

**Neuromarketing:**  
**Insights into the Consumer Brain**  
**and its Adaption to Brand**  
**Management**

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## BACHELOR'S THESIS

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### **Abstract**

A central task of marketing science is the research of consumer behavior. By investigating the human black box, the consumer brain, the young discipline of neuroeconomics is searching for answers to marketing relevant questions in order to explain the economically relevant consumer behavior from a neurological perspective. This thesis is dealing with the topic of the neuroeconomics subdiscipline neuromarketing and how to adapt the insights gained to the field of brand management.

The aim of this thesis is to gain insights into the factors that influence consumer brand perception through the acquisition of knowledge about the theoretical background of a modern research area and to identify neuroscientific brand management concepts. Thereby the questions how neuroeconomics could be applied to marketing, which factors influence consumers in their decision making and how brand management could benefit from neuromarketing are examined.

In order to answer the research questions, this paper will be divided into two parts, a theoretical part and an empirical part. The theoretical framework is mainly based on literature research while for the empirical part insights are gained by conducting a qualitative case study and implementing a quantitative survey.

The result of the thesis is the identification of application areas for neuroscientific methods in the strategic brand management. By discussing the theoretical concepts and methods of neuromarketing as well as by empirically investigating brand perception, especially the areas of brand positioning, product management and brand communication could be identified as potential application areas of neuromarketing in brand management.

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Language: English      Key words: Neuroeconomics, Neuromarketing, Brand Management

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## List of Abbreviations

$\alpha$	Alpha significance level
AMA	American Marketing Association
$\chi^2$	Chi-Square-Test
EDA	Electrodermal activity
EEG	Electroencephalography
e. g.	For example
fMRI	Functional magnetic resonance imaging
GmbH	Limited liability company
i. e.	That is
KG	Limited partnership
MEG	Magnetoencephalography
NMSBA	Neuromarketing Science & Business Association
PET	Positron emission tomography
%	Percent
®	Registered trademark
t	T-Test
TM	Trademark
TV	Television

# 1 Introduction

“Products are made in a factory, but brands are created in the mind”

— Walter Landor

The German brand designer Walter Landor was aware early of the positive influence of popular brands on the perception of their products. During his career, he developed the typefaces of many well-known brands, including the famous Coca-Cola font (Twemlow, 2004). Using Coca-Cola as an example, the influence of the brand name on the perception of a product can be illustrated particularly well. In the 1970s and 1980s, experiments were conducted in which a number of test persons made a choice between Coca-Cola and Pepsi. In a blind test, the Pepsi brand was rated better by consumers than Coca-Cola. However, when the two brands were visible to the test subjects, the preference clearly shifted towards Coca-Cola. Researchers were able to demonstrate the influence of a positive brand image on the perception of product features, in this case the taste of the cola. In 2002, a research team replicated this test setup, this time using brain scanners. The result was the same as 30 years earlier: in the blind test, the preference for Pepsi was initially determined at the neural level as well. The images from the brain scanner showed that when drinking Pepsi, the reward center was activated five times more than when drinking Coca-Cola. When the brand factor was added to the experiment in the open test design, the same subjects who previously chose the Pepsi brand now preferred the Coca-Cola brand at the neural level. For the first time, the neuronal influence on product perception could be scientifically proven visually. At the same time, this experiment marked the birth of a new research area – the neuroeconomics and neuromarketing. (Felix, 2008, pp. 73-75)

This bachelor’s thesis connects the topic of neuromarketing with brand management. By presenting the neuroscientific basics and research methods, examining the current theoretical concepts of neuromarketing and conducting a case study and survey, it will be shown what neuromarketing is about and how brand management could benefit from its findings.

## 1.1 Purpose and limitations

The purpose of this bachelor’s thesis is to investigate the fundamentals of neuromarketing and how the knowledge gained can be applied in brand management. For this purpose, it will be shown what neuroeconomics deals with, which research methods are used and what theoretical concepts exist. Through the implementation of a case study and a survey, the

insights gained from the theoretical part will be used to analyze four commercials and to prove relevant theoretical neuroscientific factors influencing consumers perception within a practical frame. The findings derived from theory and empiricism should ultimately make it possible to identify potential applications of neuromarketing in brand management.

Accordingly, this thesis is limited to the topics of neuromarketing and brand management only. Other application areas of neuroeconomics will not be further investigated. Moreover, the empirical part is limited to the German-speaking market as neuromarketing is a very German scientific research field. Therefore, four commercials of different German companies within an industry advertising a similar product will be analyzed and a survey will be implemented in German as well.

## **1.2 Research questions**

According to the purpose of the thesis the following research questions arise, which are answered in this academic paper:

- How can the insights of neuroeconomics be applied to marketing?
- Which factors influence consumers in their decision making from a neuromarketing perspective?
- How can brand management benefit from neuromarketing?

## **1.3 Methodology**

In order to answer the research questions, this paper will be divided into two parts, a theoretical part and an empirical part. This separation should allow relevant theories from the first part to be tested in a realistic environment during the second part.

For the theory part, methodologically literature research is mainly used. This enables the elaboration of basics, backgrounds and relevant theories of neuroeconomics and neuromarketing. The basis of the literature research are specialized textbooks, scientific articles, publications, relevant websites and existing academic papers.

For the empirical part, a comparative case study is conducted, and a survey is developed, implemented and statistically evaluated within the framework of an empirical quantitative and qualitative study. This makes it possible to verify or disprove theoretical concepts, to

draw conclusions about important neuroscientific factors regarding brand perception and to adapt the gained results to brand management later on.

## **1.4 Aims and goals**

The aim of this thesis is to gain insights of the factors that influence consumer brand perception through the acquisition of knowledge about the theoretical background of a modern research area and the practical implementation of a case study and a survey. Furthermore, this work aims to identify neuroscientific brand management concepts in order to provide own products a competitive advantage on a marketing base. The insights gained this way should enable to react to the growing competition and the resulting rivalry for potential customers in later professional life and to adapt the marketing structures of the employer accordingly to the needs of the customers. Besides the acquisition and deepening of marketing relevant knowledge, the acquirement of new skills is a major goal. These include the method-based implementation and statistical evaluation of surveys, scientific writing of papers and in-depth literature research of relevant sources. The acquisition and deepening of these skills should make it possible to act successfully in the further academic career.

## **2 Introduction to neuroeconomics and neuromarketing**

Business administration traditionally deals with fundamentals, explanations and concepts for the concrete regulation and optimization of decision-making processes within a company. Thereby, scientific findings of economics, philosophy, sociology and psychology are repeatedly integrated. Since the beginning of the 21st century, business administration has also increasingly implemented concepts and techniques from the neurosciences in business management considerations and decision-making processes. In particular, the role of emotions and feelings is receiving increasing attention. The result of this development was the emergence of a new field of economic research - neuroeconomics. (Raab, et al., 2009, p. 1)

In the following chapter, a fundamental knowledge will be conveyed by defining and delimiting relevant terms, which contributes to a better understanding of the topic of neuroeconomics and its subdiscipline neuromarketing. Thus, a deeper immersion into the matter is facilitated.

### **2.1 Neuroscience**

The term neuroscience is used to summarize and interpret integrative studies on the structure and function of nervous systems. This interdisciplinary field of research represents the interface between different biological, medical and psychological disciplines with the aim of understanding neuronal functions at all levels of complexity by merging the individual approaches (Pickenhain, 2000). By carrying out so-called imaging procedures, neuroscientific research makes it possible, among other things, to localize, analyze and explain the development of thoughts, emotions and feelings in the brain. In order to economically transform these findings and make them usable, the field of neuroeconomics has been established. (Raab, et al., 2009, pp. 2-3)

### **2.2 Neuroeconomics**

Neuroeconomics is dedicated to the description and explanation of human behavior in the context of economically relevant decision-making processes by applying various neuroscientific methods. By interweaving perspectives from the humanities and natural sciences, researchers aim to answer economic questions relating to behavior, consumption and investment and, based on this, to develop new business concepts. In this context, the focus is on affective neural processes such as activation, involvement, emotions, motives,

attitudes and values on the one hand, and cognitive processes of perception, learning, thinking, as well as judgment and decision-making on the other. (Reimann & Weber, 2011, pp. 5-6)

By further developing the new approaches, neuroeconomics transforms the hitherto dominant and rigid theoretical-economic model of the *homo oeconomicus*, in which all decisions are made completely rationally (Gillenkirch, et al., 2018), into the new model of the *homo vivens* by illuminating the importance of emotions and feelings in the decision-making process. Ultimately, the goal of neuroeconomics is to explore the background of these phenomena and to apply the findings in the context of issues of classical economic disciplines, and thus to contribute to the optimization of existing processes. Due to the resulting multiple applications of neuroeconomics, it can be divided into different application-oriented subdisciplines such as neurofinance, neuroleadership or neuromarketing. (Raab, et al., 2009, p. 4)

### **2.3 Neuromarketing**

Hence, neuromarketing deals with the application of research results of neuroeconomics in traditional marketing. According to the *American Marketing Association* (AMA), marketing comprises “the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large”. (Jaworski, et al., 2017) In neuromarketing, the insights gained by using instrumental brain research methods for market research purposes are integrated into marketing theory and practice in order to acquire a better understanding of the consumer's brain. This enables companies to adjust their own products and services more effectively to the consumer behavior and brand perception of potential customers and thereby encourage them to purchase. (Häusel, 2012, pp. 13-14)

The *Neuromarketing Science & Business Association* (NMSBA) pursues a more scientific and research-oriented approach and defines neuromarketing as brain research “to reveal subconscious consumer decision-making processes. Neuromarketers study brain- and biometric responses, as well as behavior, to understand and shape how consumers feel, think and act” (Neuromarketing Science and Business Association, n.d.) and the neuromarketing research as “systematic collection and interpretation of neurological and neurophysiological insights about individuals using different protocols allowing researchers to explore non-

verbal and physiological responses to various stimuli for the purposes of market research.” (Neuromarketing Science and Business Association, n.d.)

This discrepancy shows the lack of a uniform definition of neuromarketing and, depending on the perspective, that this area is assigned either to marketing or to neuroscience. However, the consensus is that neuromarketing should not be seen as a revolution that tears down existing concepts. Rather, this branch should be understood as a new perspective and verification process that develops existing concepts by using scientific methods. (Gentner, 2012, p. 6) Even if research makes it possible to better understand the background of the customer's decision-making process, this development will not lead to transparent consumers as frequently feared. It is also proven that the existence of a universal buy button is not possible due to the complexity of the brain and individual experiences and preferences. Nevertheless, there are many small buy buttons, a thousand small levers and pressure points that help to anchor one's own brand in the consumer's mind. (Häusel, 2012, p. 18)

Corresponding tests and studies were able to identify various buy bottoms and implement the findings in the economy. Due to its proven effectiveness, neuromarketing experienced a real surge in popularity in the new millennium. If the Google search in 2001 did not yield a single hit with regard to the term “neuromarketing”, in 2012 there were about 400,000 result and today, 11<sup>th</sup> April 2020, this number has risen to 4,230,000 (Google, 2020). This shows the enormous interest in this new branch of research, especially in the field of brand management. (Häusel, 2012, p. 12)

## **2.4 Brands and brand management**

According to AMA, a brand is “a name, term, design, symbol or any other feature that identifies one seller's good or service as distinct from those of other sellers” and “an intangible asset that is intended to create distinctive images and associations in the minds of stakeholders, thereby generating economic benefit/values”. (Jaworski, et al., 2017) According to *Alina Wheeler*, brands have three main functions: navigation, reassurance and engagement. Brands help consumers to choose from a variety of options, communicate the quality of the product or service, and use distinctive images, language and associations to promote customer identification with the brand. (Wheeler, 2018, p. 2)

The task of brand management is to manage and optimize the values of the brand and thus increase the perceived value of a product line or brand over time. Effective brand management allows you to increase the price of products and to build loyal customers

through positive brand associations and brand images or a strong brand awareness. (Grant, 2019) Accordingly, brand management is expected to create preferences for the company's offering, thereby differentiating it from competing products. This requires the development of a strategic plan and a comprehensive understanding of the brand, the target market and the overall vision of the company. (Burmans, et al., 2017, p. 3)

Brand managers are now facing the problems of interchangeability and stimulus satiation. The general quality and design of comparable products is getting very close and makes product differentiation increasingly difficult. Accordingly, *Stiftung Warentest* rated 85% of the products sold in Germany as *good*. In addition, consumers are exposed to an average of more than 3000 advertisements per day, with 95% of the advertising being perceived unconsciously. (Scheier & Held, 2018, p. 19)

