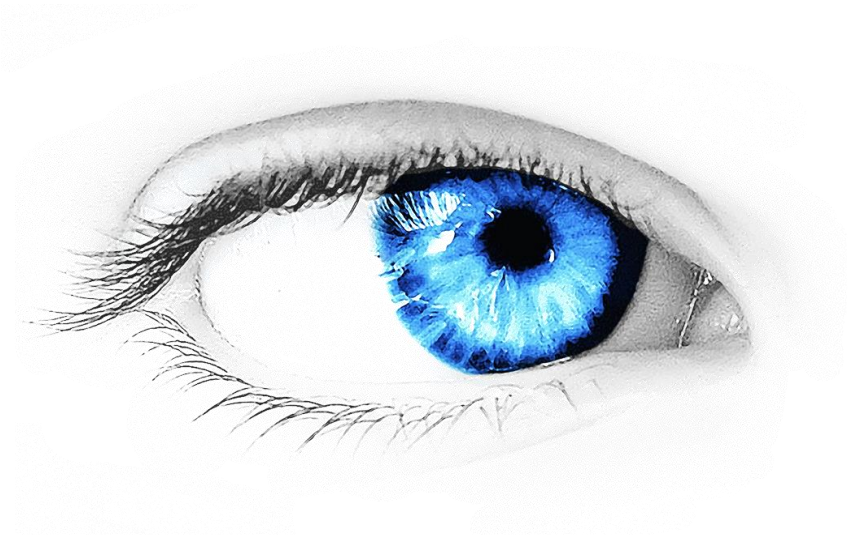
980187
986058

MAS5100

MASTEROPPGAVE

Markedshøyskolen



The Effects of Perceptual and Conceptual Priming on Attention and Evaluation in Commercial Breaks

Vår 2015

Acknowledgements

This thesis marks the end of an exceptionally rewarding last year at Oslo School of Management. While we started the work on this thesis well over a year ago, and despite a lot of hard work, we are undoubtedly indebted to many people that have supported us along the way. We would like to extend our gratitude to Cathrine von Ibenfeldt and Tarje Gaustad for valuable and constructive suggestions during the development of this thesis. We are also incredibly grateful for the support from TNS Gallup, and in particular Anders Mamen, for allowing us the privilege of lending the research equipment and facilities to conduct the experiment. Lastly, we would like to thank Thomas Hagen for assisting us with a previously unfamiliar and complex methodology.

Oslo, 12.08.2015

980187

986058

Abstract

While a vast number of studies have examined the effect of priming on positive evaluation towards an object, little research has been done on its effect on attention. Priming's effect on positive evaluation has generally been attributed to an increase in associational availability that results in easier mental processing. This ease of mental processing is known as fluency. Furthermore, the theoretical review reveals that fluency, attention and emotional responses are highly interconnected. In this thesis, the priming paradigm is applied to a novel context; a sequence of video commercials. By manipulating the relatedness of two commercials, we examine whether a commercial can influence advertising effectiveness in the form of attention and increased positive evaluation towards product exposures in another commercial. This research involves collecting data from three groups, two of which are manipulated by different kinds of primes, and one which acts as control group. The commercial that the dependent variables are measured upon is known as the target commercial, and shown last in the sequence. The first group is exposed to a stimulus that is physically alike to the target commercial (perceptual prime). The second group is exposed to a stimulus that is only associatively alike (conceptual prime). Establishing the distinctions of these prime's effect on attention was an important aspect of this paper. We predicted that the product in the target commercial should be more noticeable, and that attention would be paid to the product for a longer time. Furthermore, we predicted an increased positive evaluation of the target commercial and increased emotional arousal, both of which are connected. Data was collected both implicitly in the form of eye tracking measures, and explicitly through a questionnaire. The results suggest that the product attracts attention for a significantly longer time for the conceptual group. Furthermore, perceptual priming increases explicit positive evaluation. However, neither forms of priming makes the viewers notice the product exposures easier, nor elicit any substantial emotional arousal. The results are discussed in light of previous research on the topic of priming, fluency, attention and positive evaluation.

Table of Contents

Models

Tables

Illustrations

Figures

Attachments

1.0 Introduction

As Liza entered the supermarket, she tried to recollect the items on her shopping list. "What did I write?", she thought to herself, walking down the aisle. Her eyes scanning the shelves, they fixed on a bottle of fruit-smoothie. "Excellent!", Liza muttered to himself, blissfully content with her choice of beverage as she placed it in her cart. Little did Liza know that this very small choice of beverage was actually affected by her accidentally passing a man carrying a gym-bag on her way to the store.

Now, how is this possible you might ask? Notably, this is an example of prior exposure affecting implicit memory, which we refer to as priming. As Liza walks past the man carrying the gym-bag, she is subliminally primed with the concept of "workout". This has the effect of activating related associations, including "healthy", and by extension "fruit-smoothie", and making these more easily accessible in her mind. Consequently, she is more sensitive to these objects in the environment. As a result, Liza spent slightly more of her attention on the shelves of healthy beverages. In addition, she unknowingly experienced a subtle feeling of familiarity and positive emotions towards these products, ultimately increasing the chances of wanting the fruit-smoothie. We refer to the associative prime exemplified above as a conceptual prime. On the other hand, if Liza chose the fruit-smoothie after passing a man drinking a soda, this could be as a result of a perceptual prime. The latter meaning that the effect occurred due to the physical similarity of the primed object (soda bottle) and the subsequently exposed object (fruit-smoothie bottle). Distinguishing between the effects resulting from these two types of primes has in previous research been a topic of much discussion, which this thesis aims to contribute to.

Significantly, the effects of prior exposure on our feelings and perception is something that constantly affects us in an almost unlimited variety of scenarios throughout our lives. Like Liza, we encounter similar events every day, yet by definition, we remain unaware of both its occurrence and the extent of its influence.

The phenomena that Liza experienced is the topic of this thesis, although in an entirely different and novel context; specifically a sequence of commercials. Can exposure to one commercial positively influence viewers' attention and positive evaluation towards another, related commercial? The implications stand to break new ground on how marketers consider

intra-commercial coordination and competitive synergies. Furthermore, the current research aims to contribute new insight to the already extensive field of priming-theory, by focusing on a subject that has to our knowledge seen little prior research in this field, namely attention. We operationalize attention to concern both time spent on initial orienting towards a stimulus, and the length of time spent attending a stimulus, known hereafter as noticeability and duration of visual attention, respectively. This leads to our research question:

How can a prime in the form of a commercial increase visual attention and positive evaluation towards a subsequently exposed commercial?

1.1 Empirical contribution

Priming's effect on positive evaluation has generally been attributed to an increase in associational availability that results in easier mental processing (Lee and Labroo 2004; Lee 2002; Shapiro 1999). This ease of mental processing is known as fluency. For this reason, fluency is an essential theoretical concept when examining priming. Alter and Oppenheimer (2009, 233) states that existing research fails to capitalize on the range of possible instantiations for fluency, and that fluency effects on attention is an example of this. For these reasons, our empirical contribution is just as much towards the subject of fluency as it is towards priming.

While the effects of prior exposure on product evaluation and attitude have been previously extensively researched (for a review, see Alter and Oppenheimer 2009), as far as we know, the connection between prior exposure (priming) and attention have not. Nor have the principles of priming effects such as evaluation, as exemplified in the story of Liza, previously been researched in the context of a commercial break.

Several independent research articles have demonstrated an effect on attention to subsequent commercial due to priming, reflected in reduced audience loss during commercials (Schweidel, Foutz and Tanner 2014; Woltman, Wedel and Pieters 2003). Schweidel, Foutz & Tanner (2014) suggested that future research should examine the possibility that the increased degree of attention that is reflected in reduced audience loss to a commercial, may have the potential to increase advertising effectiveness. This research will not examine audience loss, but rather the aspects of attention pertaining to the product exposures in the commercials. Specifically, if the ease with which the product is noticed, and the length of time viewers

spend looking at these exposures, can be enhanced. Other studies have more specifically described how attention towards products is affected by priming, although in other contexts including in-store advertisement (Bagdziunaite et al. 2014). Milosavljevic and Cerf (2008) emphasizes that there is an increasingly important and understudied relation between a primed product and attention, which further accentuates the timeliness of this topic.

A heightened degree of attentional interest and a more readily selected stimulus on account of priming may be an ubiquitous phenomena in the world of advertising, although indiscernible without implicit measures. The current research will focus on the context of video commercials to make an empirical contribution that is novel, yet builds on an already established foundation of attentional theory.

1.2 Practical contribution

Classical conditioning is the process of repeated exposures of two things together to strengthen their associations. Much of brand advertising use the implicit memory learning method of classical conditioning (Genco, Steidl and Pohlmann 2013, 141). For this reason, we conjecture that many commercials feature repeated exposures of their products in their respective commercials, and that this is in part to capitalize on the effect of classical conditioning. However, for classical conditioning to work, viewers must necessarily pay attention to both objects of the conditioning; the product and the commercial. This implicates that attention is a crucial step for advertising effectiveness. This thesis examines to what extent attention can be influenced by placing either a commercial for the same brand, or a related brand, prior to the target commercial in a sequence. The experiment thus simulates the scenario of a commercial break, much like they would appear in television advertisement or on the internet. Being able to influence attention towards a commercial by coordinating the sequence in which they appear, would constitute helpful knowledge for marketers involved in video commercials. The context of video commercials is highly relevant, because this form of advertising is exceedingly prevalent in today's media-saturated society, and increasingly so on the world's fastest growing advertising medium, the internet (Barnard 2014).

1.3 Structure of thesis

This thesis consist of 7 chapters. In the introductory chapter we have presented the topic, research question and contributions of the thesis. The second chapter introduces the

theoretical foundation that the experiment in this research rests upon. Hypotheses will be presented in the subchapters that follows in chapter two. Firstly, this includes the two different types of priming and fluency; perceptual and conceptual conditions. These are discussed in length, resulting in a discussion of the causal effects of fluency. Lastly, chapter two concludes with the theoretical basis for our predictions of priming influencing attention. In chapter three, the thesis's conceptual model and associated hypotheses are presented. Chapter four involves the experiment's methodology and research design. Chapter five starts of the analysis. Here we discuss the procedure of analysis that are mutual for all groups. In chapter six we present the empirical findings of the thesis, structured in two parts: one for each group of conceptual and perceptual conditions. Lastly, in chapter seven, the findings are discussed in light of recent research. In regards to this last chapter, the discussion will be separated in three main parts. The first two parts are discussions of the findings pertaining to duration of attention towards the stimulus and positive evaluation for each of the respective groups. The last part discusses emotional response and the predicted increase in noticeability. The reason for this is that theoretical foundation upon which the two latter variables rests are highly connected. The thesis is concluded with a discussion of limitations, implications and future research.

2.0 Theoretical framework

2.1 Priming

Priming refers to the exposure of a stimulus and how it can activate mental associations that can make consumers think or act in a manner that is implied by the stimulus (Laran, Dalton and Andrade 2011). Another definition is that priming involves exposure to a stimulus, with the goal of activating a particular idea, category, or feeling (Cameron, Brown-Iannuzzi and Payne 2012; Fennis and Stroebe 2010, 85). This activation will seemingly exert its influence on an individual over a shorter time-span, without the individual being aware of the influence. Priming can function subliminally, without the recipient's awareness, or supraliminal. Supraliminal priming means that the recipient is conscious and aware of the stimulus that primes, but not the stimulus' intention to prime (Tom et al. 2007). An example would be any situation where the recipient is primed by reading a text. The recipient is aware of the stimulus, but not its intent to influence said person. Subliminal priming means that the recipient is unaware of the stimulus that primes. Subliminal and supraliminal priming has

been demonstrated to achieve similar effects, like increased associational availability (Fennis and Stroebe 2010, 88). We will now explain two different ways of achieving priming effects.

Chartrand et al. (2008) distinguishes between two key types of priming: motivational goal-related processes and associative processes. The former means that cues in the environment can activate a goal with the consumer (for example to save money) (Fitzsimons, Hutchinsons and Williams 2002). However, this presupposes that the consumer has positive emotions towards the condition (in this case, saving money). Activation of cognitive associative processes, on the other hand, does not involve any specific goal, but can still alter behavior. For example, Bargh, Chen and Burrows (1996) showed that exposure to the concept of "elderly people" activated the corresponding mental associational network, which lead to a number of the participants reducing their walking pace, without being aware of this themselves. Researchers have developed techniques to separate these two kinds of priming. One way of doing this, is by examining whether an association increases or decreases over time. Motivational goal-related processes increases in strength over time unless fulfilled, while associative processes are reduced in strength over time after activation (Chartrand et al. 2008, 191).

Chartrand et al. (2008) suggest that there are three components that can affect consumers' choices of products through priming, and these are related to priming of goals. Firstly, this is that cues in the environment can activate goals for action, outside of the consumer's conscious awareness. In addition, these goals are pursued until fulfilled, and the goals have consequences that are expressed in preference. Unconscious pursuit of goals actually inherits all the properties of goals that are conscious to us, like for instance flexibility, persistence, and that success or failure in achieving a goal can affect our mood (Bargh 2002). Akin to Chartrand et al. (2008), Genco, Steid and Pohlmann (2013, 375) argues that nonconscious goal-pursuits is what connects priming to consumer actions. However, it can be argued that cognitive associative activation also can exert significant influence on consumer behavior and preference through the concept of processing fluency. Processing fluency refers to ease of cognitive processing, and is abbreviated to 'fluency' for the remainder of this paper. These terms are interchangeable. We would like to clarify that when the term priming or prior exposure is used throughout this paper, it is to describe the act of exposure to a stimulus. Importantly, the term fluency is used to describe the effects resulting from the prime. This is based on previous research that priming's effect on positive evaluation has generally been

attributed to an increase in associational availability that results in easier mental processing (Lee and Labroo 2004; Lee 2002; Shapiro 1999). Consequently, when the term 'fluent stimulus' is mentioned, this refers to a stimulus that is subject to effects that have been created from a prime. For example, an exposure of an apple could mean that an individual has increased associational availability for apples. As a result, apples constitute a 'fluent stimulus' for this individual. As will be demonstrated however, a prime is not the sole source that fluency can originate from.

Several features of a stimulus can enhance fluency, like symmetry, clarity, contrast or conservation of information (Winkielman and Cacioppo 2001, 990; Genco, Steidl and Pohlmann 2013, 166). More noteworthy however, is that prior exposure to a stimulus enhances fluency (Lee and Labroo 2004; Lee 2002; Reber, Winkielman and Schwarz 1998; Whittlesea 1993). Fluency can facilitate a stimulus to be interpreted as more likeable, true and persuasive (Genco, Steidl and Pohlmann, 2013, 74). Reviews of research on fluency has also shown that it can affect judgments of confidence, intelligence, familiarity, valuation, fame and category typicality (Alter and Oppenheimer 2009). It has also been demonstrated to increase performance in tasks such as word fragment and word stem completion, perceptual identification, anagram solving, and picture naming (Lee 2001, 1255). However, for the purposes of this paper, we are primarily interested in the effects that fluency may elicit on attention. This will be elaborated upon in chapter 2.3.

In relation to priming, fluency is significantly affected by the recency, frequency and duration of an exposure (Oppenheimer 2008). The current research addresses fluency as resulting from a recent exposure to coincide with the paradigm of priming, although we acknowledge that this is not the only way to create fluency. Within the paradigm of priming, we distinguish between two independent types of priming and their respective fluency effects, which we will review in parts below.

2.1.1 Perceptual priming, perceptual fluency and mere exposure

The definition of perceptual priming is that it involves exposure to a specific physical shape, color or brightness (Labroo, Dhar & Schwarz 2007). As mentioned, fluency speaks to the ease of processing. Perceptual fluency, thus involves easier perceptual processing. For example, a vivid contrast or improvement of visual clarity in text or picture is a way to

enhance perceptual fluency (Lee and Labroo 2004). Importantly, perceptual fluency can also be achieved through perceptual priming.

The effects mentioned above are similar in nature to the *mere exposure* -effect, though still largely referred to as *incidental exposure* or *prior exposure* in literature. The mere exposure-effect entails that a stimulus that is repeated, leads to a more positive evaluation compared to a stimulus that is not repeated (Janiszewski 1993; Zajonc 1968). Through decades, this phenomenon has been confirmed to exist within a wide range of different stimulus and conditions among participants (Tom et al. 2007). More importantly, in many cases it is unclear whether effects can be attributed to processing fluency, or mere exposure.

