### The Cognitive Neuroscientific Foundations of

## **Brand Memory**

Unravelling Non-declarative Brand Memory



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## List of Contents

1.0 Introduction
1.1 Motivation
1.2 Problem Statement and Hypothesis
1.3 Delimitation7
1.4 Methodological Deliberations 10
2.0 Foundations of Memory from the Perspective of Cognitive Neuroscience
2.1 The Typological Overview of the Human Memory System
2.1.1 Sensory Memory
2.1.2 Short Term Memory
2.1.3 Long Term Memory
2.2 Memory Processes and the Morphology of Memory Regions in the Human Brain
2.2.1 Memory processes
2.2.2 The Brain Basis for Short and Long Term Memory
2.3 Chapter Overview
3.0 The Field of Memory from the Perspective of Marketing
3.1 Brand Loyalty
3.2 Brand Awareness
3.3 Perceived Quality
3.4 Brand Associations
3.5 Other Proprietary Brand Assets
3.6 Chapter Overview
4.0 A Comparative Analysis of the Theory of Brand Equity and Cognitive Neuroscientific Memory Theory

4.1 Associations	59
4.2 Perceived Quality	
4.3 Brand Loyalty	
4.4 Brand Awareness	
4.5 Chapter Overview	
5.0 Empirical Investigation of Non-declarative Brand Memory	
5.1 Experiment I	
5.2 Experiment II	105
5.3 Chapter Overview	109
6.0 Discussion	
6.1 Implications for Consumer Behaviour	
6.2 Implications for Brand Management	115
6.3 The Absence of Brand Memory in Consumer Choice	
6.4 Chapter Overview	
7.0 Conclusion	

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In The Memory Of

Mohammad Rasul Wardak

(1929-2010)

## The Cognitive Neuroscientific Foundations of Brand Memory

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## Resumé

Vores hukommelse spiller en central rolle i udvælgelsen af brands. På trods af dette, er brandhukommelse et relativt uberørt område i markedsføringslitteraturen. Derfor har vi dedikeret denne kandidatafhandling til undersøgelsen af dette emne. Vi opstillede hypotesen om, at brandhukommelse er bevidst såvel som ubevidst. Yderligere, har kendsgerningen, at langt størstedelen af vores hukommelse finder sted ubevidst, været årsagen til, at vi næsten udelukkende har valgt at fokusere på dette område. Derudover, har vi gennemgående forsøgt at eftervise eksistensen af ubevidst brandhukommelse i forbrugeradfærd og brand management.

Vi har i den første del af teoridelen inddraget relevante teorier og modeller indenfor kognitiv neurovidenskab omhandlende den menneskelige hukommelse. I denne kontekst, har vi nævnt de mange hukommelsestyper, de tre hukommelsesprocesser samt det psykologiske fænomen framing.

Udover, systematisk, at have gennemgået den teoretiske baggrund for menneskets hukommelse, har vi i denne sammenhæng i den anden del af teoridelen også beskrevet relevant markedsføringsteori omkring begrebet "brand equity" (dvs. brandets samlede værdi). I og med, at brandets samlede værdi fra et kognitiv neurovidenskabeligt perspektiv udgøres af forbrugerens samlede antal associationer omkring dette, opfordrer denne opfattelse af brands til inddragelsen af hukommelsesteori og hukommelsesmodeller. Da vi mener, at den bedste teori som forklarer "brand equity" er udarbejdet af marketingprofessoren David Aaker, har vi valgt udelukkende at gennemgå denne brand equity teori i den markedsføringsteoretiske del.

Efter gennemgangen af relevante teorier omhandlende den menneskelige hukommelse og Aakers brand equity teori, har vi foretaget en komparativ analyse med det formål at undersøge i hvor høj grad Aakers brand equity teori tager udgangspunkt i den kognitiv neurovidenskabelige hukommelsesteori beskrevet tidligere. I den komparative analyse kom vi frem til, at Aaker i særdeles høj grad havde forsømt at inddrage den ubevidste side af brandhukommelse og at hans teori desuden kun løst var baseret på den kognitiv neurovidenskabelige hukommelsesteori.

Efter den komparative analyse har vi inddraget to forsøg udarbejdet af Dr. Thomas Ramsøy og Martin Skov omhandlende ubevidste brand associationer. Resultaterne af disse forsøg faldt i tråd med vores komparative analyse, der netop viste at ubevidste hukommelsestyper og processer var til stede i forbrugerens brandhukommelse. Da disse forsøg udelukkende fokuserede på ubevidste brandassociationer, byggede vi videre på dem. Dette gjorde vi ved at integrere elementerne "brand loyalty" og "perceived quality" fra Aakers brand equity teori i forsøgene.

Sidst men ikke mindst, har vi diskuteret hvilken betydning resultaterne af vores analyse har for forbrugeradfærd og brand management. I den forbindelse har vi perspektiveret ud til relevante emner. Vi viste, at vores resultater kan bruges til at belyse den ubevidste side af forbrugerbeslutningsprocessen. Herefter diskuterede vi Maslows behovspyramide i forbindelse med ubevidste hukommelsestyper og processer. Denne diskussion mundede ud i, at vi modificerede Maslows behovspyramide, så de ubevidste hukommelsestyper og processer integreredes i denne. Til sidst i diskussionsafsnittet, introducerede vi begrebet "Message Sensation Value (MSV)" og foreslog, at reklamer med høj MSV kunne benyttes med fordel i tilfældet af fraværet af brandinformationer i forbrugerens hukommelse.

## **Chapter 1**

## **1.0 Introduction**

#### A Day at the Shopping Centre

On a day off from work you decide to visit the shopping centre "Fisketorvet" in Copenhagen. The first thing you have planned to do is purchasing everyday consumer goods, so you visit Føtex. On your shopping list you can see that the first item you have to buy is a loaf of bread. Thus, you start looking for your usual brand of bread, "Levebrød" from Schulstad, which you are very fond of. You find the bread and put it into your shopping cart. The next item on your list is eggs. Unlike bread, you do not prefer a specific brand of eggs. In the aisle you can see several brands of eggs. Next to the "usual" egg brands you especially spot the brand "DAN ÆG". The package says "DAN ÆG", "Leverandør til Det Kongelige Danske Hof", is marked with the eco brand "Statskontrolleret Økologisk"<sup>2</sup> and also the package has a picture of fresh eggs in a basket surrounded by hay. After having placed the eggs in your cart you notice that the next item on your list is apples of the type Pink Lady. In the Fruit & Vegetables section there are two kinds of Pink Lady. One is packed, while the other is not and, in addition, it is sprayed with cool water in order to keep them fresh. You go for the latter. Then you have to buy kitchen tissues. In the aisle the brand Lambi catches your attention. On your list you also have batteries for your remote control. In the Electronics Section a pink rabbit and the slogan "trusted by everyone" catch your gaze and you go for your usual Duracell batteries. After you have finished buying the rest of the items on your list, you want to leave the store. Suddenly, you recall that you have run out of Stimorol (you had forgotten to write down this item on your list). Now, you have realized that your list is incomplete and that it would be a bad idea to leave the store. So, you step back for a moment and try to remember whether there are other items you need to buy that are not on your list. Now, you remember that you need to buy a soft drink for your movie night with friends.

<sup>&</sup>lt;sup>1</sup>Translation: "Distributor to the Royal Danish Court".

<sup>&</sup>lt;sup>2</sup> Translation: "State Controlled Organic"

You end up choosing a bottle of Coca Cola for the occasion. The next item that comes into your mind is fruit juice. Next to the soft drinks you see a mango juice brand called Maaza and are inexplicably struck by a sensation of excitement. Thus, you choose Maaza amongst other alternatives without any consideration whatsoever. After you have bought the items, on the way out of Føtex you meet a friend, whom you have not seen for a very long time. So, you decide to have a chat over a cup of coffee at Starbucks. The fine aroma in the coffee shop, all of a sudden, brings back pleasant memories of your backpacking trip to Antigua in Southern Guatemala where you enjoyed a cup of authentic, freshly brewed coffee with indigenous Mayan coffee farmers. Without any consideration, the two of you order Guatemalan Antigua and sit down in comfortable chairs, listening to ambient music. After a while, a friendly waitress serves you your coffee and you start to chat about your experiences of the trip. After some time, your conversation is interrupted by another waitress who offers you a taste sample of a chocolate. You eat the chocolate and notice that you are familiar with the taste. However, you do not know which chocolate it is, are unable to remember the last time you had tasted it or who had produced it. After having a good time at the shopping centre you say good by to your friend and head home. On the way home you start wondering why you chose those specific products/brands among the myriad of alternatives. As a consumer you will, naturally, not be able to fully understand why. And there is a good reason for this. In fact, 95 % of the time unconscious processes controlled your buying behaviour. Thus, it was not a coincidence that you bought Lambi, nor that you chose DAN ÆG or that you went for the Guatemalan Antigua. This master's thesis will investigate the nature and mechanisms of unconscious brand memory behind your buying behaviour and give you a better understanding of your choice of products/brands.

#### Brand Memory in Marketing

In today's complex and competitive business environment brand memory is an essential factor to consider in the marketing of any brand. In spite of this, brand memory is a relatively understudied domain within the field of marketing. Thus, the purpose of this thesis is to address the lacking focus on this crucial subject. We will undertake this by, firstly, giving a thorough

description of the human memory system. More precisely, we will describe the different subtypes of human memory and memory processes that we have acquainted ourselves within cognitive neuroscience. Secondly, we will investigate whether we can find these in marketing literature. In this context we will look into Aaker's brand equity theory. Thirdly, we will undertake a comparative analysis of the neuroscientific memory theory and Aaker's brand equity theory. In the analysis we will observe brand memory from managerial (brand management) as well as consumer (consumer behaviour) perspectives. In this context we will draw parallels to our introductory case combined with real-life cases involving different companies and their brands. Furthermore, we will include various experiments on implicit brand memory to support our findings. Fourthly, we will support our comparative analysis with implicit brand memory experiments conducted by Dr. Thomas Ramsøy and Martin Skov at the DNRG SenseLab. Finally, we will discuss the implications of our research for the fields of consumer behaviour and brand management, respectively.

Generally, we will introduce light and shade into the domain of brand memory by demonstrating that brand memory is treated in a much more complex manner in cognitive neuroscience as compared to how brand memory is treated in Aaker's brand equity theory. We will try to illustrate that brand memory is a vital, highly complex, multi-facetted and multi-disciplinary concept that encompasses much more than what we know from Aaker's theory.

After a short introduction to brand memory in general we will elucidate especially one very significant aspect of brand memory; namely that of non-declarative long term brand memory. This is the area within brand memory that is mostly understudied and generally underestimated. Thus, it will be the main focus of this thesis.

All in all, it is our objective to illuminate the neglected domain of brand memory, and especially non-declarative brand memory by approaching it in an interdisciplinary manner. In this way, we will try to give a more holistic picture of brand memory than the one we know from Aaker's brand equity theory.

#### **1.1 Motivation**

#### Lacking Focus on Brand Memory

Brand memory is an extremely important issue within the field of marketing. Unfortunately, according to our research marketing has generally underprioritized the role of this important subject. In fact, the lacking focus of marketing on brand memory was addressed by Professor James R. Bettman as early as in 1979 in his research paper *Memory Factors in Consumer Choice: A Preview*. In his paper he states: "Despite its potential importance, research on consumer memory is a relatively neglected area" (Bettman 1979:1). Unfortunately, even thirty years after Bettman addressed this issue, there is still not enough focus on brand memory in marketing. Although marketing sub-disciplines such as consumer behaviour and brand management have focused more on the subject than introductory marketing literature, there is still much room for improvement. For instance, how many marketing scholars differentiate between declarative and non-declarative memory? Or the three memory processes? The answer is: Astonishingly few.

Especially the investigation of non-declarative brand memory has been greatly neglected. The consciousness variable is essential to understand unconscious brand memory; more precisely unconscious brand retrieval. In order for a brand to be chosen, it must be successfully retrieved from long term memory (Walvis 2008:181). Marketers have failed to understand that a great part of the retrieval process takes place outside of conscious awareness (ibid). According to Bargh & Chertrand, approximately 5 % of the time conscious processes play a role in behaviour guidance (Bargh & Chertrand 1999). This is in accordance with Grunert 1988 who states: "It seems clear that the vast majority of consumer decisions are in fact not based on a large degree of conscious thinking. (...). A lot of information processing is unconscious. (...). The basic pattern is clear: unconscious information processing sets the limits within which conscious information processing can occur" (Grunert 1988 in Franzen & Bouwman 2001: 66).

#### Outdated Knowledge Must Be Updated

In addition to the lacking focus of marketing on brand memory, the research in many marketing books is, at best, based on Atkinson and Shiffrin's memory model which will be explained later. There is, of course, nothing wrong with this. However, it has been significantly updated since the 1960's and many marketing scholars have not followed the trend. In the past few decades cognitive neuroscience has illuminated many areas that psychologists have struggled to comprehend for more than a century; such as consciousness, memory, attention etc. Thanks to the vast array of groundbreaking technologies available to cognitive neuroscientists (Lee et al. 2006 (B)), great progress has been made in memory research. Thus, our knowledge of memory has been greatly extended. As students of marketing, who are also studying cognitive neuroscience, we find it crucial to focus much more on brand memory within marketing and attempt to fully exploit the opportunities that cognitive neuroscience has to offer the field of marketing. You may have wondered why we have chosen to display a painting of Plato and Aristotle on the title page of the thesis. There is a good reason for this. Like Aristotle learned from his teacher Plato, marketing must also learn from the field of cognitive neuroscience<sup>3</sup>.

#### Lacking Cognitive Neuroscientific Knowledge

Most of the brand memory research available to us in contemporary marketing literature is undertaken by scholars who do not possess sufficient knowledge of cognitive neuroscience. In recent years, some marketing scholars have borrowed memory theories from cognitive psychology and in some cases even from cognitive neuroscience and attempted to adapt these to marketing issues, such as brand memory. Although, we think it is a good sign that marketing scholars have managed to put the issue of brand memory on the agenda, there are many problems with how they are applied. In our opinion memory theories, like many other subjects within cognitive neuroscience, are hyped and have become part of a pseudoscience/pop-science culture.

<sup>&</sup>lt;sup>3</sup> It should be noted that a teacher can also learn from his students. We are of the opinion that cognitive neuroscience can also learn a lot from marketing. But we will not elaborate on this aspect.

A perfect example of an author who has harvested the fruits of this trend is the famous marketing "guru" Martin Lindstrøm. Not only has he treated memory and other neuroscientific theories superficially but has also drawn conclusions of which he has no scientific evidence and thus cannot support. It is not our intention to be disrespectful towards Lindstrøm and the other authors. We are merely trying to underline, for the sake of future scientific research on memory, the fact that the application of cognitive neuroscience can be beneficial as it can also be dangerous if not applied in a scientifically justified manner. We should be very careful not to simplify things but rather accept their complex nature. The human brain is the most complex of all human organs and at present we only see a fracture of the top of the iceberg when it comes to the functions of this highly complex, fascinating and at times utterly mysterious organ. Thus, it does not make us brain experts to show people colourful brain scans when we have no idea what they mean.

#### **1.2 Problem Statement and Hypothesis**

On the basis of the lacking focus on brand memory in marketing literature, we will investigate

## What different memory types and processes are at stake in brand management and consumer behaviour?

On the basis of the abovementioned problem statement we hypothesize that

Brand memory (Brand Equity) is conscious as well as unconscious.

#### **1.3 Delimitation**

Brand memory is a broad and complex area of research. This means that we will have to clearly choose which aspects of the domain we will be investigating and which we will have to exclude.

#### Theory

#### Cognitive Neuroscientific Memory Theory

When it comes to human memory types we will describe them all in the theory section in order to give a complete picture of the abundance of memory types and how these are interconnected.

#### Marketing Theories and Brand Memory

Although, several theories within marketing, either directly or indirectly, investigate brand memory they are not nearly as sophisticated as the theory of brand equity. For example, the AIDA/Hierarchy-of-effect model (Jepsen & Schoubye1995: 96), models of consumer decisionmaking processes (high/low involvement purchases and the forces affecting these) (Mullins et al. 2008: 100, 116; Andersen 2005: 173-181), the Means-End-Chains model (Paul & Olson 1994), the S-O-R or Stimulus-Organism-Response model (here the consumer's *black box* is mentioned which, among other things, refers to consumer memory) (Jepsen & Schoubye1995: 75) and several others. We enlisted these models and theories just to mention a few of the relevant research areas regarding brand memory. Furthermore, it should also be noted that it is very difficult in our case, if not impossible, to investigate all these theories in a meaningful and detailed manner in one thesis because of the limited amount of space. Although, these theories and models will be mentioned shortly in specific contexts, they are not specifically tailored for investigating brand memory. Hence, we will concentrate on the theory that, according to our research, describes brand memory best, namely the theory of brand equity. More specifically, we will deal with David Aaker's brand equity theory and use it as a point of departure. The reason for this choice is that his theory, in our opinion, is relatively sophisticated and comprehensive in

nature. David Aaker and Kevin Lane Keller are the pioneers in the field of brand equity. However, according to our research, due to its depth Aaker's theory is better when it comes to describing brand memory as it takes more brand memory factors into consideration than Keller's and makes more use of theories from cognitive psychology.

#### Analysis

In our analysis of Aaker's brand equity theory we will only analyse four of the five components: *associations, perceived quality, brand loyalty* and *brand awareness*. There are two reasons why we have chosen this particular order. Firstly, all the other components are difficult to understand if the most basic component, *associations*, is not introduced first. Secondly, by choosing this order we avoid unnecessary repetition, as many issues in the different components are similar to those analysed in *associations*.

In addition, we will not include every single aspect of Aaker's four components that are mentioned in the theory section but try to include as many aspects as possible in connection with the four components. By stating that we will "conduct a comparative analysis" we mean conducting a general analysis, in which we will compare the two theories in connection with memory types and processes. It is our intention to find out what memory types and processes are included in Aaker's theory compared to memory types and processes in cognitive neuroscience. The reason we have described Aaker's theory in a very detailed manner is to better understand the big picture, namely memory types and processes in connection with brand management and consumer behaviour.

In the comparative analysis some of the memory types, described in the theory chapter, have no direct relevance for brand memory. Hence, we will not focus on the following subtypes: sensory memory, short-term memory (working memory), procedural memory and non-associative learning. However, it can not be ruled out that some of the mentioned sub-types will be briefly mentioned in the analysis.

When it comes to long term memory our main focus will be on the non-declarative memory types in connection with brand equity. The reason for this is that, as mentioned in section 1.1, according to our research, non-declarative long term brand memory is much more under-studied than long term declarative brand memory. However, it cannot be excluded that some aspects of declarative memory will be included.

Declarative long term brand memory has definitely not been neglected by Aaker and other brand equity researchers. For instance, LaTour, who has investigated explicit long term brand memory, states: "Long term memory is where brand equity information is stored. This type of information contains both semantic (general knowledge) and episodic (personal experience) information" (LaTour 2010). For more on explicit long term brand memory, see Warlop et al. 2005.

Underprioritizing non-declarative brand memory is a huge problem since there is much evidence for unconscious brand memory in brand equity. In recent years, some marketing scholars have directed their attention towards the unconscious nature of brand memory, for instance Franzen & Bouwman (Franzen & Bouwman 2001: 44, 66); however, seldom in a brand equity context (ibid: 334).

Moreover, it is important to notice that although Aaker talks about many memory factors in his theory, he rarely uses psychological terms when describing them. For instance, although he talks about consolidation, he does not explicitly use this term. Thus, it does not necessarily mean that he has not considered memory consolidation. So, in order to undertake a fair comparative analysis we will keep such factors in mind.

#### Empirical (Experimental) Investigation of Brand Memory

When it comes to the investigation of brand memory *types* we will only focus on non-declarative aspects of brand memory. The reason for this is, as mentioned in section 1.1, that non-declarative brand memory has been neglected the most in marketing theory despite the fact that the vast majority of cognitive processes take place on an unconscious level. More precisely, the focus of

the experimental work will be on one specific non-declarative long term memory type, namely priming.

