors of target characteristics affect recall of LED perimeter advertising?*. This was carried out in five steps: (i) selection of sport, (ii) selection of sample location, (iii) selection of games, (iv) establishing relationship with partners O’Leary’s, (v) pre-study

4.2.1 Selection of Sport - Football

One of the main reasons that football was used as the appropriate sport for the study was the ease of measuring perimeter advertising. Other sports were discussed as well, but since a football game comparably to e.g. tennis has an almost fixed game time with little differences in the length of the perimeter advertisements, football were the most appropriate sport for our study when measuring recall (Josefin Rydhede, Interview, 5 October 2012). Another reason for choosing football was the large national interest of the sport and actuality of the qualification games for FIFA world cup in Brazil 2014.

4.2.2 Selection of Location – Sports Bars and Online

An important factor of our study was to test recall in a natural setting, which is primarily in front of a TV screen. To get the best responses we therefore decided to distribute our survey both online, to individuals watching the game at home, as well as in a real life setting at sports bars or at an event. The authors were well aware of the risk included in this design² that could

² Consumption of alcohol, crowded and noisy places, time of the played game, outcome of the game.

affect the responses due to credibility of the response and the memory of recall. This design however was chosen since it proves a much higher external validity than a study performed as a laboratory experiment.

4.2.3 Selection of Games

The selected games for this study were chosen due to the high public interest of the games. This assured that we would get a substantial population to draw a sample from that would be large enough for the analysis. Since there was a time frame as well, we chose to carry out the study at the two qualifying games played in Sweden for the World Cup tournament in 2014. Both games were played at the Swedish National Arena, Friends Arena, in Stockholm at the 15th of October and the 19th of October. These two games were chosen since they're played on the same arena, using the exact same perimeter LED system and same type of TV-production.

4.2.4 Establishing Relationship with O'Leary's

We also reached out to O'Leary's to create a partnership with them in order to obtain permission to conduct our first survey at one of their sports bars, and also to raise cooperation with their staff. We had a meeting with Edward Lundberg, one of the owners at O'Leary's Norrtull in Stockholm, who agreed to let us distribute our survey for the first game there. He also enlightened us about, and confirmed, our beliefs regarding a crowded night with a mixed group of visitors that could be hard to connect to after having dinner and some glasses of alcohol. At the same time, he also ensured us that we would have the opportunity to approach from 300-600 persons during the evening, which was the number of bookings for that specific night. He confirmed that conducting the field study at O'Leary's Norrtull would give us the highest possible response rate with a broad sample of the population, but also warned us for a hectic night since the game was of huge importance for Sweden's survival in the tournament. He also mentioned that if we were to conduct our field experiment at a bar in a more suburban area, we might obtain skewed data, as the respondents may not be as diverse.

4.2.5 Pre-Study - Testing the Questionnaire

Before launching our main questionnaire we began with a pre-study. It is according to Bryman & Bell (2011) necessary to pre-test the questionnaire on a small sample before using it in the field in order to ensure that the questionnaire is of high quality and not unclear on any points. Our purpose of testing the survey was to ensure the quality and understandability of the questions and statements. We let 10 persons take the survey and evaluated their responses afterwards. This helped us to identify parts and questions where misinterpretations as well as

misspelling were made. We got valuable feedback and could make some minor changes and corrections. This achieved a higher quality of the survey as well as a better flow. After testing the survey we also had a meeting with our tutor, professor Patric Andersson, as well as professor Magnus Söderlund to correct some statements and formulations of the questions. The questionnaire was designed to ask structured, dichotomous and scale questions as recommended by Malhotra and Birks (2007). These types of questions are frequently used in quantitative studies since they simplify the analysis of the data (Bryman & Bell, 2011). The questions were taken from previous research whenever possible in order to increase the reliability of the answers and facilitate comparison between ours and other studies. To determine a clear direction of the questionnaire, responses were evaluated on a Likert scale ranging from 1 to 7 with numerically equal distances and bounded at each end by one of two bipolar adjectives (Esaiasson, Gilljam, Oscarsson & Wängnerud, 2002; Malhotra, 2004). The range of 1-7 was chosen in order to give the participants a decent range of degrees to choose from as well as the alternative of staying neutral (4). A scale with a neutral alternative was chosen, as it was important that the highest scoring statement scored higher than neutral. As recommended by Söderlund (2005), the low value in the interval scale (1) was placed to the left end and represented a low degree e.g. “I do not agree at all”, and the high value (7) was placed to the right end and represented a high degree e.g. “I completely agree”. Some variables were measured using multi-item scales in order to achieve a high internal consistency and thereby increase the reliability (Söderlund, 2005).

By using the same range 1-7 for most of our statements, it allowed us to do easy comparisons between the results of the different statements. The respondents were exposed to six different blocks regarding our target characteristics; *Knowledge, attitude towards the game, satisfaction, involvement, attitude towards perimeter advertising and sports interest*,

Our initial thought was to use the first game between Sweden and Austria as a pilot study. However, the results were of great quality and in line with the results of the responses of the second game, so after discussing it with Patric Andersson and Magnus Söderlund we decided to let the pilot study become a part of Study 1 instead.

4.3 Field Experiment

In order to answer our first research question, a total of eight groups were examined in a field experiment carried out both at O’Learys Norrtull and at a football event hosted by the Sports Committee at Stockholm School of Economics as well as online by using the Qualtrics Survey Software. The online respondents for the first game were sent a link on Facebook in the final minutes of the game that led them to the survey. The online survey for the second game was distributed in a similar way. The only exception was that the online survey was sent out by email with randomly assigned individual links at the end of the game to a list of Swedish football fans. The same link was sent to all respondents for each game, and a randomization feature in Qualtrics was used to assign each respondent to one of the two online surveys (aided and unaided). This was done in order to ensure that the sample was as random as possible and to avoid any possible biases. At the sports bar, two different questionnaires (aided and unaided) were handed out randomly as customers entered the bar prior to watching the game. Every respondent was given the same information on the first page on the survey. People were also asked not to open the survey until after the game to secure the validity of the answers in the survey. At the second game, we handed out the survey towards the end of the game instead. This to increase the validity of the study and to minimize the risk that people would look at the survey while watching the game, thus been notified that questions regarding the LED perimeter advertising would be asked. This could have redirected their attention and given an unnaturally high recall score.

As an incentive to participate in the study, the respondents were notified that if they completed the survey they had a chance to win a lottery ticket (Trisslott) as long as they entered their email address in the end of the survey.

For the online survey, all questions were marked as mandatory in order to minimize the amount of incomplete surveys. This was however nothing we could ensure for the surveys at the sports bar or the school event. The results from Qualtrics were then transferred to Microsoft Excel and the statistical analysis computer program SPSS in order to analyze the data.

4.3.1 Quantitative Data Sampling

To obtain generalizable results we needed to collect a sample size of a minimum of 30 respondents (Bryman & Bell 2010). A total of 288 respondents answered the survey and 233

of the responses were deemed of satisfactory quality. The amount of responses in aided vs. unaided ranged from 78 aided and 63 unaided in game one and 44 aided and 48 unaided in game two. The responses that were excluded were either only partially filled in, didn't have any variation at all in all the answers or were unserious. The unserious answers were easy to sort out in the open-end questions where some people had written very unserious answers. The slight skewness in the response rate was due to the fact that some people just didn't turn in their survey after the games.

When analyzing the results in our field experiment, we combined the aided and unaided online results with the real life setting results. This gave us only two groups from each game; one aided sample and one unaided sample. First we treated the two different games as separate, but after analyzing them we saw that they with benefit could be merged together and analyzed as one. There were little to no difference between the games, both in terms of how the respondents answered and their demographics. The gender distribution of the total sample consisted of 167 male respondents (71.7%) and 62 female respondents (26.6%). This implies that 1.7% chose to not declare their gender. The ages ranged from 18-61 years with a mean age of 27 years. The even distribution in age and gender between the games and aided vs. unaided groups gives us reason to believe that combining the samples will provide a better sample for the analysis.

The fact that these games were chosen was due to the similarities of them. Both games were played in the qualifying tournament to the FIFA World Cup. Both games took place at the same arena on somewhat similar premises. The outcome of the games resulted in one game where Sweden won (game 1) and another where Sweden lost (game 2). By combining the results of both these games the result will be more diversified and capture more feelings and circumstances. This makes the data sample more reliable and tests for several variances in the characteristics measured.

4.4 Questionnaire

In the first game respondents who got the unaided survey at the bar were asked to answer 25 questions, and the ones who got the aided survey were asked to answer 26 questions, printed on a double sided, single page questionnaire.

The two different questionnaires, aided and unaided, was equipped with exactly the same questions regarding the target characteristics. The only difference occurs when respondents were asked to recall the perimeter advertising in the game. The unaided survey had an open-ended question where the respondents were asked to state all brands they recalled during the game. The aided survey, however, had a multiple-choice question with 12 possible answers. Six of these were actual advertisers during the game and the other six were false advertisers in order to test their recognition. The aided survey also included one additional question that was not possible to include to the unaided group. It showed the exact same 12 multiple-choice answers, but instead the respondents were asked: “*Which of the following brands do you know/are familiar with?*” This was to test whether respondents had easier to recall known brands than unknown brands. For natural reasons this question had to be excluded in the paper version of the unaided questionnaire, since the brands named as multiple choices would have been seen as hints and thus could have helped the respondent to score recall points. This problem was solved in the online survey by delimiting the option to back between questions. In the end of the survey, demographic questions were included as well (see Appendix 2 for the complete questionnaire).