**Table 1: Human capacity of conscious information processing (Scheier & Held, 2006, p. 47)**

Sensory organ	Sensory Bandwidth (bits per second)	Bandwidth of consciousness (bits per second)	Ratio (in %)
Eye	10.000.000	40	0.000004
Ear	100.000	30	0.0003
Skin	1.000.000	5	0.000005

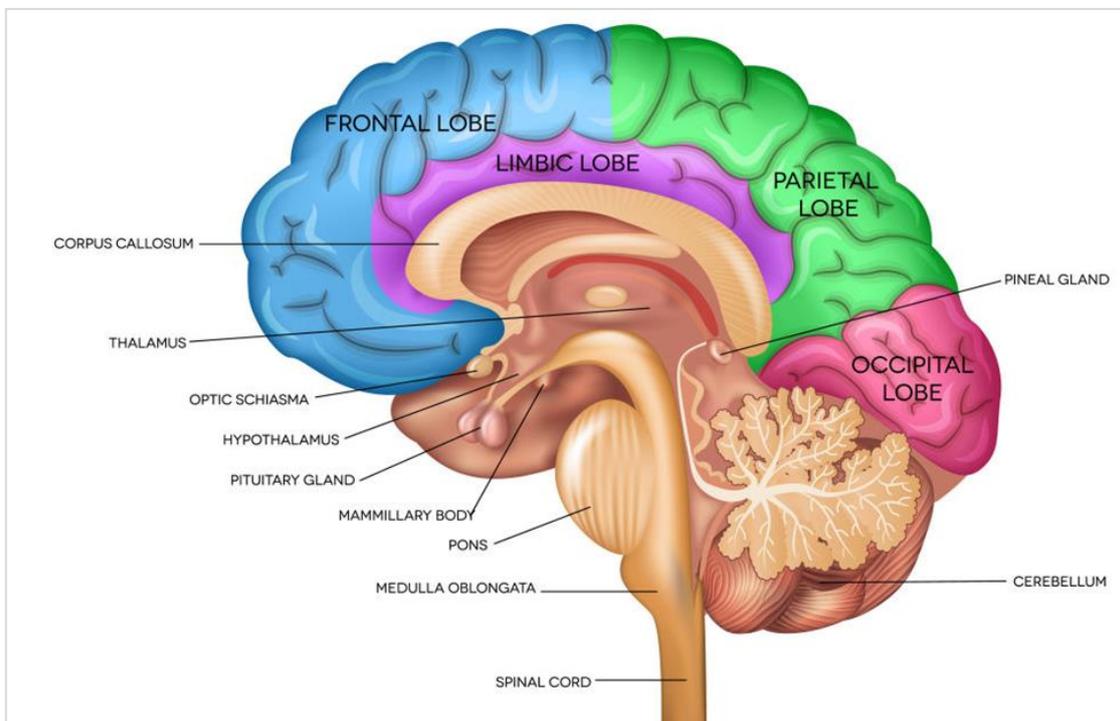
In general, as shown in *Table 1*, we see ourselves exposed to 10,000,000 bits of visual information per second, whereby humans can consciously process only 40 bits per second, which corresponds to a ratio of 0.000004%. Against this background, brand managers are now consulting neuromarketing in order to anchor their own product in the consumer's memory and gain a competitive advantage in the face of sensory overload and growing competition. Neuromarketing, in turn, investigates which factors attract the attention of the customer so that they buy a product, how companies can convey their message subconsciously and which brain areas generally respond to the messages. (Scheier & Held, 2006, pp. 47-51)

### 3 Biological fundamentals

In order to understand and interpret the research methods and the knowledge gained, it is essential to deal with the structure and functions of the human brain. The following chapter briefly outlines the general structure of the brain in order to take a closer look at the brain areas relevant for neuromarketing in the further course.

#### 3.1 General structure of the human brain

The human brain can generally be divided into three areas - forebrain, midbrain and hindbrain - and is composed of nerve cells, neurons and glial cells. A general overview about the brain can be seen in *Figure 1*. As part of the central nervous system, its main functions are information processing, the control of emotions, learning and memory. In an average human brain, there are approximately 100 billion nerve cells, which are linked by synapses and transmit as well as process feelings, stimuli and external impressions. Each nerve cell can contain up to 15,000 synapses as contact points, which corresponds to a total of 100 trillion contact points. (Felix, 2008, p. 10)



**Figure 1: Anatomy of the brain (Taub, 2016)**

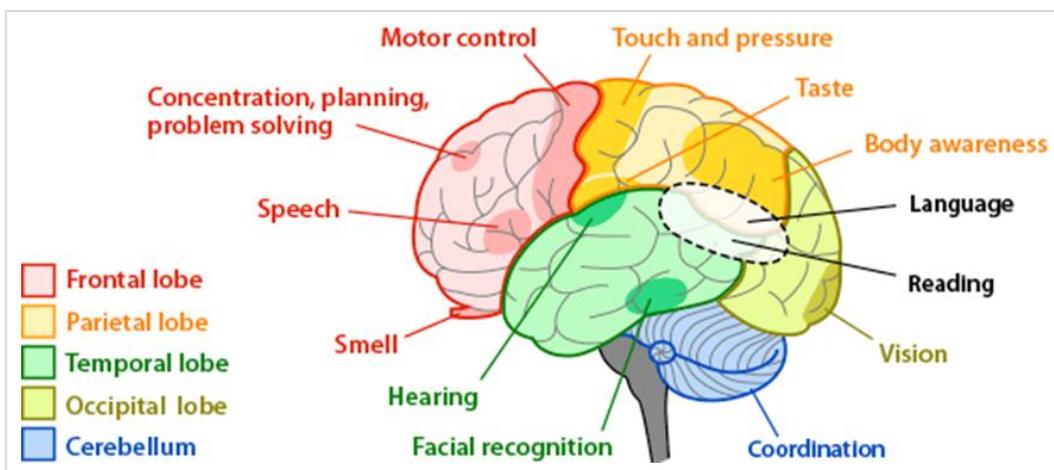
The exchange between the individual nerve cells is regulated by electrical impulses, caused by neuronal charge differences. These charge differences are caused by a redistribution of positively and negatively charged ions such as chloride, potassium and sodium. (Raab, et al., 2009, p. 48 et seq.) Neurotransmitters like dopamine, serotonin, glutamate or adrenaline play

an important role in this transmission of stimuli. Neurotransmitters act as messengers in the brain and control human emotions. (Raab, et al., 2009, p. 65 et seq.)

The brain is a highly complex structure in which all areas are interrelated and interact. As a consequence, no information processing takes place independently of other processes in the brain. (Felix, 2008, p. 10) Even though the human brain represents only 2% of the body surface, it is responsible for 20% of the energy demand. Only 20% of all brain activities are conscious, 80% are unconscious. (Roth, 2013, p. 4) This fact plays a decisive role in neuromarketing. Although almost all areas of the brain have an influence on people's decision-making, the so-called *triune brain*, consisting of the neocortex, the limbic system as well as the cerebellum and brain stem, should be highlighted. (Farley, 2008)

### 3.2 The neocortex

The neocortex, shown in *Figure 2*, is the youngest and largest part of the human brain. It accounts for about 85% of the total brain mass and can be roughly divided into 4 areas: Frontal lobe, parietal lobe, temporal lobe and occipital lobe. Of particular importance for neuromarketing is the prefrontal cortex. (Raab, et al., 2009, p. 102)



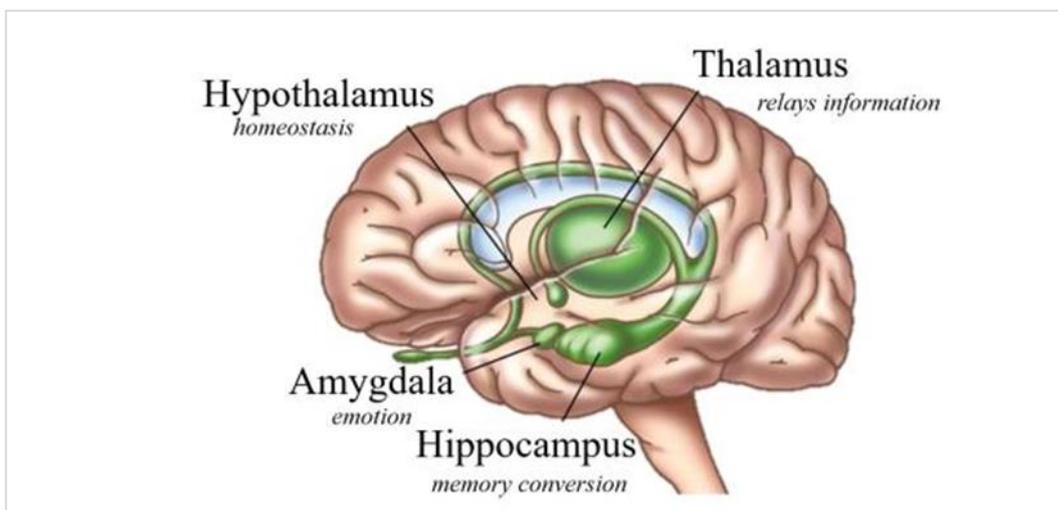
**Figure 2: The human neocortex (Szymik, 2011)**

The prefrontal cortex comprises the majority of the frontal lobe and is considered the seat of consciousness and personality. (Hundschell, 2011, pp. 14-15) It is repeatedly mentioned in connection with life experience, consequences, attention, reflection, decision and planning, and acts as the director of the brain and as the interface between the will and the translation of the will into concrete action. (Häusel, 2012, pp. 249-250) Thus, the prefrontal cortex is the most important area of the cerebrum when it comes to making purchasing decisions. The areas behind the frontal lobe, the premotor cortex and the motor cortex, translate the decisions into concrete actions. (Häusel, 2012, pp. 245-247) The other functional units of

the neocortex, parietal lobe, temporal lobe and occipital lobe, are responsible for multisensory perception: Visual stimuli, auditory perception, skin sensations and sensations from inside the body are ultimately combined in the temporal cortex to form a holistic picture. (Bielefeld, 2012, pp. 59-61) The prefrontal cortex functions as a kind of interface that retrieves information from different areas of the brain to assess new situations. The most important information from a neuromarketing perspective is obtained from the limbic system. (Strang, 2009, pp. 26-27)

### 3.3 The limbic system

The limbic system is often described as the emotional center of the human being and is regarded as the power and decision-making center in the head. It is located partly in the cerebrum and partly in the diencephalon and plays a central role in neuromarketing. (Häusel, 2012, p. 251) It is regarded as an association system that processes information from the human environment, emotional stimuli and memories and converts them into targeted purchasing and consumption wishes. The most important areas from a neuromarketing perspective, shown in *Figure 3*, are the hypothalamus, the amygdala, the hippocampus and the nucleus accumbens. (Raab, et al., 2009, p. 170)



**Figure 3: The limbic system (Lowen, 2019)**

The hippocampus is the learning center, which links object, location and situation characteristics with emotional meaning and stores them at different locations in the neocortex and retrieves them from there when required. The amygdala is significantly involved in the emotional evaluation of objects and is an important part of all major emotional systems such as dominance, stimulus, fear or sexuality. The hypothalamus translates the evaluation of e.g. the amygdala into physical reactions by initiating the release

of neurotransmitters and hormones and is the center of vital needs (hunger, sleep, thirst, sex). (Häusel, 2012, pp. 251-252)

Although the Nucleus accumbens is not localized in the limbic system, it is also often considered to be part of it. By translating motivation and emotion into action, it is an important part of the reward system, a complex network of the prefrontal cortex and the limbic system. The nucleus accumbens and thus the reward center is activated as soon as a stimulus is classified as a pleasurable reward and causes a targeted action by the person to satisfy the need that has arisen. If the action is successful and the need is satisfied, the person experiences a feeling of reward and satisfaction through the release of the happiness hormones endorphin and dopamine in the nucleus accumbens. (Raab, et al., 2009, pp. 148-152) Since the observation of its activity provides conclusions about the circumstances under which the human reward system is activated, the nucleus accumbens is a very interesting research object in neuromarketing.