When it comes to brand memory processes the focus of the experiments will only be on the process of brand retrieval and not encoding and consolidation.

Furthermore, the experiments focus only on unconscious memory retrieval in connection with brands in general and not advertisements etc.

#### Discussion

In the discussion section of the thesis we will only discuss some relevant selected aspects of consumer behaviour and brand management that have not been discussed in the analysis. The reason we have selected exactly these aspects is that we find them especially relevant. In the discussion chapter we will make use of some models that we have not included in the theory and analysis chapters, although some of them have been briefly introduced in the delimitation of the marketing theory.

#### **1.4 Methodological Deliberations**

#### Brand Memory and the Consumer Behaviour Paradigm

Marketing is a multi-facetted academic field. Hence, when conducting marketing- related research it is important to be clear about the fact that it is undertaken from the perspective of one or more schools. In our case, it is mainly the *school of consumer behaviour*, which has integrated *the behaviourist school of thought* and the *cognitive school of thought* from psychology. This is in accordance with Aslin & Rothschild 1987 who claim: "The field of consumer behaviour has traditionally borrowed from the behavioural sciences – particularly cognitive psychology – in developing models of consumer decision processes" (Aslin & Rothschild 1987: 566).

Investigating brand memory from the perspective of the cognitive school is relevant because memory is predominantly a cognitive construct. To illustrate this from the perspective of the Stimulus – Organism – Response model, the cognitive school of thought focuses on the Organism or *the black box* (in Philip Kotler's terminology this is called the *buyer's black box*) as well as *Stimulus* and *Response* (unlike the behaviourist school, whose main focus is on *Stimulus* and *Response*). More precisely, it also focuses on the cognitive factors that take place between the phases of *Stimulus* and *Response* (ibid). In short, cognitivists focus much on cognitive processes including memory, while behaviourists focus on stimulus and response without really considering cognitive processes that lead to response.

However, it is important to underscore that it is impossible to solely investigate brand memory from a cognitive perspective since we are dealing with the field of consumer *behaviour*. Although, historically, there have been fierce debates and much disagreement between the behaviourist and the cognitive schools of thought in psychology we think it is important to view consumer behaviour from both perspectives. For instance, generally memory is a product of the cognitive school since it is a cognitive phenomenon; however *classical conditioning* is a product of the behaviourist school. We will discuss this later in further detail. We should remember that memory is an integrated part of consumer behaviour. Thus, consumer behaviour is not a simple construct that can either be explained by cognitive or behaviourist theories. This will also be elucidated later.

#### Science Theory and Brand Memory Research

On a meta-level it is important to be clear about how you have planned to conduct your research. After having investigated the problem statement and hypothesis in our analysis we will also include Ramsøy & Skov's experimental work to further verify or falsify our hypothesis. This means that our approach will be deductive; meaning that we will start out by formulating a hypothesis and end up with either confirming or rejecting the hypothesis.



Figure 1.1: The Deductive Approach

(Source: Trochim 2006)

Our sources include books, research papers and web-pages. Furthermore, our research is predominantly of quantitative nature because the main part of our sources is based on quantitative data. However, some of the sources we have used are based on qualitative data such as questionnaires.

#### Source Critique

When writing this thesis the biggest problem we encountered was that marketing literature is full of rigid definitions. For example, the rigid distinction between *brand* and *product* creates problems in the context of brand equity. Still many marketers talk about product-related issues when discussing brand equity. This makes the traditional, straight forward dichotomy between brand and product obsolete. Thus, we think it is too simplistic to view a brand as something that adds value to a product, since the associations of product features also add value to the brand. In our opinion a brand should therefore be viewed as something that can add value to a product but, at the same time, also receive value (equity) from the product itself.

#### Structure of the Thesis

Generally, it is our objective to achieve focus, consensus and coherence between the main parts of the thesis. This can be observed in figure 1.2 below.



Figure 1.2: Methodological Overview

(Source: Andersen 2002)

The structure of the thesis can be seen in figure 1.3 below.



Figure 1.3: Structural Overview

## **Chapter 2**

# 2.0 Foundations of Memory from the Perspective of Cognitive Neuroscience

In chapter 3 of the thesis we will focus on Aaker's brand equity theory. Later on in chapter 4 we will undertake a comparative analysis of the theory of brand equity and memory theory within cognitive neuroscience. But before that, this chapter will describe memory from the perspective of cognitive neuroscience, so that we build a solid basis for the comparative analysis and discussion.

In this chapter we will describe human memory from the perspective of cognitive neuroscience. In the field of cognitive neuroscience memory has been studied quite thoroughly. Memory theory within cognitive neuroscience builds on memory theories that we already know from cognitive psychology. Later, behavioural psychology has also been included in the unravelling of human memory, as we shall see. More precisely, this chapter will give an overview of the human memory types and processes. It will also explore the pivotal role of other cognitive mechanisms that are inextricably intertwined with memory processes. These areas include attention and consciousness. In fact, memory is very difficult to study in isolation, so mentioning such decisive cognitive mechanisms is unavoidable.

#### What is Memory?

The term *memory* is indeed an old one. It stems from *Mnemosyne*, who according to the ancient Greek mythology was the Titan Goddess of memory and remembrance and the inventress of language and words (Theoi 2000-2008). She had knowledge of the present, past and the future (Clayson 2007).



#### Illustration 2.1: Mnemosyne, the Greek Goddess of Memory

(Source: Theoi 2000-2008)

In the course of history, many great intellectuals have been intrigued by the mysterious concept of memory and have attempted to disentangle its nature and fabricate their own descriptions definitions of it. Below, we can observe some of these:

"Memory is the scribe of the soul" (Aristotle)

"Memory is the treasury and guardian of all things" (Marcus T. Cicero)

"Memory... is the diary that we all carry about with us" (Oscar Wilde)

*"Memory is the library of the mind" (Francis Fauvel-Gourand)* 

"God gave us memory so that we might have roses in December" (James Matthew Barrie)

But how do cognitive neuroscientists perceive and define memory? According to Baars & Gage (2007) memory is defined as "a lasting representation that is reflected in thought, experience or behaviour" (Baars & Gage 2007: 255). What this exactly means, will be investigated in further detail in the following sections.

## 2.1 The Typological Overview of the Human Memory System

In cognitive neuroscience memory can be classified according to three parameters: duration of memory retention, information type and temporal direction (retrospective and prospective). Duration of retention is, however, the universal way of describing the different memory types. In his book *Über das Gedächnis*, Hermann Ebbinghaus was the first scholar to undertake the classification of memory types according to their duration. It was also the first systematic analysis of human memory (Pawlik & Rosenzweig 2000: 128). From this perspective, cognitive neuroscientists agree that there are three types of memory, beginning with the shortest: Sensory, short term (working memory) and long term memory.

Figure 2.1 below illustrates these three memory types.



Figure 2.1: Model of the Human Memory

The model gives an overview of the human memory system. Traditional memory models have looked at the three memory types in isolation. However, this model seeks to integrate the three memory types into one big memory model.

#### 2.1.1 Sensory Memory

Sensory memory is the type of memory that for a very short period of time retains sensory information from our environment after the external stimulus has ceased. According to Galán et al. 2006 sensory memory is defined as: "(...) short-lived persistence of a sensory stimulus in the nervous system (...)" (Galán et al. 2006).

Sensory memory is unconscious in its nature. However, when we pay attention to the external stimuli from our environment we become conscious of them (the stimuli are said to be *perceived*) because we transfer them into our short term memory (working memory) and, if processed further, they will be transferred to long term memory (Bernstein & Nash 2008: 212). These aspects will be discussed later. See figure 2.2 below.



Figure 2.2: The Path from Sensory Memory to Long Term Memory

(Source: Based on Porter et al.1999: 26)

Sensory memory is traditionally grouped in: *Iconic* (visual) and *echoic* (auditory) memory<sup>4</sup> (ibid).

*Iconic* memory refers to our visual information storage. It has roots in, among several others', George Sperling's work. Iconic memory is the most studied type of sensory memory and thus the sensory memory type we know the most about (Darwin et al.1972: 255-256). Iconic memory has a time course of less than a second (Nairne 2009: 247), approximately 0.2-0.5 second (Yang 1999: 5; Huitt 2003). To illustrate how iconic memory works, let us view an example. Imagine if an image is shown to you very rapidly (flashed at you for 0.2 second). After the image has been shown you will be able to remember a number of the details of the image for a very brief time period.

*Echoic memory* refers to our auditory information storage and lasts approximately 3 seconds (Huitt 2003; VSU 2010). Imagine if you hear some words. These will be retained in your auditory memory for 3 seconds after the external stimuli have ceased, unless they are paid attention to and thereby transferred to your working memory and from there to long term memory if further processing is chosen. In the absence of attention the sensory representation of the stimuli will be ignored. The work on echoic memory has primarily been pioneered by researchers such as Robert G. Crowder and David Sperling (Darwin et al. 1972).

However, it is widely believed that iconic and echoic memory are not the only sub-types of sensory memory. There are also other types of sensory memory, such as memory for *touch* (haptic), taste (gustatory) (Byrne 2003: 607) and *smell* (olfactory) (Galán 2006). However, much less is known about the latter three subtypes. We will not go into further detail about sensory memory in this thesis.

<sup>&</sup>lt;sup>4</sup> These are also called short term visual and short term auditory memory by some authors.

#### 2.1.2 Short Term Memory

The notion of short and long term memory has roots in William James' work of 1890: *The Principles of Psychology*. In his work he used the terms *primary* memory for short term memory and *secondary* memory for long term memory (Moxon 2000: 4). In this section we will describe the nature of short term memory, while long term memory will be scrutinized in the next.

Short term memory is temporary storage of information (Baars & Gage: 2007: 258-259). Due to its function, short term memory has a limited capacity (ibid: 259). It operates over a time span of a few dozen seconds or minutes (ibid: 286), but the exact time span is a matter of debate (Huitt 2003). However, it is too simplistic to refer to short term memory as memory that works for a certain amount of time and has a limited capacity. According to George Miller, we can normally store five plus or minus two items in our short term memory for a few seconds (Baars 2007: 259) under optimal conditions (Pieters & Warlop 1999). This will be explained in further detail later. According to the *Modal Model*, proposed by Atkinson & Shiffrin in the 1960s, short term memory has two functions: Storing information that we have to retrieve in a few seconds time and providing a path for long term memory storage (Atkinson & Shiffrin1966; Atkinson & Shiffrin1968; Yi 2004).

#### Short Term Memory and Working Memory

Short term memory and *working memory* are two terms that are used interchangeably in much of the scientific literature. However, there are important distinctions to be made in spite of the close relationship between the two (Hutton & Towse 2001: 383; Baddeley 2004).Working memory is defined as a: "limited capacity system, which temporarily maintains and stores information, supports human thought processes by providing an interface between perception, long term memory and action" (Baddeley 2003: 1). Pioneering researchers within short term memory, Alan Baddeley and colleagues, have redefined the concept of short term memory that we know from the Modal Model proposed by Atkinson & Shiffrin. According to them this model cannot account for several factors. Thus, Baddeley and Co. suggested what, according to them, was the

more *dynamic* concept of *working memory* which is explained by the *multicomponent model* (in contrast to STM the Modal Model is unitary) (Baddeley 2003).



#### Fig. 2.3: The Multicomponent Model.

Crystalized Systems are long term memory systems, while Fluid Systems are short term memory systems.

(Source: Baddeley 2003: 835)

This revolutionary work within short term memory research has had consequences for the terminology of short term memory as well. In the Multicomponent Model working memory can be compared to complex machinery or a working place of memory, in which the central executive is in charge. Baddeley & Hitch operate with a central component called *the central executive* and three sub-systems: the *visuospatial sketchpad, the phonological loop* and *the episodic buffer* (ibid; Baars & Gage 2007: 284). The first two are called *slave systems* and are short term memory storage systems (Baddeley 2003; Potts 1996: 5-8).

*The central executive* is the main catalyzing component of Baddeley's working memory model. It has the responsibility of coordinating the information flow to and from the three subsystems,

controlling all executive processes such as actions, directing attention to relevant information and excluding irrelevant information, suppressing actions that are undesired, supervising the coordination and integration of information and coordinating cognitive processes that are taking place simultaneously (Baddeley 2003; MITECS 2002).

*The visuospatial sketchpad* is responsible for maintaining and manipulating visual and spatial information. This slave system is comprised of further two sub-systems: One for visual information processing and the other for spatial. For instance, when finding our way in a building the central executive cooperates with the visuospatial sketchpad in order to create, process and maintain mental images and navigate through these.

*The phonological loop* maintains auditory information and has a rehearsal mechanism that helps the system to prevent a fast decay of the information. An example of the usage of this system is when we in our memory maintain a list of numbers (e.g. telephone number) or a set of words and repeat these to ourselves.

The final component, *the episodic buffer*, is another short term storage system. Its function is to integrate visual, phonological and spatial information (Baddeley 2000) into an episodic representation (Baddeley 2002). According to Tulving, this buffer also provides a path between the three subsystems and episodic memory (Long term memory) (ibid).

There is still much ongoing debate about the role of working memory. Many factors about working memory are still unclear and need in depth research (MITECS 2002). So, Baddeley's work is definitely not the last we have seen in the domain of working memory<sup>5</sup>.

<sup>&</sup>lt;sup>5</sup> Some authors, for instance Baars & Franklin have even found that working memory can be conscious and unconscious (Baars & Franklin 2003) just like long term memory.

#### 2.1.3 Long Term Memory

Long term memory is a permanent storage of information. Due to its function, long term memory has an unlimited capacity (Baars & Gage. 2007: 256; Porter et al. 1999: 26).

Long term memory either requires *conscious activation* of brain regions, or happens *automatically*; that is, the parts of the brain affected, are activated unconsciously. In neuroscientific terms, memory that involves consciousness is referred to as *explicit* or *declarative memory* (Baars & Gage 2007: 274, 279), while memory that does not involve consciousness is referred to as *implicit* or *non-declarative memory* (ibid).

#### Declarative Long Term Memory

According to Tulving, *declarative memory* is divided into *semantic* and *episodic* (*autobiographical*) *memory* (Baars & Gage 2007: 274).

Episodic memory refers to memory of specific events (ibid). An example of episodic memory is if you witness a sunrise on your way to the Coliseum during your holidays in Rome. Semantic memory is your memory of facts and common knowledge (ibid); for instance, the facts that the Coliseum is in Rome and that the sun rises in the East.

#### Non-declarative Long Term Memory

*Non-declarative long term memory* is divided into four different subtypes: *procedural memory*, or memories regarding cognitive and motor skills, *priming* (conceptual and perceptual), *dispositions* (classical conditioning) and finally *non-associative memory* (ibid). Unlike declarative long term memory, which can be *declared* as a result of conscious retrieval, non-declarative memory cannot be declared as a result of unconscious retrieval. Hence it is said to be non-declarative. Non-declarative memory is, according to Coates et al. 2006, defined as: "The non-intentional, non-conscious retrieval of previously acquired information" (Coates et al. 2006:

1101). It is expressed through increased performance on tasks that do not require the conscious retrieval of past experiences and general knowledge; that is episodic and semantic memory (ibid).

#### Procedural Memory

*Procedural memory*, also called *skills* include memories of both *motor* and *cognitive skills*. Examples of motor skills can be riding a bicycle or driving an automobile. When driving an automobile motor skills include shifting the gear and handling the three pedals, while cognitive skills include obeying traffic regulations. As procedural memory is beyond the scope of our thesis, it will not be discussed any further.

#### Priming

*Priming* is defined as "the facilitated processing of stimuli as a function of prior exposure" (Schott et al. 2005: 1). Priming refers to the fact that an earlier stimulus will influence the response to a later stimulus because of prior experience (Baars & Gage 2007: 260).

According to Zhang et al., priming is observed when a person's reaction or response towards a previously encountered object becomes faster and more accurate than in the case of a novel memory of a stimulus (e.g. an object) (Zhang et al. 1997: 1). The reason for the faster reaction time and accuracy is that the memory trace for the previously experienced stimulus becomes more accessible in the retrieval process (Lichtenstein & Slovic 2006: 401). Furthermore, it should be noticed that when the accessibility of a memory trace of a stimulus increases, so will the accessibility of memory traces of related concepts to that stimulus (ibid). Thus, when a person is confronted with a prime like *table*, the accessibility of a word like *chair* will increase.

Different scholars operate with different subtypes of priming. Some authors for instance operate with *associative priming*, like in the case of associative pairs *cat* and *dog*, *cat* and *mouse* and

*Butter* and *Bread* (associative pairs) (Plaut 1995). However, we are of the opinion that the best way to categorize priming is to use Baars & Gage's categorization. They divide priming into two categories: *conceptual* and *perceptual* (Baars & Gage 2007: 260).

*Conceptual priming* (semantic) (Plaut 1995; Haugtvedt 2008: 86) refers to for instance when a test person confronts a prime like *hammer*. This will in turn increase the processing efficiency of another word like *nail*, even though the two words are not similar perceptually. This is because they belong to the same semantic category just like in the case of *table* and *chair* (Pawlik & Rosenzweig 2000: 225, 227).

*Perceptual priming*, on the other hand, is when a person confronts a prime (object or word) and processes its physical form or structure. Perceptual priming has nothing to do with the prime's semantic properties (Ochsner et al.1994: 189).

Now, let us return to the term *accessibility*. As mentioned earlier, accessibility of information is achieved through priming. Accessibility has four determinants: The *strength of association*, *recency*, *frequency* and finally *how much the information was thought about at the time it was learnt* (Haugtvedt 2008: 35). *Strength of association* refers to the strength of the association between the activated concept and the one that we wish to access. *Recency* refers to how recently the knowledge that we wish to access has been learnt and activated. *Frequency* refers to how frequently the knowledge that we wish to access has been activated. Finally, the fourth determinant reflects how well the information (concept) that we wish to access was processed. Well learnt information is much easier to access (ibid).

#### Framing

Framing is not a memory subtype. It is a psychological phenomenon that can help us better understand implicit memory. Framing, basically, refers to a person's "cognitive bias". The concept has been greatly influenced by the work of Nobel Prize winning scholars Daniel Kahneman and Amos Tversky and their indirect challenge of the Rational Agent Model (For more see Tversky & Kahneman 1981; Kahneman & Tversky 2000; nobelprize 2002). Framing works because objects of choice can be represented as mental models and not necessarily actual states of the world. Like in the case of priming, *frames* impact the accessibility of associations in long term memory and thus increase the probability that a person will follow those associations when thinking about an object (inspiration from Brewer et al. 2003: 496). The difference between priming and framing is that framing does not necessarily rely on actual states of the world, while priming does. This can be seen by experiments in which the same object is presented in two different ways. An example of framing is if we slice a banana into two pieces and then label the one half "Fairtrade" and the other "normal". If the test persons perceive organic products, in this case bananas, as being of superior quality they will typically choose the half that is labelled "Fairtrade" although it is exactly the same as the one labelled "normal". If you ask them to taste both halves and later ask them: "which banana had the best taste?", they will probably answer "the organic", although it tastes exactly the same as the one labelled "normal".

#### Dispositions (Associative Learning)

*Dispositions* refer to the way we react to certain stimuli. These constructs are combined results of our *genetics* as well as *classical conditioning (learning)*. For more on the genetic aspect of dispositions see Annex 1. In our memory model we have deliberately chosen to use the term *classical conditioning* instead of *dispositions*. The reason for this is that the genetics aspect is not relevant for our research question. Hence, it will not be discussed in further detail.