The survey started with a small quiz about the game to try to maximize the number of respondents in the field experiment. We tried to keep the survey as short as possible to minimize respondent tiredness (Söderlund, 2005). But since our survey was pretty long, we hoped to attain more responses if we caught their attention in the beginning with a “fun” quiz. This was observed to be important in both our pre-study and at the first game, since a football audience often wants to socialize with their friends or leave the bar soon after the game is over. Further, as the game was TV broadcasted in Sweden and the survey was carried out to a Swedish audience, the questionnaire was created in Swedish to both simplify the understanding and to increase the reliability in the answers. The same structure and design of the survey was used as described in our pre-study.

To investigate how the target characteristics affect recall, the questionnaire had the following six sections: (i) knowledge, (ii) attitude towards the game, (iii) satisfaction, (iv) involvement, (v) attitude towards perimeter advertising and (vi) sports interest. To gain consistency in the survey, most of our questions were answered on a 1-7 point Likert scale with numerically equal distances (Söderlund, 2005).

(i) Knowledge

This section was measured by three open ended questions, suggested by our tutor Professor Patric Andersson:

1. “What team scored the first goal, and who was the scorer?”
2. “What was the score at half time?”
3. “What team had the highest ball possession in the game?”

In this section the respondents had to answer a quiz regarding the game, and this section were mainly included to catch the respondents’ interest in the survey. A “knowledge score” was made where respondents got 0-4 points based on each right answer on these four questions. By having a quiz in the beginning, we hoped to get people more interested in the survey as well as testing if they had actually watched the game. We also included a multiple choice question, testing if the respondents knew what other teams were included in Sweden’s qualifying group. For each right answer the respondent scored one point; maximum point was therefore 4. This section was not included in the analysis regarding target characteristics, but only used to assure that respondents had watched the game and to get a good introduction to the survey.

(ii) Attitude towards the game

This section was measured by four questions regarding the respondents’ attitude towards the specific game. To measure attitude of the game existing theory was used and the questions were collected from an earlier research by Magnus Söderlund. The respondents were asked to answer what they thought of the game on a 1-7 point Likert scale by reflecting on how they thought that the game was: “*Very bad/Very good*”, “*Very boring/Very exciting*”, “*Very unfair/Very fair*” and “*Not at all entertaining/Very entertaining*”.

(iii) Satisfaction

Questions regarding level of satisfaction with the game were primarily gathered from theories that measure product satisfaction by Westbrook (1980). The questions intended to measure how satisfied the respondent was with the *play* of the game as well as the *result* of the game. They also had to answer to what extent the *play* of the game and the *result* of the game met their expectations. Respondents answered the questions on a Likert scale ranging from 1-7 with bipolar labels “*Very dissatisfied/Very satisfied*” and “*Not at all/Completely*”. An index of attitude was created with a Chronbach’s alpha of 0.75.

(iv) Involvement

We used three questions to measure involvement and the level of excitement the respondent experienced:

1. *“How sad or happy do you feel right now?”*
2. *“How excited or calm do you feel right now?”*
3. *“How involved are you feeling right now?”*

These questions were answered on a Likert scale as well. The involvement questions were taken from well-established theories on how to measure level of involvement and participation, from the research by Zaichowsky (1985).

(v) Attitude towards perimeter advertising

In this section, three questions were asked about the respondents' impression of LED perimeter advertising and their attitude towards the medium. The questions intended to investigate their general opinion and their particulate impression from that game. The questions were:

1. *What is your overall feeling regarding perimeter advertising?*
2. *What is your attitude towards the perimeter advertising in this particular game?*
3. *To what extent do you feel that perimeter advertising disturbs or fits in on the stadium?*

All three questions were answered through a 1-7 point Likert scale. Question number 1 was ranging from *“Very bad/Very good”*. Question number 2 ranged from *“Very negative/Very positive”* and question number 3 ranged from *“Very disturbing/Fits in very good”*.

Since these questions were particular for this study, no existing scales could be found. We therefore conducted the statements together with our tutor, Professor Patric Andersson. An index of attitude towards perimeter advertising was created with a Chronbach's alpha of 0.86.

An additional set of questions was asked in this section regarding how respondents perceive LED perimeter advertising. These questions did not intend to be included in the analysis, but serve as a way to understand more about to what extent and when LED perimeter advertising is seen. The questions compliment the recall test somewhat by giving the subjective view of how well respondents noticed the ads. The first questions was stated as: *“Did you notice the*

perimeter advertising during the game?” measured on a 1-7 Likert scale ranging from “No, definitely not” to “Yes, absolutely”. The second question was; “*At what time during the game did you notice the perimeter advertising?”* This question had five multiple choice answers; *Never, during first period, during goals or set piece, during reruns and during second period.* Respondents could also choose to write in an open-ended answer box if they felt that none of the given answers was suiting.

(vi) Sports interest

The last section included one question: “*I think football is:*” with four different statements. Each statement was answered on a 1-7 point Likert scale, depending on to which degree the statement fitted in. The four statements were: “*Very unimportant/Very important*”, “*Means very little to me/Means very much to me*”, “*Very uninteresting/Very interesting*” and “*Very boring/very captivating*”. The questions were adapted from theories on measuring sports interest by Funk, D.C. et al. (2001). An index of interest was created with a Chronbach’s alpha of 0.88.

4.5 Measures Chosen for Hypothesis Testing - Recall

We measured aided recall by asking: “*Which of the following companies do you remember being displayed on the perimeter advertising during the game?”* A similar question was asked to measure unaided recall: “*Do you remember any of the companies that were displayed on the perimeter advertising during tonight’s game?”*

In the aided recall survey the respondents were given 12 multiple choices of brands. Six of them that were true and six alternatives that was false. The false brands were included to ensure that respondents just didn’t tick all boxes without reflecting about what they’ve actually had seen. In the unaided recall survey this was just an open-end question, and did not provide any prompting of brands. At the second game we included a question in the aided recall survey, “*Other companies I remember*”, to be fair to the respondents if they had recalled other then the six brands that we were suggesting. The brands showing as multiple choices was chosen together with ISP Sports & Marketing, which provided us with information of what brands that would be advertising during the two games. We used both well-known brands and less-known brands as multiple choices since we wanted to test if that could make any affect on recall. The “false” brands chosen was provided by ISP and based on

of if they had invested in LED perimeter advertising before. This ensured that the brands would be credible in that setting, and provided a similar setting that earlier research on static perimeter advertising had used (Johar & Pham, 1999).

4.6 Analytical Tool

After collecting the answers, we transported the online studies and manually entered the paper studied into the statistical computer program SPSS. At the same time, we performed the above mentioned quality check to ensure that we had the requested level of the responses and excluded the inadequate answers from the analysis.

- For hypothesis H1.1 – H1.4 we used independent sample T-tests and accepted p-values ($p < 0.10$) on a significance level of 10%.
- For hypothesis H1.5a and H1.5b we investigated group differences by using a ANOVA test and accepted p-values ($p < 0.05$) on a significance level of 5%.
- For hypothesis H1.6 excel was used to analyze and compare the data

4.7 Result & Analysis Study 1

The purpose of Study 1 was to answer the first research question “*What factors of target characteristics affect recall of LED perimeter advertising?*” This section will first present the result of the overall study, then the result of each hypothesis.

4.7.1 Analysis Method

The first striking result from Study 1 was the clear division of the sample on the depended variable recall. A total 102 respondents, representing 43.8% of the total sample, showed no cognitive process of the LED advertisements and had no recollection. The other half of the sample recalled from 1-7 ads. The sample consisted of 233 valid respondents, (71.7%) men and 62 (26.6%) women. The distribution between aided recall and unaided recall showed as expected higher scores for aided recall. The distribution between aided and unaided recall was deemed similar and thus appropriate to analyze both measurements together (Magnus Söderlund, Interview, 24 October 2013).

Correct recalls	Number of aided recall	Number of unaided recall	Total number of respondents	Percent	Cumulative percent
0	42	60	102	43.8	43.8
1	27	27	54	23.2	67.0
2	37	9	46	19.7	86.7
3	10	5	15	6.4	93.1
4	5	6	11	4.7	97.9
5	1	2	3	1.3	99.1
7	0	2	2	0.9	100.0
Total			233	100.0	

Table 2 – Distribution of recall

To test the theories regarding recall and target characteristics, the sample was divided into two groups based on their cognitive perception. All respondents who had a recall score of 0 was classified into group 1 (No recall), the control group, and all respondents who had recalled 1 or more ads was grouped into group 2 (Recall), the manipulated group. The two groups were found to be equal in distribution of both size and demographics. The analysis for Study 1 was therefore performed with independent t-tests comparing the means for group 1, No recall and group 2 Recall to detect differences in target characteristics. The mean value of recall for group 2 was 2.02 ads.