Zajonc (2001) suggest that mere exposure entails that affect and cognition are two entirely separated psychological processes that can be affected independently of each other. This means that preference to an object can be created without being influenced from cognitive functions (Zajonc 1968). In line with this thinking, one potential explanation to the phenomenon of mere exposure is that novel objects, that we know can activate the brain structure *amygdala,* creates a negative emotional response. Repeated exposures thus leads to a decrease of this negative emotion (Ramsøy 2014). Mere exposure is by some researchers referred to as a distinct phenomenon from processing fluency, which cannot be explained through memory-theory (Zajonc 2001). Nor can it be explained with the reasoning of a person's subjective feeling that something is familiar (Wilson 1979). Still, more recent research attribute this effect to the construct of familiarity (Genco, Steidl and Pohlmann 2013, 77), which is also considered the most common explanation relied on to explain fluency (Lloyd et al. 2014). Winkielman and Cacioppo (2001, 989) and Winkielman et al. (2003, 15) argues that the effects on positive evaluation that are elicited by mere exposure are a consequence of perceptual fluency that creates a positive affective reaction. In accordance with this theory, we make the assumption that perceptual priming and mere exposure are the same, as they both increase positive evaluation on account of one or several exposures. Moreover, several studies have shown that perceptual priming increases positive evaluation of the target (Labroo, Dhar and Schwarz 2007; Lee and Labroo 2004; Shapiro 1999; Lee 2002; Nedungadi 1990). However, none of them examines an increase in positive evaluation towards a video commercial as resulting from perceptual fluency elicited by the priming of another commercial. If an increased positive evaluation of the video commercial on account of priming is observed, this would constitute a novel and useful contribution for intra-

commercial coordination. In addition, as increased positive evaluation is an inherent characteristic of perceptual fluency, this will serve as a proxy for an assessment that the prime was successful. This latter finding will serve as an important finding when discussing the results of the prime on attention. The reason for this is that if no increase in positive evaluation is observed, this is indicative of the priming having failed in the context of commercials. On the other hand, if an increase in positive evaluation is observed, the prime was successful, regardless of whether or not effects on attention are observed. On the basis of this discussion we have formed the following hypothesis:

H1a: *Perceptually primed respondents will have increased positive evaluation towards the fluent stimulus compared to the control group.*

It must be emphasized that a video commercial does not constitute a definitionally perfect perceptual prime. The brand logo that will be shown in the prime is identical to the brand in the subsequent commercial, in accordance with what constitutes a perceptual prime. However, the perceptual prime in this study will be in the form of a commercial for the same brand as the target commercial (although the commercials are different). Inevitably, this entails that the two commercials are conceptually related as they are both for the same brand. Therefore it is unavoidable that the commercials will share some associative commonalities, and thus resemble a conceptual prime. The confounding consequence of using a video commercial as perceptual prime, is that we cannot attribute any positive findings on attention from our perceptual prime as resulting from perceptual fluency exclusively, unless our hypothesis concerning conceptual fluency-effects on attention is negative.

Another matter of concern for the perceptual prime is that they generally benefit from shorter exposures (Lee 2002), which is an inherently incompatible criteria in the paradigm of video commercials. We still distinguish between our independent variables as perceptual and conceptual primes, respectively, because based on prior literature this is what they most closely resemble. Moreover, this design ensures that the current research contributes to two different advertising contexts; when two different commercials of the same brand are shown in sequence (perceptual priming) and when two differently branded, but related commercials (for example competitors) are shown in sequence (conceptual priming).

2.1.2 Conceptual priming, conceptual fluency and spreading activation

Conceptual priming involves presentation of cues that are conceptually related to the target stimulus, but are in no way physically alike (Lee 2002). The effect of this type of priming is known as conceptual fluency, which implies the ease of processing the meaning of an object (Fennis and Stroebe 2010, 49). For example, Lee & Labroo (2004) showed that exposure to an advertisement for 'mayonnaise', activated the concept of 'ketchup', because these two objects are associatively interconnected. Specifically, the concepts are both related to fast-food. In this case, the exposure to the first stimulus causes an indirect activation of the related stimulus in the consumer's brain, and this makes the meaning of the stimulus easier to understand. Lee and Labroo (2004) points out that conceptual fluency is enhanced by an increased elaboration at the time of exposure, and that it can also be enhanced by increased predictability caused by the context the stimulus is represented in.

It is commonly accepted that activating any particular idea has the effect that associated thoughts, memories and feelings are drawn to the mind, because the mind is organized as networks of associations (Cameron, Brown-Iannuzzi and Payne 2012). This is also known as "spreading activation". According to Ratcliff and McKoon (1994), spreading activation is almost indisputably acknowledged as the explanation to priming. In this paper, the conceptual priming implies the activation of interconnected associations. A successful prime necessitates that the object that will be affected (for example the commercial stimulus) is within the associative network that is activated by the conceptual prime. This means that a pre-test must be conducted to establish that the conceptual prime and the target commercial are sufficiently closely related.

Labroo, Dhar and Schwarz (2007) states that the consensus between scientists today is that objects that are easier to process, are also more likely to be perceived better in the consumer's mind. Prior research has demonstrated that positive evaluation did not increase on account of conceptual fluency, even though the primed object became more accessible in memory (Nedungadi 1990). In a seminal study on conceptual fluency, Whittlesea (1993) demonstrated increased positive evaluation on account of conceptual fluency, although this occurred on account of the predictive context the stimulus was presented in and not priming. In contrast to these studies, Winkielman et al. (2003) demonstrated increased conceptual fluency from priming. However, the latter finding was based on a paradigm in which so called semantic

priming was applied. Semantic priming refers to a sub-type of conceptual priming, where cross-modal, but related stimuli (i.e. pictures priming a conceptually related word) are exposed for a short period of time (~250ms) (Winkielman et al. 2003). Lee and Labroo (2004, 164) showed that conceptual fluency induced by priming can increase positive evaluation, although this was seemingly contingent on a context where there is a high expectancy of encountering the target. We we do not intentionally attempt to create a context of high expectancy. The reason for this is that we wish to simulate as closely as possible a natural setting where the viewer has no knowledge of what kind of commercial that comes next, and where they remain unaware of the study's intent. Despite this, we hypothesize an increased positive evaluation due to the conceptual prime in the current research, because of the variety of studies that demonstrate conceptual fluency can increase positive evaluation. This leads to our hypothesis:

H2a: *Conceptually primed respondents will have increased positive evaluation towards the fluent stimulus compared to the control group.*

2.1.3 Distinctions of fluency effects

We have previously emphasized that priming is a different way of enhancing processing fluency than perceptual characteristics such as salience or clarity. Wherein then, lies the distinction between conceptual and perceptual fluency when both can be achieved through prior exposure? The purpose of this chapter is to discuss how these types of fluency effects differ, and how this may influence the results of the current research.

Similarly to Schweidel, Foutz and Tanner (2014), we base our theoretical foundation on the notion that a prior product exposure functions as a prime. However, this imposes the matter of how to distinguish between conceptual and perceptual priming and their respective fluency effects when both can be achieved through prior exposure. A better explanation of their distinctions are warranted.

The primary key distinction between perceptual and conceptual fluency is made on the basis of the context it is presented in. For example, presenting the word "Shampoo" and later presenting the exact same word, assesses perceptual fluency because the words are physically alike. If however, the word "Conditioner" is presented later, it would be conceptual fluency

that is assessed because the two words are conceptually related, but bears no perceptual resemblance. This same principle of physical similarity would apply for any object.

Conceptual and perceptual fluency are known to be independent of each other, and have unique antecedents and consequences (Lee and Labroo 2004, 152). Conceptual fluency is supposedly more sensitive to repeated exposure than perceptual fluency (Janiszewski and Meyvis 2001, 20). As a result, in the context of commercial where viewers are exposed to the concept surrounding a brand for a prolonged duration and often with multiple exposures to the brand, conceptual priming may elicit higher degrees of fluency than perceptual priming. Seemingly, this is related to the fact that perceptual priming functions independently of elaboration at the time of exposure (Winkielman, Reber and Schwarz 1998). On the other hand, conceptual fluency has been demonstrated to benefit from elaboration at the time of exposure or a predictive context (Lee 2002, 442). A predictive context has in fact been described as a requisite for conceptual fluency to induce increases in positive evaluation (Lee and Labroo 2004), although researchers are not in consensus on this matter (Winkielman 2003). Concerning exposure time, perceptual priming has been demonstrated to benefit from shorter exposures, in contrast to conceptual priming. In fact, for some longer exposures effects have been reversed (Lee and Labroo 2004, 152). This in turn, may suggest that fluency to a previously primed advertisement may be inhibited in the context of commercials, because of commercial's relatively long duration as opposed to perceptual primes in prior research.

It is debatable whether fluency that can potentially affect attention can be considered to be conceptual at all. Labroo, Dhar and Schwarz (2007, 820) demonstrated that a conceptual prime facilitated easier perceptual processing towards a related stimulus. This effectively suggests that conceptual priming enhances perceptual fluency. Also, as the aspects of attention we are examining are inherently related to perception (i.e. time spent orienting and time spent gazing at a fluent object), it can be argued that we are examining solely perceptual fluency. As a result, we refer to fluency arising from both the perceptual and conceptual prime simply as fluency-effects, although we still examine them as independent groups. There is precedence for such a generalization (Winkielman et al. 2003), which is justified by the fact that conceptual and perceptual fluency both have similar effect on positive evaluation (Lee and Labroo 2004; Winkielman et al. 2003, 6; Reber, Winkielman, and Schwarz 1998).

Furthermore, in the next chapter we will argue that the effects on attention we hypothesize in this thesis are largely attributable to this effect on positive evaluation.

2.2 Cognitive and affective accounts of fluency-evaluation

In this chapter we will conclude that the effects observed as a result of fluency (e.g. increased positive evaluation) stems from an inherently positive affective reaction. In addition, this reaction can be measured through psychophysiological measures such as facial electromyography (EMG) (Winkielman et al. 2003). This has implications for the hypotheses we arrive at in the chapter on attention, and the hypotheses this chapter concludes with.

There are however, several purposes to this chapter. Firstly, the issue of 'what' fluency actually is has been debated in existing literature, which calls for a discussion of some different perspectives. Two contrasting schools of thought are recognized in this regard, known as cognitive and affective accounts. Any potential effects on attention that are seen as a result of our manipulation, may be induced as a result of positive affect if we assume that fluency always elicits a positive affective reaction. On the other hand, if the assumption that fluency is inherently nonaffective is suggested, it would suggest a cognitive connection between fluency and attention that is on par with other processing effects, like judgments of truth and clarity that have previously been demonstrated to result from increased fluency (Winkielman, Reber, and Schwarz 1998; Janiszewski and Meyvis 2001).

Secondly, the assumption of an affective account of fluency specifically, lends significant theoretical credence to our hypotheses that fluency can affect attention. This is due to the fact that emotional responses have been demonstrate to modulate attention, which we will go into detail later on in this paper (Vuilleumier et al. 2004). Therefore, the reasons for such an account to be assumed must be argued.

Thirdly, the causal effects of fluency are, in much of the existing fluency- and priming-literature dealt with as an enigmatic topic. We believe an in-depth look at the causal effects of fluency is prudent because these effects are theoretically the sole causative factor to the manipulations in this experiment.

Finally, this chapter also substantiates why emotional arousal may be increased due to fluency, and why the confirmation of such a hypothesis would constitute a theoretical contribution to existing literature on implicit memory.

2.2.1 Debating the causal effects of fluency

The apparent discrepancy in explanations for the mere exposure -phenomenon is what prompted the creation of several different models to account for how prior exposure increases positive evaluation. Interestingly, several models account for an increase in positive evaluation without any connection to the affect system (Winkielman and Cacioppo 2001, 990). In the case of mere exposure specifically, the latter of the explanations mentioned earlier as posited by Ramsøy (2014), involving a reduction of negative emotional responses over repeated exposures is consistent with Berlyne's (1970) *uncertainty-reduction account*, also known as the two-factor model (Lee 2001, 1257). This states that people prefer familiar and predictable stimuli, and that repeated exposure leads to a reduced uncertainty towards the stimulus which enhances liking. In other words, the theory posits that the combination of an uncertainty reduction and familiarity caused by prior exposure enhances affect. On the other hand is the *misattribution account*, which posits that perceptual fluency resulting from prior exposure is misattributed to the stimulus being pleasing or more truthful. This results in an increased positive evaluation of the stimulus (Janiszewski and Meyvis 2001). Significantly, exposure does not necessarily cause an increase in liking, according to the *misattribution model*. Rather, it implies that perceptual fluency is affectively neutral in nature and can thus lead to more negative judgments if an exposure is framed in a negative way (Winkielman, Rieber and Schwarz 1998).

2.2.2 Cognitive accounts

The *misattribution account* is consistent with Winkielman and Cacioppo's (2001) *cognitive accounts* of the processing-liking connection. These propose that liking (increased positive evaluation) can result from processing without connection to the affect system. The first cognitive account is known as the *nonspecific activation model*. According to this model, processing is conducive to increased accessibility of activated representations, but does not elicit affective reactions. To be more specific, the model posits that prior exposure activates

the stimulus representations, which is then related to any judgment about the stimuli (Winkielman and Cacioppo 2001). Secondly, the *fluency-attribution model* suggests that fluency is affectively neutral, but still enhances evaluation on account of participants "attempting to find a reasonable explanation" for the fluency they are experiencing (Winkielman and Cacioppo 2001). Finally, the *familiarity-attribution model* proposes that a vague feeling of familiarity is induced as a result of ease of processing. Despite being affectively neutral, it can influence a variety of judgments depending on context. Furthermore, it is likely that misattributions to either disliking or liking will occur as a result of familiarity, and thus positive evaluation is affected (Winkielman and Cacioppo 2001).

2.2.3 Affective account

These explanations are contrasted by the affective account of processing-liking connection, in literature referred to as hedonic fluency (Fennis and Stroebe 2010; Winkielman et al. 2003). This view concerns the general principle that easier processing elicits a genuine affective reaction (Alter and Oppenheimer 2009; Winkielman et al. 2003). Winkielman and Cacioppo (2001, 996) suggests that easy processing is affectively positive because it signals progress toward recognition and cognitive organization of a stimulus. Another argument is that fluency may be positive because it is a cue that the stimulus has been encountered before, meaning that it is "familiar" and "not harmful" from an instinctual point of view (Winkielman et al. 2003, 7).

Most of the research on fluency relies on the construct of familiarity to explain it (Lloyd et al. 2014). However, Winkielman and Cacioppo's (2001, 996) study suggests that positive affect is related directly to processing ease without the mediation of any feeling of familiarity. This finding is based on the increase in preference that resulted from manipulating processing ease in other ways than repetition, implying that familiarity was not affected. Similarly, manipulations of processing ease through symmetry and figure-to-ground contrast have demonstrated increases in preference in other studies (Winkielman, Reber and Schwarz 1999). These findings indicate that positive affect is enhanced by fluency without familiarity as a mediator. In other words, enhanced positive affective responses as a result of repeated exposure need not be a result of familiarity as suggested by Whittlesea (1993) in his seminal study on fluency, despite any correspondence between affect and familiarity. Rather it may be the result solely of fluency enhancing affective responses. As an example, the act of

reading the present paper can infer positive affective reactions on the basis of its processing fluency(or lack thereof) that have nothing to do with the content (or how familiar it is), thus constituting a source of judgmental bias. Note that the term familiar is used in this context to describe a reaction that is very subtle and is subconsciously detected even before the content of a stimulus is decoded (Winkielman et al. 2003, 7). Still, it should be noted as Winkielman and Cacioppo (2001, 997) points out, that the exact mechanisms behind the connection between fluency and positive affect remains speculative.

2.2.4 Psychophysiological manifestations of fluency

Previous research has demonstrated that fluent stimuli can create a positive affective response which is measurable with psychophysiological methods. Winkielman and Cacioppo (2001, 992) found that fluency induced higher activity in the zygomaticus region (an area of facial muscles associated with positive affect), through the use of facial electromyography (EMG). Similarly, Bagdziunaite et al. (2014) demonstrated that fluency induced by priming of an advertisement increased emotional arousal and motivational responses through electroencephalography (EEG). However, the latter experiment was performed in an in-store context, while the current research employs a sequence of commercials in a laboratory context. Definitionally, emotional arousal is not to be confused with a positive affective response. Emotional arousal is one of two dimensions that pertains to emotion, and can be described as bodily responses of excitement to cues in the environment (Ramsøy 2014, 3327). The other dimension of emotion is valence, ranging from positive to negative. Because positive affective response is an emotional response that results from fluency, we predict that respondents that are exposed to fluent stimuli will have an increase in emotional arousal. On the basis of this discussion we present our hypotheses concerning emotional arousal:

H1b: *Perceptually primed respondents will have increased emotional arousal towards the fluent stimulus compared to the control group.*

H2b: *Conceptually primed respondents will have increased emotional arousal towards the fluent stimulus compared to the control group.*

2.2.5 Implications of an affective account of fluency

The implications of this discussion for the current research is that fluency is assumed to be hedonically marked, in keeping with the findings of Winkielman et al. (2003) and Winkielman and Cacioppo (2001). Moreover, we assume that a positive affective reaction is manifested in both physiological indicators (H1b and H2b) and explicitly reported judgments of increased positive evaluation (H1a and H2a) of a stimulus. The reasoning for this is that the affective reaction directly mediates evaluation and fluency, because undermining the informational value of the affective reaction reduces evaluative judgments (Winkielman and Cacioppo 2001, 991). Therefore, both positive evaluation and measures of affect can serve as proxy measures for fluency.

Furthermore, conclusions pertaining to the fluency-attention connection that may result from this paper, must acknowledge that any effects on attention may be a result of a positive affective reaction. In fact, the connection between attention and emotion has been proven to be deeply intertwined (Mangun 2012, 50). One empirically supported view to explain this, is that the region of the brain involved in salience and emotion known as the amygdala, also modulates attention in the form of sensory processing (Vuilleumier et al. 2004). For this reason it follows that any findings need not be specific to fluency, despite the fact that they will in this study originate from fluency (barring the potential for imperfect experimental control muddling our results). Rather, any variations in affective reactions originating from other sources may produce similar results, such as variations in mood.

In this chapter the link between fluency and emotion has been discussed. In the next chapter we elaborate upon the concept of attention. Additionally, we examine prior literature including research that relates to different combinations of connections between attention, priming, fluency, and emotion. Notably, prior research studying priming effects ultimately affecting attention are inconsistent in applying either a fluency-based or affective-based explanation (or both) as mediators for their findings. This necessitates our discussion on the subject below.