#### Classical conditioning

Classical (Pavlovian) conditioning is a product of the positivist behaviourist school of thought within psychology and is a type of *associative learning* (Encyclopedia 2010; Psyknet 2010; Larsen 2010: 127). Classical conditioning has its roots in Ivan Pavlov's famous experiment with

dogs (Nairne 2009: 217-221; Baumeister & Bushman 2008: 229). In his experiments the tone of a bell was sounded before dogs were given meat powder. After repeating this same procedure multiple times Pavlov noticed that the dogs secreted saliva to the sheer sound of the bell or even the sight or sound of his assistants, who used to feed them meat powder (ibid). The dogs instinctively associated the sound of the bell or the sight or sound of the assistants with meat powder. Hence, the dogs were said to be *classically conditioned*, meaning that their reaction was learned from conditions in their environment (Larsen 2010: 129). It is important to notice that the dogs' reaction (salivation) was an entirely unconscious process (ibid).

Pavlov's theory of classical conditioning contains four main components: *the Unconditioned Stimulus* (US), *the Conditioned Stimulus* (CS), the *Unconditioned Response* (UCR) and the *Conditioned Response* (CR) (Lavond & Steinmetz 2003: 3-4; Larsen 2010: 128). The *unconditioned stimulus* refers to the source that elicited the response in the dog instinctively; that is the meat powder. The *conditioned stimulus* refers to what elicited the response in the dog; that is the sound of the bell. The *unconditioned* and *conditioned* responses refer to the dogs' behaviour; that is the saliva secretion. However, unconditioned response refers to saliva secretion in connection with the meat powder, while the latter is the response to the sound of the bell and the sight and sound of the assistants (ibid).

Whether classical conditioning can occur is dependent on several factors. These are: *Latency*, *spontaneous recovery* and *generalization* (ibid; Psychology World 1998).

*Latency* refers to the difference in the amount of time between the conditioned and the unconditioned stimuli, respectively (Lavond & Steinmetz 2003: 3-4; Nairne 2009: 219). The general rule is that the time between the two stimuli must be short if you want conditioning to occur (ibid; ibid).

*Extinction* means that an organism (for instance a dog) stops showing the conditioned response if the conditioned and unconditioned stimuli are not paired for a certain number of times (Psychology World 1998; Larsen 2010: 129).

28

*Spontaneous recovery* refers to the reoccurrence of a conditioned stimulus after this stimulus has extinct (ibid).

*Generalization* refers to situations, in which stimuli that resemble the conditioned stimuli elicit the same response as the conditioned stimuli (ibid). A classical example of this phenomenon is the case of Watson's experiment with a child, *Little Albert* (ibid). As he was playing with a rabbit, Watson made a loud sound behind the child's head. Although the child loved playing with the rabbit, he developed a fear of the rabbit after the noise took place (ibid). After this incident, Little Albert was afraid of anything furry, like for instance other fury animals and even his mother's fur coat (ibid).

#### Consciousness and Classical Conditioning

When it comes to consciousness in classical conditioning we must be very careful because consciousness is a product of the cognitive school, while classical conditioning is a product of the behaviourist school. The role of consciousness has thus not been discussed in connection with classical conditioning in the behaviourist circle until recently. It remains generally a hot issue of debate (Núñez & De Vicente 2004: 14). However, there seems to be general agreement that classical conditioning is non-declarative. Thus, it is seen as a subtype of non-declarative long term memory (Sweatt 2003: 8; Kim et al. 1996: 319; Kesner & Martinez 2007: 272).

#### Non-associative Learning

Non-associative learning can be defined as: "those instances in which an animal's behaviour toward a stimulus changes in the absence of any apparent associated stimulus or event" (Encyclopædia Britannica 2010). There are two main types of non-associative learning: habituation and sensitization (Poon & Young 2006; Bendrup 2000).

*Habituation* is defined as: "The decline in the tendency to respond to an event that has become familiar through repeated exposure" (Nairne 2009: 216). We have the tendency to initially unconsciously respond to novel stimuli. However, as these occur again and again without having any consequences for us, we tend to ignore them. For instance, if you sit in a train and hear an annoying ring tone, initially you will unconsciously respond to it and you will be annoyed by it. However, after a while you will get accustomed to the sound and it may not even bother you anymore. This is because the sound does not have any further consequences for you and your response to the sound will decrease.

*Sensitization*, on the other hand, is defined as: "increased responsiveness, or sensitivity, to an event that has been repeated" (ibid). We talk about sensitization when our response to a certain stimulus increases with repeated exposure. For instance, a loud ring tone may increasingly annoy you. The reason for this may be that the loud noise may damage your ears.

# 2.2 Memory Processes and the Morphology of Memory Regions in the Human Brain

Before we describe the processes of memory we will introduce some factors that play a vital role in memory formation and retrieval processes. We are of the opinion that without a short introduction to these factors it will be very difficult to comprehend what memory is, how it is formed and how it works.

The Presence of Attention and Consciousness as Pre-conditional Catalysts in Memory Formation and Retrieval Processes
*Attention*<sup>6</sup> starts the process of memory consolidation, as we also saw earlier on Atkinson & Shiffrin's model. Although it has some flaws, it demonstrates this point brilliantly. In neuroscientific terms, attention is your ability to *select* information for cognitive purposes (Baars & Gage 2007: 228). Attention activates the parts of the brain needed to process relevant information (ibid: 227). Imagine the billions of stimuli we are bombarded with every day. The brain cannot process all of them. Thus, with the aid of attention some of these raw stimuli (Darwin et al. 1972: 255-256) are carefully filtered, selected and integrated by the cerebral cortex (Baars & Gage 2007: 225). Information can be selected using various criteria such as novelty (Webb1999: 30).

Attention is undoubtedly a precondition for memory formation, as it catalyses the processes of memory encoding, consolidation and retrieval. As we shall see later, the Hippocampal Complex (which will be described shortly) is only activated when a memory is consciously retrieved; in other words, when attention has been focused on memory retrieval (ibid)<sup>7</sup>. Thus, this witnesses that attention is the preconditional catalyst in memory retrieval.

When we speak of attention it is inevitable to mention the illusive phenomenon of *consciousness*. Clearly, attention and consciousness are closely related, but the difference between the two is that consciousness<sup>8</sup> is thought to be the result of attention (ibid: 226-227). There is, however, a reciprocal relationship between attention and consciousness, as it has also been shown that conscious goals can influence attention (Fitzsimons et al. 2002: 271). No matter how you see the

<sup>&</sup>lt;sup>6</sup> A great many subtypes of attention exist, including *voluntary attention, selective attention, executive attention, stimulus driven attention* etc. (Baars & Gage 2007: 226-228). Attention may also be subdivided into the senses that activate it, for instance *visual attention, auditory attention* etc. (Pieters & Warlop 1999: 2). Attention activated by senses is closely linked to sensory memory (Langleben et al. 2008: 219).

<sup>&</sup>lt;sup>7</sup> Other researchers have since then expanded this theory, so that it includes both conscious and unconscious attention (ibid: 226).

<sup>&</sup>lt;sup>8</sup> Tulving divides consciousness into two subtypes: *noetic* and *autonoetic consciousness* (Baars & Gage 2007: 276). Both are associated with declarative memory, but the first mentioned is inextricably intertwined with semantic memory, while the latter is entwined with episodic memory (ibid: 276). Noetic consciousness can best be described as *knowing* something, while autonoetic consciousness can best be described as *remembering* something.

relationship between attention and consciousness, it is clear that both play a pivotal role in all three memory processes. These will be touched upon in the next section.

## 2.2.1 Memory processes

After having discussed the different memory types and some significant factors in memory formation, we will now describe the three memory processes. In cognitive neuroscience we distinguish between three processes of memory: *Encoding*, *consolidation* and *retrieval*. We have already touched upon these in the section on attention and consciousness and now we will elaborate more on them.

#### Memory Encoding

The first process of memory is encoding. It is a process in which sensory data are converted into a form that the brain can "understand" (process) in order for them to be remembered (consolidation). That is, sensory data in the form of sounds (acoustic), images (visual), smells (olfactory), tastes (gustatory), touch (haptic) but also meanings (semantic) are transformed to codes that the brain can understand (electric signals) (Bernstein & Nash 2008:209). From an anatomical and neurophysiological viewpoint, all our sensory organs are connected via neural pathways to the brain where sensory information is represented.

#### Memory Consolidation

Memory consolidation (also called storage or retention) refers to how information is transferred from short term to long term memory. Memory consolidation requires correlated activity between nerve cells, also called neurons (interneuronal communication) (U.S. Department of Health and Human Services 2008: 9-10).



## Illustration 2.2: Interneuronal Communication

The illustration shows neurons communicating with each other via electrical impulses.

#### (Source: Slanevskaya 2009)

This process of memory consolidation (for more see Annex 2) is referred to as *Hebbian learning* (Baars & Gage 2007: 256) and has roots in William James' work. In his famous statement "neurons that fire together, wire together", Donald Hebb proposed that neurons that are activated simultaneously are also connected. In addition, according to Gerald Edelman synapses that are activated frequently become stronger and if not activated frequently they will become weaker and eventually cease to exist (ibid: 79-80). This follows the principle of *Neural Darwinism*.

Though, there is some debate about how memory consolidation takes place on a psychological level. According to Moscovitch, the process of memory consolidation follows two steps: At first, all memories are episodic. As time passes, these memories are transformed into semantic memories (ibid: 277).

Finally, when we talk about consolidation, it is important to also mention the term *reconsolidation*. Earlier, we saw that long term memories exist as a result of consolidation. However, when we retrieve a consolidated memory from our long term memory, it becomes labile again and can therefore be manipulated and altered<sup>9</sup> (ibid: 382). Reconsolidation refers to the process of maintaining or restabilizing already consolidated memories in the long term memory after retrieval is over (Tronson & Taylor 2007; Nader et al. 2000; Dudai & Eisenberg 2004; Nadel & Land 2000; Nader 2003; Blum et al. 2006; Alberini 2007; Nader 2007).

#### Memory Retrieval

This far, we have only described in which way memories are formed in the human brain. Another important aspect of memories is how they are retrieved. Memory retrieval includes two processes: *recall* and *recognition* (Bernstein & Nash 2008: 210). As explained earlier, attention and consciousness are central in the process of memory retrieval. As with memory formation, memory retrieval takes place either consciously or unconsciously.

#### Memory Recall

*Recall* is normally conscious but it can also be unconscious. In neuroscientific terms, conscious recall is referred to as *strategic* retrieval, while unconscious recall is referred to as *spontaneous* retrieval (Baars & Gage 2007: 287; Langleben et al: 2008: 224). Recall takes place in the context

<sup>&</sup>lt;sup>9</sup> Several factors could alter a labile retrieved memory, for instance emotions. However, reconsolidation is a hot research topic and not much is known about it.

of general information, for instance the meaning of a word or an episode. Normally, it is not a passive process. We actively and consciously put our effort into remembering something. When we plan to recall things consciously we refer to the concept of strategic retrieval. However, when a memory "pops up" spontaneously in our minds (e.g. an episode, an object or word), we refer to spontaneous retrieval.

Strategic memory retrieval depends on several factors. First, in order for strategic retrieval to be effective, the information retrieved must match the information that was learned (Baars & Gage: 2007: 286-287). This aspect is closely related to the *accessibility of information*, which refers to how easily information can be retrieved from memory (Fitzsimons: 2002: 271). Information that is retrieved very easily, as a result of repeated exposure, and eventually retrieved spontaneously is explained by the term of *automaticity* (ibid). Another crucial concept in this context is the *diagnosticity* of information. This refers to how sufficient the information is for solving a task at hand (ibid). Second, one must have a conscious goal of retrieving the memory. This means that one must be willing to search for the desired memory and be willing to pay attention to cues (Baars & Gage: 2007: 286-287). Strategic memory retrieval involves a degree of consciousness. These are referred to as *metacognitive processes* (ibid: 287).

The processes needed for strategic memory retrieval are largely administered by the Medial Temporal Lobes, while the Prefrontal Cortex (PFC) is also involved in strategic memory retrieval (Baars & Gage 2007: 287; Langleben et al 2008: 224). This is based on new evidence that suggests that the Medial Temporal Lobes and the Prefrontal Cortex may cooperate during memory retrieval (Baars & Gage 2007: 288). It is clear that both the Medial Temporal Lobes and the Prefrontal Cortex are activated during memory retrieval (Langleben et al. 2008: 224).

#### Recognition

Unlike recall, recognition is a retrieval form that takes place in the context of something specific, for instance a face or an object. That is, it is such specific external stimuli (visual, auditory etc.) that enable recognition. Put simply, recognition is a feeling that you have experienced a presented stimulus before, when you are presented with it again. That is, recognition will be absent if the stimulus or related cues regarding the stimulus that you have seen before are not presented. Recognition is a weaker form of retrieval. Hence, recognition is tested with the aid of a so-called *aided recall test*. In these tests subjects are given cues in order to retrieve information. The reason why recognition is weaker than recall is that recognition is based on selective encoding and consolidation of information about an experience and much information is forgotten as a result of this selection. This makes recognition a more demanding retrieval process than recall (Encyclopædia Britannica 2010).

Recognition can be both conscious and unconscious. The evidence for unconscious recognition is, among many others, provided by Voss & Paller 2009: "(...) we provide evidence for recognition lacking two hallmark explicit-memory features: awareness of memory retrieval and facilitation by attentive encoding" (Voss & Paller 2009). This means that recognition can take place without selective encoding; thereby suggesting that it can be unconscious.

Conscious recognition takes place if you are presented with an already known stimulus and whose recognition you can report. This is, however, not the case in unconscious recognition. Several experiments have demonstrated unconscious recognition, such as an experiment in which faces were shown to test persons unconsciously. Unconscious recognition can only be measured with the aid of brain scanning techniques and other methods measuring bodily reactions as the person will not be able to notice subliminal stimuli. In contrast to unconscious recognition, conscious recognition can be measured by simple recognition tests.

## 2.2.2 The Brain Basis for Short and Long Term Memory

## The Brain Basis for Short Term Memory: The Prefrontal Cortex (PFC)

A marked difference between short and long term memory is that they involve two different parts of the brain. While long term memory is largely found in the Medial Temporal Lobes, short term memory mainly operates in the *Prefrontal Cortex (PFC)* (Baars & Gage 2007: 279; Kesner & Martinez 2007: 293).







The illustration shows a vertical (sagittal) section dividing the brain in left and right.

(Source: brainexplorer 2010; sein 2009)

So far, researchers have found that the Prefrontal Cortex stores information temporarily, and that the information storage is organized by using two criteria: *Spatial content* and *function* (Baars & Gage 2007: 280). Those who emphasize that the Prefrontal Cortex organizes short term memory

by their spatial content follow the *content approach* (ibid: 280), while those who emphasize that information is stored according to its function follow the *function approach* (ibid: 280). According to the content approach it is claimed that the Prefrontal Cortex specializes in recognizing spatial information, while the latter approach claims that the Prefrontal Cortex specializes in recognizing objects, faces etc. There is strong evidence for both approaches (ibid: 280).

Recently, the role of the Prefrontal Cortex has been questioned. One alternative theory is that the Prefrontal Cortex plays a central role in the retrieval of information from long term memory by activating short term memory (ibid: 282, 286; Baddeley 1998). See section 2.1.1.2 on working memory. From studying lesions to the Prefrontal Cortex it has also been theorized that the Prefrontal Cortex plays a pivotal role in consciousness (ibid: 283). It is clear that the exact role of the Prefrontal Cortex is currently unknown (ibid: 285).

### The Brain Basis for Long Term Memory: The Medial Temporal Lobes (MTL)

It is important to note that memory is not stored in one specific brain area. In stead, it is spread out all over the brain (Baars & Gage 2007: 256). The area from which memories are spread out and retrieved is believed to be the Hippocampal Complex; that is the hippocampi and the surrounding areas in the Medial Temporal Lobes (ibid: 256).



Medial temporal lobes



## Illustration 2.4: The Medial Temporal Lobes

The illustration shows a vertical (coronal) cut through the brain dividing the brain in front (anterior) and back (posterior).

(Source: Baars & Gage 2007:256, Ramani et al. 2006: 31)

The Medial Temporal Lobes (MTL) play a central role in organizing and retrieving memories of specific events and general knowledge. Thus, they are a key player in memory consolidation (ibid: 277).

The MTL have multiple functions besides retrieving memories. They also play a central role in integrating visual and olfactory stimuli received from the eyes and the nose after they have sent the stimuli to the neocortex (ibid: 272, 257; Kirk et al 2008: 1130). Furthermore, the Medial Temporal Lobes and thus the hippocampi are situated next to the auditory cortex (hearing), and the amygdalae<sup>10</sup>. Therefore, the Hippocampal Complex is directly interconnected with various areas of the brain such as the amygdalae (McGaugh 2004) and the neocortex. These areas are constantly feeding The Hippocampal Complex with huge amounts of information. The hippocampi then integrate, coordinate and retrieve the memories needed (Baars & Gage 2007: 252, 257).

Put simply, memory consolidation is organized when the MTL communicate with other parts of the brain (Baars & Gage 2007: 272-273). Following Moscovitch's two phases of memory consolidation described above, the Medial Temporal Lobes retrieve episodic and semantic memory (Kirk et al 2008: 1125). Furthermore, they assimilate these memories into other parts of the neocortex (Baars & Gage 2007: 277).

Traditionally, the MTL are connected with conscious long term memory (semantic and episodic), and not with implicit memory (Hansen & Christensen 2007: 116; Sweat 2003: 8; Squire 1992). The *striatum* is connected with procedural memory, the *neocortex* with priming, the *amygdalae* with classical conditioning and *reflex pathways* with non-associative learning (Sweat 2003: 8). Though, based on solid evidence we are of the opinion that the MTL are also included in implicit long term memory (Henke 2010; Baars & gage 2007: 278; Degonda 2005; Beauregard et al. 1998; Koenig et al. 2008).

<sup>&</sup>lt;sup>10</sup> These are known to control anger, intensity of reward (Walter et al 2005: 371) etc.

## 2.3 Chapter Overview

As we have seen, human memory can be divided into three main classes: sensory memory, short term memory and long term memory. We divided sensory memory into iconic, echoic, olfactory, gustatory and haptic memory. In addition, we introduced short term memory and working memory with its different components: the central executive, the phonological loop, the visuospatial sketchpad and the episodic buffer. We categorized long term memory into declarative (explicit) and non-declarative (implicit) memory. Declarative memory consisted of semantic and episodic memory, while non-declarative memory comprised procedural memory, priming (conceptual and perceptual), dispositions (including simple classical conditioning) and non-associative learning (habituation and sensitization). Classical conditioning included the aspects US, UCR, CS and CR. In the context of classical conditioning we also mentioned factors such as latency, spontaneous recovery and generalization. Furthermore, we shed light on the three memory processes: encoding, consolidation and retrieval. We saw that there were two types of retrieval: recall and recognition. There were two types of recall: strategic retrieval (conscious) and spontaneous retrieval (unconscious). We also divided recognition into two subtypes: conscious and unconscious. In the context of short term and long term memory we also mentioned the brain basis for these two memory types. As for short term memory, we found that the Prefrontal Cortex played a key role in temporarily storing information. In the case of long term memory the Medial Temporal Lobes were highly involved. The functions of the Medial Temporal Lobes were to consolidate and retrieve information.

## **Chapter 3**

## 3.0 The Field of Memory from the Perspective of Marketing

As mentioned earlier, there has not been much focus on the significant area of memory within marketing. However, there are still theories and models within marketing that investigate brand memory. Though, according to our research Aaker's theory of brand equity is the theory that deals with brand memory the best. Thus, in this thesis we will include this theory in order to have the best possible point of departure when discussing brand memory in marketing.

#### Brand Memory and the Concept of Brand Equity: Why Brand Equity is Brand Memory

But what is *brand equity*? The term is a combination of two words *brand* and *equity*. According to the American Marketing Association (AMA), a brand is defined as "a name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors"(Kotler & Keller 2006: 274). Equity is a term borrowed from accounting and means value. Thus, the term brand equity refers to the value that a brand name adds to a product.

However, there are several definitions of brand equity; something that has stirred confusion among marketing scholars. Though, in our case the most important issue is neither to demonstrate, nor to discuss which definition is the right one or the best one. Our objective is to show that all the definitions are, in their own ways, centred on the concept of *brand memory*. This is highlighted in italics below, where some of the most commonly used definitions of brand equity are enlisted. For more definitions see Franzen et al. 1998: 184.