Group recalls		Frequency	Percent	Cumulative percent
1. “No recall” (recall=0)	Male	72	70.6	72.7
	Female	27	26.5	100.0
	Missing	3	2.9	
Total		102	100.0	
2. “Recall” (recall≥1)	Male	95	72.5	73.1
	Female	36	26.7	100.0
	Missing	1	0.8	
Total		131	100.0	

Table 3 – Demographic distribution of recall groups

4.7.2 Captive Setting & Dual-Task Situation

H1.1 states that involvement for group 2 who notice LED perimeter advertising should be higher than involvement for the control group 1. Involvement and emotional excitement was

measured on a question on self-experienced involvement. The mean difference between the groups “no recall” (M=4.67) and “recall” (M=5.20) was 0.53. Based on a t-test H1.1 was accepted on a 1% level of significance. Thus, the analysis reveals that people who notice LED perimeter advertising have a higher experienced involvement than those that did not.

	No recall (Recall=0)	Recall (Recall>1)		
	Mean	Mean	Mean difference	P-value
<i>How involved are you feeling?</i>	4.67	5.20	0.53	0.00***

***p<0.01, **p<0.05, *p<0.1

Table 4

H1.2 states that strong sport interests for group 2, who noticed LED perimeter advertising, should be lower than that for the control group 1. Sport interest was measured through a statement with four perimeters (Q1: *Very unimportant/Very important*”, Q2: *Means very little to me/Means very much to me*”, Q3: *Very uninteresting/Very interesting*”, Q4: *Very boring/Very captivating*”). A reliability test was performed to test if the questions could be analyzed as an index. The Chronbach’s alpha was 0.88, which is a satisfactory measurement (0.88>0.7). The mean difference between the groups “no recall” (M=5.61) and “recall” (M=5.25) was 0.37. Based on a t-test H1.2 was accepted on a 1% level of significance. Thus, the analysis reveals that people who noticed LED perimeter advertising have a lower self-perceived interest in football as a sport than those who didn’t notice the advertising during the game.

	No recall (Recall=0)	Recall (Recall>1)		
	Mean	Mean	Mean difference	P-value
<i>Index: Interested in the sport football?</i>	5.61	5.25	0.37	0.01**

***p<0.01, **p<0.05, *p<0.1

Table 5

4.7.3 Credibility & Feelings Transfer

H1.3 states that a positive attitude towards the game for group 2 who notice LED perimeter advertising should be higher than that for the control group 1. Positive attitude towards the game was measured on four questions on attitude that was assembled to an index over attitude

towards game. The reliability analysis resulted in a Chronbach’s alpha of 0.82, which is a satisfactory measurement ($0.82 > 0.7$). The mean difference between the groups “no recall” ($M=4.69$) and “recall” ($M=5.15$) was 0.13. Based on a t-test H1.3 was rejected on a 10% level of significance. The analysis fails to prove that people who notice LED perimeter advertising in general have a more positive attitude towards the game.

	No recall (Recall=0)	Recall (Recall>1)		
	Mean	Mean	Mean difference	P-value
<i>Index: Attitude towards the game</i>	4,69	4,82	0,13	0,634

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6

H1.4 states that satisfaction with the game for group 2 who notice LED perimeter advertising should be higher than satisfaction for control group 1. Satisfaction with the game was measured on three questions on attitude. Reliability test to assemble questions on satisfaction to a common index revealed a Chronbach’s alpha of 0.62. Since ($0.62 < 0.7$) the questions were analyzed individually instead of through an index. On Q1: “*Satisfaction with the play in the game*” the mean difference between the group 1 ($M=3.24$) and group 2 ($M=3.70$) was 0.56. It was accepted on a 1% level of significance. Q2: “*Satisfaction with the result of the game*”, the mean difference between group 1 ($M=5.44$) and group 2 ($M=5.86$) was 0.42 and accepted on a 5% level of significance. However, the results on Q3: “*How the play in the game met expectations*” and Q4: “*How the result in the game met expectations*” was not supported. Mean difference in Q3 between group 1 ($M=4.39$) and group 2 ($M=4.69$) was 0.12, and the mean difference in Q4 between group 1 ($M=5.22$) and group 2 ($M=5.53$). The analysis thus reveals that people who notice LED perimeter advertising in general is more satisfied with the game, but not in regard to how the game met their expectations and the hypothesis is only partially supported.

	No recall (Recall=0) Mean	Recall (Recall>1) Mean	Mean difference	P-value
<i>Q1:Satisfaction with the play in the game?</i>	3.24	3.79	0.56	0.04**
<i>Q2:Satisfaction with the result of the game?</i>	5.44	5.86	0.42	0.04**
<i>Q3:How did the play in the game meet your expectations?</i>	4.39	4.69	0.12	0.30
<i>Q3:How did the result in the game meet your expectations?</i>	5.22	5.53	0.09	0.31

***p<0.01, **p<0.05, *p<0.1

Table 7

H1.5a states that those who have positive attitudes towards LED perimeter advertising should be more inclined to notice and remember the advertising. At the same time H1.5b states that those who express a negative attitude towards LED perimeter as a medium would also be more inclined to remember the advertising. Attitudes towards perimeter advertising was measured on three questions, reliability analysis gave a Chronbach's alpha of 0.84, which is a satisfactory measurement of relatedness between the questions (0.84>0.7).

In order to investigate the two hypothesized H1.5a and H1.5b, a distinction has to be made within the variable of what should be considered as positive and negative attitudes in order to compare these. The questions were posed as a Likert scale (1-7) where 4 = indifferent and 1-3= negative opinion and 5-7 = positive opinions. Distribution within the index showed a large group that was indifferent to their attitude towards LED perimeter advertisement and two equally large groups on either side. The sample was divided into three groups based on the question. Group 1 who expressed a negative attitude (M=1.00 – 3.67), group 2 who were indifferent (M=4) and group 3 who expressed a positive attitude (4.33 – 6.67).

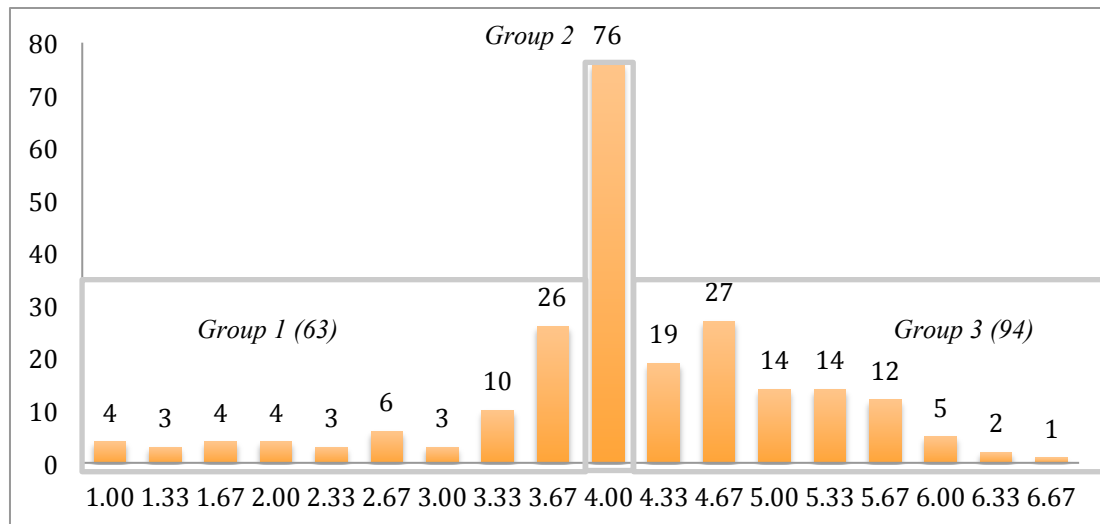


Figure 2 - Response distribution of index over attitudes towards LED perimeter advertising

A one-way ANOVA over the dependent variable recall for the three groups of attitude was performed. It showed significant differences over the groups ($F_{2,230}=6.31$; $p=0,00$). The recollection of the group that was indifferent towards LED perimeter advertising was significantly lower than both of the negative and positive groups. A post-hoc test using Fisher’s Least Significant Difference (LSD) was run that revealed a statistically significant difference between the neutral group and the other two ($t_{139}=-0.572$; $p=0.012$), thus providing empirical support for hypothesis H1.5a and hypothesis H1.5b.

	Group 1 (Negative)	Group 2 (Neutral)	Group 3 (Positive)	F	P-value
Index: Attitude towards perimeter advertising	1.27 (1.47)	0.70 (0.95)	1.39 (1.46)	6.307	0.00**

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 8

4.7.4 Advertising Fragments

Hypothesis H.1.6 predicts that recollection for known brands will be higher than for brands that the respondent has no prior knowledge of. To test this the authors have examined aided recall points and compared these to questions regarding previous knowledge of the brands. The same 12 alternatives (six correct and six false) for brands that people were given in the recall question were also included in the question, asking respondents which brand they knew since before. The comparison was thus made between the question on aided recall: “Which of the following companies do you remember being displayed on the perimeter advertising during the game?” and the question on previous brand knowledge “Which of the following

brands do you know/are familiar with?” The comparison was made for each game separately since they were different in reference to brands displayed.

When looking at the distribution between recalled companies and known companies both effects on general recall and familiarity were examined, as well as effects in individuals’ recall and familiarity. The effects on general recall and familiarity will provide insight regarding if the same brands that are well known are also those that are recalled the most. The effects on recall for each individual will show if individuals in turn remember the same brands, as they are familiar with.