2.3 Prior exposure, emotion and attention

As we have reviewed, priming is a way of influencing this implicit memory through the concept of fluency. We will now discuss how fluency can affect attention. First we acknowledge the need for a clarification on our use of the term 'attention'.

By use of the term 'attention' in this thesis, we more precisely refer to 'visual attention', implying the orienting of sensory input towards an object or event in the environment. As exemplified in our story about Liza, attention can operate on or be drawn to a stimuli that never gets consciously perceived (Cohen et al. 2012). Two important implications can be surmised from this statement. Firstly, implicit memory can be affected without conscious involvement. Secondly, any abilities that allows us to influence the chances of attention being drawn and held to the stimuli of our wish, constitutes a useful tool for marketers. This highlights the importance of our automatic nature and implicit memory in consumer behavior.

Attention is an essential part of any advertisement communication, yet more attention does not necessarily increase advertising effectiveness. The reason for this is that we have developed mechanisms to counter the amount of ad exposures we experience (Genco, Steidl and Pohlmann 2013, 181). Overall, we are capable of processing far fewer ads consciously than unconsciously, because the latter requires less cognitive resources. Additionally, our default reaction to ads that grab our attention is just as likely to be negative as positive, implying that a lower degree of attention is often favourable (Genco, Steidl and Pohlmann 2013, 182). We differentiate between two aspects that influence attention:

Bottom-up attention is when our lower senses are stimulated by an exogenous event to such an extent that effects are produced higher up in the processing system (Ramsøy 2014, 2493). In other words, properties of the stimulus itself ensures that it forces itself upon our attention, for example by being very bright, noisy or otherwise unexpected. Bottom-up attention is characterized by being an automatic, fast and non-volitional response (the latter meaning it does not require wilful focusing of the mind) (Ramsøy 2014, 2512). On the other hand, top-down attention is an example of endogenous attention (attention driven by inner processes). It is characterized by being controlled, slow, volitional (meaning it requires wilful focusing of the mind) (Ramsøy 2014, 2602). The current research focuses on the bottom-up aspect of

attention. We will discuss the implications of this, and how it distinguishes the current research to prior priming-attention studies later in this chapter.

As briefly noted in the chapter on theoretical contribution, several independent research articles demonstrate an effect on attention to subsequent commercial due to priming, in the sense that audience loss during commercials are reduced (Schweidel, Foutz and Tanner 2014; Woltman, Wedel and Pieters 2003). This indicates that to some degree viewer's interest is better retained, or some other aspect of their cognitive or emotional state is enhanced to keep attention. However, the authors are not specific in describing whether the effect can be attributed to fluency, or something else entirely.

We distinguish between two aspects of attention that will be tested in this study, which we refer to as 'noticeability' and 'duration of visual attention'. First, we will describe how these represent key aspects of attention. Then we will review prior literature where these are involved in relation to priming and fluency. Finally, we arrive at our hypotheses on how noticeability and duration of visual attention can be influenced in the context the current research employs. Note that the terms noticeability and selective attention will be used interchangeably (Bojko 2013).

2.3.1 Noticeability

Human's mental processing capacity is notoriously limited (Genco, Steidl and Pohlmann 2013). To cope with these limitations, our brains have mechanisms that help us prioritize objects by relevance, effectively guiding our sensory inputs and attention (Vuilleumier 2005). The objects that are prioritized, are able to force themselves upon our attention (bottom-up attention). We refer to the degree that something is prioritized as how noticeable an object is. However, which factors make an object more noticeable?

Mangun (2012, 133) refers to the process of determining the most important information at any time as *competitive selection.* The term constitutes the combining of information pertaining to both the relevance of a stimulus to behavior (top-down) and characteristics of the stimulus itself (bottom-up). This information competes for access to relevant sensorimotor circuitry like gaze control. While the neural mechanisms behind selective attention are not fully understood, several specific influences on this aspect of attention have

been described (Mangun 2012, 3). One prominent example of this is physical salience, which refers to the uniqueness of the physical properties of the object relative to its surroundings, making the object "pop out" in the environment (Milosavljevic et al. 2011). This reflects a bottom-up process, where the salience of the object directly increases the chances of a faster involuntary initial orienting of attention towards the object (Ramsøy 2014, 2583).

However, Vuilleumier (2005) suggests there is also another form of salience. He coined the term 'emotional salience' after he found that emotional processes serves to modify perception, in addition to its primary role of recording the value of sensory events. Specifically, he found that emotional information receives prioritized access to attention, which indicates an increase in salience on emotional objects. Thus, selective attention may be affected by the affective significance of a stimuli (Vuilleumier 2005). As we have discussed, fluency is demonstrated to elicit an inherent positive affective response. This in turn suggest that fluent stimuli may receive prioritized access to attention. This principle is pertinent irrespective of what gives rise to the fluency effect, as there is to our knowledge no theoretical basis for differentiating between conceptual and perceptual fluency in regards to emotional responses. As fluency can originate as a result of prior exposure, emotional salience can essentially bridge the theoretical gap between selective attention and item memory. This is of particular importance because it theoretically circumvents the previously mentioned refutal by Parks and Hopfinger's (2008) that suggested noticeability is not affected by item memory.

Yashar and Lamy (2013) found that implicit memory traces, on the basis of priming, can guide our attention. Specifically, they propose that any attribute of an object that has recently been attended to, a defining feature, or even its location, enhances the observer's ability to reselect the object. This suggests that priming-effects affects noticeability, although the authors did not elaborate on any mediating effects, like fluency. Similarly, Labroo, Dhar and Schwarz' (2008) study on perceptual fluency and positive brand evaluation demonstrated that priming consumers with the concept of a frog led them to process a bottle of wine with a label of a frog more readily than other wine bottles. Even when the prime (two wine bottles) was presented for no more than 16ms, the effect still persisted. This study suggests that implicit memory can be affected by a subliminally, perceptually or conceptually primed object, and that fluency-effects increases one's ability to reselect it. On a similar note, Gazzaniga, Ivry and Mangun (2009, 322) states that forms of objects or words that have been

primed are identified faster and are more recognizable than forms that have not been primed. While the latter statement refers to increases in noticeability on account of perceptual priming in particular, we hypothesize that conceptual priming will incur similar effects, due to the previously mentioned emotional salience. Whether or not the context and approach of the present study allows for a significant increase in noticeability on account of fluency is part of what we aim to find out.

As discussed, prior literature indicates that both conceptual and perceptual fluency may be conducive to increased noticeability. Immediate visual fixations from eye-tracking are indicative of automatic drivers of visual attention. If fluency-effects are present and capable of enhancing noticeability, they can decidedly be considered automatic drivers. A fixation is defined as when the eye remains still over a period of time, and can be from tens of milliseconds up to several seconds (Holmqvist and Nyström 2011, 21). Additionally, the earlier one fixates on a feature (from onset of stimulus), the more salient one can assume that feature is (Ramsøy 2014, 2583). In the following hypotheses concerning attention, it should be noted that by the term fluent stimulus we refer to the exposures of the product that appear in the commercial that is measured. While particularly in the case of the conceptually primed group it can be argued that the length of the commercial is fluent, we emphasize that the key associative relation between the prime and the target is the product that appears in the commercial. And in the case of the perceptual prime, it is the logo that appears on the product that constitutes the prime. For these reason, the term fluent stimulus pertains to the product exposures. On the basis of this discussion, we present our hypotheses concerning noticeability:

H1c: *Perceptually primed respondents will have increased noticeability towards the fluent stimulus compared to the control group.*

H2c: *Conceptually primed respondents will have increased noticeability towards the fluent stimulus compared to the control group.*

2.3.2 Duration of visual attention

Attentional hold refers to the object's or event's ability to retain attention (Mangun 2012, 49), implying that increased attentional hold corresponds to increased duration of visual attention towards an object.

Memory accessibility has been demonstrated to increase the amount of time which attention dwells on an object. There is an inconsistency in previous studies regarding the effects of item memory on the initial orienting of attention. Specifically, some studies find that familiar objects capture attention (Mangun 2012, 49), while others find that novel items capture attention (Genco, Steidl and Pohlmann 2013, 91). According to Parks and Hopfinger (2008), the primary effect of item memory on attention is not increased noticeability but rather that attentional dwell time is prolonged when the item is attended. Dwell time refers to the duration of time an individual spends gazing or fixating within a predefined area in space, like an object (Holmqvist og Nyström 2011, 387). In other words, items that are prominent in memory will receive visual attention over a longer period of time than novel items, but are not necessarily more easily selected in the environment. Additionally, the average duration of fixations were shown to be significantly longer on old items than on novel items (Parks and Hopfinger 2008).

Similarly, Bagdziunaite et al. (2014) conducted a study of how implicit memory is affected by prior exposure. The study was performed on in-store consumer behavior with the use of neurological methods including eye-tracking- and electroencephalography (EEG) - equipment. The participants were exposed to advertisements before they went inside the store, after being told that the advertisement was for calibration of the eye-tracking equipment. The group that were primed with the advertisement showed a significant increase in the time spent on exploring the primed brand shelves (i.e. the fluent objects). They also saw an increase in respondents' emotional engagement and motivational responses towards the products they were primed with (Bagdziunaite et al. 2014). This demonstrates that a prime has a profound effect not only on attention, but also emotional engagement. The latter finding lends further credibility to the notion that the prime in the current research may increase noticeability, as immediate visual fixations are enhanced by emotional salience (Vuilleumier 2005). Additionally, 92% of subjects in Bagdziunaite et al.'s (2014) study

reported they did not perceive the link between the prior exposure and the tasks in-store, suggesting subliminal effects were present.

The effects on duration of visual attention demonstrated by Bagdziunaite et al. (2014) may be very context-specific, as the subjects are essentially in a mode of top-down attention. The reason for this is that subjects are tasked with finding and buying the product they were exposed to in the prime. On the other hand, when subjects are watching a continuous stream of stimuli (as in video commercial), they are primarily in a mode of bottom-up attention, where salient features are likely to gain priority to visual attention as viewers are rarely actively engaged (Ramsøy 2014, 2559). Thus, the effects seen in Bagdziunaite et al. (2014) may not be strong enough or have opportunity to manifest itself in the current research that employs video commercials as stimulus. On a similar note, Pieters and Wedel (2007) found evidence that the duration of visual attention to an object in an advertisement is different depending on participant's goals. Specifically, they found an increase in duration of visual attention under goals related to memorizing the ad and learning about the brand. However, the discussion above entails that the current research examines a crucial difference to Bagdziunaite et al. (2014), namely whether priming-effects on attention are present when subjects are not in top-down mode, instead essentially relying more on bottom-up sensory input. We refrain from using the term bottom-up mode, as we are (by definition) almost always receptive to bottom-up information.

As we have discussed in this chapter, there is evidence that priming can, in some circumstances, increase subjects' propensity to keep their visual attention on fluent objects for a longer duration. To our knowledge, this has not been demonstrated previously in the context of commercials. Specifically, we suggest that the preceding priming commercial will increase the time respondents look on the fluent object in the target commercial. While the design employed by Bagdziunaite et al. (2014) featured a perceptual prime, we hypothesize that conceptual priming will also increase the average duration of visual attention on the fluent stimulus. The reason for this is two-fold. First, increases in time spent looking at an object is often associated with increased interest and preference towards an object (Bojko 2013, 128; Holmqvist and Nyström 2011, 387). This is consistent with theories on both conceptual and perceptual fluency, as previously discussed, that these effects are liable to increase positive evaluation (Lee and Labroo 2004). Secondly, conceptual fluency is recognized as a cue for increased memory accessibility (Lee 2002, Nedungadi 1990, Lee and

Labroo 2004), which is precisely what Parks and Hopfinger (2008) argues can increase attentional dwell time. For the same reason as concerning the noticeability hypotheses, it must be emphasized that fluent stimulus relates to the product exposures that appear in the measured commercial for these measures.
For these reasons, we hypothesize that duration of visual attention to fluent stimuli will increase as a result of both a conceptual and perceptual prime:

H1d*: Perceptually primed respondents will have increased duration of visual attention towards the fluent stimulus compared to the control group.*

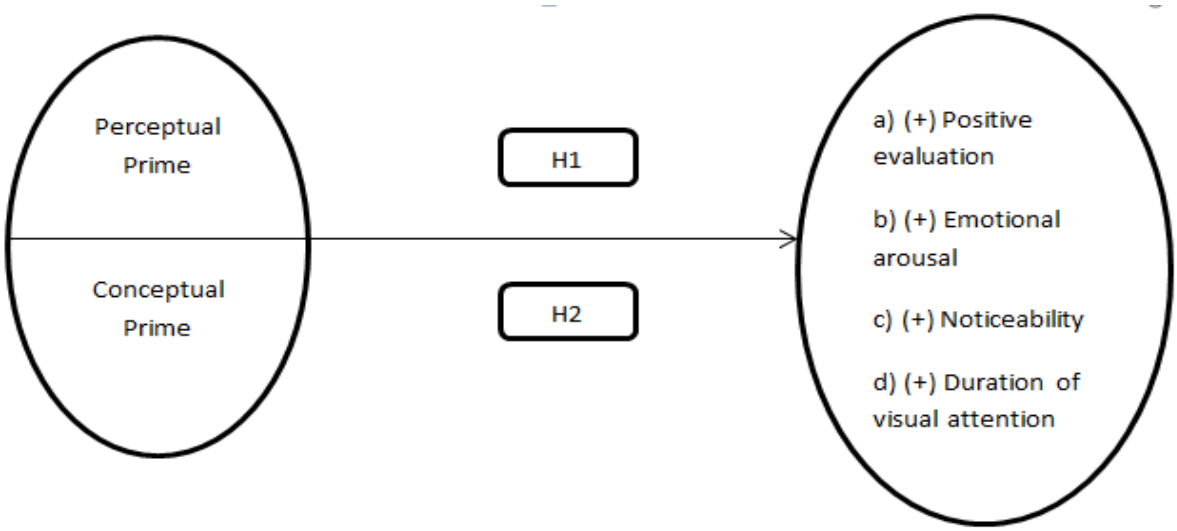
H2d*: Conceptually primed respondents will have increased duration of visual attention towards the fluent stimulus compared to the control group.*

There is a final note to be made in regards to noticeability. Mangun (2012, 133) states that prioritizations of stimuli are produced by combining information about the stimuli (bottom-up) with information about how relevant the stimulus is to behavior (top-down). While the stimuli employed in Bagdziunaite et al.'s (2014) study was highly relevant to behavior (as participants were task-driven), the opposite is true for the stimuli in our study. For this reason our findings on H1d and H2d will be indicative of whether stimulus relevant to behavior is a requisite for effects on noticeability induced by priming. Specifically, positive findings indicate that stimuli need not be highly relevant to behavior.

3.0 Conceptual model and hypotheses

Our conceptual model is a diagram which illustrates the set of relationships between all factors that are believed to have impact on or lead to the target condition. Our conceptual model shown in model (1) below, demonstrates the interferences that our literature has led us to hypothesize. Model (1) illustrates how our independent variables affect our dependent variables, and their valence. The conceptual model is illustrated below.

Model 1: Conceptual model



As mentioned earlier, conceptual priming as well as perceptual priming can increase positive evaluation towards the target commercial. Moreover, an increased positive evaluation towards a stimulus on account of priming is considered a consequence of this emotional response (H1a and H2a). As discussed, there is theoretical basis for assuming fluency effects elicit an emotional response, which can be reflected in increased emotional arousal (H1b and H2b). These two measurements relate to the entire length of the target commercial. The measures of attention relate to product exposures of the fluent product throughout the target commercial. We intend to measure noticeability toward the target commercial (H1c and H2c), and both primes can also have the effect of increasing the duration of visual attention (H1d and H2d).

3.1 Hypotheses:

H1: *Perceptually primed respondents will have increased a) positive evaluation, b) emotional arousal, c) noticeability and d) duration of visual attention towards the fluent stimulus compared to the control group.*

H2: *Conceptually primed respondents will have increased a) positive evaluation, b) emotional arousal, c) noticeability and d) duration of visual attention towards the fluent stimulus compared to the control group.*

4.0 Methodology and research design

The purpose of this study is to examine the effects of priming in the context of a video commercial sequence, and analyze the extent of these effects on attention. First, we will explain the experiment's research design. Secondly, we will substantiate our choice of quantitative eye tracking methods. Then we will elaborate upon which measures we intend to use and why these are appropriate for the current research. Following this, we will present which measures we have taken to ensure adequate levels of validity and reliability, and go through the execution of the experiment. The remainder of this thesis will involve presentation of results, a discussion of our findings and implications.

To summarize, we conducted two separate experiments. In the first experiment, the group is manipulated with a conceptual prime, and in the second group respondents are manipulated with a perceptual prime. We will control for our manipulations by adding a control group that will function as comparison for the two other groups. We expect that our independent variables (perceptual and conceptual prime) should affect and directly manipulate our dependent variables. To examine our research question we created four hypotheses for each experiment, and apply one method of measurement for each of these.