"Brand equity is the set of brand *assets and liabilities linked to the brand*, its name, and symbol, that adds or subtracts values to a product or service for a firm/or its customers" (Aaker 1991: 15)

"The differential effect that *brand knowledge* has on consumer response to marketing-activity" (Kevin Lane Keller) (Franzen et al.1998: 184)

"Brand equity is everything the customer walks into the store with" (Peter Farquhar) (ibid)

"Brand equity is the *set of associations* that permits the brand to earn greater volume than it would without the brand name" (Marketing Science Institute) (ibid)

"A *set of associations* which are most strongly linked to a brand name" (Andrea Dunham) (ibid "The perceived value customers *associate* with a particular brand name and its logo or symbol" (Mullins et al. 2008: 432)

After having looked at the definitions of brand equity it is safe to say that the term *brand equity* can be understood as the collective cognitive network or web of associations of a brand represented in memory. This is because the added value is based on associations in the consumer's long term memory. This is supported by Plassmann et al. who state: "The collection of brand memories can be described as what marketing researchers have labelled 'brand equity' – the asset created by good marketing" (Plassmann et al. 2007 (A): 3). The fact that memory is the core of brand equity is supported by Pitta & Katsanis (1995) as well: "The underlying basis of brand equity is consumer memory (...) Brand equity represents a condition in which the consumer is familiar with the brand and recalls some favourable, strong, and unique brand associations" (Pitta & Katsanis 1995: 52). Last but not least, brand equity is a mental construct because there are always associations attached to a brand itself. This is supported by Aaker who defines a *brand* as a *mental box* in the consumers' minds where all information and associations regarding a brand X is filed and labelled X (Aaker 1996: 10).

As seen, Aaker's theory of brand equity explains that brand equity is "the set of brand *assets and liabilities linked to the brand*, its name, and symbol, that adds or subtracts values to a product or service for a firm/or its customers" (Aaker 1991: 15). More precisely, according to Aaker brand equity consists of 5 categories of assets and liabilities. These are linked to a brand, its name and

symbol and add to or subtract from the value provided by a product or service to a firm, to that firm's customers or both (Aaker 1996:7-9; Keller 2008: 670).

The 5 categories are:

Brand loyalty, brand awareness, perceived quality, Brand associations and finally other proprietary brand assets (Aaker 1991: 17).



Figure 3.1: The Five Components of Aaker's Brand Equity Model

The figure shows the 5 components and how they create value to brand, customer and the company.

(Source: Aaker 1991)

## **3.1 Brand Loyalty**

According to Aaker, brand loyalty is a measure of a consumer's attachment to a brand. It tells us how likely the buyer of a brand is to switch the brand with another, especially after a change in for example price or product features (Aaker 1991: 39). According to Aaker, brand loyalty is the core of a brand's equity (ibid). A brand's equity will be little if the consumer buys the brand because of its price and convenience and not because of the brand's name (the consumer has a low brand loyalty) (ibid). In contrast, if a consumer buys the brand because of its name, even though other producers have developed a better product, the brand enjoys high loyalty and thus equity (ibid). High brand loyalty means low vulnerability in competitive environments, which makes it an important indicator of future sales and profits (ibid). There are different levels of brand loyalty. This can be seen on the *loyalty pyramid* below (ibid: 39-40). Note that one should not assume that these five levels always appear in their pure forms. A consumer could be a combination of two or more different levels.



Figure 3.2: The Loyalty Pyramid

(Source: Aaker 1991: 39-40)

From the bottom, the *first level* is the disloyal consumer with an indifferent attitude towards the brand (ibid: 39-40). Hence, the brand name is not important in his decision making process but other variables such as price, are.

The *second level* of the pyramid is reserved for habitual buyers. That is, consumers, who are satisfied or at least not dissatisfied with the product or brand. The level of dissatisfaction is not enough for these consumers to stimulate a switch of brand (ibid: 40).

The *third level* consists of satisfied consumers. However, these consumers see a risk in switching the brand with another (switching costs) (ibid).

*Fourth level* consumers are those who like the brand. The reasons for their preference can be many, e.g. use experiences etc. These consumers have a long-time emotional relationship with the brand and are therefore called friends of the brand (ibid: 40-41).

*The fifth* level of the pyramid is the committed buyers. They are proud of using and discovering the brand. The brand plays an important role for these consumers either because of its function or because it defines who the consumers are as individuals (social role). Such consumers could recommend the brand to other potential consumers (word-of-mouth) and thereby create brand equity (ibid: 41).

#### How to Measure Brand Loyalty

Brand loyalty can be measured in a number of ways.

By measuring the buying behaviour of the consumer (Aaker 1991: 43-44).

By measuring the consumer's switching costs (ibid).

By measuring consumer satisfaction (ibid: 45).

Finally, it can be measured by looking at their commitment to the brand (ibid: 46).

## **3.2 Brand Awareness**

*Brand awareness* indicates how strongly the brand is consolidated in the mind of its consumers. It is the consumer's ability to recognize or recall that a certain brand belongs to a certain product category. In this context, we are talking about a linkage between the brand and the product class (Aaker 1991: 61). There are three different levels of brand awareness. This is demonstrated by the *awareness pyramid* below (Aaker 1991: 62; Aaker 1996: 10).



Figure 3.3: The Awareness Pyramid

(Source: Aaker 1991: 62)

The minimal level of brand awareness is called *recognition*. It is based upon aided recall tests, in which respondents are given a number of brand names from a certain product class and asked whether they have heard of the brands before (Aaker 1991: 62). There needs to be a link between the brand and its product class and it does not have to be strong (Aaker 1996: 10). According to

Aaker, recognition does not include remembering where the brand was seen, why it is different from other brands, or much knowledge of the brand's product class. It is just a memory of the fact that the consumer was exposed to the brand before (ibid). According to Aaker, recognition is especially important for consumers' choice of the brand at the point of purchase, as recognition can result in positive feelings towards the brand (Aaker 1991: 62; Aaker 1996: 10).

The next level of brand awareness is *brand recall* which is based upon asking a respondent whether he can name the brand in a product class. This method is called unaided recall because the respondent is not helped by having the names provided (Aaker 1991: 62). Thus, unaided recall is a more difficult memory task than the aided recall task and requires stronger brand position in the consumer's mind (ibid). Compared to when a brand is recognised, recollection of a brand indicates that product class is present in the consumer's memory. This can have great influence on which brand is considered (Aaker 1996: 11).

The last level of brand awareness in the awareness pyramid is called *top-of-mind* and refers to the first brand name that comes into a consumer's mind in an unaided recall test. This brand is said to have obtained top-of-mind awareness or position (Aaker 1991: 62).

#### How is Awareness Achieved, Maintained and Improved

According to Aaker, awareness is achieved in a number of ways. It is important that the brand name is linked to the product class (Aaker 1991: 72). Aaker suggests a number of ways in which awareness can be maintained and improved: by being different and memorable, involve a slogan or jingle, considering symbol exposure, publicity, brand extensions, using cues, and finally considering the relationship between recall and repetition (ibid: 72-76).

When it comes to *differentiation and memorability* it is important that a message of a brand is noticed and is memorable. This can be achieved in different ways, for instance by making the brand unusual and different. This is important in a saturated market, in which many brands have similar communication approaches (e.g. automobile and perfume advertisements (ibid: 72)).

Moreover, it is important to notice that the link between the brand and the product class must be transparent.

*Slogans and jingles* are also important in brand awareness. They can help the consumers to recall the brand. However, they must be relevant and have strong links to the product class (ibid: 72-73).

A brand's *symbol* is another powerful tool in creating and maintaining awareness, as it can be creative and involve a visual image. Therefore, it is much easier to learn and thus recall and recognize than a word or word phrase (ibid: 73).

*Publicity* is another factor that should be considered. Advertising can have a major impact on brand awareness. Similarly, newsworthy events and issues are a significant way to create brand awareness (e.g. the Goodyear blimp (ibid: 74)).

*Event sponsorships* are also important tools in the creation of brand awareness (ibid: 75). For instance, Mercedes Benz has sponsored tennis tournaments, in which the Mercedes logo was seen by millions of people worldwide. The same is true for Heineken, the sponsor for the European Champions League football tournament.

*Brand extension* is another key factor to consider when trying to gain brand recall and thus make the brand name more salient.

Considering *cues* of a brand or product class could also be beneficial for brand awareness. For instance, packaging can be used as a cue to a brand. A famous person can also cue a brand (ibid: 75-76) (e.g. George Clooney and Martini).

A final factor Aaker mentions is the relationship between *recall* and *repetition*. According to him, recall is much more difficult to generate than recognition. The reason for this is that the brand's name must be made more salient and the link from the brand to the product class must be much stronger. Aaker states that recall is difficult to maintain, because compared to recognition recall cannot persist based on only a number of exposures; recall decays with time. In addition, he states that the reason recall is so difficult to achieve is that it requires an extensive learning

experience or many repetitions. Top-of-mind recall is even more difficult to accomplish (ibid: 76). According to Aaker, achieving top-of-mind awareness does not only create awareness but also brand salience. Top-of-mind brands inhibit the recall of other brands (ibid). This is because the memories of these brands are much stronger in the mind of the consumer compared to those of the rival brands.

## **3.3 Perceived Quality**

According to Aaker, *perceived quality* is "the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives" (Aaker 1991: 85). Simply put, it is a brand's perceived overall quality compared to alternative brands. According to Aaker, perceived quality is an overall feeling about the brand (ibid: 86).

## Signals of High Quality: The Context of Perceived and Actual Quality

It is significant that actual quality is also translated into perceived quality (the consumer's subjective assessment of quality). Perceived quality is not only a factor created in the mind of the consumer. It is also a variable the company behind the brand can create and manage (Aaker 1991: 101).

### How Perceived Quality is Formed in the Mind of the Consumer

Dependent on the product type, a consumer's perceived quality of a brand is a result of different product and service dimensions (Aaker 1991: 90). In this context, the overall perceived quality of a brand depends on the brand's product features, also called *intrinsic cues*, and other brand associations, also called *extrinsic cues*, such as a brand's name (for instance an elegant name), price (mostly, high prices are connoted with superior quality) and amount of advertising for the brand (Aaker 1991: 99). For instance, for a car these are reliability, performance, design and

warranty. A long warranty indicates that the firm trusts its product (ibid). This affects the consumers' perceived quality of the product positively. Hence, it is wise to investigate product and service dimensions:

Product quality characteristics comprise the following areas (ibid):

*Performance* refers to the *primary* elements of a product. For instance, how well does your vacuum cleaner clean your living room?

*Features* refer to the *secondary* elements of the product. This could for example be whether your plasma TV-set includes the newest technologies such as USB port.

*Conformance with specifications* refers to the absence of defects; that is, whether a product lives up to your expectations.

*Reliability* refers to a product's performance in terms of stability or the acceptability of the product's performance from one purchase to the next.

*Durability* corresponds to the life of a product. For instance, a car like VW has a longer life-time than an Alfa Romeo.

Serviceability is a company's ability to service its customers.

*Fit and finish* refers to the "appearance or feel of the quality" (Aaker & McLoughlin 2010: 166). According to Aaker, different visible dimensions are important in the case of different products' perceived quality (Aaker 1991: 97-98). For instance, the *size* (power) of stereo speakers, the thickness of tomato juice (quality in the case of tomato juice), the freshness of products in supermarkets (a good indicator of quality) etc. (ibid).

Several of the service characteristics resemble those of the products' characteristics. *Service quality characteristics* comprise the following areas (ibid: 93-94):

*Tangibles* is the service counterpart of *fit and finish* in product quality, as both act as signals of the company's competence. For instance, the appearance of a waiting room, the scrubs of doctors and nurses or live Italian music in an Italian restaurant are good examples.

*Reliability* indicates stable and reliable service. Service will always be dependent on factors such as people involved, the consumer and even the day or time of the day. This is why services are more difficult to standardise than products. Successful standardised operating systems are for instance those of McDonald's or Starbucks.

*Competence* is almost similar to the *performance* dimension of product quality, as it is about the delivery of primary functions sought by the company's customer. For instance, how professionally your plumber fixes your kitchen sink.

Responsiveness tells us how responsive a company is when interacting with its customers.

*Empathy* indicates whether the company treats its customers with respect and whether it really cares about them.

In sum, in the context of service quality the most significant indicator of quality is the overall competence of the service provider (ibid: 97). However, judging the competence regarding service brands is more difficult than judging a product brand due to its intangible nature (Elliot & Percy 2007: 206). Therefore, it is natural that the consumer relies on physical or observable dimensions of the service brand. For instance, when visiting a dentist or physician the decoration of the waiting room, the scrubs etc. could be some of the decisive factors or indicators of the personnel's competence, professionalism and consequently general service quality (Cornellissen 2004: 211; Rose et al. 2004).

## **3.4 Brand Associations**

According to Aaker, a *brand association* is anything linked in a consumer's memory to a brand (Aaker 1991: 109). For instance, the Austrian chocolate Milka could be linked to anything connected to the brand in our memory (Austria, mountains, ski resorts, snow, milk, yodelling and

holidays). According to Aaker, associations have different levels of strength (ibid). The strength of a link depends on the amount of experiences or exposures to the brand. In addition, the link is stronger if supported by a network of other links (ibid). Thus, if the link between Milka and Austria were only based on advertisements you had seen, it would be much weaker than if the link was represented in a complex cognitive network involving holidays in the Austrian Alpines, where you had enjoyed Milka with your friends or family. In this context, Aaker mentions *the anchor metaphor* (see illustration 3.1 below). It tells us that the brand is the anchor and the associations are the boats linked to the anchor via chains (links in memory) whose thickness represents the strength of the links in memory (ibid: 63-64). It is important to note that when a company is selling a branded good to a consumer it is not merely selling a physical object but everything that is attached to the product brand. That is, the brand should be seen as a whole. The idea of seeing a concept as a whole is also known as *Gestalt* (Aaker 1996: 93).



Courtesy of Jennifer Aaker.

<u>Illustration 3.1:</u> The Anchor Metaphor

(Source: Aaker 1996: 74)

### Classification of Association Types

Theoretically, innumerable associations can be attached to a brand. However, the interesting thing for any brand manager to know is not the number of associations but rather the nature of them (Pitta & Katsanis 1995: 55). The types of associations of interest are primarily those that may directly or indirectly have consequences for the consumer's purchase decision (Aaker 1991: 113). Another interesting thing is whether the associations have strong links to the brand and are shared by many consumers (ibid). These factors have an enormous effect on the final result of any brand management process.

There are many types of brand associations. Below, some of the most important are enlisted:

*Product attributes* are associations attached to a specific product. For instance, absorbency of a paper towel brand (Aaker 1991: 115).

*Intangibles* such as perceived quality, technological leadership etc. can be more effective than specific tangible product attributes (Aaker 1991: 116). Specific product attributes, such as for instance a fast processor of a computer, can be vulnerable to innovation and is not necessarily protected against competition (ibid). More specifically, such specific attributes may not be unique and may thus be shared by rivals (ibid).

*Customer benefits* are divided in two types: *rational* and *psychological* (ibid). The former is connected with a product attribute and is typically part of a rational decision making process (ibid). For instance, what product benefits do you think of when the Colgate-brand comes to your mind? Is it the amount of fluoride, its whitening function or some other benefits? In contrast, the latter relates to the consumer's feelings in connection with the purchase and use of the brand (ibid: 118-119). For instance, Kit-Kat is not just a chocolate bar, but also your well-deserved reward when you are having a break. In the case of Colgate, one psychological benefit is an attractive smile.

*Relative price* can be divided in different price categories (ibid: 120): For example *premium price, super-premium price, store brand* or *economy*. It is inextricably intertwined with perceived quality and product image. For instance, product brands that belong to the premium price category are intended to be perceived as high-quality product brands, justifying the price. Furthermore, *economy* price includes product brands with a substantially lower price. At the lowest end of the price hierarchy is the *store brand*.

*Use or application* refers to when a brand is associated with a certain application (Aaker 1991: 122). For instance, Nokia has associated calling with "connecting people", Risifrutti is positioned as milk rice to be "enjoyed between meals" and Kim's Chips is snack that you can enjoy if "you are hungry for fun".

*User or customer* refers to when a brand is associated with a certain type of product user within the brand's target segment (ibid: 123).

*Celebrity or person* refers to when celebrity endorsement is used in branding strategies (McCracken 2005). This is an effective method, since the consumer often has strong associations of celebrities, which can then be transferred to the brand (Aaker 1991: 124; McCracken 2005). Examples are George Clooney in Martini commercials and Michael Jordan in Nike Air commercials. Celebrity endorsement also enhances the credibility and likeability of the brand (McCracken 2005).

*Lifestyle or personality* can also be associated with brand (Aaker 1991: 126). The question is: How is the brand perceived by the target group? Is it seen as classic, traditional or innovative? For instance, Coca Cola is perceived as hip, cool, innovative and exciting. Hence, the Coca Cola Company has used famous pop stars such as Britney Spears in its advertising campaigns. In addition, Coca Cola's arch rival Pepsi, of which its consumers also have the same image, used Michael Jackson. Furthermore, Kohberg used Cosmetics guru Ole Henriksen in its commercials. He is perceived among consumers as a person with a healthy lifestyle.

*Product Class* can also be associated with a brand (ibid: 126-127). For instance, Senseo Coffee is positioned with respect to, not only regular coffee, but also other types of instant coffee.

*Competitors* can, either implicitly or explicitly, be used as positioning reference (ibid). This is true in for instance the case of detergents, batteries (Duracell) and online calling companies. For instance, VoIP Buster explicitly attacks Skype by referring to price difference.

*Country or geographic area of the brand* can also be highly effective in branding strategies. For instance, Switzerland is connected with chocolate. Hence, Toblerone has used the Swiss national image in the branding of its chocolate. Arla has used the Danish national image in its branding of dairy products. In the minds of the consumers, a country is a strong symbol and thus connected with different product categories, capabilities etc. (Aaker 1991: 128; Djursaa, Kragh & Holm1991; Hinton 2000; Jaffe & Nebenzahl 2001; Papadopoulos & Heslop 2002; Usunier 2000).

#### How to Measure Brand Associations

Brand associations can be measured in a number of ways. One way to find out what the brand means to the consumer is to *directly* ask him. Direct questions can take place individually or in focus groups (Aaker 1991: 136). Though, brand associations can also be measured *indirectly* (ibid)<sup>11</sup>. The benefits of this method are that respondents will reveal associations that they sometimes find hard to express. Furthermore, respondents do not always know why they prefer a brand. They may not be *consciously aware* of the reasons (as a result of feelings, attitudes, motivation and thoughts) (ibid). In addition, the stimuli in the tests are ambiguous, so that freedom to express experiences, feelings etc. is achieved (ibid).

<sup>&</sup>lt;sup>11</sup> Aaker describes these indirect approaches as *projective methods* because they enable the respondent "to project himself into a context which bypasses the inhibitions and limitations of more-direct questioning" (Aaker 1991: 136). In these projective tests the goal of the research is disguised, so the focus is not on the brand but on for instance the brand user, brand experience etc.

## **3.5 Other Proprietary Brand Assets**

The fifth element of Aaker's brand equity is a "waste basket" category that contains many different factors such as distribution channels, patents, trademarks etc.<sup>12</sup>. All these factors are interconnected with the other four elements of brand equity (Aaker 1991: 21). However, due to the limited amount of space this last element of brand equity will not be discussed in further detail in this thesis.

## **3.6 Chapter Overview**

As we saw in this chapter, brand equity had many definitions. In our case brand equity could be understood as the total sum of associations of a brand. Aaker's brand equity model comprised five categories: Brand loyalty, brand awareness, perceived quality, brand associations and other proprietary assets.

Brand loyalty referred to a consumer's attachment to a brand. Aaker's loyalty pyramid comprised five different levels: the switcher, the satisfied buyer, the satisfied buyer with switching costs, the friend of the brand and, finally, the committed buyer. We also described how brand loyalty could be measured.