Table 9 and table 10 below, show the general distribution over the six correct brands in the aided recall question for game 1 and game 2 respectively. The tables also show the number of respondents that had previous knowledge of each brand and how many percent of the whole sample this represents. Included is also data for total number of respondents that recalled each brand, and how many percent of the total number of responses this represents. The brands have been assigned a rank order where the most known ones receive the highest rank (1). A rank order has also been assigned to the brands based on most recalled in order to compare the two variables.

Brand	Known	Percent of total known	Rank known	Recalled	Percent of total recalled	Rank recalled
Adidas	77	97%	1	15	19%	3
Svenska Spel	75	95%	2	32	41%	1
Sportbladet	72	91%	3	32	41%	1
InkClub	65	82%	4	20	25%	2
Björnkälder	48	61%	5	7	9%	5
Verisure	15	19%	6	4	5%	4

Table 9 – General distributions in game 1 (Sweden – Austria)

Brand	Known	Percent known	Rank known	Recalled	Percent recalled	Rank recalled
Adidas	41	91%	1	5	11%	3
ICA	41	91%	1	4	9%	4
Svenska Spel	26	58%	2	11	24%	1
Sportbladet	25	56%	3	8	18%	2
Malmö Aviation	23	51%	4	1	2%	6
Björnkälder	18	40%	5	2	4%	5

Table 10 – General distributions in game 2 (Sweden – Germany)

Results show that there is little consensus between the rank of known brands and the rank for most recalled brands for any of the games. We can therefore not conclude that known brands automatically would be recalled more easily. Explanations to why some brands are recalled to a higher extent are more likely explained by each brands exposure characteristics than on how known they are (as examined in Study 2).

Table 11 and table 12 below, show the individual distribution over the six correct brands in the aided recall question for game 1 and game 2 respectively. Two types of recollection situations regarding recall and previous knowledge were identified. Individuals could both state that they recalled a brand and also state the brand as previously known. They could also state that they recalled a brand but did not have any previous knowledge of it. The table below illustrates the number of individuals who stated that they both recalled and knew the brand, and the number of individuals who stated that they recalled the brand but had no previous knowledge of it.

Brand	Recalled & previously known	Recalled & previously unknown	Total number of respondents
Adidas	32	0	32
ICA	32	0	32
Svenska Spel	18	2	20
Sportbladet	15	0	15
Malmö Aviation	3	4	7
Björnkälder	3	1	4
	103 (94%)	7 (6%)	110

Table 11 – Individual distributions in game 1 (Sweden – Austria)

Brand	Recalled & previously known	Recalled & previously unknown	Total number of respondents
Adidas	11	0	11
ICA	8	0	8
Svenska Spel	3	2	5
Sportbladet	4	0	4
Malmö Aviation	1	1	2
Björnkälder	0	1	1
	27 (87%)	4 (13%)	31

Table 12 – Individual distributions in game 2 (Sweden – Germany)

Table 11 and 12 show that individuals are much more inclined to recall brands that they are previously familiar with. The number of respondents that recalled previously known brands

was over-represented both in game 1 (94%) and game 2 (87%). This indicates that the hypothesis is supported regarding individuals’ inclination to recall known brands to a larger extent than unknown brands. Thus, the effect of the extended reactivation hypothesis (Pham & Vanhuele, 1997) on individuals is also applicable to LED perimeter advertising.

4.7.5 Hypothesis Summary

Hypothesis	Factor	Result
H1.1	Involvement	Supported
H1.2	Sport interest	Supported
H1.3	Attitude towards game	Not supported
H1.4	Satisfaction	Partially supported
H1.5a	Attitude towards perimeter advertising	Supported
H1.5b	Attitude towards perimeter advertising	Supported
H1.6	Knowledge of brands	Partially supported

Table 13 – Over hypothesis summation study 1

4.8 Discussion Study 1

Study 1 set out to examine the effects of target characteristics on recall of LED perimeter advertising. Theory regarding factors that have been proven to affect recall of static perimeter advertising have been tested on LED perimeter advertising. The variables tested regarded: *involvement, sport interest, attitude towards game, satisfaction, attitude towards LED perimeter advertising* and *knowledge of brands*. The analysis was made by comparing group 1 that had no cognitive perception of LED perimeter advertising with group 2 who had, in order to examine what characteristics were significantly different.

The first hypothesis H1.1, concerning the involvement with the game, shows very clearly that those who recalled LED perimeter advertising were also more involved with the game. Theories regarding the dual-task setting of perimeter advertising state, that in order for recall to occur, the first-hand task needs to be interrupted (Shapiro et al. 1997). Involvement has proven to heighten the attention of viewers and also make them more inclined to perceive second-hand stimuli. This has proven to be the case also in LED perimeter advertising. The

strong significance of this test can be due to the better abilities of LED to break through a first-hand task (Herrmann et al., 2011). Involvement with a game has been shown in this study to be of big importance. This is something advertisers should bare in mind when considering the target groups for LED perimeter advertising. This conclusion is however complicated by the results in H1.2. It was confirmed that, for this study, a strong sports interest among respondents resulted in low recollection of LED perimeter advertising. This implies that a high involvement target group is favorable, but can potentially be negatively affected if they also possess a strong sports interest. The fact that there was a large group of respondents that was both very involved with the game, but had a small interest in football in general, can be explained by the public interest these games had. In smaller league games the correlation between involvement and football interest might be so strong that the effects of both might take out each other. Thus, the result of this study should primarily concern LED advertising in sport event with a strong public interest.

The hypothesis H1.3 regarding attitude towards the game showed no significance between the two groups. That indicates that theories regarding the atmospheric affects on recall are not supported. The result would perhaps have been different if the study was performed on spectators on site of the arena and not of those who watched the TV broadcast, since this live environment provoke stronger feelings than TV broadcasts. Satisfaction of the game was however found to affect the level of recall in some aspects. The result was significant for Q1 and Q2 regarding the satisfaction of the play and the result of the game. It was however not found to hold for Q3 and Q4 regarding the satisfaction of play and results based on expectations. This result might be due to the high expectations that people have on games that are considered as important as these. When expectations potentially exceed reality the responses might be non-representative. Thus, we conclude that satisfaction to a large degree can affect recall of LED perimeter advertising.

The findings on H1.5a and H1.5b confirmed theories regarding the importance for a medium to evoke emotions in order to be noticed (Donthu, et al., 1993). It is an interesting finding that both negative feelings and positive feelings affect recall. This would imply that advertisers could benefit (in terms of attention) of being both likable and disturbing. This further motivates tests of repetition in Study 3.

The results on H1.6 regarding general effects of known brands on recall showed a weak relation. In general, no evidence could be shown between being a known brand and high recall. Therefore it cannot be concluded that known brands are automatically easier for consumers to perceive and recall. The results of individuals connection between brands they know and brands they recalled was however stronger. A clear majority of all brands that was recalled was also previously known by that individual. This indicates that the effect of the “extended reactivation hypothesis” holds for LED perimeter advertising. The conclusion of this is that despite the potentially better communication abilities of LED perimeter advertising existing brand associations with customers will improve effectiveness of advertisement.

Overall most of the variables proven for static signs were also applicable to LED perimeter signs. This confirms the belief that LED is entitled most of the positive attributes of static signing but also have been able to add effectiveness through the use of animation.

5. Study 2 – Expert panel

This chapter discusses all parts directly related to Study 2. It starts off with a discussion of how this study is linked to the field experiment. Then it moves on to describe the design of this study, which is followed by the layout of the questionnaire. The chapter is concluded with a presentation and a discussion of the results.

5.1 Relation to the Field Study

Study 2 was conducted by consulting an expert panel that evaluated the different exposure characteristics on the ads shown at the LED perimeter advertising for the two games in Study 1. Study 2 is therefore an extension of Study 1 and will complement the findings by giving more information on the exposure characteristics of each brand. The reason why exposure characteristics are investigated in a separate study is because a field experiment was not found to be the optimal research design to use. The exposure characteristics could not have been included in the survey in Study 1 since they require that people, in advance, need to know that they're evaluating the LED perimeter advertising.

Exposure characteristics take form as color, movement, heuristics (level of fit) and message clarity (Herrmann et al., 2011). Therefore the aim of this study is to investigate how much these characteristics affect recall. After discussing the possible research design with our tutor Professor Patric Andersson and Professor Magnus Söderlund, we decided to use an expert panel to determine the effect of the exposure characteristics. The choice of an expert panel was to get a more objective view instead of letting the authors label the different ads with degree of the characteristics. This would give this study higher reliable result as well as a more general and a nuanced view.

5.2 Research Design Study 2

The expert panel consisted of 15 persons that got to evaluate the exposure characteristics of the ads shown at the two qualifying games. Participators in the expert panel were randomly chosen students at Stockholm School of Economics. The design of this study was to let the participants individually watch sequences from the two games, where each of the exposed ads was showed one at a time. All respondents were informed in advance that they were a part of an expert panel. They received all necessary information that was needed prior in order to evaluate the exposure characteristics of each brand. After seeing one ad, they were given a

moment to reflect upon the characteristics and then asked to assign points to different statements in an online survey made in Qualtrics Survey Software. The participants were shown 20 brands in total and were asked to evaluate all of them on their exposure characteristics in respect to each other. Each session for every respondent took 30-35 minutes (15 minutes of video sequences and 15-20 minutes to answer the questionnaire) and was collected during two days on the 28th and 29th of October. The reason why two days were chosen was due to the participants' time schedule and the fact that each participant needed enough time not to stress through the questionnaire. The authors decided to be present while the participants answered the survey in order to be able to answer any questions regarding the sequences, and to assist if the participants needed to watch any sequence again to determine the exposure characteristics.