### **3.4 The brain stem and cerebellum**

The brain stem, along with the cerebellum is also known as the reptilian brain and is the oldest part of the human brain. It consists of the midbrain, the pons and the medulla oblongata. (Jackson, 2008, pp. 6-7)

The brain stem connects and processes incoming sensory impressions and outgoing motor information and is also responsible for elementary and reflex-like control mechanisms, e.g. eyelid closure, swallowing, or coughing reflex. The nerve pathways of the two halves of the body cross in the hindbrain, where many automatic processes such as heartbeat, breathing, metabolism or sleep rhythm are controlled. The function of the brain stem is accordingly the control of the vital, instinctive systems of the body such as breathing, heartbeat, food intake, escape. (Raab, et al., 2009, pp. 96-98)

The cerebellum accounts for about 10% of the total brain mass and is responsible for the control of motor function, balance, movements and their coordination. In addition to automated movement sequences, the cerebellum is also attributed a function in unconscious learning. The reptilian brain ensures our survival and instinctively makes the final decisions. This part of the brain therefore judges complicated correlations negatively. Neuroscientists are mainly interested in the unconsciously induced actions of the brain stem and cerebellum in response to products and services, which are therefore investigated using a wide variety of research methods. (Raab, et al., 2009, pp. 97-98)

## **4 Research methods in neuromarketing**

Nowadays, brain research can distinguish between various technical methods which make it possible to investigate unconscious behavior and to graphically display the emotional activities of individual nerve cells as well as the brain as a whole. (Pispers & Dabrowski, 2011, p. 61) In the following, some of the measurement methods commonly used in neuromarketing are briefly introduced. A distinction is made between methods based on brain activity, the imaging and electrophysiological methods, and the implicit methods, which do not directly measure brain activity.

### **4.1 Electrophysiological and imaging methods**

Imaging methods are diagnostic procedures that provide two- or three-dimensional images of functional brain structures by measuring neuronal metabolic processes. The most important imaging methods in neuromarketing, also known as “neuroimaging” (Pritzel, et al., 2003, pp. 117-118), are positron emission tomography (PET) and functional magnetic resonance imaging (fMRI). Electrophysiological methods, on the other hand, measure electrical brain activity and represent it in the form of curves and waves, which is why these methods are also referred to as “neuromonitoring” (Pritzel, et al., 2003, pp. 111-112). The most important electrophysiological methods are electroencephalography (EEG) and magnetoencephalography (MEG). (Felix, 2008, pp. 46-50)

#### **4.1.1 Electroencephalography**

The EEG uses surface electrodes on the skullcap to record voltage fluctuations on the head surface in order to measure summed electrical activity of the brain. Depending on where in the brain the neurons are located, the potentials of these neurons add up, so that potential changes can be visualized on the entire head. The advantage of this investigation is the temporal accuracy and the associated measurability of neuronal activity. (Nufer & Wallmeier, 2010, p. 8) The disadvantage is an insufficient spatial resolution and localization of the activities. (Felix, 2008, p. 48)

#### **4.1.2 Magnetoencephalography**

Inside the neurons there are electrical processes that produce a so-called biomagnetism. The MEG can be used to measure and localize these magnetic activities. The changes in the magnetic fields, which run parallel to the brain surface, can thus be displayed spatially deep

and very accurately. This method provides a good overview of the temporal structure of the activities and chemical processes in the neocortex. When performing a MEG examination, it should be noted that any muscular activity, such as eye movement, generates a relatively large magnetic signal that can influence the result. (Raab, et al., 2009, pp. 182-183)

#### **4.1.3 Positron emission tomography**

In PET, the test person is injected with a weakly radioactive contrast medium which is transported to the brain via the bloodstream. Here it accumulates in brain regions with particularly active metabolism. Meanwhile, the test person lies in a PET scanner, which records the areas with increased activity and displays them three-dimensionally on a computer. This procedure provides a very high spatial resolution and localization of relevant brain areas but is the most cost-intensive method and may be harmful to health due to the low radiation exposure. Thus, this method is rarely used in marketing practice. (Felix, 2008, p. 54)

#### **4.1.4 Functional magnetic resonance imaging**

As with PET, the basis of fMRI is the regional change in blood flow in the brain. For this method, test persons are placed in a magnetic resonance tomograph in which they are shown visual stimuli. If a brain area is activated, it requires more oxygen and glucose at this point and the red blood cells supply the oxygen there. This leads to a disturbance of the biological magnetic field at the corresponding location, which is related to the different magnetic charges of oxygen-poor and oxygen-rich blood. A computer converts the received measured values into a spatial image. This enables neuroscientists to identify the areas of the brain that have been affected by the visual stimuli and the corresponding intensity of activation. The fMRI is the most popular method in neuromarketing as it provides a very accurate representation of brain activity and has no harmful side effects. Disadvantages are high costs and the fact that external stimuli always activate several brain regions whose interaction has not yet been fully clarified, which can lead to misinterpretations. (Felix, 2008, pp. 52-53)

## **4.2 Implicit procedures**

In recent years, implicit methods of market research such as eye-tracking or electrodermal activity (EDA) have also gained increasing importance. This research approach focuses on the unconscious influences on the decision-making processes of humans (Nufer & Wallmeier, 2010, p. 26) and does not observe brain activity, but rather measures emotional

and motor responses to an external stimulus. Due to their relatively low cost, both methods are frequently used in economics and provide indications regarding attention, focus and emotional excitement of the proband. However, they do not provide information about the activated brain areas and the related reason for the reaction shown. (Pispers, et al., 2018, pp. 69-78)

#### **4.2.1 Electrodermal activity**

EDA is a method for measuring the activation of the autonomic nervous system. If it is activated by external stimuli, the autonomic nervous system produces more perspiration, which has an influence on skin conductivity. EDA measures the fluctuations of the conductivity with electrodes attached to the hand and is a good indicator of emotional fluctuation. (Pispers, et al., 2018, pp. 69-72)

#### **4.2.2 Eye-tracking**

Eye-tracking uses technical instruments to record the eye movement of a test person and thus tests the focus and shift of attention. Not only the eye movements are measured, but also the change in pupil diameter, which provides information about how interesting visual stimuli are for the test person. This method is often used in the design of products and websites. (Pispers, et al., 2018, pp. 76-78)

## 5 Neuroscientific insights

In the previous chapters, the biological fundamentals and research methods were examined, and it was illustrated that all decisions are influenced by emotions. All information converges in the brain and the newly received stimuli are linked to already existing emotional information and processed further. In the following chapter, the insights gained through neuroscientific research are transformed into economic concepts.

### 5.1 Motive and emotion systems

In brand management, it is essential for companies to know precisely their target group and their needs in order to guarantee a targeted sale of their own products. According to neuroscientific findings, the motivational and emotional systems of the human brain have a decisive influence on the needs and related purchasing decisions of consumers (Strang, 2009, p. 49 et seq.). The terms *motive* and *emotion* are closely linked but cannot be used synonymously. While emotions represent reactions to certain stimuli from a neuroscientific perspective, motives describe the concrete implementation of the emotion systems in daily life (Häusel, 2016, p. 37). Emotion systems thus define the behavioral, evaluation and goal frameworks of people, while motive systems concretize the orientation of space, time and objects. In interaction, the two systems significantly shape the human personality, making them of central importance in target group segmentation and the analysis of the relevance of brands and products within the respective audiences. (Häusel, 2012, p. 76)

Based on the *Zurich Model of Social Motivation*, in which the German psychologist *Norbert Bischof* identifies three basic systems in humans - the striving for security and safety (security system), the striving for variety and novelty (excitement system) and the striving for independence and assertiveness (autonomy system) (Scheier & Held, 2012, pp. 107-110) - the German psychologist and neuromarketing expert *Dr. Hans-Georg Häusel* develops the concept *The Big 3* by adding emotions and influences from neuromarketing. At the center of all motivational and emotional systems are physiological vital needs such as food, sleep and breathing. In addition, there are three major motivational and emotional systems: the balance system, the stimulant system and the dominance system, each supplemented by respective emotional sub-modules. Depending on the characteristics of the individual modules, consumers are more or less accessible to certain products. (Häusel, 2012, pp. 77-78)

### **5.1.1 The Balance system**

The Balance system has the greatest influence on human actions and regulates the needs for harmony, balance, stability and security. In order to get by with as little energy as possible, the Balance system prefers to fall back on decisions which have already been made in the past and which have been connected to positive emotions in memory. The resulting situation of perceived security rewards the person with a feeling of safety and avoids the opposing feelings of insecurity and fear. The Balance System is complemented by the two sub-modules *Bonding* and *Care*. The primary goal of the bonding module and the care module is to ensure the survival of the offspring. The bonding module is particularly important for babies who cannot ensure their own survival and react accordingly with crying and fear when their bonding person, often the mother, is not within reach. The care module, on the other hand, provides a double safeguard by releasing the hormone estrogen, is particularly active with mothers and reacts very sensitively to the crying of the offspring or the needs of pets. Products and industries that particularly appeal to these emotion and motivational systems include insurance companies, pharmaceuticals, alarm systems, doctors or baby and pet food. (Häusel, 2016, pp. 40-43)

### **5.1.2 The Stimulant system**

The Stimulant system regulates the desire for new, unknown stimuli and experiences, such as foreign food, holiday trips or unusual activities. It awakens the need to discover and explore one's environment and to stand out from the crowd. By releasing the neurotransmitters endorphin and dopamine, the customer experiences the fulfilment of these wishes as fun and excitement, the non-fulfilment as boredom. Mankind owes its new inventions and trends to researchers who were driven by the stimulant system and the curiosity associated with it. This system is complemented by the sub-module *Game*, which is particularly active with children, as they develop their mental and motor skills through play. Brands and products that appeal to the stimulation system can be found in all areas of entertainment, such as cinema, culture, television and concerts, but also in the travel industry, gastronomy, as well as with toys, gaming, stimulants and gambling. (Häusel, 2016, pp. 43-44)

### **5.1.3 The Dominance system**

The last of the three systems, the Dominance system, makes people strive for power, superiority, success, autonomy, status and control. From an evolutionary point of view, it

drives people to surpass their competitors in the fight for resources and sexual partners, to pass on their own genes to the next generation and to expand their own territory. By the fulfilment of its orders humans experience pride, a feeling of victory and superiority, when not being fulfilled they react with anger, rage and inner restlessness. Thus, the system of dominance functions as a motor of progress, since the inner drive of success and power fuels interpersonal competition, the result of which are innovations such as electricity, cars or antibiotics. Associated sub-modules are the *Hunting* module and the *Tussling* module. Both modules have a playful as well as an aggressive component, whereby the hunting module is more active with adults, especially during actual hunting, fishing or shopping, and the tussling module is more active with boys, who train their physical and fighting skills in a playful way by tussling. By releasing the hormone testosterone and the neurotransmitters dopamine and adrenaline, these modules regulate human behavior. Brands and products that stimulate the dominance system are mainly status symbols, elite events, sports competitions and sporting events as well as products, systems and services that increase one's own strength, speed, performance and efficiency, such as sports equipment, performance-enhancing preparations or cars. (Häusel, 2016, pp. 45-47)

#### **5.1.4 Sexuality**

The emotional and motivational system of sexuality holds a special position and is of similar importance for brand management as the Big 3. According to Häusel, during evolution sexuality has integrated into the three existing systems and thus plays a major role in all systems. The sexuality system is mainly driven by the sex hormones estrogen and testosterone. Due to the unequal distribution of the concentration of these hormones in men and women, female sexuality is more likely to be assigned to the balance system and male sexuality more to the dominance system, which has been shown to have an effect on the differentiated consumer behavior of both sexes. In the balance system, the sexuality module contributes to partner bonding, while in the dominance system it provides the impetus for the displacement of other potential competitors with regard to the sexual partner. Both sexes have the same sexuality in the stimulus system, which makes the sexual act fun and strengthens the attention towards the partner. Accordingly, sexuality also occupies a central place in his presentation of the Limbic® Map. (Häusel, 2016, pp. 47-48)



### 5.1.6 Limbic® Types

Assuming that the personality of the consumer consists of a mix of different strengths of the Big 3 and its sub-modules, then a large number of different customer types, the so-called Limbic® Types, result (Häusel, 2012, pp. 86-87). According to Häusel, a distinction is made between the following types:

- **Harmonizer:** The supremacy of the Balance system coupled with a stronger emphasis on the care and bonding system. Characterized by low ascent and status orientation. Home and family are of high importance, therefore products for family and home are in the focus of consumption.
- **Connoisseurs:** slight supremacy of the Stimulant system and, as a result, a positive attitude to life and prioritization of known and new pleasures and experiences. Due to an additionally relatively high Balance proportion, attention is paid to the quality and origin of the products.
- **Hedonist:** Supremacy of the Stimulant system, therefore always looking for something new. Characterized by high individualism and high spontaneity. Quality plays a minor role; products should be much more extraordinary and novel.
- **Adventurer:** Supremacy of the Stimulus system, but with a combative component due to the Dominance system. Characterized by a high willingness to take risks and low impulse control. Consumption is all about fun and excitement, the products must be liberating or performance-enhancing.
- **Performer:** Supremacy of the Dominance system. Characterized by high performance orientation and ambition, prioritizes products that promise high quality and perfection and are regarded as status symbols.
- **Disciplined:** High influence of the Dominance system combined with a rather pessimistic attitude due to the Balance system. Characterized by a high sense of duty and low consumerism, only that which is really needed is bought. Quality and guarantee aspects play a major role, but thriftiness is also one of the highest virtues.
- **Traditionalist:** Supremacy of the Balance system, therefore somewhat fearful and cautious of new things. Characterized by a low future orientation and a strong desire

for order and security. Checks everything very carefully and has relatively rigid consumer habits, brands have a security and trust function.