4.1 Research design

To answer our research question we applied an experimental design. This is known to be the only way in which causality can be obtained, since it makes it possible to manipulate, isolate for correlations and to obtain control (Shadish, Cook and Campbell 2002, 12). The current research employs a deductive design, as our hypotheses are made in light of established theory on the connection between priming, fluency and attention. We decided upon using between-subject design as each participant is exposed to only one of the tested stimuli, and it is important to eliminate carryover effects. This implies that we will need a larger sample size then within-subject design, to help offset the variability between participants. Furthermore, it is increasingly important to make sure that the different participants groups are as equal as possible in terms of characteristics, such as age (Bojko 2013, 81). The significant difference between our groups, is that they are given one different independent variable from the other. This difference is known as a manipulation (Kantowitz et. al. 2009).

4.1.1 Choice of methodology

Our experimental design requires a methodology that allows us to illuminate our research question. It needs to supports the measurement of visual attention and of emotional arousal, in addition to traditional explicit measures of evaluation. For this purpose, the field of consumer neuroscience (also referred to as Neuromarketing) is applicable. In this field, the goal is to adapt theory and methods from neuroscience in combination with behavioural models and theories. Commonly used research tools in this field include eye tracking, EEG (electroencephalography), fMRI (functional magnetic resonance imaging), and EMG (electromyography), amongst others. Consumer neuroscience studies range from studying cells with cellular neuroscience to studying how different areas of the brain such as visual systems interact, with the purpose of deeper insight into consumer behavior (Plassmann, Ramsøy and Milosavljevic 2012). We used eye tracking for our study to be able to predict finding and to fully investigate concerning our research question.

Eye tracking is suitable for measuring visual attention. Here the eye movements are recorded in a database, to indicate the individual fixation patterns (Plassman, Ramsøy and Milosavljevic 2012). When aiming to research the effects of fluency on attention, we surmise that explicit surveys would fall short. The reason for this is that we expect changes in attention that respondents are not aware of and that are so small they require more precise measurements. By combining neuroscientific methods and consumer psychology, we are able to research the effects of priming, and its possible effect on our visual attention.

To measure positive evaluation we conducted a survey that enabled the consumers to explicitly evaluate the commercial after the experiment. The hypotheses H1a and H2a concerning this, is measured easiest and most effective in an explicit survey as we cannot examine this with the equipment of eye tracking. We selected some established measures for attitude towards the ad (Janiszewski 1988). Where a list of words that described an attitude towards an advertisement was placed in a bi-valent likert scale ranging from 1-7. We will elaborate upon this method for measuring positive evaluation more specifically in next chapter (4.2).

4.2 Operationalization

In this part, we will first explain how we operationalize the mental constructs which we previously have hypothesized will be influenced on account of the primes. As we will go into more detail on in our analysis, areas of interest (hereafter referred to as AOIs) are an integral part of our measures of attention. AOIs define regions in a stimulus that we are interested in gathering data about, and are created in the eye tracking software. When we mention 'AOIs' in this chapter, we refer to areas in the target commercials that surround the object that participants have been primed with, namely the Powerade product. Four such AOIs have been selected in the target commercial, and serve as the basis from which the dependent variables on attention are measured. The reasoning for this selection will be elaborated upon in chapter 5.1.

4.2.1 Evaluation

We hypothesized increases in positive evaluation towards the fluent stimulus for both the conceptually and the perceptually primed group compared to control. Previous studies on fluency have used explicit increases in attitude to measure the effects fluency have on positive evaluation (Lee and Labroo 2004; Nedungadi 1990). We assimilated this approach, and selected established measures for attitude towards the ad (Janiszewski 1988). All the items are based on a bi-valent likert scale ranging from 1-7. There is a specific reason we selected "attitude towards the ad" specifically, and not "-towards the brand". For the conceptually primed group in particular, we predict that fluency should be present for the entire duration of the commercial, because of its associative relatedness to the prime. On the other hand, it can be argued that it is the Powerade product in the target commercial that is the primary source of fluency because this is what the conceptual prime is for. Still, we deemed attitude towards the ad as the operationalization that best allows us to compare the perceptual and conceptual groups. The operationalization is based on Janiszewski (1988), and involves the following items:

Table 1: Operationalization of positive evaluation

Item	Translation	Origin
Not irritating / irritating	Ikke irriterende / Irriterende	Janiszewski 1988
Interesting / boring	Interessant / Kjedelig	Janiszewski 1988
Soothing / Not soothing	Beroligende / Ikke beroligende	Janiszewski 1988
Impressive / Unimpressive	Imponerende / Ikke imponerende	Janiszewski 1988
Attractive / Unattractive	Attraktiv / Uattraktiv	Janiszewski 1988
Eye-catching / Not eye-catching	Iøynefallende / Ikke iøynefallende	Janiszewski 1988
Pleasant / Unpleasant	Behagelig / Ubehagelig	Janiszewski 1988
Likable / Unlikable	Liker / Liker ikke	Janiszewski 1988

Table 1 illustrates the translation from English to Norwegian. Janiszewski (1988) also suggested to include the items of warm-hearted/cold-hearted and appealing/unappealing to measure attitude towards the ad. These items were excluded from our operationalization. The reason for this was that the resulting translation were deemed to be too different in Norwegian from their original meanings in English. Additionally, in the case of appealing/unappealing, the item is very similar to the translation of attractive/unattractive. While this is a limitation, it was considered that the number of items is likely to be sufficient to measure this variable well.

4.2.2 Emotional arousal

We hypothesized that emotional arousal would increase on account of the positive affective reaction that has been demonstrated to result from fluency (Winkielman et al. 2001) and the increased levels of emotional arousal found in other priming studies (Bagdziunaite et al. 2014). We propose to use increased levels of pupil dilation as a measure of emotional arousal. Pupils dilate based on three processes: brightness, increased cognitive load, and increased emotional arousal (Ramsøy 2014, 1213; Bojko 2013, 130; Holmqvist and Nyström 2011, 435). We control for changes in brightness by shielding the lab room from daylight, retaining only a ceiling lamp and the computer screen as light sources. The natural variations in brightness resulting from a video stimulus (as opposed to a static stimulus) are not a concern, as calculation of this measure is based on the average throughout the commercial. There is a weakness in controlling for cognitive load, as this is a psychological response that

cannot be measured with the equipment that is at our disposal. However, all groups are given the same information and distraction tasks beforehand. Furthermore, cognitive load is primarily associated with increased level of difficulty in a task (Ramsøy 2014, 1213), which indicates that it is highly unlikely changes in pupil dilation will result from increased cognitive load in this experiment.

Hypothetically, emotional arousal for the perceptually primed group is only present when the stimulus logo is viewed in the target commercial, because this is the stimuli that respondents are perceptually primed with. Emotional arousal for the conceptually primed group on the other hand, should be present for the entire duration of the target commercial because the entire commercial is associatively related to the conceptual prime. To be able to compare these groups, we therefore measure average pupil dilation for the entire length of the target commercial for both groups, although we realize that this is a limitation particularly for the perceptual condition.

By measuring average pupil dilation on the target commercial, we are able to observe if the positive affective response is manifested in emotional arousal. To our knowledge the affective responses incurred from fluency has previously not been associated with increased pupil dilation measurements, implying that the support for this hypothesis would constitute a theoretical contribution. Importantly, emotional arousal is bivalent, and cannot confirm whether an emotion is positive or negative (Ramsøy 2014, 3337). For this reason increases in emotional arousal cannot prove a positive affective reaction, merely indicate that participants had an emotional response.

A concern when measuring pupil dilation is that pupil size is idiosyncratic, meaning that everyone has an individual default level (Bojko 2013, 131). Therefore we establish a baseline level for each participant by selecting the average pupil dilation from another commercial (we selected the Telenor commercial). Then we calculate the difference from the Telenor commercial to the Powerade commercial, and use the resulting number for statistical analysis.

4.2.3 Noticeability

We hypothesized that priming would make the objects that were fluent (Powerade products) more noticeable in the target commercial. This was based on several findings that priming could affect noticeability (Yashar and Lamy 2013, Labroo, Dhar and Schwarz 2008; Gazzaniga, Ivry and Mangun 2009). In addition, it was based on Vuilleumier's (2005) argument that emotional objects receive prioritized access to attention. This in turn suggests fluent objects may be more noticeable, as a positive affective reaction is an inherent result of fluency (Winkielman and Cacioppo 2001).

Time-to-first-fixation has been previously used to measure how long it takes from a stimulus is presented until people look at it (Ramsøy 2014, 2576). The shorter the TTFF is, the more noticeable the object is. This measure is assessed by calculating the time it takes from onset of an AOI in the target commercial until the respondent looks at the AOI.

4.2.4 Duration of visual attention

As a measure for duration of visual attention we use total gaze duration (TGD) on AOI, which implies the total time spent viewing the selected areas of interest. This measure implies that we not only measure the first time the gaze enters and exits the AOI, but also subsequent returns to the AOI. This applies for the duration of each recorded scene (of which there are four in the target commercial). This includes the time spent on the subsequent returns to the AOI for the duration of each scene, and not only the first time the gaze enters and exits the AOI.

The basis for choosing this measure is that fluency is a cue for increased memory accessibility, which Parks and Hopfinger (2008) has demonstrated will increase dwell time on the fluent object. Total gaze duration is also known as dwell time, but because the latter is often confused as meaning the sum of all fixation durations in an area of interest we refrain from using this term (Holmqvist and Nyström 2011, 387). There is a specific reason why we choose gaze duration over fixation duration. As previously mentioned, a *fixation* is defined as a period where the eye remains still over a period of time, and can range from tens of milliseconds up to several seconds (Holmqvist and Nyström 2011, 21). In contrast, a *gaze* is a term that encompasses all measurements of where someone looks at a stimulus, meaning it

includes time of fixations and smaller positional changes (Holmqvist and Nyström 2011, 24). The exact way the distinguishment between a gaze and a fixation is made is dependent on software and algorithms applied for analysis. However, the implication of this is that in the context of a fast-moving commercial where stimuli is often exposed for a short time (between hundredths of a second to a few seconds), measurements of gaze duration is more appropriate to measure minute differences in gaze positional changes over time. Additionally, duration of fixations can be related to difficulty of processing information, which could skew our measures of attention (Bojko 2013, 128). By selecting total gaze duration, controlling for duration of fixations is thus unnecessary. On the other hand, gaze duration is considered an established measure of interest towards a stimulus (Holmqvist and Nyström 2011, 387). On the basis of this discussion we operationalize duration of visual attention by applying the measurement of total gaze duration, which implies the total time spent looking at the defined AOIs.

4.3 Selection of stimuli

Manipulation stimuli

We selected the sports drink brand Powerade as the basis for our experiment. This entails that the target commercial that we measure our dependent variables on is a Powerade commercial. The perceptual prime (which needs to have physically similar exposure) is thus a different and shorter commercial for Powerade than the target commercial. The prime in this condition is the Powerade logo, which is shown at the end of the commercial. We suggested brand YT as a conceptual prime, because this is seemingly associatively related to Powerade. This connection was pretested, which is explained further below.

4.3.1 Pretest for conceptual prime

A pretest was conducted to ascertain whether our suggestion for conceptual prime (sports drink brand YT) were sufficiently associatively related to our target commercial stimulus, Powerade. The stimulus for the perceptual prime is a given, as that is the same as the target commercial. The reason we needed to establish which and how many associations was linked to the same brands, is because the conceptual prime is dependent on being significantly

related, which is reflected in strong links between the brands' associations. This is essential to acquire necessary spreading activation of associations and in turn, fluency.

First we conducted a test of associations where about 50 respondent were asked to name the first word that appeared in their mind when we named the following brands: Powerade and YT. Out of these selected words we made a survey, where about 70 respondents answered the questions questions regarding if they meant that the two brands was associated with given words of associations.

In this way we were able to establish a control and two prime settings, one perceptual including the same brand (Powerade) but in a shorter commercial, and one conceptual where a YT commercial was presented earlier. The following terms were measured. (This means the respondents who crossed of both Powerade and YT, for the given associations). Model 2 illustrated the association to the left, and the percentage for the amount that crossed of on both brands for each given associations.

Table 2: Conceptual prime pre-test results

Sports	62%
Training	39%
Endurance	30%
Running	21%
Health and energy	15%
Jogging	10%

The associations that were most shared between the two brands include: sports, training, running and endurance. Whereas jogging and health and energy, indicates that there is, a wider range of associations that the two brands share. Since the pretest was established to see if and how many associations they shared, this means that there are at least 6 mutual associations. This indicates that exposure to the first stimulus (YT) can have an indirect activation of the related associations in the consumer's brain. Thus, any subsequent exposure to stimuli that activates these associations will be more fluent than if they were not activated.

Distraction task and distraction stimuli

The distraction task is that we tell respondents they will be shown a commercial for "Telenor" amidst a sequence of other commercials and that they will be asked to evaluate this specific commercial at the end of the experiment. We selected a commercial for this brand

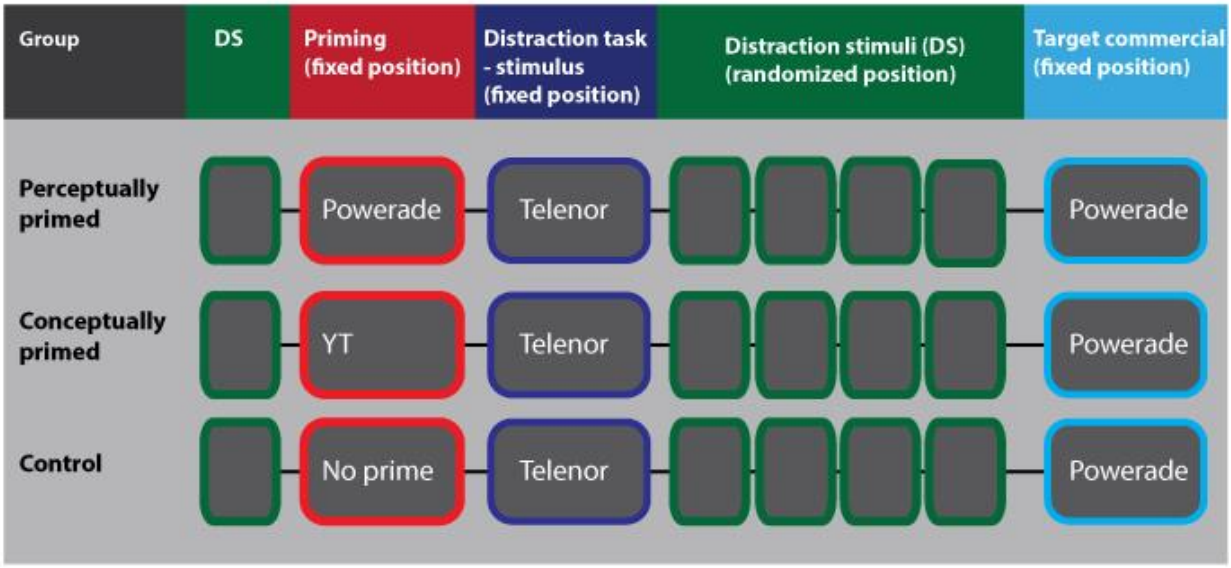
because as a phone network operator, this is unrelated to the primes and target commercials. We inform them that the other commercials are there to make the Telenor -commercial appear in a more natural context. However, the commercial that is related to the distraction task respondents are instructed with (Telenor) will remain in a fixed position as the third commercial in a series of a total eight commercials. This is because viewer engagement must remain equal between all groups, particularly when the prime and target commercial is shown. Additionally, we surmise that viewer engagement may be reduced after the task-related commercial appears. For example, if the Telenor-commercial position was randomized, and appeared as the first in the sequence, viewer engagement may be lower among respondents who view the prime-commercial afterwards. Lower degrees of engagement is conjectured to more accurately represent a natural context of a viewer watching a sequence of commercials. However, we acknowledge that the artificial context the experiment is being conducted in may nonetheless alter engagement to unnatural levels. For this reason, we also control for respondent's understanding of the experiment in the qualitative questionnaire.

The distraction stimuli are six unrelated commercials that are placed in the sequence. These commercials are for the brands Star Tour, Maybelline, Solidox, StayHard, Brelett and Telenor. To further strengthen the experiment's validity, these commercials are placed in randomized positions for all three groups. This is crucial to rule out the possibility that the effects of the preceding commercial to the target commercial systematically interferes with the results. For example, if the preceding commercial is particularly humorous, minor variations in mood may carry over to the subsequent target commercial stimulus. Additionally, the temporal interim between the prime and the target commercial is the same for both the conceptual and perceptual group. This is important for purposes of comparison as the effects of associative primes are known to subside with time (Chartrand et al. 2008, 191).

4.3.2 Stimuli overview

The resulting overview of the stimuli in the experiments are illustrated in the model below.

Illustration 1: Stimuli overview



The diagram illustrates, from left to right, the sequence of the stimuli. The experiments for each group consists of a total of eight commercials, of which six are entirely unrelated to the experiment (indicated in green). Note that each commercial is signified by a grey box. It should be reiterated that the perceptual prime (Powerade), is a different, shorter version than the target commercial (Powerade).

4.4 Execution of experiments

4.4.1 Recruitment of respondents

On the basis of our research design and methodology, the number of respondents was set to about 25 in each group. This was based on Bojko's (2013, 158) suggested sample size calculations for eye tracking studies with between-subjects design and continuous measures. Respondents were recruited from Oslo School of Management and the surrounding offices where the experiment was conducted. A convenience sample of 84 respondents was recruited in total, which included 40 males and 44 females. Mean age 29.8 years (range = 14-66). As an incentive, we advertised that participants could win a selection of different prizes. These

included a day for two at Tusenfryd family park in Oslo, about 90 tickets to bowling, 10 days free workout at Myrens Sportssenter and several other incentives. The experiment required about 15 minutes per respondent, and they had to come to our laboratory for the experiment. Participants were randomized between groups as we do not require any particular group of people in the study. However, the distribution of gender is evened out to ensure sex is not a biasing factor on the results.