It is important to clarify that Study 2 is an extension of Study 1. However, the only measurement that is used from Study 1 in Study 2 is the recall points collected in Study 1. The difference in Study 2 is that the recall points are not analyzed on individuals but on each brand.

5.3 Pre-Test of the Questionnaire

As stated earlier, all of our surveys in our three studies were pre-tested before they're launched. A pre-test with two respondents were made, which was followed by a personal session where the survey was evaluated. This helped to identify parts where misinterpretations were made. The pre-test was very valuable and made it clear that the survey was way too long and that some statements were hard to fully understand. Therefore the survey was revised to a much shorter version with fewer statements that still captured the essence of what the survey intended to investigate. This improved the flow of the survey as well as it reduced the risk of tiredness of the respondent.

5.4 Questionnaire

The questionnaire was created in Swedish since all the participants were Swedes. It only contained one question with four statements: *“Judge the following ads from 1 – 7 (1= not at all and 7=very much) on degree of movement, how colorful the ads were, how well the ads fits into the situation and on message clarity”*.

This question was asked in the beginning of the survey as an explanation of the purpose of the study. Then all participants watched one brand at a time on a video sequence and answered the four statements regarding each brand's exposure characteristics. The four statements were: *“How much movement is used in the ad?, How colorful is the ad?, How well does the ad fit in into the context? and How clear is the message?”*. The same four statements were given for all 20 brands. Each statement was answered on a 1-7 point Likert scale where 1 meant *“Not at all”* and 7 meant *“Vey much”*. The 20 brands exposed³ were all the same brands that had been shown in the perimeter advertising during the two qualifying games in Study 1. This made the survey long, and therefore only four statements were presented for each brand, still capturing the perimeters the authors wanted to investigate. As 15 respondents evaluated each brand on a 1-7 Likert scale, this ultimately generated a mean value on each exposure characteristics for each brand that was used to evaluate each brand's exposure characteristics.

5.5 Analytical Tool

The results from Qualtrics were transferred to Microsoft Excel in order to analyze the data by the use of a polar coordinate plot and draw conclusions from it. The data from Study 2 was compared to the data in Study 1. The results from Study 2 have mainly been used for grouping different exposure characteristics to draw conclusions from what affects recall the most.

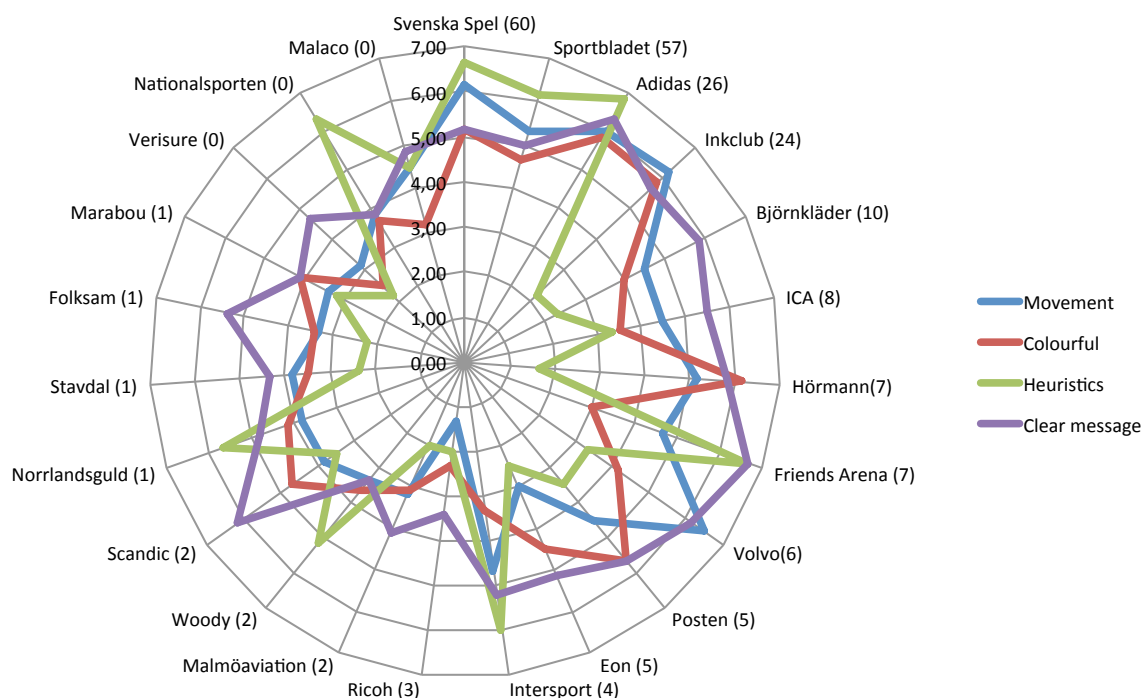
5.6 Result & Analysis Study 2

The purpose of Study 2 was to examine the exposure characteristics on each brand to see which exposure characteristics might have highest affect on recall. The variables that were examined were movement, color, heuristics (how well they fit in) and message clarity.

To examine this, an expert panel was used to assign an objective value of each characteristic to the brands. This resulted in an individual pattern for each brand, showing the specific characteristics of that message. These patterns where then assembled into a polar coordinate plot to illustrate the differences in exposure characteristics. The plot was organized according

³ Svenska Spel (Oddset), Aftonbladet (Sportbladet), Hörmann, ICA , Posten , Verisure , Volvo, Inkclub, Friends Arena (Swedbank), Intersport, Ricoh, Woody, Norrlandsguld, Nationalsporten SvFF, Scandic, Malaco, Adidas, Eon, Stavdal and Björnkkläder

to which brands had scored the highest recall points, in order to see which characteristics that were most significant.



Graph 1 – Polar coordinate plot

Graph 1 above, shows the polar coordinate plot over the exposure characteristics. The corresponding recall points are displayed in the parenthesis after each brand. The graph is organized after recall points with the highest scores on the very top and the subsequent brands plotted clock-wise. The most recalled brands were “Svenska Spel” (60) and “Sportbladet” (57). After that follows “Adidas” (25) and “Inkclub” (24). When looking at the graphic scheme for Svenska Spel and Sportbladet it is clear that these brands have particularly strong attributes of heuristics and movement (see Appendix 3). This indicates that the effects of brand heuristics and relatedness highly affect recall. It is however not certain that high heuristic fit automatically leads to high recall. The brands “Friends arena”, “Intersport” and “Nationalsporten SvFF” also showed high heuristic; these are however remembered to a lot lower extent. Hypothesis H.2.1 states that brands with strong heuristics also have high recall; this statement can be considered to hold partially for this study.

Both Adidas and Inkclub show high scores on use of the animations effects movement and color. The overall distribution of color and movement over the brands is skewed to the right side of the graph. This indicates that a better use of movement and color will also entitle a

higher recall. The pattern over movement indicates a very clear relation to recall. Those brands that have very low values on movement are solely found on the left side of the chart, and the line for movement is highly skewed to the right toward brands with high recall. The hypothesis H.2.2 regarding how movement and color affect recall can therefore be considered to hold.

Brands that have scored medium on recall “Björnkäder” (10) and “ICA” (8) have comparably weak scores on heuristics but show overall high scores on message clarity. This indicates that for brands with weak heuristics a clearly communicated message can affect recall positively. The pattern of message clarity is scattered in the graph to provide both high values for medium-to-high recalled brands and for low recall brands (i.e. Scandic (2)). This indicates a weak relationship between message clarity and recall. Hypothesis H2.3 regarding positive effects of message clarity and recall can therefore not be supported.

5.6.1 Hypothesis Summary

Hypothesis	Factor	Result
H2.1	Message clarity	Not supported
H2.2	Heuristics	Supported
H2.3	Animation	Supported

Table 14

5.7 Discussion Study 2

The study showed how the pattern for exposure characteristics was distributed over brands plotted with highest recall in the top left corner and lowest recall in the top right corner. Results showed that though it is important to have strong relatedness to an event, this would not guarantee a higher recall. The effect needs to be complemented by the use of other characteristics, such as better use of movement and color. The two most recalled brands (Svenska Spel and Sportbladet) had consistently high values on all variables. It seems that heuristics and brand relatedness are important in order to be recalled in an event. This must however also be complemented with strong animated attributes. The effect of having a clear message showed little consistency in the study. A weak pattern for message clarity was displayed where brands with both low recall (left side) and high recall (right side) indicated

high message clarity. The results of this study revealed that though some characteristics were more important than others, the key to high recall primarily comes from a combination of all.

6. Study 3 – Laboratory Experiment

This chapter goes through all parts related to the laboratory experiment. It starts with a discussion of how Study 3 is linked to the previous studies. Then moves over to describe the design of Study 3 followed by the layout of the questionnaire. The chapter is concluded with a presentation of the analysis and a discussion on the results.

6.1 Relation to Study 1 & 2

Study 1 & 2 aimed to answer the first two research questions regarding target and exposure characteristics. The findings in these studies further motivated a third study. This study aims to answer the third research question; “*How can advertisers increase recall of LED perimeter advertising?*” In order to answer this question, repetition and its potential effect on recall was further investigated.