The typification of customer target groups allows brand managers to formulate specific strategy recommendations for marketing communication and to analyze the target group before the launch as well as to adapt the products to it. The Limbic® Map and the Limbic® Types thus offer marketing managers a unified platform for identifying emotions, motives and values. This platform can be used to structure markets, formulate target groups and improve TV spots, packaging and advertising copy. Furthermore, the Limbic® Map and the Limbic® Types enable analysts to position products on the map based on their presentation, communication and advertising and to identify target customers. From the brand manager's perspective, it is important to define their target group and to market the products according to their needs and preferred values. It is possible to activate the consumers' emotional and motivational systems in a targeted manner and to induce them unconsciously to make a purchase. (Häusel, 2012, p. 94)

## **5.2 The influence of the unconscious on human action**

As already mentioned in 2.4 Brands and brand management, a large part of the recordings of external stimuli are made in the unconscious. According to this, a person can only consciously perceive less than 1% of all stimuli affecting him. Most decisions and human thought processes also take place subconsciously. If people are asked after their purchase why they have decided for that product, each respondent would have an explanation and would claim that they have consciously decided for the product (Nufer & Wallmeier, 2010, p. 14). In reality, however, 95% of all human decisions are made unconsciously while only 5% are conscious. (Raab, et al., 2009, p. 17)

### **5.2.1 Pilot and autopilot**

In neuromarketing, two systems have become established in connection with decision-making and behavior: the implicit system of the autopilot, which represents the subconscious, and the explicit system of the pilot, which represents the consciousness. The five senses provide people with up to 11 million bits of information every second, but they are only able to consciously process 40 bits. The pilot processes the conscious 40 bits while the autopilot processes the remaining unconscious 10,999,960 bits (Felix, 2008, p. 2). The autopilot works highly efficiently and subconsciously processes emotions, cognitive

processes, automatism and brand associations. All the complicated processes that have to be reflected, analyzed and calculated, however, are handled by the pilot. When processing the stimuli, the two systems use different neural structures and can thus gain and store different impressions of products and brands (Häusel, 2012, pp. 104-106). To save energy, the brain tries to automate as many processes as possible, since the implicit system uses less energy. Therefore, most decisions are made subconsciously. If a brand or a product is linked to positive experiences, the autopilot always tends towards them. (Felix, 2008, pp. 19-20)

### **5.2.2 Priming and framing effect**

The priming and framing effects deal with the effect of unconscious influence. The body reacts to implicit, subtle signals and makes people do things that they would otherwise not have done or would have done differently. Priming describes the triggering of behavioral programs based on the unconscious activation of associations in our memory by subtle stimuli. These findings indicate that subliminal perception has a greater influence on behavior than people are aware of. It is shown that people are controlled by implicit and subtle signals while they are unaware of them. A factor that is mainly used in Marketing & Sales. For example, supermarkets can specifically increase sales of certain products by playing particular background music or by adding fragrances to the ventilation system. (Raab, et al., 2009, pp. 223-224)

The framing effect implies that consumers' decisions depend heavily on the decision-making framework and the presentation of the basis for the decision. This means that people are unconsciously influenced by external circumstances and do not react rationally. Customers tend to prefer the dairy product which is 80% fat free according to the label compared to the 20% fat product although both products have the same fat content. Customers also prefer more expensive products with a discount label, even if there are cheaper alternatives at a regular price. (Raab, et al., 2009, pp. 224-225)

### **5.2.3 Mirror neurons**

Mirror neurons form the neurobiological basis for intuitive perception and understanding and are special cells in the brain that allow people to feel, simulate or actually experience an observed situation themselves. Accordingly, mirror neurons make it possible to perceive what other people feel by a spontaneous inner simulation. The process mediated that way runs automatically and unconsciously and, due to the efficiency of the mirror neurons, works even with minimal attention. If, for example, a sip of cold water is drunk in an advertisement,

the same brain areas are activated in the viewer that are activated when drinking. As a result, the viewer feels the sensation of freshness or senses thirst. For brand managers, it is therefore crucial to stage the products in such a way that customers can experience what happens. This requires above all the use of so-called codes. (Scheier & Held, 2012, pp. 49-50)

### **5.3 Codes - the four entrances to the consumer**

The storage or encoding of memories are inseparably linked to their retrievability. During the encoding process, everything we see, hear, smell, taste or touch is transferred to our brain cells as engrams. The resulting traces left in the brain by the imprint of a stimulus or an experience enable them to be reproduced at a later time. How an absorbed stimulus is encoded depends on the context in which we remember it. (Zaltman, 2003, p. 174)

In order to achieve long-term storage of product information by consumers, not only unique product features are required, but above all the emotional bond of the customer. For this purpose, four codes, specific carriers of meaning in communication, are used, which act as carriers of explicit or implicit messages (Gentner, 2012, p. 21):

- Language: Words, names, associations
- Story: Episodes, stories
- Symbols: Faces, protagonists, brand symbols, locations
- Sensorics: Colors, shapes, sounds, haptics, lighting and scents

These codes are considered to be the real drivers of sales, as they are automatically processed by the autopilot, creating associations that can be called up at the point of sale. Thus, they create a bridge between product and customer and close the gap between strategy and execution in brand communication. (Scheier & Held, 2012, p. 173)

#### **5.3.1 Language**

Linguistically, a company can reach the customer through the spoken word or the written form. Language can convey messages explicitly, i.e. through the meaning of the words, or implicitly, i.e. through diction, rhythm, national language and the sound of the voice. Different letters subconsciously convey different associations through their sound. In linguistic usage the letters M, L and U sound smooth and gentle, while K, T and E sound

phonetically sharp and hard. Accordingly, brand managers have to consider whether the chosen name corresponds to the desired product characteristics and whether the information triggered by the sound corresponds to the product positioning. (Raab, et al., 2009, pp. 238-240) Furthermore, words with an exclamation mark activate the limbic system more strongly and are perceived by more concise consumers. The same applies to short and hard words like *Sale* or *Cash Back*. In particular, the unconscious autopilot in the brain reacts to implicit meanings of the linguistic codes, whereby purchase decisions are made more quickly for products that match the respective situation of the customers. Further examples of linguistic codes are dialogues in a TV spot, sentence structure, slogans, proclaimed keywords or the use of technical terms. (Scheier & Held, 2012, pp. 77-78)

### 5.3.2 Story

Another code to address customers are stories. The human brain thinks in patterns and metaphors. Thoughts are metaphors and often present experiences made in the past. Stories also consist of memories that are stored in episodic memory and are often expressed in metaphors. Stories work explicitly and implicitly, through the culturally learned, often archetypal meanings they convey, and which trigger certain emotions in the brain. Common motives include birth, love, rivalries, loneliness, death and respective characters. (Raab, et al., 2009, pp. 240-242)

In application, this is often referred to as storytelling. The basic idea is to convey a message to the consumer about certain aspects of the product in a predetermined framework, whether it is the tradition of the company or the outstanding quality of the product. (Nufer & Wallmeier, 2010, p. 23) Simplified, each good story has a reason for being told and a hero who sets out on an adventure, then encounters resistance and, in most cases, finally overcomes it. By accompanying the hero on his way, emotions are aroused in the consumer, which are linked in the brain with the advertised brand. (Sammer, 2014, pp. 46-47) The story should be structured as simply as possible, as the brain wants to work with a minimum of energy and therefore remembers simple stories better than complex ones. Of great importance in storytelling are the mirror neurons, see chapter 5.2.3, which enable the consumer to experience the story and empathize with the hero. The emotional bond created can be further strengthened by integrating recurring symbols that can be assigned to the brand within the story. (Nufer & Wallmeier, 2010, p. 23)

### 5.3.3 Symbolism

Symbols give a story a special impact, but conversely, a symbol or archetype can also tell a story and be encoded as patterns in the consumer's brain. Like the code *Story*, the code *Symbolism* transports implicit and culturally learned meanings in a particularly efficient way. Symbols can activate immediate behavioral programs in the autopilot particularly quickly. This results in an automatic reaction to the symbol. A prerequisite for this, however, is that the meaning of the symbol has been learned, as this is the only way to communicate directly with the autopilot without switching on the pilot. (Raab, et al., 2009, p. 242) Symbols can take many forms, such as the brand logo, the shape of the product packaging (e.g. the typical Coca-Cola bottle) or recurring protagonists and signs in advertising (e.g. bulls and wings by Red Bull or the bitten-in apple by Apple), but also discount signs. (Scheier & Held, 2012, pp. 85-86)

### 5.3.4 Sensory

The sensory code includes all human senses: seeing, hearing, smelling, tasting, feeling, touching. Significance carriers that convey a sensory experience in communication are forms, colors, lighting conditions, scents, sounds, taste, typography and haptics. If several senses are addressed simultaneously and the meaning of this multi-sensory pattern is coherent, the effect in the brain is potentiated and the message achieves a stronger effect. Patterns are created in the brain, linked by the autopilot to the triggering brand, which nevertheless associate an overall picture with individual sensory aspects of the brand in future contacts. (Scheier & Held, 2012, pp. 86-90)

Typical sensory impressions in advertising are conveyed, for example, by the fizzing sound of an opened beer bottle or the bite into a crisp apple. The design of the sensory impressions appeals to different types of consumers; it usually has an implicit effect and can thus have a manipulative influence. The use of sensory codes has become increasingly important in recent years. Special noise, smell, taste, sound and haptic designers have become common job profiles in marketing. It should be noted that different sensory elements of consumers are associated with different meanings. For example, colors trigger different associations as blue has a calming effect and associates wisdom, while red has a stimulating effect and conveys aggressiveness. Within the codes and when combining the individual codes, it is important to ensure that the same meaning is conveyed via all message carriers in order to achieve a maximum effect. This is also called *Multisensory Enhancement*. (Raab, et al., 2009, pp. 243-244)

### 5.3.5 Brand Code-Management™

Based on these findings, the German neuromarketing experts *Dr. Christian Scheier* and *Dr. Dirk Held* derived the management process *Brand Code-Management™*. This approach to brand communication transfers the theory of neuromarketing into marketing practice and is a method for the systematic control of all brand contact points, as well as for the direct implementation of the brand strategy in codes and brand experiences that are perceptible to the target group. (Scheier & Held, 2012, pp. 173-174)

The method consists of a three-step process, although the individual steps can also be carried out autonomously:

- **Product audit:** includes a motive analysis, a product analysis and a competition analysis. The aim is to define the motives applied in the product, to know the motives of the competitive products for comparison and to determine the product's compatibility with the motives. (Scheier & Held, 2012, pp. 177-181)
- **Brand audit:** consists of an analysis of the motive profile for the brand and a code analysis. The result: codes that set contrasts. Thereafter, the motives are differentiated as well as contrasted and suitable brand contact points are analyzed. (Scheier & Held, 2012, pp. 182-189)
- **Competition audit:** examines the competitors' codes and the implicit self-perception of the competitors and tries to address weaknesses or gaps. (Scheier & Held, 2012, pp. 190-196)

This approach is characterized by the particular focus on the implicit effect of the codes. In brand management, these can be used to define the target group of a brand more precisely, to identify relevant codes for it and to implement a successful implementation. The result is an increased and more positive brand perception. (Scheier & Held, 2012, pp. 173-196)