Brand awareness was a consumer's ability to recognise or recall a brand and its link to a specific product category. There were three levels of brand awareness in the awareness pyramid: brand recognition, brand recall and top-of-mind. Brand recognition was the minimal level of brand awareness. We also saw how brand awareness was achieved, maintained and improved by using different marketing techniques such as: slogans, jingles, publicity, event sponsorships etc.

Perceived quality was a consumer's perception of the quality or superiority of a product or service brand compared to alternatives. It was a result of different product or service dimensions: performance, features, conformance with specifications, reliability durability, serviceability and,

<sup>&</sup>lt;sup>12</sup> Patents and trademarks can protect the brand and its brand equity from competitors (though not in extreme cases).

finally, fit and finish. Service quality dimensions were: tangibles, reliability, competence, responsiveness and empathy.

Finally, brand associations were anything linked to a brand in memory. Aaker described the relationship of a brand and the associations attached to it with the help of the anchor metaphor. Brand associations were classified according to several factors: product attributes, intangibles, customer benefits, relative price, use or application, user or customer, celebrity or person, lifestyle or personality, product class, competitors and, finally, country or geographic area of the brand.

## **Chapter 4**

# 4.0 A Comparative Analysis of the Theory of Brand Equity and Cognitive Neuroscientific Memory Theory

In this section of the thesis we will compare Aaker's theory of brand equity with cognitive neuroscientific memory theory. More precisely, we will focus on the non-declarative aspects of brand memory, an area of brand memory that Aaker's brand equity theory has not explained in a sufficiently detailed manner or even left out.

But what is it exactly that Aaker has failed to illuminate when it comes to brand memory? We will investigate and discuss this in detail in the following sections.

## 4.1 Associations

As described in the theory section, brand associations are: "anything linked in memory to a brand" (Aaker 1991: 109). In the context of associations, more precisely when measuring brand associations (retrieval), Aaker has both considered the declarative and non-declarative aspects (Aaker 1991: 136). However, it is clear that the unconscious aspect of brand associations is generally not sufficiently elaborated on. This is unfortunate because the non-conscious factor is an important variable to consider in brand associations. We will clearly demonstrate this by looking into experimental work on framing, priming and classical conditioning.

### Framing

To illustrate the unconscious nature of brand associations in long term memory we will start by including examples of *framing*. As we saw in the theory section framing experiments give us useful indications of the nature and power of the unconscious associations linked to a product brand in consumers' long term memory and demonstrate how unaware consumers are of framing effects. This was demonstrated by the Fairtrade Banana example in the theory section. The fact

that consumers are generally unaware of framing effects is supported by Fitzsimons et al. who state: "(...) people are not consciously aware of influence that mere perceptual fluency and the misattribution of familiarity can have on their attitudes, confidence, perception of the truth and forecasts" (Fitzsimons et al. 2002: 274).

An example of the power of unconscious brand associations via framing is also demonstrated by the Coca Cola / Pepsi Cola experiment undertaken by McClure et al. using fMRI (functional Magnetic Resonance Imaging) (McClure et al. 2004). In this experiment the authors demonstrated that half of the participants in the experiment chose Pepsi Cola instead of Cola Coca in a blind tasting experiment. However, when the researchers gave the test persons a choice in the brand-cued experiment the majority of them (approximately 75%) preferred Coca Cola despite the fact that they previously pointed out that Pepsi had a better taste (Walvis 2008: 180). What we can extract from this experiment is that Coca Cola was chosen, not because of its taste, but because of the respondents' associations of the brand Coca Cola stored in their long term memory systems (ibid).



**Bilateral Hippocampus** 

DLPFC

Illustration 4.1: *McClure's fMRI* 

Horizontal (dividing top or superior part from the bottom or inferior) and coronal cuts of the brain showing bilateral hippocampal activation and a coronal cut of the brain showing activation in the dlPFC.

(Source: McClure et al. 2004)

The results of the experiment are also in accordance with cognitive neuroscientific evidence regarding long term memory retrieval and storage. McClure et al. showed that the strong cortical activity in the Dorsolateral Prefrontal Cortex (dlPFC) and the Bilateral Hippocampus (illustration 4.1), which are the areas of higher cognitive processing and where memory processing also takes place, was absent during the blind test (ibid). During the blind test it seems that the existence of precognitive factors such as sensory stimuli play a big role in perception in the absence of higher level cognitive activity; in this case long term memory. More precisely, in the absence of brandrelated information, the fMRI showed BOLD (Blood-Oxygen-Level-Dependent) signal in the Ventromedial Prefrontal Cortex (vmPFC) which is implicated in basic appetitive aspects of reward (McClure et al. 2004:384) (Appetitive means an instinctive physical desire for food or drink). In the case of the blind test the activation of the gustatory and olfactory sensory systems seems to have played a decisive role. The reason why the test subjects chose Pepsi Cola over Coca Cola can be many. However, the reason why Coca Cola was chosen in the brand-cued test was because of long term memory activation (manifested in Hippocampal activation) by working memory (manifested in dIPFC activation). This is supported by Walvis who states: "McClure and colleagues gave respondents no information about the Coke and Pepsi brands before or during the experiment. This means that their differing brain responses must have been entirely the result of information stored in their long term memory evoked at the moment of decision making" (Walvis 2008: 180). We think that McClure's experiment demonstrates the power of unconscious brand associations in consumer behaviour. Now, what is important to notice about McClure's experiment is that it tells us that, when seeing the Coca Cola logo brand associations stored in long term memory are activated unconsciously. This is supported by the fact that when the Coca Cola logo was seen by the participants, not only did they recognise the logo; the exposure to it was also connected with an expectation of better taste, even though Pepsi was reported to have tasted better in the blind test. Thus, McClure et al. have clearly demonstrated that brand associations stored in long term memory can be more decisive in consumer choice than taste (ibid).

The mere fact that the test persons' perception of taste is totally unconscious and a direct result of brand-cued information for Coca Cola is interesting to notice. In the same experiment it was demonstrated that Coca Cola from a cup bearing the Coca Cola brand logo was rated higher when consumed in contrast to when it was consumed from an unmarked cup. In contrast, participants did not prefer Pepsi from a branded cup more than from an unbranded cup (McClure et al. 2004: 384). Thus, McClure et al.'s second experiment showed that Coca Cola had much stronger brand associations. Correspondingly, the framing effect was much stronger in the case of Coca Cola than in the case of Pepsi Cola.

#### Priming

Think back on your purchase of DAN ÆG in the introduction chapter of the thesis. The colours red and white used in the brand name primed associations about Denmark, since the Danish flag, Dannebrog, includes both of the colours. In addition, Dannebrog itself was also depicted on the package as a national symbol of Denmark. Since you have a very positive set of associations about Denmark including Danish dairy products, the prime "Dannebrog" triggered relevant positive associations. These associations were embedded in your long term memory system, which we think were retrieved from your neocortex automatically; that is outside of your awareness.

Also, think back on your visit to Starbucks and you ordering the delicious Guatemalan Antigua coffee. What happened back there in the coffee shop was that when you and your friend entered, your attention was immediately caught by the characteristic aroma of fresh Guatemalan Antigua in the atmosphere. The aroma acted as a prime by triggering memories of your trip to Guatemala stored in your long term memory system. Thus, your purchase of the Guatemalan Antigua was a result of a complex chain reaction starting with the triggering of the memory by the smell and ultimately ending with you ordering Guatemalan Antigua. All this took place outside of your awareness.

Priming experiments can help us understand the unconscious nature of brand associations stored in consumers' long term memory. External stimuli, channelled through for instance advertisements, affect the consumers' perception of a brand. For instance, Toblerone uses different components of the Swiss national image to strengthen its own associative network. More specifically, the company uses the name of the country of origin "Switzerland", the mountain of Matterhorn (from which the structure of the package is also inspired). Finally, the package depicts a (hidden) bear, which is the cantonal symbol of Bern, the province or "canton" in which Toblerone was invented. From the perspective of cognitive neuroscience, the mentioned pictorial and textual information functions as cues that prime positive associations consolidated in the long term memory of the consumer. Following the priming of these positive associations, they are linked with the brand Toblerone by the consumer.



<u>Illustration 4.2:</u> *Toblerone* 

Toblerone relies heavily on the Swiss national image in order to strengthen its brand associations.

(Source: kraftcanada 2010)

In another priming experiment, North et al. showed how priming can illuminate the unconscious nature of brand associations. In a super market, in which wine was sold, the authors played equally pleasant music associated with either highly stereotypical French or German cultural associations. They then measured how much French and German wine was sold. What they found was that on the days when music associated with strong stereotypical French associations was played more French wine was sold than German wine, and vice versa (North et al. 1997; North et al. 1999). The reason for this was that the music as a prime cued associations regarding the country of origin. This is in accordance with Brewer et al.: "the notion of priming is built on the assumption that a stimulus can activate previously learned cognitive structures thereby influencing the judgment process" (Brewer et al 2003: 494; see also theory section). In connection with North et al.'s wine experiment, previously learned cognitive structures refer to associations in long term memory of Germany and France and, consequently, the wine brands. That is, priming is only possible through the activation of brand related associations in memory. Music improves the *accessibility* of the country associations and thus the brand traces of these in long term memory. Thus, music as prime eases retrieval of relevant brand-related information. According to the authors, this priming effect of the music was so strong that a quarter of the variance in wine sales was a direct effect of the music related to the country of origin (ibid). This experiment thus demonstrates the nature of priming; more precisely, the unconscious associations of the countries of origin and their influence on consumer behaviour.

However, we can witness the priming of brand associations in different ways. Like auditory primes (music) can function as cues for certain associations, so can olfactory (odours), visual, haptic (touch) and gustatory (taste) cues.

Marketing professionals have already spotted the opportunities of the priming effect of odours in brand associations. Starbucks is a good example. The coffee chain buys green coffee beans with the purpose of processing them themselves. The chain grinds the beans in its stores so that the odour of fresh coffee beans is enjoyed by its customers. Hence, the chain uses this technique to cue relevant associations of freshness, quality, and authenticity in the minds of its customers. However, that is just one of the techniques that Starbucks uses.

The chain also makes sure that the right kind of ambient music is played and that comfortable interior design, exhibition of coffee beans etc.(visual cues) are integrated parts of every Starbucks shop.

By exhibiting coffee beans, the customers of Starbucks can touch the coffee beans in different stages of the roasting process. Last but not least, the coffee chain also gives away coffee samples. A coffee sample, when tasted, can prime associations such as freshness, quality etc.

In general, Starbucks makes sure that the overall atmosphere of the shop is connected with relaxation, spare time and having fun with friends and family. Howard Schultz, the founder of the chain, calls this environment the *third place* and it seems that his strategy is, indeed, effective. Physical location or place, for instance a Starbucks shop and everything in it, can function as primes and hence cue for relevant associations and have great influence on consumer behaviour. In this connection, Fitzsimons et al. have found that environments can activate goals and motives associated with them in the past. These goals and motives can then facilitate and guide information processing and behaviour outside our consciousness (Fitzsimons et al. 2002: 271). The significance of environment as a cue is also supported by Siegel's work in connection with drug addiction (Siegel 1995). He found that the best way for drug abusers to continue abstinence after a rehabilitation program is physical relocation. This is because relocation removes all environmental cues associated with previous drug use (ibid). Although this example illustrates the removal of negative cues (as opposed to the Starbucks example, which makes use of positive cues in the environment), it shows the significance of the environment per se as a cue.

#### Classical Conditioning

Let us view your choice of "Lambi" kitchen tissues in retrospect. After having described the mechanisms of classical conditioning your choice of "Lambi" makes perfect sense from a cognitive neuroscientific perspective. The lamb functioned as an Unconditioned Stimulus (US) whose positive associations (the Unconditioned Response UCR) you unconsciously transferred onto the brand "Lambi" (Neutral Simulus) and connected it with the same associations as the

concept of "lamb". The response to the brand "Lambi" thus became a Conditioned Response (CR). Thus, your choice of "Lambi" over other kitchen tissues was an example of the use of Pavlovian Conditioning in a marketing context. We perceive "soft" kitchen tissues as being of high quality. That is why the company behind the brand has used a cute, white and furry lamb (US). The white colour is perceived as "clean" and furry as "soft". Cuteness just adds to the positive associations in general.

As we saw in the theory section and the example above, classical conditioning is a form of unconscious associative learning that has great influence on our behaviour (see theory). Thus, as we are investigating brand associations in this section, it is unavoidable to mention the connection between classical conditioning and brand related associations. In brand management and consumer behaviour, classical conditioning can be identified in several contexts. As McSweeney and Bierley put it: "The products of fast food chains are often marketed by associating their names with the sight and sound of a sizzling hamburger, soft drinks are associated with catchy jingles, breakfast cereals are associated with famous sports personalities, and so on. Super markets play music for their customers while they shop (...). All of this is done in the hope of altering consumer behaviour" (McSweeney & Bierley 1984: 2). The activation of senses and the amygdala by different stimuli in connection with classical conditioning can be observed below.


### <u>Illustration 4.3</u>: Sensory Stimulation

This illustration shows how different sensory stimuli are processed via the amygdalae in classical conditioning.

(Source: Franzen & Bouwman 2001: 24)

Classical conditioning can be observed in connection with a vast number of marketing actions. According to Lybarger, the marketing actions in which classical conditioning is used, can be categorised according to two groups: advertisements and sales promotions (Lybarger 1999). The application of classical conditioning in advertising is not new. In fact, the famous psychologist John Watson, who had researched in classical conditioning for many years, was the first one to see the opportunities of applying classical conditioning in advertising. Watson became famous for his groundbreaking ideas on the American advertising arena in the 1930s (Van Cleave 2008). Furthermore, Gorn's experiments, although controversial, likewise showed that there was a connection between advertising, classical conditioning and consumer behaviour (For more on Gorn, see Foxall 2002: 115). Since then, several scholars have studied classical conditioning in a marketing context (Till & Priluck 2001).

The mechanisms and application of classical conditioning have been investigated in many studies (Till 1998) in connection with advertisements in TV, radio, magazines and the Internet. In most of the studies of classical conditioning in advertisements the typical case is that an advertisement shows positive elements, which are Unconditioned Stimuli (US). These positive elements automatically elicit a positive<sup>13</sup> response in the target audience (Unconditioned Response (UCR)). When the brand in the advertisement (NS: Neutral Stimulus) is paired with the US, it becomes a Conditioned Stimulus (CS). Now, the brand elicits the same positive feeling. Thus, the target group reacts in the same way to the CS as to the US. This is what we call a Conditioned Response (CR) (Lybarger 1999; Foxall 2002: 126-127; Haugtvedt et al. 2008: 110-112; Kim et al.1996: 319).

### To recap:

Positive elements in the advertisement: US (This can be anything that elicits positive feelings in the target group, for instance cute animals, attractive people, astonishing sceneries, nice music etc.) (=Meat powder in Pavlov's experiment)

Positive response elicited by the elements in the advertisement: UCR (=Salivation in Pavlov's experiment when meat powder is seen)

<sup>&</sup>lt;sup>13</sup> Positive elements are vital in this case as conditioning is generally very dependent on emotions (Lybarger 1999).

The brand (shown in the advertisement): CS (=The Bell in Pavlov's experiment, which initially was a Neutral Stimulus)

When the brand elicits the same positive feelings, the response becomes: CR (=Salivation in Pavlov's experiment when the sound of the bell is heard)

The above description is in accordance with our investigation of classical conditioning in advertisements. We have all seen advertisements depicting a famous person using a certain product brand. This category of advertisements usually depicts beautiful singers, movie stars, models or athletes talking about how satisfied they are with a certain brand. A good example of this type of advertisements is L'Oreal's "EverStrong" Shampoo advertisement depicting Evangeline Lilly (see link in the bibliography). From a classical conditioning point of view, this could be illustrated as follows:

Evangeline Lilly = US

The positive qualities of the US (beautiful, famous, role model, credible etc.) are elicited in the target audience by Evangeline, and we react (positively) to them = UCR.

The brand, which initially was a neutral stimulus (NS), is connected with the US and consequently its (positive) qualities (UCR). The brand thus becomes a Conditioned Stimulus (CS).

When "EverStrong" elicits the same (positive) associations as Evangeline Lilly the response to "EverStrong" becomes the CR. When it comes to event sponsorships (Ohme 2001: 2), the same technique is used (Lybarger 1999).

The event = US

(Positive) response to the US = UCR

A brand (NS) is seen in connection with the US. As a result, the brand (NS) becomes the Conditioned Stimulus (CS), because we connect it with the US and the UCR.

The (positive) response to the CS is now called the CR. That is, we respond in the exact same way to the brand as to the event.

For instance, Sony Play Station and Heineken are the sponsors of the European Champions League. When we watch a Champions League game (US) we are enjoying ourselves (UCR). When the brand (NS) is connected with US and the UCR, the NS becomes the CS and elicits the same (positive) response (CR), which is enjoyment.

In addition, it is not a coincidence that we can smell McDonald's fries in the area around a McDonald's restaurant – even in trains and subways. We think this is a deliberate choice by the fast food chain. After being exposed to the smell, you will automatically associate it with McDonald's fries and your experience of their taste. If that does not work, not far from the subway or train station, you will typically see a billboard depicting delicious fries that you will unconsciously associate with the experienced smell.

### Managing Classical Conditioning

Having discussed the mechanisms of classical conditioning in marketing actions (brand management) and consumer behaviour, we move on to discuss how a conditioned (liked) brand (CS) can be even more liked (valence change in positive direction)<sup>14</sup>.

#### According to Till 1998:

A person exposed to a classical conditioning procedure in which a CS and a positive US are paired in a systematic manner will develop more favourable attitudes towards the CS than subjects in a control group.

A person exposed to a classical conditioning procedure in which a CS and a positive US are paired in a systematic manner will maintain a favorable attitude towards the CS over time.

It is important to emphasize some other aspects that are important for whether successful classical conditioning can take place.

A factor marketers need to consider when using classical conditioning, in for instance advertising, is *latency*; that is the time that passes between the presentation of US and CS. This time span must not be too long, otherwise it will have consequences for the association of the US and CS with each other. If this factor is not taken seriously, *extinction* can occur.

Another important factor for marketers to consider is *generalization* (remember Little Albert). In today's competitive environment, product and service brands are very much alike. For instance, almost all automobile advertisements share great resemblance. Thus, it is difficult for the target audience to differentiate between the advertisements for the different car brands. Furthermore, in a situation in which many brands resemble each other, reconsolidation may significantly complicate the process of classical conditioning. Remember that memories are labile structures

<sup>&</sup>lt;sup>14</sup> This domain is also called *evaluative conditioning*. For more see Houwer 2007.

and thus constantly subjected to reconsolidation (see theory section). This makes the risk that different brand memories can get mixed up, significantly higher. All this has consequences for brand management. Thus, firms with similar product brands; and especially service brands due to their intangible nature, must consider differentiation in their advertisements and general communication. This will enable discrimination and avoid generalization.

However, generalization can also be positive in the sense that it can be helpful in brand retrieval (recognition and recall). An example could be if Snickers introduce a new snack on the market, say a cake (brand extension). If consumers of Snickers chocolate bar like the bar, they will generalize and assume that the cake is also delicious. Of course, if the company aims at a private-label marketing strategy, it should pursue a discrimination strategy, so that the associations connected with the old product are not transferred onto the new one.