The third study takes on a laboratory experimental research design and aims to answer how LED perimeter advertising can be improved in light of the findings in Study 1 and Study 2. It was revealed that a connection between repetition of LED perimeter advertising messages and increased recall might exist. In order to test this the authors found it necessary to conduct a third study in the form of a controlled laboratory experiment. The focus of this study is therefore to investigate if high and medium repetition can have an effect on recall and attitude of perimeter advertising.

6.2 Research Design Study 3

Study 3 sets out to investigate the cause-and-effect-relationship between the independent variable repetition and the dependent variables attitude and recall, this means that a research design is of causal nature (Bryman and Bell, 2007).

The experimental setup is a 2*3 design: Two factors (recall and attitude) and three levels, two manipulated groups and one control group, answering the same questions in an online questionnaire built in Qualtrics after they had watched a short video. The total valid response sample consisted of 98 individuals, the control group consisted of 33 respondents, the first manipulated group consisted of 34 respondents and the second manipulated group consisted of 31 respondents.

The videos were created with assistance from Gustaf Banér, head of Handels-TV at Stockholm School of Economics. All three videos were identical, showing animated players on a football field trying to score goals, each video was exactly 5.02 minutes long, and the only difference was in reference to repetition of the ads. The manipulated variable in these videos was displayed on the LED perimeter advertising at the left side of the field. One group, the control group, was exposed to the LED perimeter advertising as it is in real life with no repetition of the ads (low repetition). The other two manipulated groups were shown the same video sequence but each ad on the LED perimeter board where now repeated. The first manipulated group got to see each ad repeated four times before a new brand was shown (medium repetition). The second manipulated group got to see each ad eight times repeated before a new brand was shown (high repetition). In total, five brands were shown on a rolling scheme during five minutes. The five brands chosen to be in the video was based upon the results from Study 1 & 2. The authors decided to include the top three recalled brands as well as the bottom two recalled brands to make the experiment as similar to as it is in real life. No other differences besides the repetition of brands was tested in this experiment since Söderlund (2010) stresses the fact that nothing except one perimeter should be of difference in an experiment to get the best results of the outcome.

The LED perimeter advertising was simulated through the use of animated text that stated the five different brand names. No differentiation in color or movement existed between the brands, and no logos were used. This made the stimuli blend in better, and assured that not too much suspicion was awakened. It also assured that the specific exposure characteristics would not affect the result.

Picture 1: The video with the LED simulation in the experiment in Study 3



Five brands were chosen to replicate the experiment as similar to real life. In a football game, approximately 15 brands are exposed during a regular game where each brand is shown for 20 seconds at a time. To replicate the same proportions we chose to include five brands that were exposed seven seconds at a time. However, we could not replicate the total length of the experiment to a third of a football game, since it would have been hard to get enough responses by letting each respondent watch a video for 30 minutes. In addition, all respondents got a task before the video started; they were asked to count the total goals scored during the video. This type of task was meant to draw the attention from the LED perimeter advertising, and to re-create the same involvement as a football game usually has. This type of task has been used in previous research by Simons & Chabris (1999) to simulate involvement and complex cognitive settings. Another reason for giving the respondents a task was to avoid hypothesis guessing (Weber & Cook, 1972). It is of high importance that the respondents cannot guess what the experiment is about in order to get the best results (Söderlund, 2010). The experiment was carried out at Stockholm School of Economics the 26th of November and at KTH Royal Institute of Technology the 27th of November. The results from Qualtrics were then transferred to the statistical analysis computer program SPSS in order to analyze the data.

6.3 Pre-Test of the Questionnaire

The pre-test of Study 3 consisted of six persons watching the videos (two persons per video) in order to cover all three groups. They were all asked to answer the questionnaire before launching the survey, and to provide input of their general impression of the experiment.

6.4 Questionnaire

The survey was carried out using the Qualtrics Survey Software. The respondents were sent a link on Facebook that lead them to the survey. The same link was used for all respondents and a randomization feature in Qualtrics was used to assign each respondent to one of the three videos. This was done in order to ensure that the sample was as randomized as possible, and to avoid any possible biases coming from selecting the respondents for each group. All questions in the survey were marked as mandatory in order to minimize the amount of incomplete surveys. Respondents who had participated in any of the previous studies were not allowed to participate in this study in order to avoid any biased results.

The questionnaire started out with one of the three videos (low repetition, medium repetition or high repetition). In each of the three videos a short instruction was shown before the actual video started, stating: *“During the following movie, we kindly ask you to carefully notice the number of goals scored in this video. Other possible questions might be asked after the video.”* The first three questions in the questionnaire regarded the respondents’ involvement task (to count goals) and their attentiveness on other details of the video:

1. *“How many goals did you count to in the video?”*
2. *“What color did the goalkeeper have on his shirt?”*
3. *“What message was written in the circle in the middle of the football field?”* These questions were included only to control the task fulfillment and thus not part of the analysis.

In the next section of the questionnaire, the respondents were asked to write down all company brands from the LED perimeter advertising simulation on the side of the field. This open-ended question measured recall. In the last section the respondents were asked to state on a 1-7 point Likert scale how they perceived the perimeter advertising during the video. The following four statements were used for the evaluation: *“Very intrusive/Not intrusive at all”*, *“Very tedious/Not tedious at all”*, *“Not interesting at all/Very interesting”* and *“Do not like at all/Like very much”*.

6.5 Analytical Tool

To analyze collected data we used SPSS 20.0

- For hypothesis H3.1 – H3.3 we investigated group differences on three factors of repetition (low, medium and high) as independent variables. For this analysis we used a MANOVA test and accepted p-values ($p < 0.05$) on a significance level of 5%.
- For the same hypothesis H3.1 – H3.3 we investigated group differences by using an ANOVA test and accepted p-values ($p < 0.05$) on a significance level of 5%.

6.6 Result & Analysis Study 3

The purpose of Study 3 was to conduct an experiment in order to answer research question 3: “How can advertisers increase recall of their LED perimeter advertising?” by looking closer into a variable that has not existed nor been investigated in static perimeter advertising before: *Message repetition*.

To investigate the three hypotheses regarding repetition effects on recall and attitude, a MANOVA test with the four attitude questions and recall points from the experiment as independent variables was run. This model showed significant differences between the conditions, Wilks’ $\lambda = .779$, $F(10, 194) = 2.6$, $p < 0.01$. Next, separate one-way ANOVA tests with each variable on recall and attitude was performed for the independent variable repetition. This showed that four conditions out of the total five included in the MANOVA test was statistically significant. The first hypothesis H3.1 investigated if the medium repetition would affect recall positively. The second hypothesis H3.2 stated that high repetition of recall would affect recall negatively due to wearing out effects. This variable showed significant mean difference between the three conditions ($F_{2,101}=5.62$; $p=0.01$). The means of number of brand names recalled for low repetition ($M=1.85$), for medium ($M=1.28$) and high ($M=2.89$) show that recall is higher for groups with higher repetition. The H3.1 is therefore supported at a 1% level of significance. A post-hoc test using Fisher’s Least Significant Difference (LSD) was performed and revealed a statistically significant difference between the groups, thus providing empirical support for H3.1. The second hypothesis H3.2 stated that high repetition would result in lower recall scores. This is not supported since recall for high repetitions were proven to be significantly higher than those for low recall.

ANOVAs: Mean values (and standard deviations) for recall:

	Low repetition	Medium repetition	High repetition	F	P-value
<i>Recall of messages</i>	1.85 (1.71)	2.97 (1.28)	2.89 (0.18)	5.62	0.01***

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 15

The third hypothesis H3.3 aimed to test if repetition would affect attitude towards messages negatively. The test showed statistically significant results only for two of the four questions. The mean for the question regarding how intrusive respondents are is reported in table 16 below. The test showed significant support for attitudes concerning how intrusive the message

is ($F_{2,101}=2.34$; $p=0.10$) and is supported on a 10% significance level. The attitude on how tedious the messages was showed a significant higher mean for those that was exposed to the video with high repetition ($F_{2,101}=4.28$; $p=0.02$) and was accepted on a 5% significant level.

The questions regarding the difference between how interesting the advertising message was, and to what degree the message was liked, showed no significant difference. The mean for the group exposed to high repetition was not significantly higher than for those in the low and medium groups. The hypothesis is therefore only supported for the factor on attitude concerning perceived intrusiveness and tediousness.

ANOVAs: Mean values (and standard deviations) for attitude:

	Low repetition	Medium repetition	High repetition	F	P-value
<i>Attitude: Not Intrusive – Intrusive</i>	4.41 (1.08)	4.61 (1.95)	3.86 (1.36)	2.34	0.10*
<i>Attitude: Not tedious – Tedious</i>	4.97 (1.03)	4.82 (1.79)	4.03 (1.48)	4.28	0.02**
<i>Attitude: Not interesting – Interesting</i>	3.00 (1.35)	3.21 (1.29)	2.92 (1.23)	0.461	0.63
<i>Attitude: Don’t like – Like</i>	3.59 (0.96)	3.82 (1.19)	3.58 (1.01)	1.61	0.21

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 16

6.6.1 Hypothesis Summary

Hypothesis	Factor	Result
H2.1	Medium repetition on recall	Supported
H2.2	High repetition on recall	Not supported
H2.3	High repetition on attitude	Partially supported

Table 17

6.7 Discussion

The laboratory experiment provides empirical support for H3.1 (a medium repetition of message will affect recall positively). This confirms theories of repetition and its effect on recall. The praxis in LED perimeter advertising of showing messages for approximately 20 seconds at a time will give advertisers a greater span of exposure during the match. However, if messages were instead shown repeatedly for a longer period of time, people would

potentially notice and recall them to a higher degree. This indicates that the current way of showing LED perimeter advertising might not be optimal. Hypothesis regarding the effect on how high repetition affects recall negatively was however not supported. The reason for this might be that the duration of the experiment was compressed to a short period of time. This might explain why no wearing out effects was observed on recall. However, this does not necessarily imply that no wearing out effects exists in LED perimeter advertising. It rather suggests that the amount of repetition in the experiment, transferred to a real-life situation will not affect recall even for what is considered high repetition (eight times). The wearing out effects on attitudes showed to be only partially supported. The effect of tediousness and intrusiveness of exposure with high repetition was evident. The fact that repetition would decrease the interest or likability of a message was however not proven.