## 5.4 Brand perception

From a neuroscientific perspective, brands are neuronal networks in which emotional worlds are linked to product characteristics and they occupy clear emotional fields on the Limbic® Map. Strong brands always have emotional attachment points, stand out from their competitors and thus secure the attention of the consumer. They act as a frame of reference and meaning for a product. Strong brands create two effects in the brain: Firstly, they provide

cortical relief, i.e. they activate fewer brain areas, which reduces the brain's workload, giving a consumer's favorite brand a competitive advantage. Secondly, in neuronal brand ranking only the first place and the rest of it exists. This *Winner-takes-it-all-Effect* indicates that the effect of *Cortical Relief* only occurs for the favorite brand and the gap between the second preferred brand and the remaining positions were lower than between first position and second position. (Raab, et al., 2009, pp. 281-282)

A strong brand activates the Balance system by conveying security. The implicit control has an even stronger effect when the customer is under stress or is uncertain in his buying decision. The autopilot connects the brand and thus the product to positive experiences, motives and emotions. This minimizes the risk of buying the wrong thing and activates the brain areas connected to the reward center. As a result, the more rewarding emotions such as pleasure (Stimulant system), security (Balance system) or superiority (Dominance system) a brand triggers, the greater its appeal to the consumer. Strong, neural brand networks are created primarily through permanent repetition of the brand message. (Häusel, 2016, pp. 182-186)

Therefore, brand management should prioritize keeping the identity of a brand consistent over the years and address the wishes and needs of the consumer across all four codes in connection with the planned explicit and implicit message. The more often and in a more focused way the consumer's needs and thus motivational systems are stimulated via different channels, the faster the brand code is retrieved in the brain. (Häusel, 2016, pp. 187-188)

In the further course of this thesis, the neuroscientific findings discussed in this chapter will be examined in a short case study within a practical application on the basis of selected German beer brands. Afterwards, by conducting a survey, insights into the needs and perception of potential consumers of these brands will be gained. The resulting duality from the perspective of the companies and the customers allows a comprehensive insight into brand management and provides conclusions for the strategic implementation.

## 6 Empirical studies on brand perception

In the framework of this bachelor's thesis, an empirical study of brand perception in the customer's mind as well as brand positioning was conducted. One of the aims of the study was to examine whether the theoretical aspects gained in the course of this thesis are also reflected in practice or can be confirmed by an empirical study. Since the technical possibilities are limited and no direct access to the research methods of cognitive neurobiology mentioned in chapter 4 was available, the classical methods of market research were used. In particular, a qualitative case study on the brand positioning of four different beer brands on the highly competitive German beer market was carried out, followed by a quantitative survey on the above-mentioned issues of brand perception and brand positioning. The survey can be divided into two parts and can be found in the appendix of this bachelor's thesis. The first part deals with the examination of the theoretical concepts and the second part with the brand perception of the beer brands examined in the case study.

### 6.1 Case study

The aim of the brief case study was to determine the possibilities for different brands of similar products to be marketed and positioned in the minds of consumers. The beer industry in Germany was chosen as illustrative material.

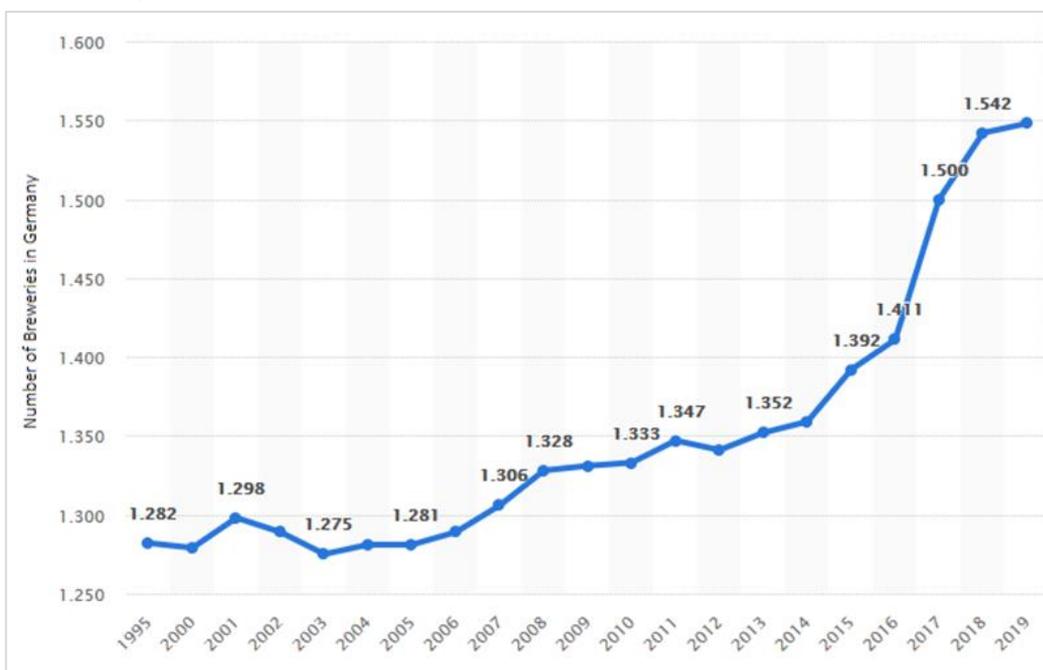


Figure 5: Number of breweries in Germany until 2019 (Henrich, 2020)

As can be seen in *Figure 5*, the number of breweries in Germany continues to rise, reaching a preliminary peak in 2019 with 1,542 breweries. Accordingly, the breweries are facing a

high level of competitive pressure in terms of selling their products, which makes skilled brand positioning crucial. In addition, the product - beer - was another decisive factor in the industry's choice. Beer is a readily comparable product with similar production processes and production costs for all breweries in a low-price segment. On the one hand, this enables breweries to compete in an equitable manner and, on the other hand, potential consumers of all income levels to afford this product.

### **6.1.1 Methodology**

To gain qualitative insights into brand positioning, commercials of four different breweries were examined. The main focus was on the implementation of the four codes observed under 5.3 and the emotion and motivation systems investigated under 5.1. When selecting the breweries, care was taken to ensure that they are regularly listed among the top 10 most popular and best-selling beer brands, in order to verify the sufficient coverage within Germany and, especially in view of the later survey, the awareness of these beer brands. In addition, it was checked that the breweries are spread over Germany in order to exclude a regional weighting on a few federal states as well as to represent the entire German area in the survey. For a representative case study of the whole of Germany it was also crucial that the breweries offered their beer throughout Germany and that the advertising spots examined were seen nationwide.

In the end, the decision was made to opt for Radeberger Exportbierbrauerei GmbH (based in Radeberg, Saxony, eastern Germany), Brauerei C.& A. Veltins GmbH & Co.KG (based in Meschede-Grevenstein, North-Rhine-Westphalia, western Germany), Brauerei Beck GmbH & Co.KG (based in Bremen, Bremen, northern Germany) and Privatbrauerei Erdinger Weißbräu GmbH (based in Erding, Bavaria, southern Germany). The selected commercials of the breweries were published within a comparable period, 2017 - 2019, are all available free of charge on *YouTube* [as of 20.03.2020] and served as a basis for determining the brand positioning and the use of the 4 codes. The main focus of the study was the use of the values of the Limbic® Map, as well as the respective use of the codes Language, Stories, Symbolism and Sensory. In addition, relevant brand-specific aspects outside of the commercials were included in the investigation in order to determine the brand positioning.

## 6.1.2 Results

In the following section, the results of the qualitative investigation by means of a case study are presented. Each of the four brands studied has been advertised in many different media for a considerable period of time, keeping its advertisements consistent. This allows the respective commercials to be considered representative of the brand and the product shown. The Brand Code Management TM approach presented in chapter 5.4.5, in particular the step "Competition Audit", was applied for the assessment. This includes the analysis of the codes and motive systems used by the competitors in the respective competition for the target customer segmentation analysis.

### 6.1.2.1 Radeberger

Radeberger Exportbierbrauerei GmbH was founded in 1872, has its headquarters in Radeberg near Dresden and is part of the Radeberger Gruppe KG, which also includes the well-known beer brands Jever and Schöfferhofer. In 2018, the Radeberger Gruppe was the undisputed market leader with 11.01 million hectoliters of beer sold in Germany (Robens, 2019). The most important product of Radeberger Exportbierbrauerei GmbH is Radeberger Pilsner. The corporate colors are gold and anthracite. (Radeberger Exportbierbrauerei GmbH, n.d.)

The commercial for the Radeberger Pilsner (Radeberger, 2017), tells the story of a little boy who is accompanied over a period of 16 years as he grows up. The story is told by a male voice. The commercial starts in black and white in the 1870s. Against this background, the protagonist of the story is introduced, the little boy, who represents the development of all Radeberger lovers since the founding of the company. The viewer follows the boy's progress with excerpts from his puberty and the associated phase of self-discovery, the first attempts at contact with the female sex, the boy's rejection, the move out of the parental home, a trip around the world and the attainment of adulthood symbolized by an interest in art, records, music and the successful contact with the female sex. In the last section, the protagonist, now aged between 30 and 40, is shown while dressed up, ordering and drinking a Radeberger in a bar, before the Radeberger Pilsener is finally shown in a glass and the accompanying beer bottle in front of Dresden's Semper Opera House.

The code *Story* mentioned above can be understood as a metaphor for the production of a Radeberger Pilsner. This fact is made clear by the code *Language* in the form of the background narrator. This code describes aspects which are appropriate for the respective

time of life of the boy or the later man, but the vocabulary used is clearly associated with beer and not with humans. As an example, the boy "must mature for 16 years and go through an elaborate refinement process and then develop his own, unmistakable taste" in order to finally be ready as a later man to consume a Radeberger, which has the claim "to be the best". Accordingly, Radeberger does not declare its Pils as just any Pils, but as "Radeberger - The Pilsner". The commercial uses a vocabulary associated with tradition, quality, pride, success and excellence.

The values of tradition, quality and excellence are also conveyed by the code *Symbolism*, on the one hand the outfits of the male bartender and the protagonist, on the other hand by the Semper Opera. At the moment the protagonist drinks a Radeberger for the first time, he wears a high-quality black suit with a black vest and the bartender wears a white vest with a black bow tie. Chic dressed people are generally associated with success, the outfits and the look of the bar convey a feeling of quality and value. The closing picture in front of the Semper Opera in Dresden, which is illuminated at night and is one of the best operas in Germany with a long tradition and has been Radeberger's distinctive image for decades. Furthermore, the Semper Opera House symbolizes Radeberger's headquarters near Dresden by its location in Dresden.

For the effect of the entire commercial, the code *Sensory* is crucial, especially the color design. Starting in black and white, the spot conveys the tradition of the company. The boy's maturing process is to be understood as a transitional phase in the spot and is presented in brighter, more vivid colors. In the final section, the spot is dominated by the colors gold, anthracite and black, which on the one hand underlines the protagonist's growing up and on the other hand conveys quality, success and value. This also reflects the corporate colors of Radeberger. The visualization and the associated typical sounds of pouring a beer awaken the viewer's desire to drink a beer by activating the mirror neurons. This impulse is linked in the consumers brain with the typical Radeberger melody, played for the first time at this moment in the commercial. This melody is linked to the melody in the brain of the potential customer.

Through the interplay of the codes, Radeberger markets its Pils as a high-quality product from a company rich in tradition, which, especially due to the absence of women in the focus of the spot, should appeal to successful men who are concerned about quality. Through the values thus highlighted, Radeberger positions itself on the Limbic® Map in the motif and emotional world of *Discipline/Control*, a hybrid of the motif worlds of *Balance* and

*Dominance* addressed by the spot. Discipline/Control is characterized by values such as quality, tradition, pride and reliability. Radeberger's main target group, according to the marketing, is likely to be the Limbic® Types *Traditionalist* and *Disciplined*, whose purchasing decisions are mainly influenced by a mix of the dominance and balance system.