# **4.2 Perceived Quality**

Perceived quality is, as mentioned, "the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to alternatives" (Aaker 1991: 85). For instance, Domino's Pizza enjoys high perceived quality due to its product dimension, which is high quality pizzas made of fresh produce. Domino's service dimensions are pizzas made in a clean and professional environment with strict hygiene codes and guaranteed fast delivery. In fact, if the delivery takes more than 30 minutes you will get your pizza for free. When it comes to perceived quality, Aaker has not at all considered the non-declarative aspects. Much research has shown that, very often, non-conscious variables influence our perception of quality (Fitzsimons 2002: 274; Dijksterhuis 2005; Ohme 2001: 1). The reason for this is that consumers are constantly influenced by external sources. In this case, Fitzsimons et al. use the term *metacognition* to describe the degree of consumers' conscious knowledge of their own thoughts. That is; source, attitudes and preferences (Fitzsimons 2002: 273). According to the authors, metacognition of consumers is low if their behaviour is controlled by external stimuli and thus processes that take place below the level of conscious awareness (ibid). In this connection, we will demonstrate that not only conditioning, but also priming and framing

experiments can illuminate the unconscious nature of a brand's perceived quality. This is in accordance with Capek 2008 who states: "Framing and priming effects operate at a predominantly subconscious, reactive level and can have a significant impact on the perceived quality (...)" (Capek 2008).

#### Framing

When it comes to exploring the unconscious aspects of perceived quality, the framing effect can be useful to study. According to Fitzsimons et al.: "perception itself can be colored by illusory correlations among product features, and perceived quality can be driven by expectations rather than performance. Indeed many framing effects reflect non-conscious influences" (Fitzsimons 2002: 274). The unconscious nature of perceived quality has been investigated in several framing experiments, such as in Plassmann et al. 2008. In their experiment Plassmann et al. show how price can influence perceived quality. More precisely, they show how increasing the price of wine increases subjective flavour pleasantness<sup>15</sup> (Plassmann et al. 2008: 1050) because unconsciously we connect expensive wine with high perceived quality (ibid). They show this relationship with the aid of fMRI, which indicates that when there is an increased level of pleasantness there is an equivalent high level of Blood-Oxygen-Level-Dependent (BOLD) activity in the medial Orbitofrontal Cortex (mOFC), which is an area thought to be involved in experienced pleasantness (ibid).

Hence, the authors show how we also in marketing actions can take advantage of knowledge about the modulation of neural correlates of experienced pleasantness and perceived quality in general (ibid).

<sup>&</sup>lt;sup>15</sup> Though researchers such as Knutson et al. suggest that several other factors than price play a significant role in purchase behaviour (Knutson et al. 2007: 153). His conclusion is based on fMRI images of the insula, mPFC (Medial Prefrontal Cortex) and NAcc (Nucleus Accumbens). For more, see Knutson et al. 2007.

Moreover, according to Olson & Dover bitter coffee is perceived as being less bitter if consumers are framed into believing that it is not so (Olson & Dover 1978 in Lee et al. 2006: 1054).

To demonstrate the unconscious nature of perceived quality in our long term memory we also refer to the Coca Cola/Pepsi Cola experiment by McClure et al (see section 4.1 on framing). The experiment did not only demonstrate the conscious and unconscious nature of brand associations, but also the conscious and unconscious nature of perceived quality. As we saw earlier, the majority of the respondents chose Coca Cola over Pepsi Cola when choosing between two identical cups, of which one was branded and the other was not. We think this indicates that perceived quality played a role in their choice. That is, they unconsciously perceived Coca Cola's quality as being superior to that of Pepsi Cola. In this context we also refer to our Fairtrade Banana example in the same section. The Fairtrade brand stands for better conditions for banana farmers and thus higher quality bananas.

#### Priming

After having looked at framing and conditioning in connection with perceived quality, we will now turn to priming. Remember when you last visited the shopping centre in chapter 1 and chose DAN ÆG over other alternatives? After having illuminated the nature of priming, it is evident that the information on the package played a pivotal role for your choice without you knowing it. In fact, the information in the form of text and image acted as primes and cued for relevant positive quality associations. The word "DAN" in the brand name "DAN ÆG" primed the country of origin, namely Denmark, and thus all the quality associations attached to it, such as agriculture. This last aspect is further supported by the picture of fresh eggs in a basket surrounded by hay. Furthermore, another prime that cued positive quality associations was the eco-brand ("Ø-mærket"). A further prime was the crown symbolizing royalty, which is very positive. All in all, unconsciously you decided to buy DAN ÆG, although they were much more expensive than the other egg brands because the brand and its different subcomponents unconsciously triggered strong, relevant and positive quality associations already consolidated in your long term memory via Hebbian Learning.

Also, remember when you stood in the Fruit & Vegetables section and had the choice between packed and unpacked Pink Lady apples, which were sprayed with cool water. Even though, the apple brands were identical, you chose the unpacked and water sprayed apples. The reason for your choice may be explained by the fact that the cool water primed freshness and thus higher quality compared to the packed Pinke Lady Apples.

The unconscious nature of perceived quality has been illuminated via priming by researchers such as Lee et al. 2006 and Allison & Uhl 1964. More precisely, Lee et al. provide evidence for how knowledge about specific ingredients in beer can unconsciously affect taste quality perception in consumers' minds (Lee et al. 2006). These results are strongly supported by Siegrist & Cousin 2009, who state that expectations influence sensory experience in wine tasting<sup>16</sup>. More precisely, they argue that when negative information was given to the participants about the wine prior to tasting it, they tended to rate it lower than if the information was given after the tasting. When they were given positive information about the wine before tasting it, the participants tended to rate the wine higher than if the positive information was given after the tasting. From a brand management point of view the usage of positive primes is an excellent idea, while using negative primes is bad idea. For instance, strawberry yogurt and cream cheese advertisements are favoured more if "full-fat" is written on the packages than if "low-fat" is written on them (Wardle & Solomons 1994 in Lee et al. 2006: 1054). In addition, people tend to consume more vanilla ice cream if it is labelled as "high fat" compared to "low fat" (Bowen et al. 1992 in Lee et al. 2006: 1054).

<sup>&</sup>lt;sup>16</sup> Robert Parker, a famous wine critic, had given the red wine used in the experiment, the Argentinean Clos de Los Siete Mendoza 2006, 92 points out of 100, which means excellent. But this information was manipulated in the experiment. More precisely, Positive information = 92 points, Negative information = 72 points (means average).

On the other hand, the words "soy protein" on a nutrition bar has a negative effect on its taste perception among its consumers compared to when the word "soy" is left out (Wansink et al. 2000 in Lee et al. 2006: 1054).

In the case of Lindt Swiss chocolate, several positive factors prime quality.



<u>Illustration 4.4:</u> Lindt Swiss Chocolate

(Source: lindt 2010)

Firstly, the fact that the brand is written in gold primes prestige, superiority of quality, reliability and luxury. Secondly, the fact that they have produced chocolate since 1845 primes authenticity and history. Thirdly, the fact that it is of Swiss origin primes superiority in quality, precision etc. Finally, the French language primes elegance. All these factors add to the perceived quality of Lindt, even if the consumer has no prior knowledge of the Lindt brand.

### Classical Conditioning

Let us jump back to the episode in the introductory case when you were standing in the Electronics Section looking for batteries for your remote control. You chose Duracell batteries without any further consideration; but why? The answer lies in classical conditioning: the sheer sight of the pink rabbit (mascot) made you automatically connect it with Duracell batteries. The rabbit thus functioned as a US with the UCR "the feeling of the rabbit being durable". This value was then transferred onto the brand Duracell, which became the CS and thus elicited the same response as the rabbit, namely "the feeling of Duracell batteries being durable". In this context it is important to notice that durability is a strong and relevant indicator of quality. It is not a coincidence that the name of the batteries is a composition of "Dura" and "cell". "Dura" implies or is short for "durability" and "cell" is associated with "battery".

Classical conditioning plays a big role in the unconscious formation of attitudes towards a brand and thus perception of a brand's quality: "Classical conditioning procedures can lead people to form attitudes toward objects without any conscious deliberation about those objects' attributes" (Eagly & Chaiken 1993: 103). As we saw earlier, classical conditioning is an unconscious phenomenon and is used frequently in all kinds of marketing communication such as advertisements and brand promotions to create, maintain and strengthen brand associations. The same is true in the case of brands' perceived quality.

Returning to the fast food industry, in its commercials McDonald's shows delicious Big Macs, succulent Chicken McNuggets and crispy fries. Coca Cola shows the irresistible sight and sound of their beverage on a warm summer's day, thereby making us thirsty. What happens is that the various stimuli in the advertisement elicit an unconditioned response, namely that of salivating. Then, when we see the McDonald's brand in connection with these stimuli, we will connect

them with each other. That is, the McDonald's brand will elicit the same primitive response in us as the stimuli. Thus, we develop a need to buy the brands<sup>17</sup>.

It is important to notice that the brand must be experienced as positive in order to create or strengthen perceived quality. In the case of negative experiences with the brand, the creation or strengthening of perceived quality will be inhibited. This is in accordance with neuroscientific research on the effect of negative memories on perception. Classical conditioning studies conducted by Olson & Fazio 2001 confirm this relationship by concluding that CS's paired with positive items (US's) were evaluated more positively than CS's paired with negative items (US's) (Olson & Fazio 2001: 413). This is also supported by other researchers such as Krosnick et al. 1991 and Field 2006.

<sup>&</sup>lt;sup>17</sup> Though, it is important to notice that there is great debate about the role of motivation and goal not only in conditioning but also in priming (Karremans et al. 2005) and other unconscious processes. For instance, will you still go and buy a Big Mac if you just had lunch?

A further example of the usage of positive US is the advertisement for Elizabeth Arden's *Provocative Woman* (see illustration 4.5 below).



Illustration 4.5: Catherine Zeta-Jones in an advertisement for Provocative Woman

(Source: Advertising Archives 2010)

The mechanisms through which classical conditioning occurs in this advertisement is as follows:

- US: Catherine Zeta-Jones
- UCR: The feelings of being provocatively sexy though elegant
- NS: The brand Provocative Woman
- CS: The brand is connected with the same associations as Catherine Zeta-Jones
- CR: The response to the brand is the same as the one to Catherine Zeta-Jones.

The use of Catherine Zeta-Jones as the US is strategically smart as she adds to the perceived quality of the brand. Not only is she beautiful and sexy, but also famous. Every feeling connected with her; that is the UCR, has an indirect spill-over effect on the brand's perceived quality in the mind of the target audience.

# **4.3 Brand Loyalty**

Due to the fact that we have provided evidence of brand associations and perceived quality being both conscious and unconscious, we are of the opinion that consumers' brand loyalty can also be conscious as well as unconscious. This is supported by Yee & Sidek who claim that: "Brand loyalty is a consumer's conscious or unconscious decision that is expressed through the intention or behaviour to repurchase a particular brand continually" (Yee & Sidek 2008: 222). Though, as mentioned in the introduction, we will only focus on the unconscious aspect; an aspect that Aaker has failed to illuminate.

#### Framing

As mentioned in the theory section, according to Aaker, brand loyalty is manifested in different ways. For instance: *commitment, liking, buying behaviour, switching costs and satisfaction*. An example that could illuminate the unconscious nature of brand loyalty can be seen from the before mentioned McClure-experiment. We think that the test persons chose Coca Cola over Pepsi Cola because of their loyalty towards the brand (among other factors). When they were given the choice the majority chose Coca Cola, although some of them preferred Pepsi Cola in the blind taste tests (anonymous test). In addition, Coca Cola was rated higher when consumed from a cup bearing the Coca Cola brand logo than when it was consumed from a cup with no Coca Cola brand (semi-anonymous test) (McClure et al. 2004). The unconscious nature of brand loyalty in this context is that the participants' knowledge of the brand Coca Cola controlled their choice. We think that McClure et al's experiment shows that at least commitment and liking are stronger for Coca Cola than for Pepsi. Additionally, the results of the semi-anonymous test can

be interpreted as showing that the Coca Cola consumers were more loyal than Pepsi Cola consumers. This is because the Coca Cola brand had a greater framing effect than Pepsi. Our reasoning follows that if Coca Cola consumers had been disloyal they would not have differentiated between the branded and unbranded cups.

The same is true for our second framing example, which again demonstrates the unconscious nature of brand loyalty. If we are loyal to the Fairtrade brand we will always choose the brand over other brands of bananas, even though the bananas are the same. This view is supported by Krosnick et al. 1992 who states that attitudes can be developed through processes other than cognitive deduction about attributes of objects (Krosnick et al. 1992: 152).

Allison & Uhl demonstrated how information about beer brands can affect the taste quality of beers. More precisely, they demonstrated that preference of the participants' favourite beer vanishes if the beer's brand is removed (Allison & Uhl 1964; Lee et al. 2006: 1054; Haugtvedt et al. 2008:198). This demonstrates the power of brand loyalty (among other factors). If the preference for the beer had not vanished their loyalty towards the brand would have been low. All this information is very valuable in the case of brand loyalty. It provides direct evidence of the fact that brands influence loyalty in an unconscious manner. The fact that Allison & Uhl could make people loyal to anything via branding and remove their preference and loyalty by removing the brand from the product, clearly indicates that there are unconscious memory mechanisms at play in brand loyalty.

In sum, brand information has great influence on subjective experience and brand loyalty. Lee et al. 2006 has gathered data from different experiments that support this fact: "Coke is rated higher when consumed from a cup bearing the brand logo rather than from an unmarked cup (McClure et al. 2004); a slice of turkey is rated higher if thought to come from a popular brand rather than an unpopular one (Makens, 1965); Perrier is preferred to Old Fashioned Seltzer when the beverages are consumed with the labels showing, but not otherwise (Nevid, 1981); preference for one's favorite beer vanishes if the labels on the beers being compared are removed (Allison & Uhl, 1964) (...)" (Lee et al. 2006: 1054). Again we think that the higher rating of the branded products mentioned has to do with unconscious commitment towards and liking of the brands.

#### Priming

Priming can also be used to influence brand loyalty. As we saw in McClure's Coca Cola experiment, brand preference (brand loyalty) can be altered when consumers are confronted with brand-related information via priming. The degree of consumers' brand loyalty is inextricably interconnected with the reward system (Stoll et al. 2008: 343). This evidence has implications for marketers as it suggests that if the consumers' reward system is activated, their loyalty towards the brand will be created or increased. In practice these findings may explain why you bought the unpacked Pink Lady apples sprayed with fresh water instead of the packed ones. We are of the opinion that the fresh water sprayed on these apples activated the appetitive aspects of the reward system by priming freshness.

In general, anything that promotes commitment and likeability can be used as primes like fresh water in the example above. For instance, many brands use logos such as "Fairtrade", "rain forest alliance" (frog symbol), "swan", organic ("Ø-mærke"), company and recycling. Furthermore, country flags, grandmas (see illustration 4.5), culturally specific characters such as Santa Claus etc. can be used. For instance, Arla uses the Danish flag on its products because the Danish flag primes quality, as Denmark is known for high quality dairy products. In addition, priming can also be used in advertisements and films (product placement). Grandma's Brand, not only, uses a positive prime (*grandma*) but it is also a prime that is closely connected with the concepts of *cookies* and *Pies* and thus relevant. However, when it comes to priming in brand loyalty, also more "direct" measures can be used such as slogans like Duracell's "trusted by everyone". In this case, the slogan directly appeals to our loyalty towards the brand Duracell.



<u>Illustration 4.5:</u> *Grandma's Cookies &Pies* (Source: stationbay 2010)

Applying the abovementioned knowledge to Aaker's loyalty pyramid, it is obvious that priming, based on both appetitive reward and associations, can create and strengthen the consumer's liking and commitment. Thus, we have proven that Aaker's loyalty pyramid also has non-declarative aspects; an important point which Aaker has neglected to mention.

### Classical Conditioning

Returning once again to the Duracell example, classical conditioning can also be used in connection with brand loyalty. Earlier, we saw how durability, represented by the rabbit, can be a quality indicator. The properties of the rabbit as a US are transferred to the brand Duracell. Thus, Duracell becomes the CS and elicits the same response as the rabbit, namely the feeling that Duracell batteries are durable. The important thing to understand here is that brand loyalty can be created and strengthened by creating a feeling of high quality among consumers. Classical conditioning can be used to maintain or strengthen brand loyalty. Brand loyalty is a conscious or an unconscious *intention* or *behaviour* and, according to Aaker, the concept is dependant on *attachment* to the brand. Thus, we have noticed that classical conditioning is also very significant in connection with brand loyalty as you can influence behaviour and attachment through it. Companies can create, maintain or strengthen brand loyalty in a number of ways using classical conditioning. Again, anything that makes a consumer more loyal towards a brand

by creating more liking, commitment and satisfaction can be used as a US in classical conditioning. For instance, "Den Gamle Fabrik" (The Old Factory) jam uses images of "the good old days" as US, McDonald's and Burger king use jingles and slogans like "I'm lovin' it" and "Have it your way", Starbucks uses Fairtrade coffee (see illustration 4.6 below) etc.



### <u>Illustration 4.6:</u> Starbucks using the image of a coffee farmer as US

Starbucks uses images of poor coffee farmers in combination with its company logo and supporting text. In this way, consumers associate the Starbucks logo with Fairtrade, which is associated with helping coffee farmers in Latin America. Sympathy with the farmers makes consumers more loyal towards Starbucks.

(Source: Geraghty 2007)

## 4.4 Brand Awareness

As we saw earlier, according to Aaker awareness is a brand's strength in the mind of its consumers. However, his description of brand awareness lacks depth. More precisely, we think that he has neglected to clearly distinguish between the three memory processes: encoding, consolidation and retrieval. In the following sections, we will conduct a systematic comparative analysis in order to illuminate the relationship between these three processes. This will help us to better understand brand awareness from consumer behaviour and brand management perspectives. Aaker has also not considered the significance of consciousness in the context of brand memory retrieval, more precisely brand recall and recognition.

### Brand Memory Encoding According to Aaker and Cognitive Neuroscience

As we have seen in the theory section, Aaker suggests a number of ways in which awareness can be achieved: by being different and memorable, involve a slogan or jingle, consider symbol exposure, publicity, brand extensions, using cues and finally the relationship between repetition and recall (ibid: 72-76). This shows that Aaker has considered how brand awareness can be achieved. From the perspective of cognitive neuroscience, what Aaker suggests is how encoding of a brand can be made more effective and thereby achieving better consolidation and retrieval. By applying our knowledge from the theory section on memory encoding, we now intend to demonstrate how sensory stimuli can unconsciously enhance our encoding of brands. Although the representation of sensory stimuli (sensory memory) is very short-lived, it nevertheless plays a vital role in a brand's encoding in the brain. This will be clearly demonstrated in this section.

Encoding of brand information can be enhanced in many different ways. For example, Morrin & Ratneshwar have demonstrated that pleasant scents can enhance encoding of brands and thereby consolidation and retrieval of brand memory (Morrin & Ratneshawar 2003). More precisely, their research has shown that using scents as cues during the process of encoding can enhance

the memory for brands (ibid)<sup>18</sup>. How much pleasant scents influence brand memory, can be seen by enhanced brand recall and recognition (ibid). These two retrieval types will be elaborated on later in this section.

Similarly, visual stimuli such as colours, shapes (brand logos), objects, faces and etc. can be used as cues in order to make encoding more effective. For instance, Coca Cola makes use of both colour and shape. The brand name Coca Cola is often written in red letters on a white background or vice versa. We think that the contrast between the two colours creates attention and consequently enhanced encoding. In addition, the brand name "Coca Cola" is written in very unique letters. The uniqueness of the letters makes the encoding of the brand name very easy, compared to if the name was written in "normal" letters. McDonald's has used the same technique when it comes to the famous "M".

Auditory cues can also be utilized to enhance brand encoding. In this case, Aaker mentions jingles. Music and pleasant sounds in general, without any doubt, help the encoding of brand information. McDonald's and Burger King use "I'm lovin' it" and "Have it your way", while Coca Cola use "Always Coca Cola". Especially, note that McDonald's slogan sounds more hip and is further supported by the relatively simple and thus memorable melody, which accompanies it.