7. General Discussion

The main purpose of this thesis was to examine the effectiveness of LED perimeter advertising by investigating the cognitive perception of spectators (through recall). The study set out to answer the following thesis questions: 1) *What factors of target characteristics affect recall of LED perimeter advertising?* 2) *What factors of exposure characteristics results in high recall of LED perimeter advertising?* And a third and subordinated research question that aimed to complement the insights from question 1 and question 2: 3) *How can advertisers increase recall of LED perimeter advertising?* Each research question was answered through an individual study. The overall results from these studies have shown great consensus between existing theories concerning static perimeter advertising and the studies made on LED perimeter advertising in this thesis. Results on target characteristics has shown that most of the theories regarding static signage also holds for LED. In addition, LED has also been proven to be more efficient, for example in terms of dual-task interruption.

7.1 Implications

Even though the actual result of recollection was considerably low (only 56% of total sample could recall one or more brands on the LED perimeter advertising), this study has shown that LED does pose a lot of benefits over static perimeter advertising, and that the new features of LED have a lot of potential. If advertiser can learn more about how the medium affects consumers, they will also be able to get more out of their investments.

Study 2 indicated that one of the most important exposure characteristics was brand heuristics i.e. to establish a strong relatedness between a brand and an event. The importance of really using the potentials of color and movement in LED perimeter advertising also showed to be of great importance for recall.

An interesting observation of Study 1 was the overall positive effect of recall on attitude. It was found that a more positive attitude as well as a more negative attitude both had positive effects on recall. This was consistent with theories regarding the effects of interruption on recollection. Since LED perimeter advertising is characterized by being a second-hand task, cognitive attention is very dependent on the interruption capabilities of the medium. The laboratory experiment in Study 3 showed how the use of repetition potentially can increase interruption and thus recall. No negative effects were proven in the study due to the limited

time. However, this does not guarantee that increased repetition is exclusively beneficial for recall. The potential risks of wearing out effects on recall and attitude might still be present and require a closer investigation.

Though many claimed that they had noticed the LED perimeter advertising, not as many could actually recollect any messages, which implies that there is room for improvements.⁴ The key to getting sponsorship recollection is to transfer the cognitive perception to actual cognitive processing of the message. The results of this study implies that this is foremost done by assuring a strong relatedness to an event and with the use of movement and color (contrast) in messages. The primary target group for LED perimeter advertiser should be people who are greatly involved with the event and who preferably have a low to moderate football interest. The effect is further enforced if consumers have prior knowledge about the brands. In that way existing brand associations can help consumers to remember brands by easing the mental process of advertising stimuli. This is in first hand recommendations regarding exposure investments in mega sporting events that have high national interest.

The reason why sport perimeter advertising was the most appreciated advertising among the Swedish population was mainly due to the fact that the advertising message was shown in a background setting (Sveriges Annonsörer, 2012). A large strength of the medium therefore lies in the fact that it is nonintrusive. It gives consumers the rare option of whether they want to watch the message or keep focus on the event. LED perimeter advertising has in this thesis been found to potentially gain a lot from being more intrusive and interrupt more often. This will of course only be efficient up to a certain point. A too extensive use of interruption that might disturb the game itself, or disrupt the course of the game, would not be favorable for advertisers. Spectators only accept LED perimeter advertising as long as it remain in its role as second-hand task, and do not challenge or fully take over the first-hand task.

7.2 Critique of the Study

The analysis in the results of Study 1 was made on a distinction on splitting the sample on recall and no recall. A more fine tuned analysis would have been to investigate the relationships with a Pearson's correlation test and calculated the magnitude of coefficients through a regression analysis. However, the variation in recall was found to be too low to

⁴ See Appendix 4

provide a satisfactory regression analysis in this study. Though the results in this study were found to be robust, further results could have been provided if the analysis was made through a causality analysis.

The analysis performed in order to answer hypothesis H1.6 – H.2.3 where all non-statistical. The analysis was provided through presentation of the results in charts and tables that were compared for characteristics and recall. In collaboration with Professor Patric Andersson and Professor Magnus Söderlund, questions and appropriate method on how to investigate exposure characteristics were generated. It was found that the use of an expert panel would provide sufficient insight in order to confirm or reject the hypotheses. For more robust results, it could have been better if the variables could have been tested statistically. For that to be possible, a complete different research approach on Study 2 would have had to be done. Due to the scope of this thesis this was not possible.

Study 1 was gathered under very authentic situations. This also resulted in a high degree of unserious answers. The internal reliability of Study 1 was kept at the highest possible level, which also resulted in a lot of excluded responses. The study might have had higher internal validity if it had been carried out in a more controlled environment. The exact influences of authentic feelings such as involvement and satisfaction would however been very hard to replicate in any other setting.

The special conditions surrounding the two games investigated might limit the generalizability of this thesis. The high national interest of the games and the specific viewing situation might limit the applicability of the results. The degree of replication of the study is therefore unsure to hold for other viewing situations than mega sporting events.

7.3 Directions for Future Research

This thesis has started to bridge the gap between existing research on perimeter advertising and new LED technology. The authors expect that research concerning perimeter advertising in the future also will take the new attributes of LED into respect.

Further research in the area of LED perimeter advertising is expected to deeper investigate how impact can be increased, since this is of very high priority for advertisers in sport events.

This thesis was limited to look at target- and exposure characteristics; future studies should concern the influence of other characteristics as well, to better explain how recall is achieved.

This thesis has focused on investigating the cognitive perception of LED perimeter advertising through recall. Other interesting factors to investigate could also be how LED perimeter advertising affects *purchase intentions*, *brand value* or *sales figures* of advertisers. The increased price of LED perimeter advertising has also actualized the need for better measurements regarding the outcome of investments. Future research should therefore be dedicated to provide a more detailed insight in how these measurements could be developed. As investments in sport exposure increases, it will also become more important to develop clear objectives and better knowledge of target groups. Knowledge regarding the own objectives of advertisers investments in LED perimeter advertising and actual outcome does not currently exist, and would provide valuable insights to the market.

Future studies should also continue to investigate the relationship between interruption and other characteristics of LED perimeter advertising. The results in this thesis prove that interruption can be positive for LED perimeter advertising. However it does not present conclusive results to which degree interruption stops being positive and start to potentially be harmful for advertisers. Since the experiment in Study 3 failed to show the presence of wearing out effects, and how they can influence recall and attitude, other studies that only examine repetition effects could be meaningful. If it can be proved that repetition is beneficial for recall in real-life situations this can potentially change the whole industry. New tactics for the order in which companies are showed would need to be developed.

Thus, the industry could benefit a lot from continuing to experiment with the new specific aspects of LED, such as repetition. Other aspects that could be of interest to look into can be the placement of the LED perimeter advertising in relation to the field, the height of perimeter signs or the length of messages and its effect on recall.

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Appendices

Appendix 1: LED perimeter systems



Appendix 2: The Questionnaire in Study 1

Var god att öppna och besvara enkäten efter att du har sett matchen!

1. QUIZ

Vilket lag gjorde första målet och vem var målskytten?

Vad var resultatet efter första halvlek? (Sverige – Tyskland)

Vilket lag hade mest bollinnehav i matchen?

2. Markera vilka andra nationer du tror ingår i Sveriges grupp i VM-kvalet:

Albanien	☐	Polen	☐	Moldavien	☐
Israel	☐	Frankrike	☐	Tjeckien	☐
Cypern	☐	Irland	☐	Holland	☐
Island	☐	Ryssland	☐	Kazakstan	☐
Slovenien	☐	Danmark	☐	Georgien	☐
Österrike	☐	Lettland	☐	Färöarna	☐
Bosnien Hercegovina	☐	Ungern	☐	Serbien	☐

3. Vilket lag hejade du på:

Sweden	Germany	Inget av dem
☐	☐	☐

Matchen

Följande frågor handlar om kvalmatchen mellan Sverige – Tyskland du precis har sett.