### 6.1.2.2 Veltins

The Brauerei C. & A. Veltins GmbH & Co. KG was founded in 1824, has its headquarters in Meschede-Grevenstein in North-Rhine-Westphalia and is still managed by the Veltins family (Brauerei C. & A. VELTINS GmbH & Co. KG, 2020a). In 2018 Veltins positioned itself with 2.819 million hectoliters of beer sold on the 7th place among the German breweries (Robens, 2019). A special feature of the Veltins Brewery is its great commitment to regional and international sports sponsoring. Among other things, Veltins is the main sponsor of the internationally renowned German football club FC Schalke 04, which stages its home games in the Veltins Arena, and is also a sponsor of major winter sports events such as the Four Hills Tournament in ski jumping, which is held annually around New Year's Day, or the Biathlon World Team Challenge, which is held annually between Christmas and New Year's Eve in the Veltins Arena on Schalke. Veltins' main products are the Pilsner and the V+ beer mix drinks. (Brauerei C. & A. VELTINS GmbH & Co. KG, 2020b)

The TV commercial "Heartbeat" for the Veltins Pilsener (Veltins, 2019), is a compilation of four different events, showing alternating scenes of them. The events in question are a football match of FC Schalke 04, a biker trip, a rock concert and a party with a campfire at a lake. The first half of the spot is only accompanied by the sound of a heartbeat and the singing of the fans of FC Schalke 04 and mainly shows close-ups of the protagonists of the spot during the preparation of the events. The viewer accompanies the Schalke football team on their way out of the players' tunnel onto the grass, a biker adjusting his motorcycle and the drummer of a rock band right before the first beat of the concert. Symbolically introduced by a shot of the football game, the second half of the spot starts. The Veltins Arena is flown over by a drone, a bottle of Veltins Pilsner shown in close-up pops off the crown cap and the entire screen is taken up by beer swirling around. The moment the crown cap pops off, the background song, "United Passion" by DamienDamien, which was produced exclusively for this spot (Sirotzki, 2019), starts, and previously indicated events, the biker tour, the concert and the soccer game, are now shown at their peak no longer focusing the main acts, but instead the fans and the community. Towards the end of the spot, the fourth event is presented where firstly three men jump into the lake during daylight and the next moment

the party starts, a night out with friends, all between 25 and 30 years old, around a campfire, talking and toasting with Veltins Pilsner. The final scene of the spot shows a bottle of Veltins Pilsner and an off-voice replaces the song by saying "passion is what connects us - fresh Veltins".

The codes *Language* and *Story* are strongly linked in this spot. Apart from the Veltins lettering on the beer bottles shown and the football arena, the only other means of communication in literal form is the final spoken slogan and the song. The featured part of the song consists of the lyrics "We're gonna raise our glasses, we're gonna light a fire in the night, we will be shining bright". The rest of the commercial is determined by the scenes shown, accompanied by background noises such as the heartbeat, clapping and breathing. By displaying four different events, there is also no classic story. The spectator does not accompany one particular protagonist on his journey, but three independent events are shown in excerpts. Only the fourth event, the Lake Party, can be understood as a unifying story element, whereby the people come together to celebrate after spending the day on different events. This is also emphasized by song lyrics played at the climax of the respective events, which already indicate that the participants of the events will toast with their glasses around a campfire in the evening and celebrate together. According to the slogan spoken at the end, the story portrays people, almost exclusively men, sharing a passion, appreciating the sense of community and celebrating together - united by passion. By focusing the story on the main protagonists immediately before the start of the respective event in the first half of the spot, the values of fame, honor, achievement and ambition are conveyed. The focus on the fans during the event in the second half of the spot conveys the values fight, pride and passion.

These values are enhanced by the choice of events in the course of the code *Symbolism*. Football, rock bands and motorcycles are classically associated with the male sex. Accordingly, the spot shows almost exclusively men. This suggests that it is mainly men who represent the target group of the Veltins Pilsner and are particularly attracted by the vicinity of the football stadium, the rock concert or the biker tour. In addition to using the Veltins Pilsner beer bottles as a link of the TV spot to the brand, the symbols "campfire" and "lake" at the end of the spot should also symbolize the value of freedom, which is also already represented by the biker tour. The fading in of the Veltins-Arena and the soccer game additionally symbolize the commitment of Veltins in sports sponsoring and the strong connection to FC Schalke 04, as well as the location of the brewery in the region of this football club and the close connection of Veltins to this region.

The *Sensory* code is decisive for the effect of the commercial, especially the auditory perception. By enhancing the first half of the spot with heartbeats, slow breathing sounds and cheering, rhythmic clapping, the viewer is given the feeling of excitement - a feeling shared by the main acts right up to the beginning of the respective event. The audience experiences a sense of inner tension, excitement and anticipation, which reflects the honor of the acts and their ambition to perform well. This feeling dissolves with the symbolic bursting of the crown cork and releases the emotions, which are transported through the song - the feeling of passion, pride, spirit and freedom emerges. From a visual perspective, the spot focuses on darker shades and repeatedly varies the tempo of the spot by using short slow-motion sequences. The tempo variations support the focus on special moments and the associated values already mentioned, while the darker shades are related to the male target group.

Through the interplay of the codes, Veltins markets its Pilsner as a passionate event product that is intended to appeal primarily to men. Through the highlighted values, Veltins clearly positions itself on the Limbic® Map in the motif and emotion world of *Dominance*. The focus of this motif system is on competition, success, pride, honor and fame. Especially men are associated with it due to the high testosterone content and are also in the focus of the marketing of the Veltins Pilsner. Accordingly, the main target group of Veltins should be the Limbic® Types *Performer*, whose purchase decisions are mainly influenced by the dominance system and are characterized by a high performance orientation and ambition, and *Adventurer*, influenced by the dominance and stimulus system and focusing on excitement, fun and freedom.

### **6.1.2.3 Beck's**

The Brauerei Beck GmbH & Co. KG was founded in Bremen in 1873, has been a member of the Anheuser-Busch InBev Group since 2002 (Vogt, 2015) and, in addition to the German-speaking domestic market, is primarily focused on international exports. Under the brand name Beck's the brewery produces beers and mixed beer drinks. In line with its international orientation, some products are produced exclusively for respective non-German territories and in return, international beers are produced for the German market under the "Taste the World" brand. In addition to its international orientation, a further special feature of the Beck Brewery is its great commitment to festival sponsoring. Under the heading of "Beck's Festival Summer", Beck's has developed into one of the largest festival sponsors in Germany and is one of the main sponsors of the largest German festivals.

In 2018, the Anheuser-Busch InBev Group was the second most successful beer producer on the German market with 6,597 hectoliters of beer sold, with Beck's responsible for most of the turnover (Robens, 2019). Beck's corporate colors are emerald green and red. (Brauerei Beck & Co, n.d.)

As with the Veltins TV spot, the TV commercial "You make it legendary" for Beck's Pils (Beck's, 2017) is a compilation of different events, from which scenes are shown in sequence. In contrast to Veltins, however, these events cannot be exactly defined or separated, and no clear structure is evident, according to which the spot can be divided into an initial, middle and final section. The spot primarily focuses on young adults between 20 and 30 enjoying life and having fun in various activities. The activities shown include partying at a festival, various activities on and near the sea such as cliff diving, surfing or making a campfire, spending time on a closed and empty area, possibly an airport, partying into the sunset on a roof terrace or walking through a city by night. In each case groups are shown, which consist of approximately equal proportions of women and men and always hold Beck's Pils in their hands. The TV spot is accompanied by the song "Legendary" by Welshly Arms. There is no talking throughout the whole TV spot, only towards the end lyrics are inserted in different sequences: "Geh voran" (Go ahead), "Nimm's in die Hand" (Take it in your hand), "Und zeig der Welt was in dir steckt" (And show the world what you are made of). The spot ends with a slow-motion study of the process of pouring beer up close into a glass vessel and then fading in the Beck's Pils bottle against a black background and the text "Erst mit dir wird's legendär" (Only with you does it become legendary).

The code *Story* plays a subordinate role for this TV spot in the classic sense. There is neither one or more clearly defined protagonists nor a consistent storyline. Instead, the complete spot is a conglomerate of individual scenes and impressions that show unusual activities and accordingly convey adventure, freedom, youth and fun. All scenes shown take place in summer, which in turn reinforces the impression of freedom and fun. This way, the story shows potential leisure activities for young adults. The message conveyed by the story is therefore clear: consumers enjoy life with Beck's, experience extraordinary moments with friends and every day becomes legendary.

The code *Language* transports its message mainly through the written word. The chosen sentence passages convey the message to the viewer that it is up to him to become active ("Take it in hand"), to go out, ("Go ahead") to explore the world and to present himself ("And show the world what you are made of"). The slogan "Erst mit dir wird's legendär" ("Only

with you it becomes legendary") at the end can be understood as a summary of the previously inserted sentences and gives again the hint that the viewer should not sit at home but instead spend some time with friends. The chosen words associate the values freedom, friendship, adventure, spontaneity and fun. A striking feature is the use of the linguistic stylistic method of "contraction", which means that instead of " Nimm es in die Hand " the shortened form " Nimm's in die Hand " is used and instead of " Erst mit dir wird es legendär " the shortened form " Erst mit dir wird's legendär " is applied. There are two reasons for this, on the one hand this stylistic device reflects the brand name *Beck's*, where the s is also separated by an apostrophe, on the other hand it is oriented towards the youth and everyday language, in which it is common practice to draw two words together into one without changing the meaning of the words while talking. Thus, Beck's again subconsciously addresses the group of young adults shown in the spot. The lyrics of the background song are negligible, as they are in English and therefore for the most part not noticed by the viewers. Only the frequently repeated keywords "Legends", "Attention" and "legendary" are likely to be perceived by many viewers and underline the intention of the slogan and the conveyance of the values freedom, adventure and fun.

In this spot, the codes *Symbolism* and *Sensory* are strongly linked to each other and refer to the values already considered. Accordingly, a wide-angle camera is used in almost all sequences to capture the horizon. The horizon visualized this way symbolizes the freedom as well as the boundless possibilities that the world offers, and the potential adventures associated with it. These values are also conveyed by the symbol's "campfire" and "sea". In a short sequence the three-master ship, which Beck's has been using for decades, is also shown. The symbol of the three-master used, is a cultural sign for expedition and adventure. The emerald green sails pick up the company color and associate it in a manner that helps Beck's to experience the adventures. The chosen events, especially the festival, symbolize youth, summer, fun and freedom and illustrate the brewery's connection to the festival scene. The advertised product itself, the Pils, represents a further component of freedom for the activities shown, which additionally connects and brings friends together and provides a high recognition value due to the emerald green color of the bottles.

Through the interplay of the codes, Beck's markets its Pils as an adventure product for young adults that brings friends together, gives joy of life and makes every day special. Through the highlighted values, Beck's positions itself on the Limbic® Map in the motif and emotion world *Stimulant* and the mixed form *Adventure/Thrill*. These motif systems focus on the desire for new, unknown stimuli and experiences and the feeling of pleasure. The main target

group of Beck's, according to the marketing, is likely to be young adults of both sexes and the Limbic® types *Adventurer* and *Hedonist*, whose purchasing decisions are mainly influenced by the stimulant system. When it comes to consumption, fun, excitement, adventure and the extraordinary are in focus of these two types.

#### 6.1.2.4 Erdinger

Privatbrauerei Erdinger Weißbräu GmbH, headquartered in Erding, near Munich, was founded in 1886 and is the largest wheat beer brewery in the world. In 2018, the Privatbrauerei Erdinger Weißbräu sold a total of 1.358 hectoliters of beer (Robens, 2019). The most important products are Erdinger Weißbier and Erdinger Alkoholfrei. In recent years, Erdinger has marketed almost exclusively Erdinger Alkoholfrei on TV throughout Germany, which is available in various flavors, thus becoming the market leader in Germany in the non-alcoholic beer segment (Erdinger Weißbräu, 2020a). For marketing, Erdinger works primarily with well-known biathlon and triathlon athletes and is involved in sponsoring the biathlon and triathlon world cups. (Erdinger Weißbräu, 2020b)

The current Erdinger Alkoholfrei TV spot "Für dich" (Erdinger, 2017) was published in 2017. The main protagonist is a woman between 30 and 40, whom the viewer accompanies during her daily life in short, changing sequences. The motifs "training" and "leisure time" are alternated again and again. The shown sport sequences encompass a man during swimming training, two men during cycling training in a mountainous and forested landscape and the main protagonist while jogging out of a city park. All the athletes wear sports outfits in the typical Erdinger Alkoholfrei blue shades. The leisure sequences mainly show the main protagonist during various outdoor activities. Thus, scenes feature her and a friend riding their bicycles through a forest to a lake and enjoying the day, the woman in her leisure outfit walking through the city along a city park and, at the end of the spot, the main protagonist with two friends in a park toasting with Erdinger Alkoholfrei. In the final scene, Erdinger Alkoholfrei is displayed standing on a tree trunk by a lake, filled in a wheat beer glass as well as in the bottle, along with two other taste variations (Erdinger Alkoholfrei lemon and Erdinger Alkoholfrei grapefruit). Throughout the entire spot, the main protagonist speaks to the viewer via an off-voice and adds statements to the situation shown: "Dieser Moment für mich" (This moment for me), "Diese Zeit für uns" (This time for us), "Dieser Geschmack – natürlich, sportlich, erfrischend" (This taste - natural, sporty, refreshing), "Erdinger Alkoholfrei – für dich, für dich und für mich" (Erdinger Alkoholfrei - for you, for you and for me) and "Jetzt neu – natürlich mit Zitrone, natürlich mit Grapefruit" (Now new

- naturally with lemon, naturally with grapefruit). The spot is accompanied by the song "Do what you wanna do" by Sebastian Pille feat. Alica.