4.4.2 Preconditions for the use of laboratory

The observations in this study will be made in a controlled experiment in a laboratory, which entails that the experiment will be executed under conditions that will be controlled by the researcher (Kantowitz et. al. 2009). An eye tracking laboratory needs both an infrastructure that keep the laboratory up-to-date and running and physical space for the eye-tracker and the experiments (Holmquist og Nystrom 2011, 17). Our laboratory is run by market analytics company TNS Gallup. The equipment used in the experiment is a single computer with two monitors, one that is viewed by us and the other viewed by the respondents which is also connected to the eye tracking equipment. According to Holmquist og Nyström (2011, 17) there is no single solution for designing an eye- tracking laboratory. It depends on what you intend to study the effects of. Firstly, we keep levels of illumination in the room constant, by covering all sources of daylight in the room. This is particularly important when measuring pupil dilation, which is sensitive to changes in light. Furthermore, disruptions like external noise is kept to a minimum as the experiment is conducted in a floor where there is very little activity unrelated to the experiment. In addition, the room faces towards a backyard, ensuring minimal amounts of background noise from external sources like traffic. We also created a protocol for execution of the experiment to ensure that each respondent experienced the same conditions in the laboratory (Attachment 1).

4.4.3 Procedure for both experiments

The experiment started with a calibration, which is an automatic test that each respondent is subjected to prior to viewing the commercials. Calibration of the eye-tracker is an in-built feature of the eye tracking software we use, Attention Tool 5.5. This is necessary because individual variations can change the geometrical values that are the basis for calculating gaze direction (Holmqvist and Nyström 2011, 128).

We then conducted the experiment where three groups of respondents were exposed to different sequences of commercials. To increase chances of the prime to have effect, the participants are instructed with the distraction task as we have previously discussed. Through the use of eye tracking equipment, respondent's gaze data was recorded. In addition, respondents subsequently answered an explicit questionnaire where positive evaluation was measured, along with some other qualitative questions to control for respondents' understanding of the experiment. One third of the participants will be exposed to a perceptual prime (Powerade), and one third to the conceptual prime (YT), while the remaining third will only be exposed to the distraction stimuli commercials prior to the target commercial (Control). All three groups will be exposed to six unrelated distraction commercials which are randomized in order, and the target commercial which our dependent variables are measured upon.

5.0 Analysis

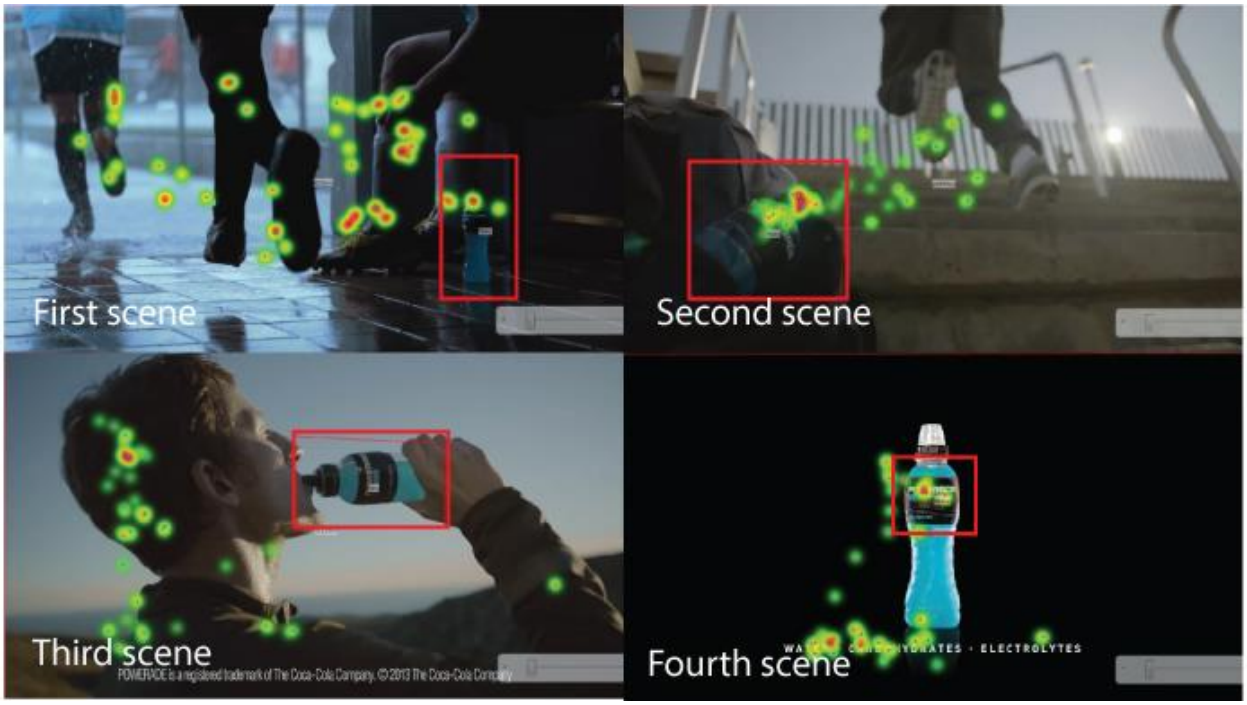
The first section of this chapter explains those aspects of the analysis that the groups have in common. This includes the procedures of analysis of eye tracking data, and how the areas of interest were defined. The areas of interest serve as the basis for which all measures of attention were performed (TGD and TTFF). Then we present each of the two experiments that were performed in comparison to the control group.

5.1 Selection of areas of interest

An area of interest define regions in a stimulus that we are interested in gathering data about. These regions are created in the eye tracking software, which in this experiment is Attention Tool 5.5, developed by Imotions. Importantly, our measures of total-gaze-duration (TGD) and time-to-first-fixation (TTFF) are based on data measured within these AOIs. For TGD, total time is calculated by adding the gaze duration on each AOI for each respondent. The resulting number provides the basis for our statistical analysis. For TTFF, time is calculated by averaging each respondent's time-to-first-fixation on all AOIs. The resulting numbers are then applied for statistical analysis.

In the current experiment the stimulus we measure our dependent variables on is a Powerade-commercial, which we refer to as the target commercial. As the target commercial is a video stimulus, as opposed to a static stimulus such as a picture, we have to use Dynamic AOIs (Holmqvist and Nyström 2011, 209). Dynamic AOI means that the area of interest moves in sync with the underlying object in the stimulus that we wish to examine. In this study the object is the Powerade product, as this is what the participants have been primed with (or not primed with, in the case of the control group). For the entire length of the target commercial there are in total six exposures of the Powerade product, which lasts between 2-8 seconds each. The length of these exposures are hereafter referred to as scenes. We selected four out of these six scenes, based on the alternatives where we deemed the product to be most prominent. This way we increase the chances respondents will look at the product across all groups, resulting in greater amounts of comparable data. The scenes are illustrated below.

Illustration 2: Areas of interest for target commercial



As shown in illustration 2, we created four Dynamic AOIs, hereafter referred to as just AOIs. Each of them start at the first frame of the scene, and end on the last frame on the scene. For the length of each scene, the AOI follows the product's movement in the video. The AOIs are highlighted in red squares in the picture below.

These four AOIs had to be created three times, for each of the groups. This is a limitation, as it means that minor differences in size of the AOIs may be present. The reason we had to create them three times is that dynamic AOIs cannot be created in the current software by input of grid coordinates. Rather, the four corners of the AOI must be manually "dragged" to surround the product. However we matched the size of the AOIs between the groups as closely as possible, to ensure comparable data.

Some space is left around the product inside the AOI to account for low precision in the eye tracking recording equipment. This is a common practice, as even in high-end eye trackers it is required to have a minimum margin around objects of interest of about 1.5 degrees (Holmqvist and Nyström 2011, 223). We acknowledge that some of the points of gazes that we measure in the AOI may not in fact be looking at the product, but closely around it.

5.2 Procedure of analysis

The software Imotion's Attention Tool 5.5 was used for recording and some preliminary analysis of the data. This software includes built-in eye-tracking, calibration, creating AOIs, data quality monitoring and data cleansing. This ensures that we have a dependent solution for ensuring our data quality for each respondent is sufficient. In accordance with the guidelines issued by Imotions concerning data quality, we retain only data in excess of 85% data quality, although we aim for >90% average data quality for all groups. This is acknowledged as adequate data quality for the kind of experiment we are conducting (Holmqvist, Nyström and Mulvey 2012). To filter, code and transpose our data, we used R (R Core Team 2015). R software is an environment for statistical computing (R Core Team 2015). To use this software we imported raw data that was exported from Attention Tool 5.5. Using R, it also helped us to clean our data before exporting to SPSS. This was done to make sure that the only data we exported into SPSS included the respondents that had good data quality, and to clean up faulty data like missing numbers (-1), measures taken during blinking and other artifacts. After preprocessing the data with R we conducted statistical tests with SPSS.

5.3 Experiment 1

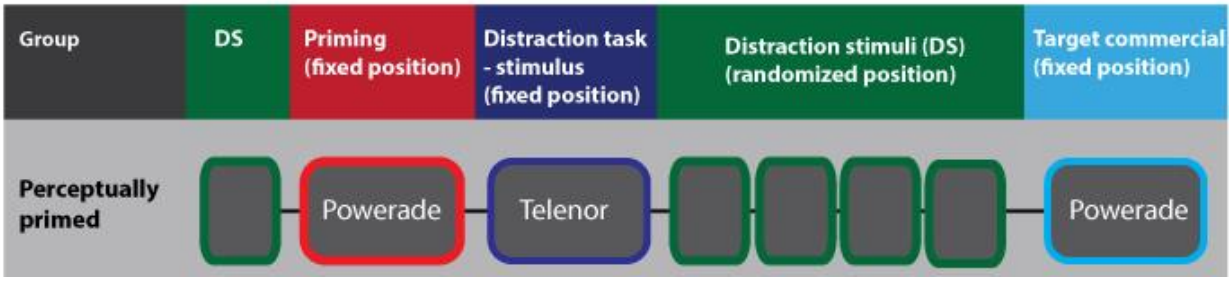
5.3.1 Procedure and stimulus

As mentioned earlier, each respondent is told to focus at Telenor-commercial, and that they will be asked to evaluate this after the experiment. As previously mentioned, this is to distract them from the true purpose of the experiment, and ensure consistently lower levels of engagement towards the prime and target commercials.

The total viewing period for all stimuli is about 4 minutes and 5 seconds, and contains in this condition a perceptual prime for the commercial of the the same brand as our dependent commercial, Powerade. The difference here is that the perceptual prime is shorter and different commercial for Powerade then the target commercial. Here, similarly to the previous experiment, the prime is also followed by randomization of commercials to distract respondents and most importantly to make sure that the sequence of the stimuli did not affect the dependent commercial of Powerade. Also here the primed group have the same

distraction stimuli between the prime and the target commercial (Powerade), including our control group (demonstrated in illustration 3).

Illustration 3: Perceptual group stimuli overview



The target commercial is the exact same as in previous experiment, and is placed at the end of the viewing period, and lasts about 1 minute and 5 seconds. The perceptual prime is positioned as the second commercial in the entire sequence. In this way it precedes the distraction task stimulus (Telenor-commercial), and respondents are not affected by increased elaboration they may experience due to it being the first stimulus they see. The picture below shows how the commercial ends. The perceptual prime is here the Powerade logo.

Illustration 4: Perceptual prime stimulus

5.3.2 Hypothesis and Predictions

To recap what was hypothesized in experiment 1, the respondents that are perceptually primed will have increased (a) positive evaluation (b) emotional arousal, (c) noticeability and (d) duration of visual attention towards the fluent stimulus compared to the control group.

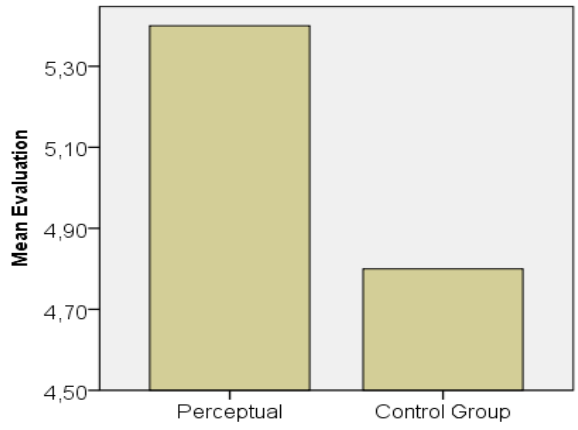
First we will conduct analysis for H1 a,b,c,d, then results from H2 a,b,c,d. This will also be discussed more thoroughly later in chapter 7.0.

5.3.2.1 Outliers

Respondents identified as outliers with the help of boxplot and scatter/dot plots were removed , which can increase the error variance and reduce power of statistical tests (Bojko, 2013).Before conducting our analysis we produced boxplots and scatter plots of the data and identified participants which deviated 1.5 * IQR(interquartile range) from the respective conditions upper and lower quartiles as outliers. This is to ensure at our data is approximately normally distributed before analysis. We will emphasize in each hypothesis the following respondents that was removed as they showed unusually high and low values, that made the observation stand out from the others (Hair et al. 2010). The following respondents are always removed in our eye tracking analysis. This include respondents B23, K16, P2, and P23 because of low eye tracking data quality (<80%) as indicated by Attention Tool 5.5 software.

5.3.3 Evaluation

Figure 1: Mean Evaluation

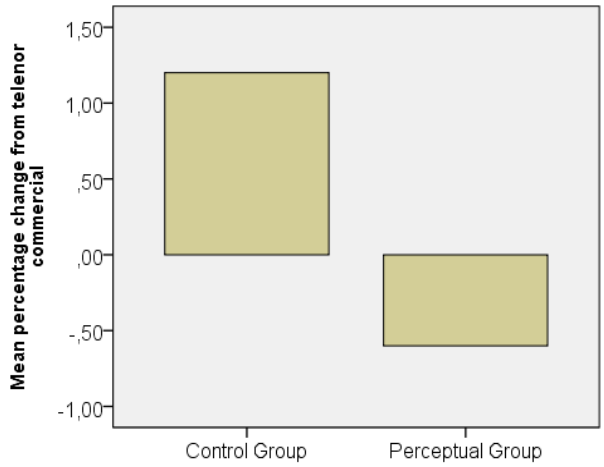


Respondent's positive evaluation was as mentioned earlier measured in a questionnaire with a scale from 1-7, including words that described their affective responses, as negative (e.g 1 boring) and positive (e.g 7 exciting). We wanted to see if the perceptually primed respondents reported on average a little more positive evaluation to the last commercial. A t-test was conducted to examine whether the perceptually primed group on average evaluated the 1-7 scale more positively than the control group. The t-test revealed significant difference, $t(53) = 2.892$, $p = 0.006$, between the perceptual ($M = 5.4567$, $SD = 0.55446$) and control group (M

= 4.8233, SD = 0.98511) conditions. By this results we have significant increase in average evaluation of the commercial, and can found support for hypothesis H1a.

5.3.4 Emotional Arousal

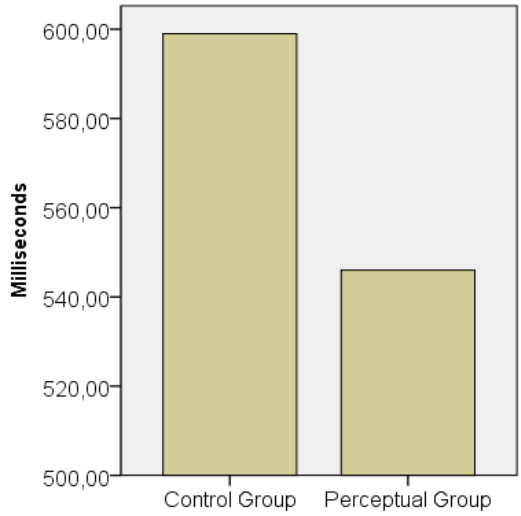
Figure 2: Mean percentage change in pupil size from Telenor commercial for perceptual group



To examine hypothesis H1b we used the measure of Pupil dilation. We computed percentage changes in pupil size between the Powerade commercial and the Telenor commercial before conducting the analysis. The Telenor commercial occurred at the same time for all participants and thus acted as a baseline condition for pupil size measurements for individual participants. An ANOVA test was performed on the whole commercial and revealed a significant difference $F(2) = 4.107$, $p = 0.020$, between the three conditions (Conceptual, control and perceptual). We conducted a t-test to examine whether we have increased pupil dilation on the perceptually primed group compared to the control group. The T-test was within all AOIs and revealed no significant difference, $t(49) = 1.595$, $p = 0.117$ between the control group (M = 1.2 %), SD = 3.2%) and perceptual (M =-0.6 % SD = 4.8%) conditions. We therefore reject hypothesis H1b.