Lately, there have been hot debates about whether haptic and gustatory sensory stimuli can be used to enhance the encoding of brands. In this connection, it does not seem to be a coincidence that companies behind some brands have chosen to "engrave" the brand name on the product's package. Toblerone is a perfect example. When you hold a Toblerone in your hand you will notice this. Furthermore, the mountain-shaped package will also make you remember the brand better because of enhanced encoding. Also, think back on Starbucks' exhibition of coffee beans

<sup>&</sup>lt;sup>18</sup> According to them, the reason for this is that pleasant ambient scents in the encoding phase increase attention to the brand stimuli, mood and the physiological arousal levels of the participants in the experiments. This influences how well memory is formed. More precisely, they argue that when the participants' arousal levels are increased, high levels of alertness is created, which in turn results in better cognitive performance; that is memory retrieval (Morrin & Ratneshawar 2003: 11-12, 20-23).

that we mentioned earlier in the thesis. Here, we are of the opinion that consciously touching the coffee beans unconsciously enhances attention towards the Starbucks brand.

#### Brand Memory Consolidation According to Aaker and Cognitive Neuroscience

When it comes to brand memory consolidation, Aaker has not elaborated enough on the subject. Though, he speaks of brand memory consolidation in connection with his anchor metaphor; that is, the representation of the strength of associations in brand-related associative networks. Hence, in this section we will use cognitive neuroscientific theories to elaborate on what brand consolidation is and how it is achieved. Aaker perceives a brand's representation as a network of associations. We will expand his perception of a brand's representation by introducing Franzen & Bouwman's extended cognitive neuroscientific definition of it: "A brand is represented in memory as relatively small combination of neurons that are connected to each other synaptically. They are activated in mutual coherence. From here, all other parts that constitute the associative network can be activated. The complete activated network is called a Gestalt" (Franzen & Bouwman 2001: 59).

In the light of Franzen and Bouwman's definition, when a brand is well consolidated it means that it is well established in the consumer's brain (long term memory) via Hebbian learning, which includes protein synthesis (for more on memory consolidation see Annex 2). This means that the connections between neurons (see illustration 4.7) in the associative neuronal networks of the brand are very strong (ibid: 17). The strong connection between neurons in the brain is a result of repeated activation of the network (pattern) by external stimuli.



<u>Illustration 4.7:</u> Connections Between Neurons

Connections between neurons are stronger in the case of well consolidated brands than in brands that are not well consolidated.

(Source: Johnson 1990)

External stimuli could for instance be sensory or semantic information in the form of marketing communicative action tools such as advertisements. In practice this is seen in the case of, for instance, the advertisement for Duracell Batteries. Every time you see the advertisement, it reactivates the neural circuit (pattern) in the brain, which represents the brand's advertisement and all the associations connected to it. The more frequently the neural pattern is activated, the stronger gets the consolidation and consequently the retrieval of the brand's memory. The explanation for this is that, the more frequently the neurons in the brand's neural network are activated, the better will become the interneuronal communication. This follows Donald Hebb's principle that: "neurons that fire together, wire together" (see illustration 4.8). In addition, brand memories, which are repeatedly activated, will become stronger, and those which are not will eventually "die out" following the principle of Neural Darwinism (see section 2.2.1 on memory consolidation).



<u>Illustration 4.8:</u> Neuronal Firings (indicated by reddish colour in the synapses) and Wirings (Interconnectedness)

Neurons involved in the consolidation of a specific brand memory create increasingly strong connections every time the memory trace of the brand is activated. From here, other memory traces connected to the brand's associative networks can be activated and thus expand the brand's associative network.

(Source: Copingskills4kids 2008).

Another type of stimuli that can be used for the same purpose are sensory stimuli; for instance pleasant scents. This was also touched upon earlier in the encoding section. According to Morrin and Ratneshwar, when there is a pleasant scent in a place, for instance a shop, we tend to stay there for a longer period of time (Morrin & Ratneshwar 2003: 12, 20-23). This means longer time of brand exposure (stimuli repetition) and viewing time. This will in turn lead to better brand memory consolidation (also longer time for brand decision making in the shop) (ibid).

#### Brand Memory Retrieval According to Aaker and Cognitive Neuroscience

We also pointed out that according to Aaker's awareness pyramid there were three levels of brand awareness: recognition, recall and top-of-mind. This is in accordance with what we have learned in cognitive neuroscience; at least when it comes to recognition and recall, which are the two retrieval processes. These two processes tell us how aware or conscious a consumer is of a brand. As we saw in the theory section, Aaker's recall is a much stronger retrieval process than his recognition, which is the minimal level of brand awareness. However, we also perceive Aaker's top-of-mind as a recall process; but one that is much stronger than recall in Aaker's pyramid.

Aaker has placed recall almost at the top of the awareness pyramid. This idea is in accordance with cognitive neuroscientific evidence, which suggests that recall is a stronger retrieval process than recognition. This is supported by the fact that unaided tests are used to test recall, while aided tests are used to test recognition. For instance, you can recall a brand from your memory in order to remember it, while recognition is only possible if one or more cues are given to the respondent and he is asked whether he recognizes a number of brand names in a certain product class that the brand belongs to. In contrast, when recall is tested the respondent is not provided with the brand name. In recognition there will typically be a weak link between the brand and product class, while in recall the respondent can recall where he has seen the brand, why it is different from other brands and what the product class is. Hence, recall is associated with much stronger brand position.

Though, Aaker has considered brand memory retrieval he has neglected to mention that both recognition and recall can also be unconscious. This is unfortunate, as much brand information retrieval takes place unconsciously (Grunert 1988 in Franzen & Bouwman 2001: 66).

As mentioned in the theory section, there are two types of recall: strategic (conscious) and spontaneous (unconscious) retrieval. If we consciously recall brand information we use strategic recall. Think back to the introductory case when you purchased Coca Cola. You stepped back for a moment and tried to remember, whether there were other items that you needed to buy that were not on your list. You remembered that you needed to buy a soft drink for your movie night with your friends and ended up purchasing a bottle of Coca Cola. From the perspective of cognitive neuroscience we could argue that this was a typical case of strategic retrieval of the concept of "beverage". During strategic retrieval the Prefrontal Cortex as well as the Medial Temporal Lobes are activated. The reason for Prefrontal Cortex activation is the activation of working memory. The fact that both Prefrontal Cortex and the Medial Temporal Lobes are activated during strategic retrieval indicates that we have to do with an active cognitive process when we plan to recall things; in this case, items you might have forgotten to add to your list. As mentioned in the theory section, in strategic retrieval we actively and consciously attempt to remember something like the before-mentioned memory of "beverage" in general. But all this does not completely explain why you ended up buying Coca Cola amongst all the alternatives. We argue that the reason why you chose the Coca Cola brand was that it was well consolidated in your brain. This means that it was well established in your long term memory as a result of repeated activation of the brand's memory by external stimuli. In this case Aaker has indeed considered the relationship between recall and repetition (Aaker 1991: 72-76). From a cognitive neuroscience perspective, what repetition does is that it strengthens the connections between neurons that represent different kinds of brand related information that are consolidated in different parts of the brain. As a result Coca Cola enjoys higher brand saliency, easier accessibility and better diagnosticity than the alternative brands. Thus, in your case it has become a top-of-mind brand.

In the case of spontaneous retrieval, brand information is retrieved spontaneously. When a memory "pops up" spontaneously in our minds, we refer to spontaneous retrieval. Remember when you were about to leave the store but suddenly recalled that you had run out of Stimorol? As in the case of Coca Cola you chose Stimorol because it was a top-of-mind brand for you, even though the brand name popped up spontaneously.

As in the case of recall, recognition can also be conscious as well as unconscious. In the case of conscious recognition, think back to the episode in which the waitress offered you a taste sample of a chocolate. You tasted the chocolate and noticed that you were familiar with its taste. But you

did not know which chocolate it was, were unable to remember the last time you had tasted it or who had produced it.

In unconscious recognition, the consumer will still recognize the brand, though without being consciously aware of the fact that he recognized it. Remember when you saw the Maaza mango juice? And how you reacted to it? You automatically chose this brand among several other popular brands. But why did you choose this brand and why did you elicit such strong reactions towards it? What you did not know and still do not know about your choice is that it was controlled by unconscious recognition of the brand Maaza: During a family vacation to Turkey, when you were just a child, your parents always bought you Maaza mango juice. Even though, you cannot consciously remember the Maaza brand and how much you loved to drink it, you still unconsciously recognised the brand. This was due to unconscious brain activation by the package, which acted as visual stimulus triggering relevant memories of the brand resulting in your choice of it. But, of course, you would be unable report this if you were asked.

# 4.5 Chapter Overview

After having undertaken a thorough comparative analysis of Aaker's brand equity theory and neuroscientific memory theory, it is evident that the theory of brand equity does not deal enough with the unconscious aspects of brand memory, while it has taken the conscious aspects into consideration. To us, this indicates that Aaker has not really considered the importance of unconscious brand memory. However, in our analysis we have clearly demonstrated that there is much evidence to support the existence and importance of unconscious brand equity (brand memory).

#### Concluding Remarks on Brand Associations

In this section we undertook a comparative analysis of the brand equity component *associations*. We found that Aaker has been successful in taking some non-declarative memory factors into consideration – albeit, not in a sufficiently detailed manner. Thus, we have added to and elaborated on non-declarative aspects of brand associations by including the non-declarative memory subtypes priming and conditioning and the psychological phenomenon of framing. We illuminated these aspects by introducing framing, priming and classical conditioning experiments conducted by various researchers. Furthermore, we illuminated unconscious brand associations by referring to real-life cases and our introductory case in the beginning of the thesis.

Starting with framing, McClure showed us that Coca Cola was chosen over Pepsi Cola because of positive associations of the brand in the mind of the subjects. This was supported by fMRI images.

Moving on to priming, in our first example, we saw how DAN ÆG made use of priming in connection with brand associations. In addition, we saw how Starbucks used sensory stimuli as primes. We also showed Toblerone's use of the Swiss national image and introduced North et al.'s wine experiment on the use of auditory stimuli as primes.

In connection with classical conditioning in unconscious brand associations we referred to the Lambi kitchen tissue example from our introductory case. Also, we looked into how fast food chains made use of classical conditioning and scrutinized classical conditioning in advertising and event sponsorships.

### Concluding Remarks on Perceived Quality

After having looked into the component of *perceived quality* in Aaker's brand equity model, it is safe to conclude that consumers' perceived quality is a very complex phenomenon whose non-declarative aspects have not been sufficiently elaborated on by Aaker. Thus, in this section we have elaborated on the non-declarative aspects of perceived quality from a consumer behaviour

perspective and illustrated how framing, priming and classical conditioning can be used by brand managers to influence a brand's perceived quality.

Firstly, we looked into framing in connection with perceived quality and showed how framing experiments can shed light on the unconscious aspects of perceived quality. In Plassman's experiment we saw that relative price functioned as a frame to high perceived quality. Next, we mentioned Olson and Dover's experiment on coffee followed by McClure's Coca Cola experiment and the Fairtrade banana example, which all showed that consumers' perceived quality of a brand can indeed be unconscious.

Secondly, we saw how priming experiments can provide us with valuable evidence on the unconscious nature of a consumer's perceived quality of a brand. We included our case once more, more precisely the examples of DAN ÆG and Pink Lady Apples. In addition, we included Allison & Uhl's experiment on beer brands and Siegrist & Cousin's experiment on wine tasting, which both illustrated that quality expectations were influenced by priming. Furthermore, we saw how fat content and soy protein labelling could influence the perceived quality of a brand in the minds of consumers. As our last example, we looked into Lindt Swiss chocolate and saw how the different components on the package primed quality associations.

Finally, we saw how classical conditioning could influence perceived quality. In this regard we referred to the Duracell batteries example in our introductory case and Elizabeth Arden's "Provocative Woman" perfume, which both showed that classical conditioning can be successfully used to promote the brand's perceived quality.

#### Concluding Remarks on Brand Loyalty

Following our analysis of perceived quality, we moved on to investigating brand loyalty. Initially, we investigated framing in brand loyalty. More precisely, we once again referred to McClure's Coca Cola experiment and deduced that the subjects chose Coca Cola because they were loyal towards the brand, while with Pepsi no significant framing effect was observed. Our Fairtrade banana example was a further demonstration of the existence of unconscious brand loyalty. Similarly, Allison & Uhl's experiments also clearly showed that beer brands can influence brand loyalty. Then, we explored several other examples, all of them showing that branded products were rated higher than unbranded ones. Finally, we also demonstrated that priming can be seen in unconscious brand loyalty. In this context we gave examples of the use of logos, slogans etc.

Lastly, we viewed classical conditioning in connection with unconscious brand loyalty. In this connection, we gave examples of Duracell and other brands using classical conditioning to enhance brand loyalty. Furthermore, we saw that the best way to create brand loyalty via classical conditioning was to influence attachment to the brand. Anything that promoted liking, satisfaction and commitment could be used for this purpose.

#### Concluding Remarks on Brand Awareness

In this section we saw that, although Aaker talked directly about retrieval and indirectly about brand encoding and consolidation, he had neglected to give an in-depth description of the three memory processes. Thus, we illuminated these with the aid of cognitive neuroscientific theory. Beginning with encoding, we looked into Morrin & Ratneshwar's scent experiment that showed the significance of scents in the encoding of brands.

Moving on to consolidation, we found that Aaker's theory was once again lacking important aspects. Thus, we felt it necessary to introduce new research by, among others, Franzen & Bouwman.

Finally, as to brand memory retrieval, we found that Aaker had, indeed, considered the two retrieval types recall and recognition. This said, we also found that he had neglected to mention the unconscious aspects of these retrieval types. Thus, we came up with evidence from the fields of marketing and cognitive neuroscience that the two retrieval types could be conscious as well as unconscious. In this context, we referred to our introductory case and showed how strategic

(Coca Cola) and spontaneous (Stimorol) recall worked and how conscious (chocolate) and unconscious (Maaza mango juice) recognition worked.

Overall, in our analysis we showed that all four components in Aaker's brand equity model have non-declarative aspects, which Aaker had neglected to consider in depth or even completely left out.

# **Chapter 5**

# **5.0 Empirical Investigation of Non-declarative Brand Memory**

Our comparative analysis provided us with clear evidence of the existence of unconscious brand memory (brand equity). To further support our findings we will introduce experimental work from the DNRG SenseLab at CBS. Thus, in the following we will introduce this experimental work on implicit brand associations conducted by Thomas Ramsøy & Martin Skov via priming. In their paper there are two studies. First, we will give a description of them. Then, we will conduct an analysis of their results. Finally, we will attempt to initiate a discussion on how to extend the scope of the experiments, so that other brand equity variables such as perceived quality and brand loyalty can also be investigated by future research.

# 5.1 Experiment I

### Experimental Procedures of Experiment I

In Ramsøy & Skov's experiment I, a total of 49 (26 female and 23 male) subjects were invited to participate. First, subjects were presented with a list of brand names which they were asked to rate on a Likert scale. The Likert scale ranges from 1 to 7 (1 being "strongly dislike" and 7 being "strongly like") (Ramsøy & Skov 2010).

Next, the subjects participated in an Implicit Association Test (IAT), in which they were presented with brand names on an unconscious level. After the presentation of the brands subjects were given a Word Valence Task (WVT) in which they were asked to rate valence words ("love" or "hate") as either positive or negative. More precisely, each brand was presented for 30 milliseconds using *forward* and *backward masking* (ibid). In forward masking a *masking stimulus* is presented before the *target stimulus*. The opposite is the case in backward masking (Baars & Gage 2007: 242). Although, the masking stimulus is not perceived consciously it has a great effect on cognitive processing of stimuli (ibid). This comprises the basis of the experiment. In the experiment the target stimuli are the brands and the masking stimuli are the random letters.



Figure 5.1: Masking<sup>19</sup> and the relationship between valence words and brands.

(Source: Ramsøy & Skov 2010)

<sup>&</sup>lt;sup>19</sup> Forward masking: Random letters followed by the brand "Nike".

Backward masking: The brand "Nike" followed by random letters.

The brand names and valence words were repeatedly presented to the subjects in random order in for different combinations:

Positive Word + Liked Brand	Positive Word + Disliked Brand
Negative Word + Disliked Brand	Negative Word + Liked Brand

#### Table 5.1: Brand Name and Valence Word Combinations

Ramsøy & Skov hypothesised that the combinations to the left of the table would not result in unconscious psychological conflict situations, as both brands and words were either positive or negative, while the combinations to the right would lead to unconscious conflict situations. This would result in prolonged response time in the Word Valence Task (WVT). The presentation of stimuli and the recording of response time were conducted using E-Prime 2.0. SPSS 16.0 was used to analyze data.

### Data and Data Analysis Experiment I

The authors found that, as opposed to non-conflict situations, response time was much longer in conflict situations. They concluded that the increased response time was a direct result of increased reaction time during conflict situations. Table 5.2 below shows that response time was longer if the valence word was negative and the brand was positive (t = 3.369). In figure 5.1 above we see this and also that response time was longer if the valence word was positive and the brand was positive than if both were neutral.

Parameter Estim	Estimate	e Std. Error	t	Sig.	95% Confidence Interval	
	Lotinate				Lower Bound	Upper Bound
Intercept	6.774	34.371	197.097	<0.001	6.706	6.843
rating	-0.008	2.473	-3.356	0.001	-13.148	-3.453
word valence=negative] * rating	4.936	1.465	3.369	0.001	2.064	7.808
word valence=positive * rating	0.000	0.000			-	-

### Table 5.2

Response time is longer in the case of negative valence words and liked brands as a result of psychological conflict. This is indicated by the red ellipse.

(Source: Ramsøy & Skov 2010)

All this was in accordance with what was hypothesised. According to the authors, the results of the experiment showed that subjective brand preference can be unconscious.

### Discussion of Experiment I

As described in earlier chapters, brand equity consists of 5 main components, of which we looked into four: brand awareness, brand associations, brand loyalty and perceived quality. The experimental work conducted by Ramsøy & Skov has demonstrated the unconscious nature of brand associations. We are of the opinion that also other components of Aaker's brand equity model, such as perceived quality and brand loyalty, can be tested by using the exact same methodology. Instead of using words that express feelings of liking in general, such as "love" and "hate" (valence words), we can use words that express quality and loyalty. This will enable us to, not only, demonstrate the unconscious nature of brand associations but also perceived

quality and loyalty. By doing so, we will be able to investigate almost all of Aaker's components of brand equity and not only brand associations.

# Perceived Quality

In the case of the investigation of a brand's perceived quality we suggest that the variables in the Likert Scale can be changed, so that a brand's perceived quality can be measured. It could for instance look as follows:

Low Quality (1) <-----> (7) High Quality

When investigating perceived quality also the words in the Word Valence Task should be adapted accordingly. This could look as follows:

	Positive	Negative
Valence Words (words from the table below)		

Table 5.3

After the subjects are presented with brands and words, we will be able to measure the response time. See table 5.4 below.

Brand +/- Words	McDonald's (either high or low P.Q)	McDonald's (either high or low P.Q)
Healthy/Unhealthy Good/Bad	Response Time is hypothesized to be longer when P.Q is high and the word is negative.	Response Time is hypothesized to be shorter when P.Q is high and the word is positive.
Delicious/Disgusting Low Fat/High Fat	Response Time is hypothesized to be longer when P.Q is low and the word is positive.	Response Time is hypothesized to be shorter when P.Q is low and the word is negative.

# Table 5.4

By observing the response time we can investigate unconscious perceived quality. For instance, if test persons think that a brand enjoys high quality (high score on the modified Likert Scale) and are then shown a negative word such as "bad", we hypothesize that we will see longer response time, which will support the hypothesis that unconscious perceived quality exists. We
think that the longer response time will be due to the fact that the respondents who like the brand will be hesitant to associate their brand with a negative valence word like "bad". That is, there is clearly a conflict situation between the masking and the target stimuli.

## Brand Loyalty

When it comes to investigating brand loyalty the variables in the Likert Scale of brands should also be adjusted and could look like the following:

Disloyal (1) <-----> (7) Loyal

When it comes to Word Valence Task it will still look like the one above. Though, in connection with brand loyalty, it is important to notice that many words can be used, for instance the ones that can be observed below in table 5.5. The important thing is that they are somehow connected with brand loyalty.