This commercial combines sports with leisure, friendship and the enjoyment of beer. It is not the competitive character of sport that is highlighted, but the enjoyment and feel-good factor. The shown athletes laugh while practicing the respective sport and enjoy time, freedom and nature. The illuminated enjoyment aspect is enhanced by the fact that the same sporting activities are also shown in leisure time together with friends. In connection with the joint consumption of beer, the Erdinger markets the product by associating the values of enjoyment, lightness, naturalness, sociability, fun and friendship. The message is conveyed accordingly that Erdinger Alkoholfrei is a refreshing pleasure drink that promotes a healthy lifestyle.

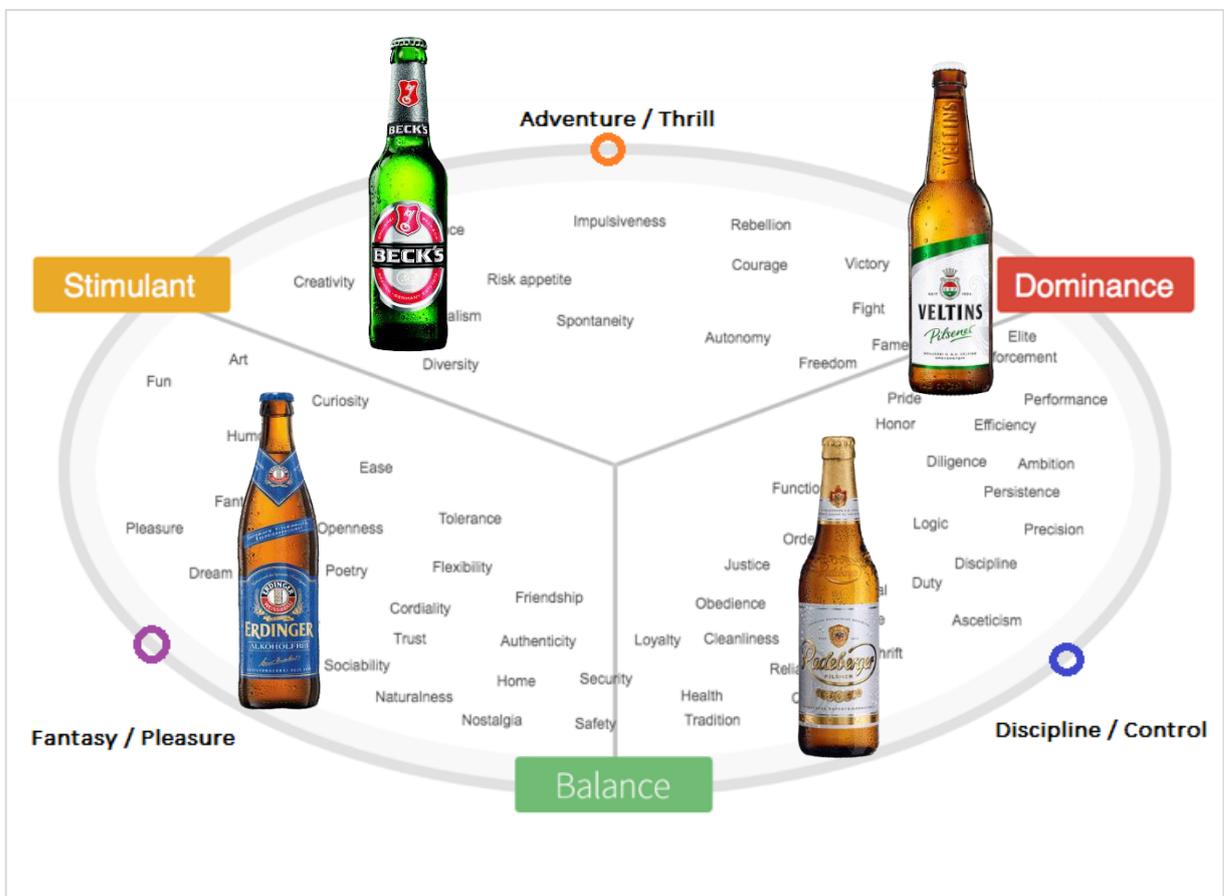
The code *Language* is used in the spot only in the form of the spoken word by the off voice of the protagonist. The linguistic messages support the aspects conveyed by the story. The sentences "This moment for me" and "This time for us" convey a feeling of pleasure, time out, well-being and sociability. These aspects are linked to the product Erdinger Alkoholfrei through the statements "This taste - natural, sporty, refreshing", "Erdinger Alkoholfrei - for you, for you and for me" and "Now new - naturally with lemon, naturally with grapefruit". In addition, by repeatedly using the term "natural", Erdinger also creates a link between beer and nature and, in conjunction with the term "sporty", underlines the aspect of a healthy lifestyle. The calm and relaxed way of speaking of the protagonists creates a feeling of inner balance in the viewer. The song lyrics are of little importance in the spot, as they are not really clear and rather the melody of the song contributes to the overall effect of the spot.

The code *Symbolism* is negligible in this spot. Erdinger uses motif worlds rather than special symbols for the development of the effect and its clarification. However, the choice of the sports shown - swimming, cycling and jogging - can be understood as a symbol for their involvement in triathlon. The order in which they appear in the spot corresponds to the order during a triathlon competition. At the same time, Erdinger thus communicates the potential integration of its product into a healthy lifestyle. The code *Sensory*, on the other hand, makes a decisive contribution to the effect of the spot. The melody of the song gives the viewer an auditory feeling of lightness. The visual capturing of the setting sun enhances the feeling of inner balance and enjoyment. Many people associate a low, setting sun with a relaxed end of the day and shaking off the stress of everyday life. This also supports the aspect of time out, freedom and naturalness.

Through the interaction of the codes, the Privatbrauerei Erdinger markets its Produkt as a pleasure and refreshment product for health-conscious consumers who are looking for a little time-out and want to get rid of everyday stress. Through the highlighted values, Erdinger positions itself on the Limbic® Map in the motif and emotion world *Fantasy/Pleasure*, the hybrid of the two motif worlds *Stimulant* and *Balance*. The focus of this motif system is the search for relaxation and pleasure. The main target group of Erdinger Alkoholfrei, according to the marketing, is likely to be primarily middle-aged athletes and women, as well as the Limbic® Type *Connoisseurs* in general, who prioritize worlds of enjoyment and experience due to the slight predominance of the stimulant system and a positive attitude to life, while paying attention to the quality and origin of the products due to an additional relatively high proportion of balance.

### 6.1.3 Conclusion

Based on the case study, it was possible to show how differently similar products can be marketed through the targeted use of the codes and how they thereby reveal a differentiated target group segmentation. The general significance of codes for the impact of advertising spots could also be clarified.



**Figure 6: Positioning of Radeberger, Veltins, Beck's and Erdinger based on the case study (own compilation based on Wahid, 2019)**

*Figure 6* shows the areas of the Limbic® Map in which the beer brands Radeberger, Veltins, Beck's and Erdinger are positioned for the respective products examined by the advertising spots and which motivational systems should be addressed by them. It also became clear what the target group of the respective brands is and the system of the Limbic® Types could also be used. With the help of the following study it should be examined whether the commercials can really convey the desired motives and whether the target group of a brand favors the respective commercial. Furthermore, the survey serves to validate the insights gained in the case study.

## **6.2 Survey on brand perception**

In the following, the survey design is described more in detail. First of all, the applied survey design, information on the participants of the survey and their recruitment, as well as the aim and procedure of data collection are explained. The aim of the survey was to test the theoretical hypotheses collected in the course of this work in a realistic environment. This includes both the collected theoretical foundations of neuromarketing and the findings of the case study. The results of this survey should enable statements to be made about the relevance of the theoretical concepts of neuromarketing in the working environment of brand management. Based on this quantitative gain in knowledge, advice for the inclusion of neuromarketing in brand management will then be given. Due to financial, logistical and technical reasons, there was no access to the classical research methods of neuromarketing. To achieve these goals, a survey was deliberately chosen to be implemented, as this way many test persons of different ages and social classes can be reached in a short time.

### **6.2.1 Methodology**

The survey was based on a questionnaire conducted by a focus group in 2009 in the context of the book "Neuromarketing - Grundlagen, Erkenntnisse, Anwendungen" (Neuromarketing - Basics, Findings, Applications) by Raab, Gernsheimer and Schindler. The self-initiated implementation of a focus group did not make sense due to governmental restrictions in the wake of the worldwide corona virus pandemic. Due to the local limitation of the survey to the German-speaking advertising space, it was conducted in German. The international online survey platform *www.surveo.com* was chosen for implementation.

### 6.2.1.1 Research design

In order to test the hypotheses already stated, the format of an experimental survey on brand perception was chosen as the method of collection. The design of the survey can be divided into three sections.

In the first section, general information on the test persons was collected, such as age, gender or profession, as well as information on cigarette, chocolate and alcohol consumption which is important for the evaluation of subsequent questions. The information on these questions makes it possible to scientifically evaluate the influence of personal life circumstances and lifestyle on brand perception. The age information was given within previously defined groups, with the individual groups being classified based on the concept of *Erik Erikson's Stages of Psychosocial Development* (McLeod, 2018) in connection with *Armstrong's 12 Stages of life* (Armstrong, 2019). Accordingly, the following age groups resulted:

- 17 and younger: the average respondent attends school and lives with his parents
- 18 - 25: the average respondent is in apprenticeship or study and is financially dependent on his parents
- 26 - 35: the average respondent starts his working career, is financially independent of his parents and founds a family him- or herself
- 36 - 50: the average respondent being midway through their working life and having a family with children in need of financial support
- 51 - 65: the average respondent has reached the final stages of their working life and their own offspring are financially independent
- 65 and over: the average respondent has finished working life and has reached retirement age

The second section of the survey deals with the brand network built up in the minds of the test persons. To investigate brand perception, the test persons were shown four advertisements without product images and brand names. Specifically, these were an ad by the German beer brand Beck's, an ad by the Swiss chocolate manufacturer Milka, an ad by the American tobacco giant Marlboro, and an ad by the telecommunications company o2. The advertisements contained typical stimuli and codes of the brand manufacturers that are frequently used in TV and print media.

The last part of the survey served to verify the concepts Limbic® Map and Limbic® Types, as well as to validate the case study. For this purpose, the test persons were first assigned to the Limbic® Types by means of a questionnaire on the most influential aspects of their lifestyle and their prioritization of possible product features. Afterwards, the advertisements of the German beer brands Radeberger, Veltins, Beck's and Erdinger were evaluated. For all questions, the test person was given characteristic values from the Limbic® Map for the respective motif and emotion systems to choose from. Finally, the respondent was asked to indicate which commercial he or she prioritized and to give information about the preferred beer brand. In addition to the four brands considered, the respondent was given the opportunity to indicate another beer brand or the absence of a preference.

A complete version of the questionnaire can be found in *Appendix A and B*. It should be noted that these are the original survey in German and its transcripts in English.

### **6.2.1.2 Recruitment and distribution**

The subjects were recruited via a link leading to the questionnaire generated on Survio. This link was transmitted primarily via social media as well as communication platforms and thus, was especially spread among my contacts via WhatsApp. However, as the link was mainly distributed by students, a large proportion of the respondents are also students, which has an impact on the transferability to different age groups and the general representation of the survey. The survey ran over a period of 10 days, starting in the morning of 20.03.2020 and ending on 29.03.2020 at 23:59, with almost 77% of all responses received within the first three days. The participants took part in the study voluntarily and without payment.