5.3.5 Noticeability

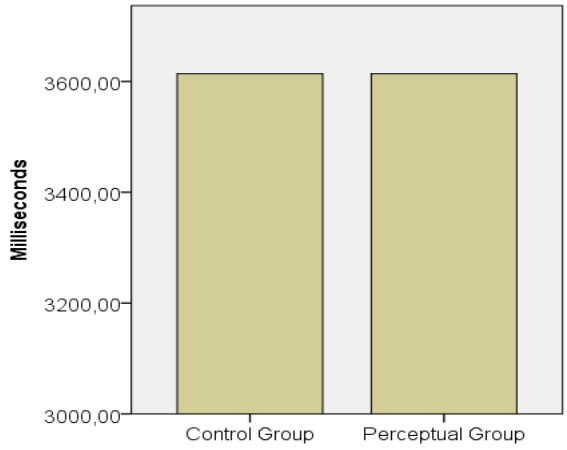
Figure 3: Time-to-first-fixation for perceptual group



Noticeability and analyse hypothesis H1c we used Time-to-first-fixation as measurement and Before analysing our results, we conducted a boxplot between the groups for respondents, and according to 1,5* IQR.The following were classified as outliers for the perceptual group 6, conceptual group 6 respondents.We conducted ANOVA test within all AOIs which revealed no significant difference, $F(2) = 1.345$, $p = 0.268$, between the three conditions (conceptual, control group and perceptual). To see if conceptual conditions were different from the control group we performed an independent sample test to get more insight. The independent sample test revealed no significant difference, $t(41) = 1.333$, $p = 0.190$, between the control group (Mean = 599 ms, SD = 154 ms) and perceptual (M = 546 ms, SD = 94 ms) conditions. Hypothesis H1c is rejected, as there is no increase in noticeability compared to the control group.

5.3.6 Duration of visual attention

Figure 4: Duration of visual attention for perceptual group



To examine Duration of visual attention and analyse hypothesis *H1d* we first conducted an ANOVA test on total gaze durations (TGD) within all AOIs. The results revealed a significant difference, $F(2) = 11.679$, $p < 0.001$, between the three conditions (conceptual, control group and perceptual). We took an independent sample test to get more insights between the three conditions. The t-test on total gaze durations between all AOIs revealed no significant difference, $t(51) = 0.533$, $p = 0.730$, between the control group (Mean = 3749 ms, SD = 1385 ms) and perceptual (M = 3614 ms, SD = 1463 ms) conditions. Results thus indicate that we have no support for hypothesis H2a. We predicted an increase in TGD for the perceptually primed group, just as we did for the respondents exposed to the conceptual prime. Total-gaze-duration was measured to be not significant for the respondents who were perceptually primed, resulting in the rejection of hypothesis H1d.

5.3.7 Additional findings in perceptual conditions

We generated a set of additional questions to complement the other results. The first question, was an open questions regarding which commercial they liked the best. Here the respondent had to name one of the commercials before they could go on to the next question. We conducted a Pearson Chi-Square test on the conceptually primed respondents, the Chi-Square Test revealed significant difference, $X^2(2, N=56) = 9.617$, $p = 0.008$, between perceptual conditions. This indicates a significant preference for the Powerade commercial, between the perceptual primed group and the control group. 16 respondents of a total of 28, named

Powerade as the commercial they liked the best, in contrast to only 5 respondents in the control group. The next question was that the respondent was asked with an open question if they could name the first commercial they could remember, out of the previously exposed commercials. The Chi-Square Tests on which commercial they could name first revealed no significant difference, $X^2(1, N=56) = .292$, $p = 0.589$, between the control and perceptual conditions. We also asked a "Yes" or "No" question regarding if they could remember the last commercial they saw. Results from Descriptive Statistics showed that about 96 % of the respondents in the perceptually primed group said that they remembered the last commercial. We then followed up with a question concerning if they said "Yes", to the previously queston, if they could remember which one. This was an open question, and results indicated that about 88% of the 96% respondents that said "Yes", named Powerade as the last commercial.The results concerning the same questions for the control group indicated that about 72% out of the 75% that wrote "Yes" mention Powerade as the last commercial they had seen.

5.3.8 Summary perceptual results

On the T-test of positive evaluation / attitude towards the ad, we revealed a significant, $p < 0.006$, difference between the perceptual and the control group. We thereby have increase in average evaluation of the commercial. To analyse emotional arousal we used pupil dilation as measurement and and compared the perceptual group to the control group. Conducting a T-test was within all AOIs revealed no significant difference, $p < 0.117$. The independent sample test on TTFF for analysis of Noticeability, revealed no significant, $p < 0.190$, difference between the control group and conceptual conditions. For analysis regarding duration of visual attention for the perceptual group compared to the control group revealed no significant difference, $p < 0.730$.

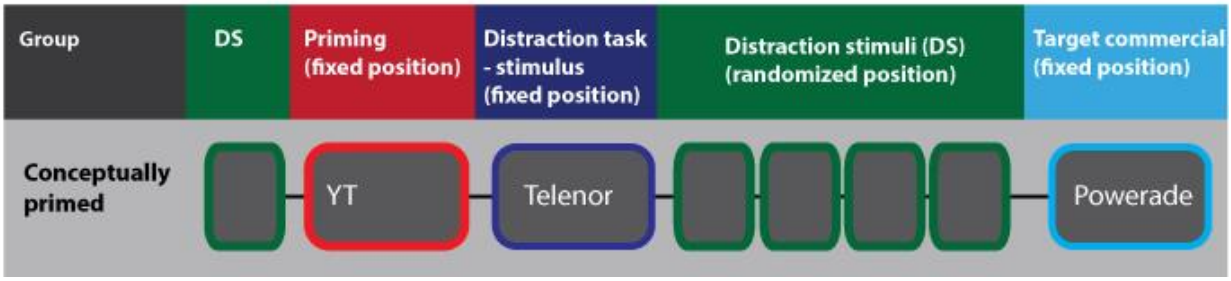
5.4 Experiment 2

In the following chapter we will go through the procedure for the conceptually primed group, Thereafter we will present our findings and ascertain whether we can approve or discard the hypotheses. Our results will be presented briefly, and then discussed more thoroughly in chapter 7.

5.4.1 Procedure and stimulus

As mentioned earlier each respondent is then told to focus at Telenor-commercial, and that they will be asked to evaluate this after the experiment. Which is to distract them from the true purpose of the experiment, and ensure consistently lower levels of engagement towards the prime and target commercials.

Illustration 5: Conceptual group stimuli overview



The viewing period consists of 8 commercial for the conceptually primed group, and contains in this condition a conceptual prime in the form of a commercial for sports drink product YT. This is followed by randomization of commercials, and most importantly to make sure that the sequence of these stimuli did not affect the target commercial of Powerade. The primed group have the same distraction stimulus between the prime and the target commercial (Powerade) as the control group (this is shown earlier in illustration 1). The Powerade commercial is at the end of the viewing period, and lasts about 1 minute and 5 seconds. The conceptual prime (YT-commercial) is positioned as the second commercial in the entire sequence. In this way it precedes the distraction task stimulus (Telenor-commercial), and respondents are not affected by increased elaboration they may experience due to it being the first stimulus they see.

The picture below illustrates two frames from the conceptual prime.

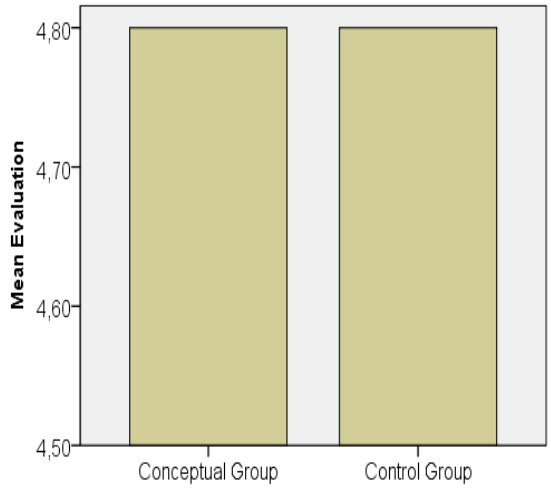
Illustration 6: Conceptual prime stimulus

5.4.2 Hypothesis and Predictions

To summarise, in experiment 1 it was hypothesized that respondents that are Conceptually primed respondents will have increased a) positive evaluation, b) emotional arousal, c) noticeability and d) duration of visual attention towards the fluent stimulus compared to the control group. First we will analyze H1 a,b,c,d then in next chapter (6) we conduct analysis for H2 a,b,c,d.

5.4.3 Positive evaluation

Figure 5: Mean positive evaluation for conceptual group

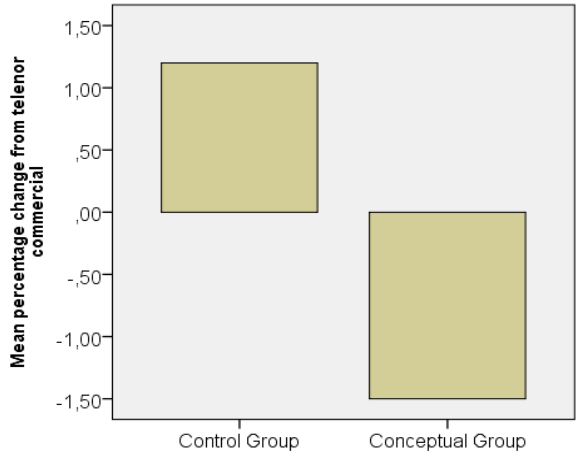


To conduct analysis for hypothesis H*2a*, on participant's positive evaluation, we expected an increased positive evaluation. This was measured on a likert scale from 1-7, combining words that described their affective responses, as negative (e.g 1: boring) and positive (e.g 7: exciting). We conducted a t-test to see whether the conceptually primed respondent on

average evaluated the 1-7 scale more positively than the control group.We now wanted to look at the average difference, results revealed no significant difference, t(53) = 0.058 p = 0.954 between the Conceptual (M = 4.8413, SD = 1.31508) and control group (M = 4.8233, SD=0.98511). This results in rejection of hypothesis H2a.

5.4.4 Emotional arousal

Figure 6: Mean percentage change in pupil size from Telenor commercial for conceptual group

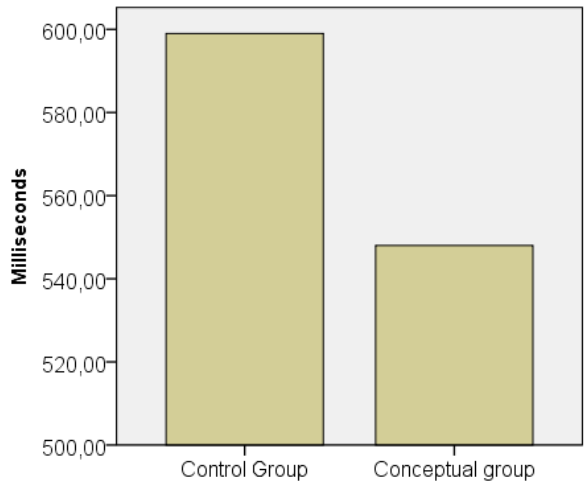


To examine emotional arousal and analyse hypothesis *H2b*, we used pupil dilation as mention earlier. We computed percentage changes in pupil size between the Powerade commercial and the Telenor commercial before conducting the analysis. The Telenor commercial occurred at the same time for all participants and thus acted as a baseline condition for pupil size measurements for individual participants. We conducted an ANOVA analysis for average pupil dilation throughout the commercial and revealed a significant difference, F(2) = 4.107, p = 0.020, between the three conditions (Conceptual, control and perceptual).

We then conducted a t-test to examine whether we have increased pupil dilation on the conceptually primed group compared to the control group. The t-test significant difference, t(50) = 3.059 p = 0.004, between the control group (M = 1.2%, SD = 3.2%) and conceptual (M = -1.5 %, SD = 3.3%) conditions. Results indicates that we found conversely results than expected, with increased change in pupil dilation for the control group compared to the conceptually group. We did not observe emotional arousal by using this measurement, and therefore our Hypothesis H2b is rejected.

5.4.5 Noticeability

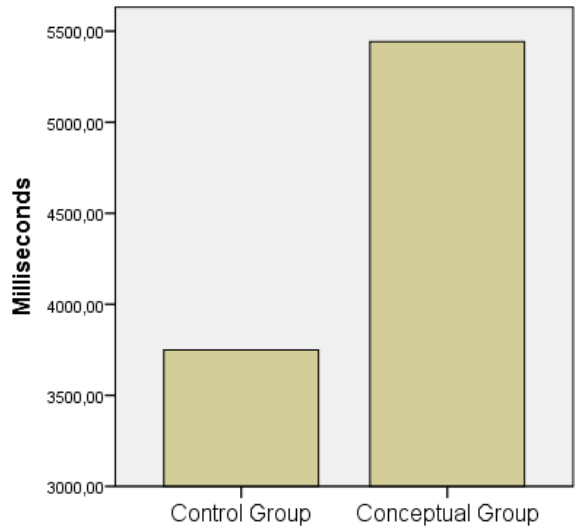
Figure 7: Time-to-first-fixation for conceptual group



We used the measure of Time-to-first-fixation to measure noticeability. Before analysing our results for hypothesis H2c, we conducted a boxplot for the different groups and marked respondents with scores beyond 1.5 * IQR from the upper and lower quartiles as outliers: 4 for the control group, 6 for the perceptual group, and 6 for the conceptual group. To analyse H1b. we conducted an ANOVA test within all AOIs which revealed no significant difference, $F(2) = 1.345$ $p = 0.268$ between the three conditions (conceptual, control group and perceptual). To see the difference between the conceptual conditions from the control group we performed an independent sample test to get more insight. The independent sample test revealed no significant difference, $t(41) = 1.236$, $p = 0.201$, between the control (Mean = 599 ms, SD = 154 ms) and conceptual (M = 548 ms, SD = 98 ms) conditions. The results from hypothesis H2c, provided no further evidence that perceptual priming decreases time-to-first-fixation, and we reject hypothesis H2c.

5.4.6 Duration of visual attention

Figure 8: Duration of visual attention for conceptual group



To examine hypothesis H2d and analyse duration of visual attention we conducted an ANOVA test on total gaze durations (TGD) within all AOIs. The results revealed a significant difference, $F(2) = 11.679$, $p < 0.001$, between the three conditions (conceptual, control group and perceptual). We took an independent sample test to get more insight between the three conditions. The t-test on total-gaze-durations between all AOIs, revealed a significant difference, $t(52) = 3.937$, $p < 0.001$, between the control group (Mean = 3749 ms, SD = 1385 ms) and conceptual (M = 5442 ms, SD = 1752 ms) conditions. This indicates support for our hypothesis *H2d*, and suggests that respondents maintained their attention significantly longer on the product that was conceptually related to what they had been exposed to earlier in the commercial sequence.

5.4.7 Additional findings in conceptual conditions

We generated a set of additional questions to complement the other results. One of these was an open questions regarding which commercial they liked the best. Here the respondent had to name one of the commercial before they could go on to the next question. We conducted a Pearson Chi-Square test on the conceptually primed respondents, the Chi-Square Test revealed no significant difference, $X^2(3, N=56) = 3.983$, $p = 0.263$ between the control group and conceptual conditions. From a total of 28 respondents in both the conceptual primed group and the control group, conceptual priming questionnaire results reported that 10 respondents named “Powerade” as the commercial they liked the best, only 5 named Powerade in our control group. 8 respondents named Brelett and 7 in our control group. The

next question was that the respondent was asked with an open question if they could name the first commercial they could name. The Chi-Square Tests revealed no significant difference, $X^2(1, N=56) = 1.310$, $p = 0.256$, between the control and conceptual conditions.indicate

We also asked a yes or no question regarding if they could remember the last commercial they saw. Results from Descriptive Statistics showed that about 75 % of the respondents in the conceptually primed group said “Yes” that they remembered the last commercial. We then followed up with a question concerning if they said “Yes”, to the previously queston, if they could remember which one. This was an open question, and results indicated that about 76% of the 75% respondents that said “Yes”, named Powerade as the last commercial. The results concerning the same questions for the control group indicated that about 72% of the 75% that wrote “Yes” mention Powerade as the last commercial they had seen.

5.4.8 Summary conceptual results

To summarize the previous results, we found no significant, $p < 0.954$, difference between the conceptual group and the control group regarding evaluations/ attitude towards the ad. Results from pupil dilation, did not in fact indicate conversely results then we expected, concerning that the control group had significant more, $p < 0.004$, average increase in pupil dilation than the conceptual group. Our measure for noticeability, TTFF, to see if there were any significant difference between the conceptual and the control group, showed no significant, $p < 0.201$, difference from the control group. To measure the duration of visual attention we used TGD, and performed a T test that showed significant, $p < 0.001$, difference between the conceptually primed group and the control group. The mean difference mounted to a total 45% higher TGD than the control group.

6.0 General Discussion

We will now relate the empirical findings that were presented in the previous chapters to the research question. By reviewing and discussing our findings in light of the previously established theoretical framework we intend to arrive at conclusions of theoretical and practical value. First, findings related to our hypotheses will be discussed. This includes findings relating to positive evaluation, emotional arousal, noticeability and duration of visual attention. We first intend to discuss results regarding positive evaluation and duration of visual attention, first for the perceptually primed group then for the conceptually primed group. Following this, the results from emotional arousal and noticeability will be discussed in unison for both groups. The reason for this is that the basis for the hypotheses concerning these variables share much of the same theoretical framework.