Brand	Coca Cola (either	Coca Cola (either
	high or low	high or low
	loyalty)	loyalty)
+/- Words		
Love/Hate	Response Time is	Response Time is
	hypothesized to be	hypothesized to be
	longer when brand	shorter when brand
Cool/Uncool	loyalty is high and	loyalty is high and
	the word is	the word is
	negative.	positive.
Tasty/Gross	Response Time is	Response Time is
•	hypothesized to be	hypothesized to be
	longer when brand	shorter when brand
Cood/Pod	loyalty is low and	loyalty is low and
Good/Bad	the word is	the word is
	positive.	negative.
Original/Fake		
Original/Fake		

Table 5.5

By looking at the response time we can investigate unconscious brand loyalty. For instance, if you are loyal to a brand (high score on Likert Scale) and are then shown a negative word such as "disgusting", we will see longer response time which will support the hypothesis that unconscious brand loyalty exists. We think that the longer response time will be due to the fact that the loyal respondents are hesitant to associate their brand with a negative valence word like "disgusting". This is clearly a conflict situation similar to those described by Ramsøy & Skov.

## **5.2 Experiment II**

#### Experimental Procedures Experiment II

In Ramsøy & Skov's second experiment, the same 49 (26 female and 23 male) subjects participated. In the experiment the subjects were asked to perform a Brand Detection Test (BDT). In this experiment subjects were shown brand names in white on a black background. Every brand name was shown to the subjects for 12, 40 or 80 milliseconds, respectively through forward and backward masking with the brand names as the target stimuli and random letters as the masking. After the brand names were shown, subjects were asked to report how clearly they experienced them. This was undertaken by using the Perception Awareness Scale (PAS) (Ramsøy & Skov 2010).

# Study 2: setup & results



### Figure 5.2

This figure shows the clarity ratings of negative, neutral and positive brands in relation to time. It also shows the brain regions thought to be involved in this task.

(Source: Ramsøy & Skov 2010)

Previous research has shown that negative valence can result in earlier stimulus detection. Hence, in this experiment Ramsøy & Skov hypothesised that brand names with subjective positive and negative value would be consciously detected at lower stimulus duration than brand names with neutral valence. When it comes to brand names with subjective positive valence, evidence from the first study suggested that these brand names were also detected at lower stimulus duration compared to neutral brand names.

#### Data and Data Analysis Experiment II

The authors then analysed the relationship between brand preference, stimulus duration and clarity rating using Pearson's Chi-square<sup>20</sup>.

$$\chi^{2} = \sum_{i=1}^{k} \frac{(O_{i} - E_{i})^{2}}{E_{i}}$$

Overall, the results of this experiment clearly show the unconscious nature of brand memory. More precisely, the results of the experiment show that subjective preference for brands influences the probability that we detect stimuli presented at the limen of consciousness. The results clearly show that the test subjects detected brand names with subjective positive and negative valence much faster and at less optimal viewing conditions as compared to brands with subjective neutral valence. More specifically, brands with high vs. neutral liking was detected most clearly (Chi-square = 129.5) compared to brands with high vs. low liking and low vs. neutral liking as can be seen in table 5.6 below. The experiment implicitly shows that neutral brands were perceived slowest.

<sup>&</sup>lt;sup>20</sup> **O**: The frequencies observed; **E**: The frequencies expected;  $\Sigma$ : The sum of.

Pairwise comparison	chi-square	р
low vs neutral liking	31.1	<0.001*
high vs neutral liking	129.5	<0.001*
high vs low liking	19.5	0.0125*

#### Table 5.6

Brands with high liking were detected much faster than brands with neutral and low liking.

(Source: Ramsøy & Skov 2010)

#### Discussion of Experiment II

In Ramsøy & Skov's second study, the main focus was on liking of brands (valence). More precisely, the authors studied subjective positive, subjective negative and subjective neutral preference for brands (that is brand associations). As in the case of the first study, we again suggest that other, more specific, components besides brand associations can be studied. These components can once again be: brand loyalty and perceived quality. This can be done for instance by replacing the variable "preference" (associations) with the variables "perceived quality" and "brand loyalty". By doing this we will be able to investigate whether high, low and neutral perceived brand quality and brand loyalty can influence detection of stimuli; that is, the brand name. Based on Ramsøy & Skov's findings, we hypothesise that brand names reported as being of high or low quality will be detected much faster than brand names reported as being of neutral subjective quality. The reason is that positive and negative brand quality associations are more likely to be detected at the limen of conscious awareness. The reason why brand names with positive and negative quality associations may be detected faster, even when the conditions are not optimal is that, as Ramsøy and Skov suggest, positive and negative emotions are linked to these brand names. According to them, emotions may influence processes of attention in a yet unknown manner. They speculated that activation of the Visual Cortex and the striatum (reward)

may take place in the context of brands with positive valence, while the the Visual Cortext, the amygdala and the insula may be activated in the case of brands with negative valence (see figure 5.2). Based on Ramsøy & Skov's findings, we hypothesise that brand names connected with high or low loyalty, will be detected faster than brands connected with neutral loyalty due to similar reason as in the case of perceived quality. Overall, Ramsøy & Skov's second study shows the unconscious nature of brand memory. The mere fact that differences between the reportings by participants in the studies of low, neutral and high-loyalty brands existed, suggests that an unconscious dimension of brand memory exists: If no unconscious dimension of brand memory exists would be detected and reported following the same pattern (equally fast and clearly).

## **5.3 Chapter Overview**

In this chapter we presented the experimental work of Ramsøy & Skov. In their two studies they successfully provided clear evidence for the existence of unconscious brand associations. In addition, we demonstrated how other components of Aaker's brand equity model such as perceived quality and brand loyalty can likewise be investigated using the same experimental procedures.

# **Chapter 6**

# 6.0 Discussion

# Implications of Our Research for Selected Additional Topics within Consumer Behaviour and Brand Management

Earlier in our thesis, we saw that approximately 95 per cent of our cognitive processes take place under the limen of consciousness. Hence, focusing on non-declarative memory processes and types is crucial in the fields of consumer behaviour and brand management. Traditional consumer behaviour and brand management literature has not been successful in focusing on these crucial research areas. In our master's thesis we have shed light on this problem and provided you with sufficient groundbreaking evidence on the existence and importance of brand memory, especially non-declarative brand memory. More precisely, by investigating our hypothesis that: *"Brand memory (Brand Equity) is conscious as well as unconscious*"; we found that brand memory was conscious as well as unconscious.

In addition, we have also found evidence for the fact that non-declarative brand memory is unavoidable to study in the context of consumer behaviour and brand management. In this chapter we will discuss some aspects of consumer behaviour and brand management which have not been discussed in the analysis but, nevertheless, are still relevant for marketers.

# 6.1 Implications for Consumer Behaviour

#### The Role of Brand Memory in Consumer Choice

By applying cognitive neuroscientific theories on framing, priming and classical conditioning combined with empirical evidence we have clearly demonstrated how unconscious brand memory indeed operates in the minds of the consumers and hence influences their behaviour.

Figure 6.1 below shows the role of brand memory in consumer choice. As can be seen, brand memory is an imperative prerequisite in order for a brand to be chosen.



Illustration 6.1: Consumer Brand Choice

(Source: Franzen & Bouwman 2001: 133)

In this connection we can apply our findings regarding non-declarative brand memory. More precisely, the new knowledge in this thesis will broaden our horizon when it comes to our understanding of consumer choice and brand management. We will be able to get a more comprehensive picture of the role of non-declarative long term brand memory in, for instance,

brand consideration and thus brand choice. By applying the findings, marketing professionals, including consumer behaviourists and brand managers, will be able to better understand, for instance, the *evocation* of brands; that is the retrieval (recall and recognition) of brands from long term memory that the consumer can choose from. In figure 6.1 above this is referred to as "activated brands" (retrieved). Our findings suggest that the evocation of brands from long term memory takes place mostly unconsciously and is dependent on how salient or noticeable the brands are. This is also supported by researchers such as Walvis (Walvis 2008: 181-182).

In a much similar manner the findings are significant for the understanding of brand evaluation. As we know from consumer behaviour literature, after the consumer undergoes the evocation of brands he will initiate the more conscious process of evaluation. In this phase the evaluation of the evoked brands is made. Evaluation especially takes place when it comes to the purchase of high-involvement product brands (ibid) and not much in low-involvement product brands, which are mostly purchased by routine as a result of automatisation (habit). In the case of routine purchases, non-declarative brand memory is especially relevant to scrutinize.



Figure 6.1: The Decision Making Process

(Source: Miller et al. 2008: 100)

In this context it is wise to draw parallels to Maslow's famous *hierarchy of needs* model (pyramid), which divides consumer needs into five categories. From the bottom of the pyramid, we have: *Physiological needs, safety, love/belonging, esteem and finally self-actualization* (Andersen et al. 2007: 162).

The Maslow Pyramid lays ground for a very interesting discussion regarding consumer behaviour (and later brand management). In this thesis we noticed that most of our examples of non-declarative long term brand memory typically included products belonging to the bottom three categories in Maslow's Pyramid. Based on the findings, we are of the opinion that the lower your location in the pyramid, the more unconscious will be your memory types and processes controlling your buying behaviour. Thus, your retrieval of the brands at the time of purchase will be unconscious, when you purchase a product that fulfils a need in the lower half of the pyramid. This means that the non-declarative long term memory types priming and classical conditioning will play a decisive role in your purchasing behaviour. In contrast, the higher your location in the pyramid, the more conscious will be your memory processes and types controlling your buying behaviour. Also, the higher your location in the pyramid, the higher will be your involvement with the product brands, and the more conscious will be your memory types and processes that influence and control your choice. Normally, the lower your location in the pyramid, the lower will be your involvement with the product brands. The three aspects: *Consciousness* (Co), *Involvement* (I) and *Needs* (N), we have integrated into one model, which we have dubbed the "CoIN Pyramid". The model can be observed in figure 6.2 below.



Figure 6.2: The "CoIN Pyramid"

# **6.2 Implications for Brand Management**

#### The Role of Brand Memory-based Consumer Choice in Brand Management

But what consequences does the information regarding unconscious brand memory, revealed in the section above, have for brand management? This depends on what we would like to investigate. We think the key questions brand managers must ask themselves are: What do we want our target audience to remember and how do we want them to remember this information? We think this depends on what needs the consumer wishes to satisfy. Brand managers can successfully benefit from our findings in connection with brand-related activities such as: The planning of advertisements, sponsorships, brand building etc. If we take a look at advertising, as we have already witnessed, classical conditioning and priming can be successfully used in advertising of all types. For instance, a company behind low involvement products such as fast food, dairy products, batteries etc. can successfully use classical conditioning and priming in its brand's advertisements. The reason for this is that food such as a Big Mac appeals to our fundamental physiological need (lowest step in the pyramid) "hunger", which is largely influenced by unconscious memory processes. This explains why we develop hunger when we see a delicious Big Mac or an ice-cold Coca Cola in an advertisement. Our findings suggest that the lower the consumer's need is in Maslow's hierarchy of needs, the higher will be the probability that he develops an unconditioned response (UCR) to an unconditioned stimulus (US), which is relevant for him. We emphasize that the CoIN-Pyramid should not be viewed in absolutes but rather as a continuum in which the degree of consciousness and involvement, respectively, increase from the bottom up but not to a degree that unconscious processes are completely absent. For instance, classical conditioning can be used successfully in high involvement product brands (e.g. Catherine Zeta-Jones in Alfa Romeo advertisements) advertisements as well, even though these brands fulfil needs such as esteem and selfactualization. Similarly, we have seen that priming can successfully be used in the advertising of low involvement products. For instance, several Danish low involvement product brands (for example Gammel Dansk,) have used priming in their advertising. Based on our findings, we are

of the opinion that priming in the case of Gammel Dansk is especially effective because it is a product that fulfils basic social needs (friendship, "hygge"<sup>21</sup>: having fun, etc.). If Gammel Dansk were a high involvement product (for instance an insurance of your house), the success of priming would be significantly reduced, as high involvement product brands are mostly purchased following extensive consideration and evaluation by the consumer, which as we know, require complex conscious cognitive activation within the Prefrontal Cortex and the Medial Temporal Lobes. This is because product brands satisfying needs like esteem and self-actualization seem to require great conscious cognitive effort due to the great financial and social risks attached to these products in contrast to products fulfilling a physiological need such a hunger or thirst (e.g. Big Mac or Coca Cola).

## 6.3 The Absence of Brand Memory in Consumer Choice

In the earlier sections of this chapter, we demonstrated how the scientific findings in our thesis could be applied in consumer choice and also what consequences they had for brand management. But what happens if the consumer lacks neural representation of a brand (that is memory constructs for the brand)? Think back on illustration 6.1. While the right half of the figure described brand memory-based consumer choice, the left half dealt with consumer choice in the absence of brand memory. As you can see, the brand evocation phase is absent and consequently there can be no brand evaluation phase either. What happens in this case is that the consumer makes his choice of brand on the basis of the competing sensory stimuli perceived in the environment. Put simply, the consumer chooses the brand which creates the most attention. Thus, his brand choice is not based on brand related concepts stored in the environment, creates.

In this connection the concept of Message Sensation Value (MSV) is very useful to explore. In advertising the concept of MSV is a measure of the sensory intensity of audio, visual and

<sup>&</sup>lt;sup>21</sup> There is no equivalent for this term in English. The translation is quite rough.

semantic features of an advertisement (Langleben 2009: 219). By using fMRI, Langleben has demonstrated that advertisements with high MSV content activate sensory processing (sensory memory) due to the activation of the Orbitofrontal Cortex and thus cognitive processing is reduced (ibid: 224). There are good reasons why high MSV (high content of sensory stimuli) advertisements work. According to Fitzsimons, perceiving visual cues does not require complex cognitive processing. Furthermore, Fitzsimons states that visual cues may strongly influence many consumer decisions (Fitzsimons 2002: 270).

#### Implications of MSV for Brand Management

As we have seen in the section above (left half of figure 6.1), the consumer does not necessarily need long term brand memory in his or her brand decision making process. In the absence of brand memory the concept of MSV is a vital one to consider, as it explains how the consumer makes a decision without the activation of long term brand memory; namely through attention created by sensory stimuli.

However, brand managers and advertisers should be aware that creating attention is not an easy task. This is due to the competitive cognitive landscape that the brands operate in. In this connection, Walvis says that brands as stimuli are fighting for cortical representation in our brains by bombarding us with sensory signals (name, logo, packaging etc.) and semantic content to catch our attention and enter our awareness (Walvis 2008: 182).

According to our research on advertisements, high MSV advertisements are typically observed in connection with low-involvement brands that we typically purchase without much consideration (cognitive effort). Figure 6.3 below illustrates this: The less conscious the consumer is of the brand, the higher is the MSV in the advertisement and the more conscious the consumer is of the brand, the lower is the MSV in the advertisement. As can be seen, consciousness and involvement with the brand are proportional. This is because the consumer is normally (but not always) conscious when purchasing high involvement product brands because of the high risk factors attached to these.



Figure 6.3: The relationship between MSV and Consciousness/Involvement

An example that illustrates MSV in connection with low involvement brands is the Indian restaurant Koh-i-Noor in Copenhagen. It makes extensive use of sensory stimuli in its advertisements and through direct marketing (delicious and colourful food samples of authentic Indian/Pakistani cuisine). This is because the majority of its target audience does not have any knowledge of the brand Koh-i-Noor. Note that high MSV can also work well when memories of a brand exist.

# **6.4 Chapter Overview**

To wrap up, in this chapter we have clearly demonstrated how our research has consequences for consumer behaviour and brand management. As for consumer behaviour, we have shown that our research can be used successfully to better understand the non-declarative brand memory

properties of consumer choice. In addition, we have discussed how consumer choice takes place in the absence of brand memory and introduced the concept of Message Sensation Value (MSV).

As for brand management, we have applied our research on non-declarative brand memory and argued that brand managers and advertising professionals can use priming and classical conditioning successfully in the context of low involvement products and, in some cases, also high involvement products. To elaborate on this aspect we introduced Maslow's hierarchy of needs model and argued that priming and classical conditioning were most effective if used in the case of low involvement product brands. Furthermore, we argued that advertisers should rely primarily on high MSV advertisements if advertising for low involvement products.

Having discussed the implications of our research for consumer behaviour and brand management, we now move on to the main conclusion of our thesis.

# **Chapter 7**

# 7.0 Conclusion

The purpose of this thesis was to address the lacking focus on brand memory in marketing. More precisely, the objective was to investigate which memory types and processes were involved in brand memory. Our hypothesis was that brand memory was conscious as well as unconscious. By referring to our introductory case, several real-life cases and research papers throughout the thesis we successfully verified our hypothesis.

Following the introduction in chapter 1, in chapter 2 we introduced the different types and processes of the human memory system and their brain basis. In chapter 3, we introduced David Aaker's brand equity theory, which in our opinion, is the best brand memory theory in marketing literature. Aaker's theory includes five components of which we introduced the four.

After having introduced the theory underlying the human memory system and Aaker's brand equity in chapters 2 and 3, respectively, we conducted a comparative analysis of the two theories in chapter 4. The result of our analysis clearly indicated that Aaker's brand equity theory did not focus enough on non-declarative brand memory. We found that both declarative and nondeclarative long term memory sub-types were involved in brand memory. More precisely, with the aid of framing and the non-declarative long term memory sub-types priming and classical conditioning, we showed that brand associations, perceived quality and brand loyalty involved both unconscious memory types and processes, and that brand awareness included unconscious memory processes.

Following our comparative analysis in chapter 4, in chapter 5, we supported our findings with experimental work conducted by Ramsøy & Skov on implicit brand associations at the CBS DNRG SenseLab. In this context, by using Aaker's brand equity theory as a point of departure, we came up with suggestions on how to extend on their experiments. More precisely, we suggested that, in addition to brand associations, perceived quality and brand loyalty in Aaker's brand equity model could be investigated using Ramsøy & Skov's methodology.

After having supported the findings of our analysis in chapter 5, in chapter 6 we went on to discussing how consumer behaviour and brand management could benefit from the interdisciplinary knowledge on brand memory presented in our thesis. As for consumer behaviour, we demonstrated that knowledge on non-declarative brand memory could help us better understand consumer choice. We also explored how consumer choice is made in the absence of brand memory. As for brand management and advertising, we demonstrated that unconscious memory types were more likely to succeed if they were applied in connection with low involvement products fulfilling the bottom three levels of Maslow's hierarchy of needs model (pyramid). Also, we introduced the concept of Message Sensation Value (MSV) and argued that in the absence of brand memory in the minds of the consumers, advertisers should rely on high MSV advertising.

# Annex

#### Annex 1

#### Genetics, Learning and Behaviour

How people behave is inextricably intertwined with who they are as biological organisms. In other words, personal traits and behaviour are inextricably bound up with our genetic composition or make up in a polygenic manner (multiple genes have influence on personal traits and behaviour, not one) (McInerney 2008). The study of the relationship between genetics and behaviour is called behavioural genetics and is an individual academic area of research and behind the scope of this thesis.

#### Annex 2

#### Memory Consolidation and Protein Synthesis

Consolidation is a process of protein synthesis, which takes place via gene transcription (Baars & Gage 2007: 273, 382). More precisely, synapses (connections between neurons) in the cortex can be excitatory (depolarization and following action potential or "peak" takes place) or inhibitory (hyper-polarization takes place and action potential does not take place). This depends on the neurotransmitter (biochemical messenger molecule, see illustration 2.2) that is used by the synapses (ibid: 269). When long term memory is to be consolidated, the excitatory and inhibitory synapses must be made permanent. The processes in which this occurs are called long term potentiation (LTP) and long term depression (LTD). LTP takes place in excitatory synapses, while LTD in inhibitory (ibid).

With the aid of protein synthesis growth of new dendrits, new supporting cells, increased number of synapses etc. take place. This knowledge is a product of the neuroscientist Stephen Rose's laboratory research on how chicks learn and construct memories (Franzen & Bouwman 2001: 17). Nash 1997 and several other neuroscientists have also shown that electrical activity of neurons alters brain structure (ibid: 18).

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