4. Vad tycker du om matchen?

	Väldigt missnöjd 1	2	3	4	5	6	Väldigt nöjd 7
Hur nöjd eller missnöjd är du med spelet i matchen?	☐	☐	☐	☐	☐	☐	☐

	Väldigt missnöjd 1	2	3	4	5	6	Väldigt nöjd 7
Hur nöjd eller missnöjd är du med resultatet i matchen?	☐	☐	☐	☐	☐	☐	☐

	Inte alls 1	2	3	4	5	6	Helt och hållet 7
I vilken grad mötte spelet i matchen dina förväntningar?	☐	☐	☐	☐	☐	☐	☐

	Inte alls 1	2	3	4	5	6	Helt och hållet 7
I vilken grad mötte resultatet i matchen dina förväntningar?	☐	☐	☐	☐	☐	☐	☐

5. Hur tycker du att matchen var?

	1	2	3	4	5	6	7	
Mycket dålig	☐	☐	☐	☐	☐	☐	☐	Mycket bra
Mycket tråkig	☐	☐	☐	☐	☐	☐	☐	Mycket spännande
Mycket oschysst	☐	☐	☐	☐	☐	☐	☐	Mycket schysst
Inte alls underhållande	☐	☐	☐	☐	☐	☐	☐	Mycket underhållande

Känslostämning**6. Hur känner du dig just nu?**

	Mycket ledsen						Mycket glad
	1	2	3	4	5	6	7
Hur ledsen eller glad känner du dig just nu?	☐	☐	☐	☐	☐	☐	☐

	Mycket spänd						Mycket lugn
	1	2	3	4	5	6	7
Hur spänd eller lugn känner du dig just nu?	☐	☐	☐	☐	☐	☐	☐

	Väldigt oengagerad				Väldigt engagerad		
	1	2	3	4	5	6	7
Hur engagerad känner du dig just nu?	☐	☐	☐	☐	☐	☐	☐

Arenareklamen

Följande frågor handlar om arenareklamen som visades under matchen.

Arenareklam är annonser kring och på planen. Under denna match visades reklamen på rörliga skyltar längst med sargerna på planens lång- och kortsida.

7. Tänk tillbaka på matchen som du precis har sett

	Nej, absolut inte	Nej, i stort sätt inte	Nej, troligen inte	Tveksam	Ja, troligen	Ja, i stort sätt	Ja, absolut
Noterade du arenareklamen under matchen?	☐	☐	☐	☐	☐	☐	☐

	Aldrig	Under första halvlek	Vid mål eller fasta situationer	I repris	Under andra halvlek
När under matchen noterade du arenareklamen?	☐	☐	☐	☐	☐

Annat: -

8a. Vilka av följande företag minns du visades på arenareklamen? (This question was only asked to the aided group)

Nike	☐	Svenska Spel	☐
ICA	☐	Malmö Aviation	☐
ISP Sport & Marketing	☐	Inkclub	☐
Carlsberg	☐	Sportbladet	☐
Björnkläder	☐	Coop	☐
Adidas	☐	Bet365	☐

Annat varumärke jag såg:

8b. Minns du någon av de företag som visades på arenareklamen under kvällens match? (This question was only asked to the unaided group)

Skriv ner så många du kan komma ihåg att du har sett:

9. Vad är ditt intryck av arenareklam?

	Mycket dålig	Ganska dålig	Något dålig	Varken eller	Något bra	Ganska Bra	Mycket bra
Vad är ditt generella intryck av arenareklam?	☐	☐	☐	☐	☐	☐	☐
	Mycket negativ	Ganska negativ	Något negativ	Varken eller	Något positiv	Ganska positiv	Mycket positiv
Hur ställer du dig till arenareklamen i denna match?	☐	☐	☐	☐	☐	☐	☐
	Mycket störande	Ganska störande	Något störande	Varken eller	Passar in något bra	Passar in ganska bra	Passar in mycket bra
I vilken grad upplever du att arenareklam stör eller passar in på arenan?	☐	☐	☐	☐	☐	☐	☐

10. Markera de varumärken som du känner till/är bekant med sedan tidigare: (This question was only asked to the aided group)

Nike	☐	Svenska Spel	☐
ICA	☐	Malmö Aviation	☐
ISP Sport & Marketing	☐	Inklclub	☐
Carlsberg	☐	Sportbladet	☐
Björnkläder	☐	Coop	☐
Adidas	☐	Bet365	☐

Fotboll

Följande frågor handlar om dina åsikter om fotboll, om du är bekant med odds och spelar på fotboll.

11. Jag tycker att fotboll är:

	1	2	3	4	5	6	7	
Mycket oviktigt	☐	☐	☐	☐	☐	☐	☐	Mycket viktigt
Betyder lite för mig	☐	☐	☐	☐	☐	☐	☐	Betyder mycket för mig
Väldigt ointressant	☐	☐	☐	☐	☐	☐	☐	Väldigt intressant
Mycket tråkigt	☐	☐	☐	☐	☐	☐	☐	Mycket fängslande

Allmänt**12. Jag är:**

Man Kvinna

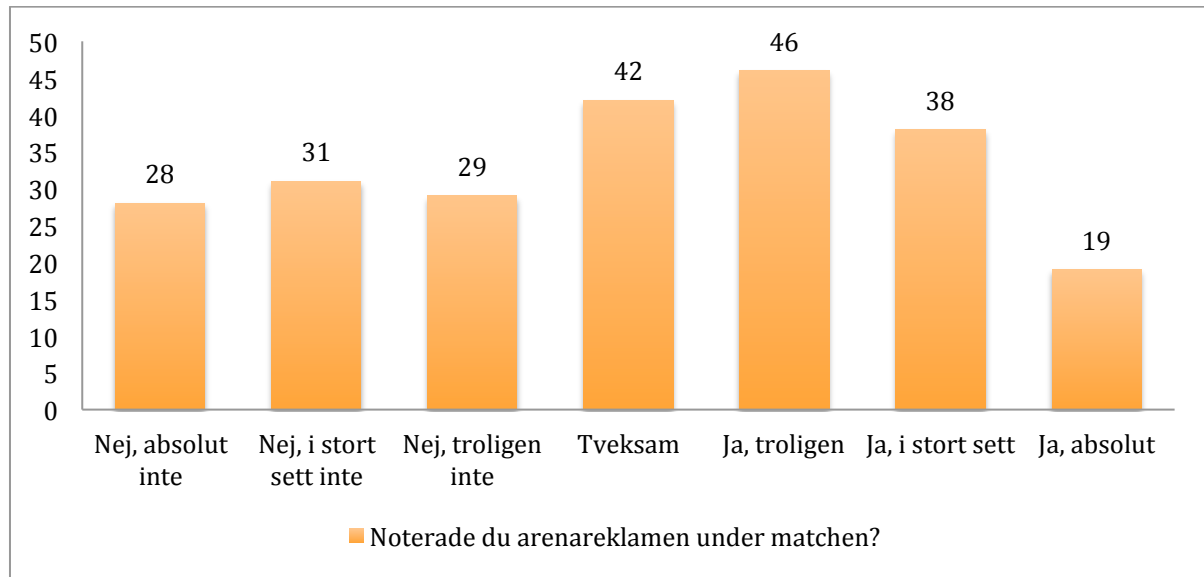
☐ ☐

Ålder: _____ år

Appendix 3: Table of exposure characteristics in Study 2

Brands	Movement	Colorful	Heuristics	Clear message	Total recollections
Svenska Spel (60)	6,17	5,17	6,67	5,17	60
Sportbladet (57)	5,33	4,67	6,17	5,00	57
Adidas (26)	6,00	5,83	6,83	6,33	26
Inkclub (24)	6,17	5,83	2,17	5,67	24
Björnkläder (10)	4,50	4,00	2,33	5,83	10
ICA (8)	4,50	3,50	3,33	5,50	8
Hörmann(7)	5,17	6,17	1,67	5,83	7
Friends Arena (7)	4,67	3,00	6,67	6,67	7
Volvo(6)	6,50	4,17	3,33	6,17	6
Posten (5)	4,50	5,67	3,50	5,67	5
Eon (5)	3,00	4,50	2,50	5,17	5
Intersport (4)	4,67	3,30	6,00	5,20	4
Ricoh (3)	1,33	2,33	2,00	3,40	3
Malmöaviation (2)	3,20	3,10	2,00	4,10	2
Woody (2)	3,33	3,67	5,17	3,33	2
Scandic (2)	3,83	4,67	3,50	6,17	2
Norrlandsguld (1)	3,83	4,17	5,67	4,83	1
Stavdal (1)	3,83	3,50	2,33	4,33	1
Folksam (1)	3,30	3,40	2,20	5,40	1
Marabou (1)	3,40	4,10	3,20	4,10	1
Verisure (0)	3,17	2,50	2,17	4,67	0
Nationalsporten (0)	3,83	3,67	6,33	3,83	0
Malaco (0)	4,50	3,17	4,50	4,83	0

Appendix 4: Question regarding the degree of notice of the LED perimeter advertising in Study 1



Appendx 5: The Questionnaire in Study 3



Vänligen titta på hela filmen och följ instruktionerna. Gå sedan vidare och svara på några snabba frågor angående filmen.

Film 2



0:00 / 5:02



Hur många mål räknade du till i klippet?

Vilken färg hade målvakten på tröjan?

Vad stod det i cirkeln i mitten av plan?



På den blå bården på vänster långsida visades budskap under klippet. Ett antal företagsnamn exponerades som en simulering av arenareklam. Hur många av dessa företag kommer du ihåg?

Skriv ner namnen på alla företag som du minns:

Hur uppfattade du arenareklamen som visades i filmen?

Mycket störigt	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Inte alls störigt
Mycket tjatigt	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Inte alls tjatigt
Inte alls intressant	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Mycket intressant
Gillar inte alls	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Gillar mycket