6.1 Discussion for perceptually primed group

We predicted an increase in duration of visual attention (TGD) for the perceptually primed group, just as we did for the respondents exposed to the conceptual prime. Total-gaze-duration was measured to be not significantly different to the control group for the respondents who were perceptually primed, resulting in the rejection of hypothesis H1d. There are several reasons that could explain why this happened. The first explanation could be that the prime-stimulus was unsuccessful in perceptually priming the respondents. The reason for this could be that too many respondents simply did not look at the Powerade-logo they were exposed to in the priming commercial. Another explanation involves the characteristic that perceptual primes are particularly sensitive to changes in shape, size, colour and brightness (Lee and Labroo 2004, 152). As the measured AOIs by their nature appears in a fast moving commercial and on the face of a Powerade-bottle, the AOIs may simply have appeared too different from the preceding prime to create a substantial fluency effect. For example, in one of the AOIs the Powerade-bottle is lifted up as a person drinks from it, partly concealing the logo. The angle of the logo in this case may be too skewed compared to the original prime, resulting in no effects on attention during the commercial. This may have limited the perceptual uniformity, and thus inhibited perceptual fluency effects.

Perceptual fluency have been shown to be sensitive to changes in features such as presentation context and modality shifts (Lee and Labroo 2004, 152). Thus, while the

modality remains the same between prime and the subsequent video commercial, the presentation context may be too different. As have been shown previously, the perceptual prime of the Powerade logo appeared in a context where it was surrounded by text (Illustration 4). In contrast, the product exposures in the target commercial are featured on the face of Powerade bottles. Thus, it is possible that these contexts are too different.

Perceptual priming has been demonstrated to benefit from shorter exposures of the prime (Lee 2002), and in some cases the effects have even been reversed from longer exposures (Lee and Labroo 2004, 152). Furthermore, as noted earlier, video commercial exposures of brand logo are, for all intents and purposes, considered to be long exposures. By the term short exposure we refer to a time-span of less than a second, as suggested by (Lee and Labroo 2004). The reason for the rejection of hypothesis H1d may be on account of excessive length of the prime. On the other hand, if this was the case, it is likely that none of the other dependent variables would have any significant changes either. That would entail the prime was simply not successful. Significantly, results were in support of hypothesis H1a, implying increased positive evaluation of the ad on account of the perceptual prime. This suggests that to some extent the perceptual prime was indeed effective as positive evaluation of the commercial increased significantly by 13%, implying that viewers were in fact primed. The rejection of hypothesis H1c and H1d suggests aspects of attention that include noticeability and duration of visual attention are not affected by perceptual fluency, in this particular context. However, perceptual fluency still increases positive evaluation of the target commercial, similarly to previous studies.

Janiszewski (1993, 3) has previously pointed out that awareness of previous exposure to a stimulus can provide an explanation for his or her familiarity with a stimulus and discourage them from interpreting the familiarity as liking. On the contrary, our findings suggest that this was not the case. We found that 73% of respondents in the perceptually primed group remembered that they had seen a Powerade commercial earlier in the commercial sequence when they were exposed to the target commercial. Despite this, attitude to the target commercial increased by 13%. Still, as the proportion of respondents who recognized the target commercial was so high, it is possible that the results on liking and attention were inhibited to some extent. The implications of this is that our findings may have been different in a design where fewer respondents remembered the prime commercial. By for example increasing the number of distraction commercials separating the prime and the target

commercials, it could probably be possible to reduce chances of recalling the prime. Further research into consequences of different temporal intervals between the prime and target commercial could help shed light on this.

The increase in positive evaluation is consistent with our open question, where significantly more respondents in the perceptually primed group stated they preferred the Powerade target commercial compared to the control group. In the open question, 57% of respondents in the perceptually primed group answered that they preferred the Powerade target commercial over all the other commercials. While in the control group, only 18% of respondents answered that they preferred the Powerade target commercial. Furthermore, we controlled for the possibility that respondents would be biased to like a commercial more simply because it had been repeated, and thus easier to recall, by including a question related to memory. We found no significant differences between any of the three groups for the question "name the first commercial you can recall".

6.2 Discussion for conceptually primed group

Our measure of duration of visual attention was total-gaze-duration (TGD), which was reported in milliseconds. This supports our hypothesis H1d and suggests effects on attention arising from the conceptual prime. For the conceptually primed group, the average TGD was 5,44 seconds, which was significantly higher compared to our control group which had an average TGD of 3,74 seconds. This amounts to a total 45% increase in time spent looking at the AOIs for the respondents who were conceptually primed compared to those who were not. Respondents proved to focus their attention significantly longer on the product that was conceptually related to what they had been exposed to earlier in the commercial sequence. This result suggests that the target commercial (Powerade) benefited from being placed last in the same commercial sequence as the prime-commercial (YT).

In chapter 2.3 we highlighted Bagdziunaite et al.'s (2014) in-store research on increases in attention (and particularly duration of attention) resulting from a prime. While participants in their study were task-driven, ours were not, implying that conceptual fluency affects attention as a result of bottom-up information. Importantly, the significant increase in duration of visual attention arising from the conceptual prime demonstrates that even conceptual primes that are unrelated to tasks can induce fluency in the context of a commercial break. For this

reason we can indicate that the conceptual prime was effective even though it was not top-down relevant for viewers.

The conceptually primed group did not have any significant changes to positive evaluation compared to the control group. Lee and Labroo (2004, 164) argues that conceptual fluency may be less effective for brands which are familiar and participants have a firmly held attitude towards. We did not control for the attitude strength of the Powerade brand. It is possible that if a less known brand (or a fictional brand) had been used as target commercial, increases in positive evaluation could have been observed. However, we had highly significant findings for this group on duration of visual attention. This might imply that while effects on attention due to fluency is not limited by strongly held attitude, positive evaluation can be limited. This could be an interesting topic for future research.

Another possible explanation for the lack of significant changes in positive evaluation is that fluency effects on positive evaluation are strongest in condition where subjects have limited cognitive capacity, like time pressure and lack of motivation to process a stimulus in detail (Winkielman et al. 2003, 20). The reason for this is that the fluency signal competes with the extracted information from the stimulus in the computation of judgment. In contrast, this implies that where there is an abundance of cognitive capacity, motivation and time, fluency effects may be limited. While watching video commercials is not always particularly engaging, motivation may be unnaturally high because our experiments are performed in a laboratory context. In a natural context viewers may not be paying as close attention. This could explain why positive evaluation did not increase. However, Winkielman and Cacioppo (2001, 995) notes that affective responses (and thus fluency) can be present even if effects on explicit judgment of evaluation is not observed. This indicates that increased fluency (and thus other concurring effects like changes in visual attention) may occur even if explicit positive evaluation does not. This could explain why we observed increases in duration of visual attention and not positive evaluation.

We have previously mentioned that conceptual fluency has been demonstrated to benefit from elaboration at the time of exposure (Lee 2002, 442). In regards to conceptual fluency, it was a concern whether participants would elaborate sufficiently when exposed to the conceptual prime to give rise to fluency effects. The reason for this is the assumption that commercials are not particularly engaging inherently, nor are participants tasked with an

objective that requires elaboration. Additionally, while the relation between the two conceptually related commercials was pre-tested, it remains unclear whether the strength of the relation between the prime (YT) and the target commercial (Powerade) mediated the observed effect on TGD. The reason for this is that the needed threshold for magnitude of fluency to give rise to an observable effect on positive evaluation and attention in this context is unknown.

6.3 Discussion of noticeability and emotional arousal for both experiments

The results from H1b and H2b, provided no further evidence that either perceptual priming or conceptual priming increases noticeability. According to Bojko (2013, 126), the measure of time to first fixation is applied when it matters how quickly an area was noticed. There are several possible reasons why this turned out to be an ineffective measurement. First and foremost, the statistical analysis of this measurement required us to remove 16 respondents (in total for all three groups). In addition, 4 respondents were removed because of low data quality. The remaining respondents are so few that we have severely reduced power for our statistical analysis. This can be one of the reasons why our manipulation did not influence attention in the form of enhanced noticeability.

The reason why so many respondents had to be removed from our statistical analysis has partly to do with the nature of the stimulus we measured (the Powerade target commercial). Noticeability measures (including time to first fixation) are useful for assessing the salience of AOIs (Bojko 2013, 125). Salience in this regard refers to the visual prominence of an area, which is highly dependent on physical characteristics such as brightness and contrast in relation to surrounding elements. It is possible that the product exposures that were selected to be measured by AOIs, were not salient enough to attract a sufficient number of fixations.

Another explanation involves the magnitude of the affective reaction predicted to result from the prime. A substantial argument for our hypothesis that priming enhances noticeability was that affective stimuli has been demonstrated to increase noticeability in previous studies (Mangun 2012; Vuilleumier 2004). The positive affective reaction resulting from fluency is likely to be weak and transient (Winkielman and Cacioppo 2001, 997). On the other hand, physiological reactions to stimuli like a snake, which is survival-relevant, is likely to be strong. It is possible that the affective reaction is not strong enough to have an effect on

noticeability. This concern also applies to our results from emotional arousal. We predicted an increase in emotional arousal due to the positive affective reaction that mediates fluency effects on positive evaluation (Winkielman et al. 2003). In addition, prior research by Bagdziunaite et al. (2014), demonstrated that the effects of fluency, created by priming, could increase emotional arousal using EEG. In this experiment on the other hand, we chose to use the measure of pupil dilation, which can be why we did not get the results we hypothesized. We did not find any significant differences in emotional arousal, resulting in the rejection of hypothesis H1b and H2b. On the contrary, for the conceptual group our results were opposite to what hypothesis H2b predicted. The control group had a higher average pupil dilation than the conceptually primed group. This could indicate that the control group were more emotionally aroused. However, Bojko (2013, 131) notes that the pupil does not necessarily mean higher emotional arousal. Increased pupil dilation during task can indicate higher mental workload (Bojko 2013, 135). Mental workload is a term used to describe the cognitive demands placed upon a user's limited cognitive resources. This is the mental state that reflects the relationship between the cognitive demands placed upon a user's limited cognitive resources. The tasks that respondents were given prior to the experiment were equal across all groups, so this should not have influenced mental workload. However, there is a possibility that some respondents experienced increased mental workload as a result of remembering that they had seen the prime. The reason for this is that several respondents explicitly reported that they had consciously recalled having seen the Powerade prime commercial during the exposure of the target commercial. This is a limitation, particular in regards to the perceptually primed group. It is presumably less of a problem for the conceptually primed group, as identifying the relation between the YT and Powerade commercial is less obvious than the relation between two Powerade commercials.

With regard to the fact that there is considerable research support for that pupil dilation will increase with positive emotional arousal, there is not as much research in terms of negative emotions (Bojko 2013, 132). Bojko (2013) points out that negative emotions also have been shown sometimes to result in pupil dilation. The negative results might result from the fact that negative emotional reaction occurred because the target commercial was in essence a novel object, in contrast to the primed group. Novel objects have previously been associated with a negative emotional response (Ramsøy 2014, 3486). This could imply that both the control group and the primed group had a substantial degree of emotional arousal, but the measurable difference was cancelled out.

6.4 Limitations

This thesis contributes towards both practical and theoretical implications, but there are still some important limitations that must be acknowledged. One of the limitations of this thesis is that the respondents consists largely of students. While we regard this as a limitation towards being able to generalize the findings of this study, we do not see any particular reason why students would influence the results differently from the population at large in the present experiment. Furthermore, respondents were distributed randomly across the three groups. In addition, the experiments were conducted in parallel. While respondents were awarded with incentives for their participation, we do not recognize this as a particular weakness, because this is common practice for experiments such as this.

Another limitation is that the validity of the experiment depended on respondents not knowing the experiment's intent. It was important that there was no awareness that what we measured was the Powerade commercial, and therefore participants were instructed to not tell anyone what the purpose was after the experiment. The reason this was needed was because the questionnaire posed specific questions about the Powerade brand, and therefore respondents would have an indication of the experiment's intent upon completion of their test. There is clearly a limitation in that we have no way of knowing if participants would talk about the experiment amongst themselves.

Overall, there is a concern that the application of our measurements on the target commercial were poorly chosen. We selected to measure emotional arousal and positive evaluation towards the entire length of the commercial, and noticeability and duration of visual attention towards the product exposures. This was made on the basis that hypothetically, conceptual fluency would be present for the length of the target commercial due to its associative alikeness to the conceptual prime. Perceptual fluency on the other hand, would be present for the exposures of the product. Thus, to be able to compare these groups under similar conditions, emotional arousal and positive evaluation was measured for the entire commercial. In hindsight, it is apparent that this is a weakness, and that our design suffered from oversimplification. For one thing, it is unavoidable that both what we refer to as the perceptual prime (Powerade) and the target commercial (Powerade), share some associative commonalities. For this reason it can be argued that the perceptual prime is in fact a

conceptual prime. The observed effects on positive evaluation in the perceptual condition may not be the result of the physical similarity of the Powerade-logo, but rather conceptual fluency. This conceptual fluency can have been created from exposure to associative similarities in the Powerade commercial that appeared prior to exposure of the Powerade logo.

Furthermore, the nature of these two kinds of fluency effects implicate that they cannot necessarily be compared in the manner that was attempted in this study. Rather, the conceptual and perceptual conditions would benefit from having different research designs. For example, it is possible that emotional arousal was present for a short duration after each exposure of the products (a few seconds). However, since we measured pupil dilation for the entire length of the commercial, this difference became insignificant.

Like any other research method there are inherent limitations with use of eye tracking. One important limitation is that it is impossible to tell from the data alone what people think. For example levels of total gaze duration, can lead us to believe that this area is interpreted as interesting for the viewer. On the contrary, this can be a result of the viewer being confused and finding the area problematic, spending more attentional resources on the area to try to comprehend the information. This "reverse inference" can make us assume that the information in the AOI was of interest to the viewer, which is not necessarily true (Holmqvist and Nyström 2011, 71). For the purposes of this study, this concern is unlikely to be prevalent. The reason for this is two-fold. Firstly, the AOIs that are measured are present for a very short window of time, around 1-3 seconds in a fast-moving commercial. This means that there is little time for respondents to consciously linger on the AOIs, and apply top-down attentional efforts to "try to understand" the object because they are confused. Secondly, the AOIs that are measured are placed on the Powerade-bottle and logo, which by their very nature does not contain a lot of text or information. For this reason it is unlikely that attention towards the AOI is on account of the object being difficult to process or that the viewer does not understand it. However, it should be emphasized that there is a possibility that reverse inference did occur, both for the results discussed above, and the others in this thesis.

6.5 Generalizability

We are not aiming to generalize our results to a larger population. Our findings will be valid for our experiment alone, as there are too many factors contributing to our results that we cannot eliminate the effects of. For our results to be used in commercial settings, the commercials must be the same as the conditions in our laboratory. This is because we use one specific combination of prime stimulus and the target commercial (Powerade / YT + Powerade). The combination is chosen based on our findings from the pretest that showed that the chosen brands had several mutual associations. We established that there is a conceptual relation between YT and Powerade, which means exposure to the former will function as a conceptual prime for the latter. However, we cannot assuredly state how strong this relation is, or whether effects on attention are contingent on the strength of two products' mutual associations. The threshold for the magnitude of associations between brands is not possible for us to predict, or how strong they need to be to act as conceptual prime that affects attention. Even if the commercial for YT does not affect attention towards the Powerade commercial, other combinations of products still might. For this reason it is difficult to generalize our findings.

6.6 Implications

In this thesis it has been demonstrated that a conceptual prime can increase the duration of visual attention towards product exposures in a subsequent commercial. This means that it can be beneficial to place two related commercials, such as competitive brands, together in the same sequence. Increased duration of visual attention means that attention is paid to the product exposures for longer durations. From this it can be surmised that increased attention towards the product may increase associational strength between the product and the commercial. However, conceptual priming does not increase positive evaluation towards target commercial in this context. On the other hand, perceptual priming was demonstrated to increase positive evaluation of a commercial in the present context. This suggests that it is beneficial for advertisement effectiveness to place two different commercials for the same brand, in a sequence. These findings represent practical knowledge for intra-commercial coordination and marketing coordination in video contexts such as internet and television. Furthermore, it suggests some degree of of competitive synergy arising from the conceptual prime, as a competitor can enhance attention towards another brand's commercial.

6.7 Future research

Firstly, future research should consider examining the context of video commercial that is applied here using other stimuli. Replicating or challenging the findings presented here, would be useful to substantiate or reject the applicability of this knowledge for use in real-world contexts.

A possible explanation for the lack of significant increases in positive evaluation is that conceptual fluency effects are strongest under conditions where participants have limited cognitive capacity. In the current experiment, it is possible that participants were more attentive towards the commercials than they would be in a real-world scenario. By manipulating cognitive capacity by subjecting participants to tasks, it is possible that increases in positive evaluation could be observed for the conceptual condition in future research.

The results of the current research did not support the hypothesis that priming in this context increased emotional arousal towards the target commercial. The theoretical basis for this hypothesis was that other studies indicated this effect could be possible. As discussed, weaknesses in research design and controlling for variables like mental workload may have limited the validity of this measure in the current research. In addition, this research employed different forms of measurement. Specifically, the current research used measures of pupil dilation, while previous research used electroencephalography (EEG). Future research could examine whether EEG could indicate emotional arousal in a similar context.

As noted previously in the discussion, participant's ability to recall the prime may inhibit the fluency effects on positive evaluation. This is because the positive affective reaction then has reduced informational value, and is no longer attributed to the stimulus, which eliminates increases in positive evaluation (Winkielman et al. 2003, 19). In our experiments, the length and number of distraction commercials meant that many respondents (73% for the perceptual group) stated that they recalled the priming stimulus during the exposure of the target commercial. If the design was manipulated to make it harder to recall the stimulus, fluency effects on attention and positive evaluation may have increased. This is both a limitation with the design of the current research, and suggests and an interesting topic for future research.

As previously discussed, it is possible that conceptual fluency effects may be inhibited by brands that participants have a strongly held attitude towards. It is possible that Powerade, as a presumably well-known brand, had too firmly established judgments of evaluation towards it to be influenced by fluency effects. Future research could control or manipulate brand strength in the context of video commercials, to examine if increased positive evaluation could be observed for less well-known brands.

7.0 Conclusion

In this thesis it has been demonstrated that a commercial can function as a conceptual and perceptual prime, and have effects on visual attention and evaluation towards a subsequently exposed video commercial. Moreover, the results indicate that both forms of priming had effect, although in different ways. According to our findings, the perceptual prime can increase positive evaluation of the target commercial. Furthermore, the results suggest that the product exposures in the target commercial can attract attention for a significantly longer time after exposure to a conceptual prime. However, neither forms of priming makes the audience notice the product exposures faster, nor elicit any substantial emotional arousal towards the target commercial.

8.0 References

Alter, Adam L. and Daniel M. Oppenheimer. 2009. "Uniting the tribes of fluency to form a metacognitive nation". *Personality and Social Psychology Review,* 13:219-235, DOI: 10.1177/1088868309341564: http://pages.stern.nyu.edu/~aalter/tribes.pdf

Bagdziunaite, Dalia, Khalid Nassri, Jesper Clement and Thomas Zöega Ramsøy. 2014. "An added value of neuroscientific tools to understand consumers' in-store behavior." *EMAC European Marketing Academy 2014.* Copenhagen Business School.

Bargh, John A. 2002. "Losing Consciousness: Automatic Influences on Consumer Judgment, Behavior and Motivation". *Journal of Consumer Research.* 29(2002):280-285. JSTOR Journals(edsjsr.341577)

Bargh, John A., Mark Chen and Lara Burrows. 1996. "Automaticity of Social Behavior: Direct Effects of Trait Construct and Stereotype Activation on Action". *Journal of Personality and Social Psychology.* 71(2):230-244. Date read January 6th 2015: http://www.yale.edu/acmelab/articles/bargh_chen_burrows_1996.pdf

Barnard, Jonathan. 2014. "How the Internet is Fuelling Global AdSpend Growth", *ZenithOptimedia blog, October 3rd 2014.* Date read March 14th 2015: http://www.zenithoptimedia.com/how-the-internet-is-fuelling-global-adspend-growth-jonathan-barnard-head-of-forecasting/

Berlyne, D.E. 1970. "Novelty, Complexity and Hedonic Value". *Perception & Psychophysics*, 8(5):279-286, Date read February 2nd 2015: http://link.springer.com/article/10.3758%2FBF03212593#page-1

Cameron, Daryl C., Jazmin L. Brown-Iannuzzi og B. Keith Payne. 2012. "Sequential Priming Measures of Implicit Social Cognition: A Meta-Analysis of Associations With Behavior and Explicit Attitude." *Personality and Social Psychology Review.* 16:330. Date read November 27th 2014: DOI: 10.1177/1088868312440047

Chartrand, Tanya L., Joel Huber, Baba Shiv and Robin J. Tanner. 2008. "Nonconscious Goals and Consumer Choice". *Journal of Consumer Research.* Date read 27. November 2014: DOI: 10.1086/588685

Cohen, M.A., Cavanagh, P., Chun, M.M., and Nakayama, K. 2012. "The attentional requirements of consciousness. Trends in Cognitive Sciences",16, 411-417. Date read January 15th 2015: http://camplab.psych.yale.edu/articles/Cohen_2012_TICS.pdf

Estes, Zachary and Michelle Verges. 2008. "Freeze or flee? Negative stimuli elicit selective responding", 108(2):557-565, *Cognition.* Date read February 3rd 2015: DOI: 10.1016/j.cognition.2008.03.003

Fennis, Bob M. and Wolfgang Stroebe. 2010. *The Psychology of Advertising.* New York: Psychology Press.

Fitzsimons, G. J., Hutchinson, J. W., and Williams, P. 2002. "Non-conscious influences on consumer choice". *Marketing Letters*, 13, 269–279. Business Source Complete(7476770)

Gazzaniga, Michael S., Richard B. Ivry and George Ronald Mangun. 2009. *Cognitive Neuroscience.* 3rd ed. W.W. Norton.

Genco, Stephen J, Andrew P. Pohlman and Peter Steidl. 2013. *Neuromarketing for Dummies*. A Wiley brand. *John Wiley & Sons Canada, Ltd.*

Holmqvist, Kenneth and Marcus Nyström. 2011. *Eye Tracking: A comprehensive guide to methods and measures.* 1st ed. New York: Oxford University Press.

Holmqvist, Nyström and Mulvey. 2012. "Eye tracker data quality: What it is and how to measure it". Date read August 5th 2015: http://www.researchgate.net/profile/Kenneth_Holmqvist/publication/254007815_Eye_tracker_data_quality_what_it_is_and_how_to_measure_it/links/54db175a0cf2ba88a68f0b7 6.pdf

Janiszewski, Chris and Tom Meyvis. 2001. "Effects of Brand Logo Complexity, Repetition, and Spacing on Processing Fluency and Judgment". *Journal of Consumer Research.* 28(6):18-32, Date read January 25th 2015: http://pages.stern.nyu.edu/~tmeyvis/merexp.pdf

Janiszewski, Chris. 1993. "Preattentive Mere Exposure Effects". *Journal of Consumer Research,* 20(3):376-392, Business Source Complete(9409161965)

— — —. 1988. "Preconscious Processing Effects: The Independence of Attitude Formation and Conscious Thought," *Journal of Consumer Research,* 15(2):199-209. Date read August 2nd 2015: http://warrington.ufl.edu/departments/mkt/docs/janiszewski/Preconscious.pdf

Kantowitz, Barry H., Henry L. Roediger and David G. 2009. *Experimental Psychology.* 1. ed. Cengage Learning.

Labroo, Aparna A, Ravi Dhar og Norbert Schwarz. 2007. "Of Frog Wines and Frowning Watches: Semantic Priming, Perceptual Fluency, and Brand Evaluation." *Journal of Consumer Research.* Vol. 34. Business Source Complete(31506485)

Laran Juliano, Dalton Amy, N og Edurado B. Andrade. 2011. "The Curious Case of Behavioral Backlash: Why brands produce priming effects and slogans produce reverse priming effects". *Journal of Consumer Research,* 37(4).

Lee, Angela. 2001. "Effects of Implicit Memory on Memory-Based Versus Stimulus-Based Brand Choice." *Journal of Marketing Research,* 39(4):440-454. Business Source Complete(8542430)

— — —. 2002. "The Mere Exposure Effect: An Uncertainty Reduction Explanation Revisited". *Society for Personality and Social Psychology,* 27(10):1255-1266. Date read February 5th 2015: http://www.communicationcache.com/uploads/1/0/8/8/10887248/the_mere_exposure_effect-_an_uncertainty.pdf

Lee, Angela Y. and Aparna L. Labroo. 2004. "The Effect of Conceptual and Perceptual Fluency on Brand Evaluation". *Journal of Marketing Research.* 41(5):151-165. Business Source Complete(13205228)

Lloyd, Marianne E., Ashley Hartman, Chi T. Ngo, Nicole Ruser, Deanne L. Westerman and Jeremy K. Miller. 2014. "Not enough familiarity for fluency: Definitional encoding increases familiarity but does not lead to fluency attribution in associative recognition". *Mem Cogn,* 43:39-48, DOI: 10.3758/s13421-014-0449-3

Mangun, George R. 2012. *The Neuroscience of Attention: Attentional Control and Selection.* 1st ed. Oxford: University Press.

Milosavljevic, Milica and Moran Cerf. 2008. "First attention, then intention, insights from computational neuroscience of vision". *International Journal of Advertising,* 381-398. DOI: 10.2501/S0265048708080037.

Milosavljevic, Milica, Vidhya Navalpakkam, Christof Koch og Antonio Rangel. 2011 . "Relative visual saliency differences induce sizeable bias in consumer choice". *Journal of Consumer Psychology.* 22(2012):67-74. ECONIS(EDSZBW717957624)

Nedungadi, Prakash. 1990. "Recall and Consumer Consideration Sets: Influencing Choice Without Altering Brand Evaluations", Journal of Consumer Research, 17(12):263-76, Business Source Complete(4656925)

Oppenheimer, Daniel M. 2008. "The secret life of fluency". *Trends in cognitive neurosciences,*12(6):237-241, Date read February 12th 2015: http://web.princeton.edu/sites/opplab/papers/TICS686.pdf

Parks, Emily L. and Joseph B. Hopfinger. 2008. “Hold it! memory affects attentional dwell time”. Psychon Bull Rev. 15(6): 1128-1134. Date read January 9th 2015: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2734387/

Pieters, Rik, and Wedel, Michel. 2007. “Goal control of visual attention to advertising” *Journal of Consumer Research.* 34 (2): 224-233. JSTORJournals(edsjsr.519150)

Pieters, Rik, Warlop Luk, and Michel Wedel. 2002. “Breaking Through the Clutter: Benefits of Advertisement Originality and Familiarity for Brand Attention and Memory”. *Management Science*, 48(6):765-778. JSTOR Journals(edsjsr.822628)

Plassmann Hilke, Thomas Zoëga Ramsøy og Milica Milosavljevic. 2012. “Branding the brain- A Critical Review and Outlook”. *Journal of Consumer Psychology*, 22(1):18-36. Business Source Complete(73286235)

R Core Team. 2015. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Ramsøy, Thomas Zoëga. 2014. *Introduction to Neuromarketing & Consumer Science.* 1st ed. Neurons Inc APS.

Ratcliff, Roger og Gail McKoon. 1994. “Retrieving information from memory: Spreading-Activation Theories Versus Compound-Cue Theories. *Psychological Review*, 101(1):77-184. PsycARTICLES(1994-16298-001)

Schweidel, David A, Natasha Zhang Foutz and Robin J. Tanner. 2014. “Synergy or Interference: The Effect of Product Placement on Commercial Break Audience Decline”. *Marketing Science.* DOI: 10.1287/mksc.2014.0864

Shapiro, Stewart. 1999. “When an Ad's Influence Is beyond Our Conscious Control: Perceptual and Conceptual Fluency Effects Caused by Incidental Ad Exposure”, *Journal of Consumer Research*, 26(1):16-36, Business Source Complete(2177133)

Shadish, William R., Thomas D. Cook og Donald T. Campbell. 2002. *Experimental and Quasi- Experimental designs for generalized causal inference.* Bellmont: Wadswortk cengage learning.

Teixeira Thales S. and Wedel M, Pieters R. 2010. “Moment-to-moment optimal branding in TV ads: Preventing avoidance by pulsing”. *Marketing Science*. 29(5):783–804. Business Source Complete(54407870)

— — —. 2012. “Emotion-Induced Engagement in Internet Video Advertisements”. *Journal of Marketing Research.* 39(2012):144-159. Business Source Complete(74279107)

Tom, Gail, Carolyn Nelson, Tamara Srzentic, and Ryan King. 2007. "Mere exposure and the Endowment Effect on Consumer Decision Making". *The Journal of Psychology.* 141(2):117-125. Business Source Complete(24944355)

Vuilleumier, Patrik. 2005. "How brains beware: neural mechanisms of emotional attention". *Trends in cognitive neuroscience,* 9(12):585-594, Date read March 5th 2015: http://zpf.psychologia.uj.edu.pl/esns/Vuilleumier_2005_How%20brains%20beware: %20 neural%20mechanisms%20of%20emotional%20attention.pdf

Vuilleumier, Patrik, Mark P. Richardson, Jorge L. Arnony, Jon Driver and Raymond J. Dolan. 2004. "Distant influences of amygdala lesion on visual cortical activation during emotional face processing", *Nature Neuroscience,* 7(11):1271-1278, Date read February 26th 2015: http://www.cns.nyu.edu/events/spf/SPF_papers/vuilleumier_etal_2004.pdf

Whittlesea, Bruce W.A. 1993. "Illusions of Familiarity". *Journal of Experimental Psychology.*19(6):1235-1253, DOI: 10.1037/0278-7393.19.6.1235

Winkielman, Piotr, Rolf Reber og P. Schwarz. 1998. "Effects of perceptual fluency on affective judgments". *Psychological Science,* 9(1):45–48. Business Source Complete (195011)

Winkielman, Piotr, Norbert Schwarz, Tedra A. Fazendeiro and Rolf Reber. 2003. "The Hedonic Marking of Processing Fluency: Implications for Evaluative Judgment". In J. Musch & K. C. Klauer (Eds.), *The Psychology of Evaluation: Affective Processes in Cognition and Emotion.* Mahwah, New Jersey: Lawrence Erlbaum. Date read February 26th 2015: http://sitemaker.med.umich.edu/norbert.schwarz/files/winkielman_et_al_fluency_hed onic _pri.pdf

Winkielman, Piotr and John T. Cacioppo. 2001. "Mind at Ease Puts a Smile on the Face: Psychophysiological Evidence That Processing Facilitation Elicits Positive Affect", *Journal of Personality and Social Psychology,* 81(6):989-1000. DOI: 10.1037//0022-3514.81.6.989

Wilson, W. R. 1979. “Feeling more than we can know: Exposure effects without learning.” *Journal of Personality and Social Psychology,* 37:811–821. SocINDEX(16690671)

Woltman Elpers JLCM, Wedel M, Pieters RGM. 2003. “Why do consumers stop viewing TV ads? Two experiments on the influence of moment-to-moment entertainment and information value”. *Journal of Marketing Research*. 40(4):437–453. Communication & Mass Media Complete (11235614)

Yashar, Amit and Dominique Lamy. 2013. “Temporal Position Priming: Memory Traces of Recent Experience Bias the Allocation of Attention in Time”. *Journal of Experimental Psychology: Human Perception and Performance,* 39(5):1443-1456. Date read 2nd February 2015: DOI: 10.1037/a0031231

Zajonc, R. B. 1968. “Attitudinal effects of mere exposure”. *Journal of Personality and Social Psychology.*, 9, 1–28. Communication & Mass Media Complete (16645282).

Zajonc, R. B. 2001. “Mere exposure: A gateway to the subliminal”. *Current Directions in Psychological Science,* 10, 224–228. Date read : November 21st 2014: http://www.communicationcache.com/uploads/1/0/8/8/10887248/mere_exposure_gate_way_to_the_subliminal.pdf

Attachment I: Protocol for execution of experiment
Page 1:

Protokoll for gjennomføring av eksperiment

Formal information

- I de neste 10 minuttene skal du se på pc skjermen. Det er plassert kamera under pc skjermen, som vil ta opp dine øye bevegelser, når du ser på skjermen.
- Finn en komfortabel posisjon, som du vet du mer eller mindre kan holde i de neste 10 minuttene.
- Først vil vi foreta en kalibrering av Eye-tracking utstyr. Se på skjermen under hele kalibrerings perioden, følg den røde prikken på skjermen fra øvert til venstre. Du vil så bli vist en serie av reklamefilmer. Du vil få spørsmål om å evaluere disse til sist."

Lab set up: *For lab-based studies there are a few basic considerations.*

Lighting : Make sure that lightning doesn't`t interfere with eye- tracking. Sunlight contain infrared light, which can create an additional corneal reflection, causing inaccuracies in the data. Good window shades or a windowless lab with fluorescent light are the best.

Preconditions: The curtains will be shut, only lamp light will be used in lab.

Sounds: Make sure that the tracking room is some what sound isolated, to minimize the risk of distracting participants` attention from the task. considering that we are measuring the level of attention to a stimulus,which should not be affected by other noises that can draw their natural attention away from our stimuli. Also minimize variations from nearby motion of people or outside traffic.

Preconditions: The participants will have headphones, to minimizing the risk of interference of sounds. The lab will consist of 4 walls and a door, the room is in second floor and is placed with windows facing a back alley, the floor is also barely used, so we are alone and can control for sound interference.

Equipment placing : For sensitive measurements, place the eye tracker on a firm table standing on a concrete floor. Do not allow the participant to click the mouse or type on the keyboard on the same table where the eye tracker is located.

Preconditions: The participants will be told not to use the keyboard and will be in 60 cm distance.

Page 2:

Distractions: Minimize distractions, because they could add noise to your data or invalidate them. If the moderator is in the same room and observing the participant`s eye movements on a separate monitor. The monitor should be placed and angled away from the participant. The door should also be placed away from the participant.

Preconditions: The monitor it angled away from the participant. The door is not in the participant's eye sight.

Seating: Studies during which participants are seated in front of remote eye-tracker. Ideal chair is one that doesn't roll or swivel. Important so that the participant is not moving.

Preconditions: The chair we will be using is adjustable in height, so that the participant can sit in the right position, and without rolling function.

Location: If possible have your laboratory close to a participant population, or at least make it easy for your participants to reach your lab. That makes it easier to set up a production line where participants arrive on after the other to large recordings.

Preconditions: Using the TNS Gallup booking system , we make sure that there is no waiting line, and the participant arrive and leave alone.

Other preconditions

1.The task should be neutral with regard to the experimental and control conditions. The task should not favour any particular condition.

2. The task should be engaging. An engaging task distracts the participant from the fact that they are sitting in, or wearing, an eye tracker and that you are measuring their behavior.

3. The task should have a plausible cover story or be non-transparent to the participant. This stops the participant from second-guessing the nature of the experiment and trying to give the experimenter the answers that she wants. When the experiment itself causes the effects expected it is said to have *demand characteristics.*