### **6.2.1.3 Pretest**

A focus group consisting of family members, acquaintances and friends was formed to pre-test the survey before publication. Care was taken to cover all age groups to be tested and different educational levels. This resulted in the following composition of the focus group, consisting of five women and five men:

- 17 and younger: one pupil (school branch: secondary school)
- 18 - 25: one trainee (sanitary engineering field), one student (communication sciences and psychology field)
- 26 - 35: one PhD student (biochemistry), one employee (car mechanic)

- 36 - 50: one employee (Head of HR), one employee (kindergarten teacher)
- 51 - 65: one employee (key account manager), one employee (retail salesperson)
- 66 and over: one pensioner

The test sessions were conducted via Skype and revealed minor formulation and comprehension errors, which were corrected before the start of the survey period. The pretest was not used to collect initial data.

#### **6.2.1.4 Evaluation of data**

The evaluation of the data obtained was carried out using the survey platform used and the Microsoft Excel program. The Survio survey platform evaluated each question individually and presented the answers given graphically. In order to investigate cross-connections, the list of individual answers was exported directly from Survio to Excel, where it was descriptively quantified, analyzed and assessed using the available statistical tools. To evaluate the significance of the observed accumulations, either the Pearson Chi-Square-Test ( $\chi^2$ ) (Hemmerich, 2020a) or the T-Test for paired samples (t) (Hemmerich, 2019) was used, depending on the test object. A result was considered statistically significant if the calculated test value was smaller than the significance level 5% ( $\alpha = 0.05$ ). If the calculated value was below an alpha value of 1% ( $\alpha = 0.01$ ), the test result was considered highly significant (Hemmerich, 2020b). The results and findings identified in the process are presented and evaluated in the following section.

### **6.2.2 Results**

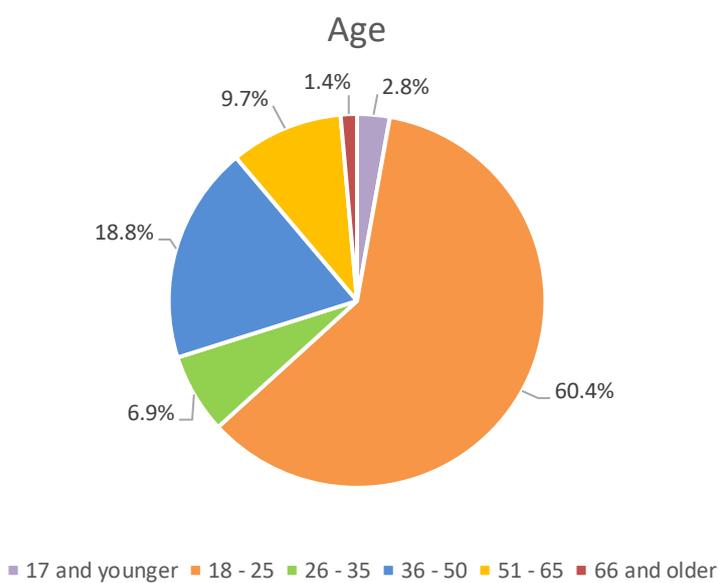
The results are viewed in the order of the survey. Accordingly, first the general information about the respondents is given, then the findings on brand perception are analyzed and finally the results of the test for the concepts Limbic® Types and Limbic® Map are shown. Not all questions are analyzed in depth, while only the most important results are discussed. Exemplary calculations of the significance tests with the inclusion of Excel can be found in *Appendix C*.

#### **6.2.2.1 General information**

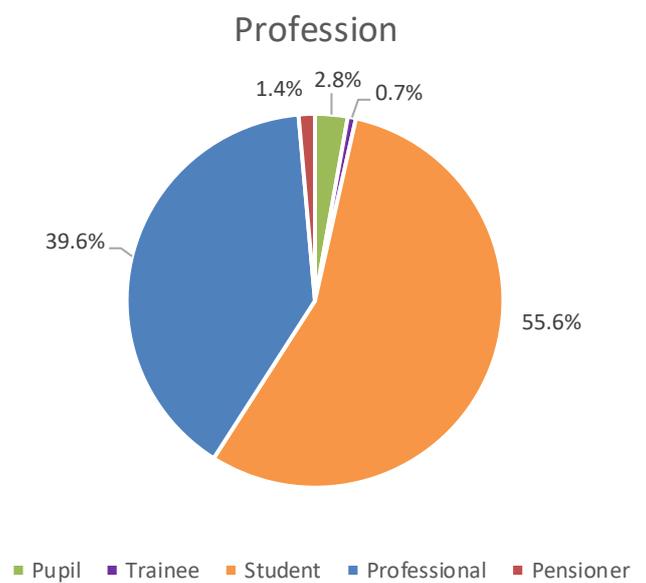
A total of 212 people took part in the survey, with a drop-out rate of 32%, which corresponds to 68 people. 144 participants completed the survey and are the sole subjects for the

evaluation of the results. The answers already given by the dropouts will not be considered further. The aim of the first task type was to gain knowledge about important, specially selected characteristics of the test persons for the evaluation of later tasks.

The test persons are composed of 52 men and 92 women, which corresponds to a ratio of 36% to 64%. None of the respondents made use of the option not to specify their gender. The respondents rated themselves as having an average affinity for advertising with an average value of 3.0 on a scale of 1 - 5, whereby women rated themselves as more affinitive to advertising with a value of 3.11 than men with a value of 2.75.



**Figure 7: Distribution of age of the test persons**



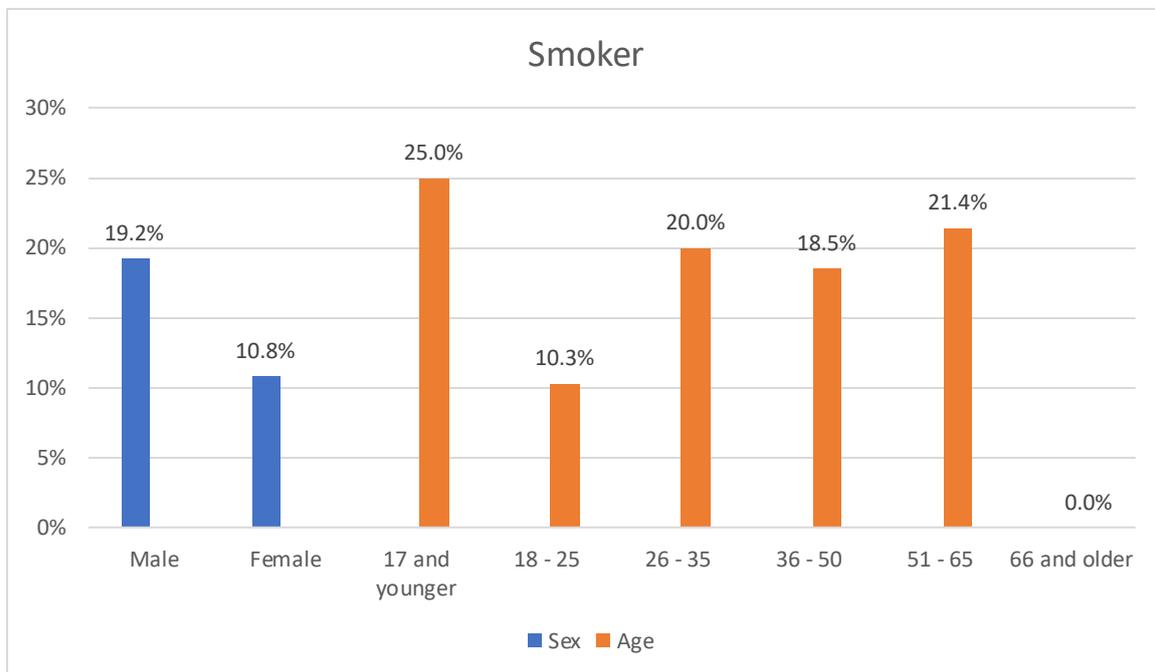
**Figure 8: Distribution of profession of the test persons**

The age distribution of the test persons, as shown in *Figure 7*, was dominated by the group of 18 - 25-year-olds with 87 test persons or a share of almost 60%, followed by the 36 - 50-year-olds with 27 test persons. From the age group of 51 - 65, 14 persons participated, from the 26 - 35-year-old group 10 persons. In addition, there were 4 underage participants and 2 seniors. According to the age distribution, the occupational distribution, as shown in *Figure 8*, is almost completely determined by students with 80 participants and the working population with 57 participants. The remaining 7 test persons were distributed among 4 students, 2 pensioners and 1 trainee. None of the respondents were jobseekers. The group with the greatest affinity for advertising was that of 26-35-year-olds with an average of 3.1 and the group with the least affinity for advertising was that of 51-65-year-olds with an average of 2.86.

**Table 2: Distribution of tested characteristics among the test persons**

Characteristic	Yes (Amount)	Yes (Percentage)	No (Amount)	No (Percentage)
Children	41	28.5 %	103	71.5 %
Smoker	20	13.9 %	124	86.1 %
Chocolate consumer	90	62.5 %	54	37.5 %
Alcohol consumer	78	54.2 %	66	45.8 %
Beer drinker	75	52.1 %	69	47.9 %

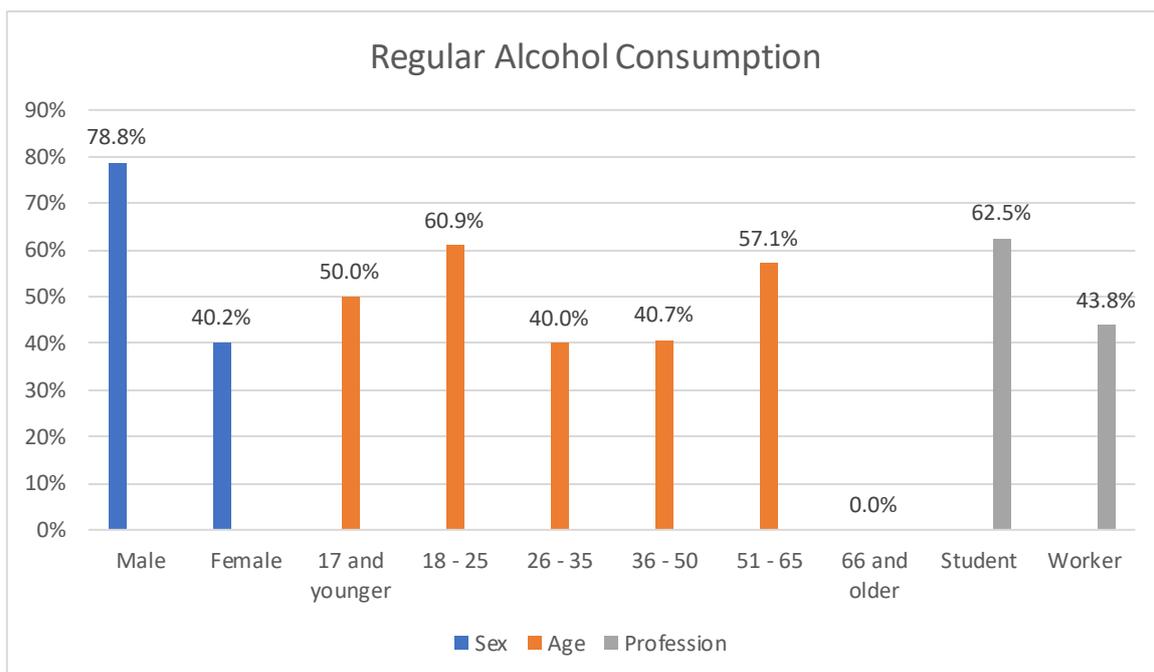
In the following, the distribution of the characteristics surveyed shown in *Table 2* is analyzed in conjunction with the characteristics gender, age and occupation. Only 41 respondents or 28.5% have children, 39 of whom belong to the age groups older than 25. Two subjects with children are between 18 and 25 and are studying. 103 test persons are childless.

**Figure 9: Breakdown of smoking test persons by selected characteristics**

124 test persons are non-smokers. Of the corresponding 20 smokers, almost half, 9 test persons, belong to the age group of 18 - 25 years, which corresponds to a smoker share of 10.3% within this age group and the lowest smoker share of all age groups with smokers, as shown in *Figure 9*. The highest percentage of smokers was found in the group of underage

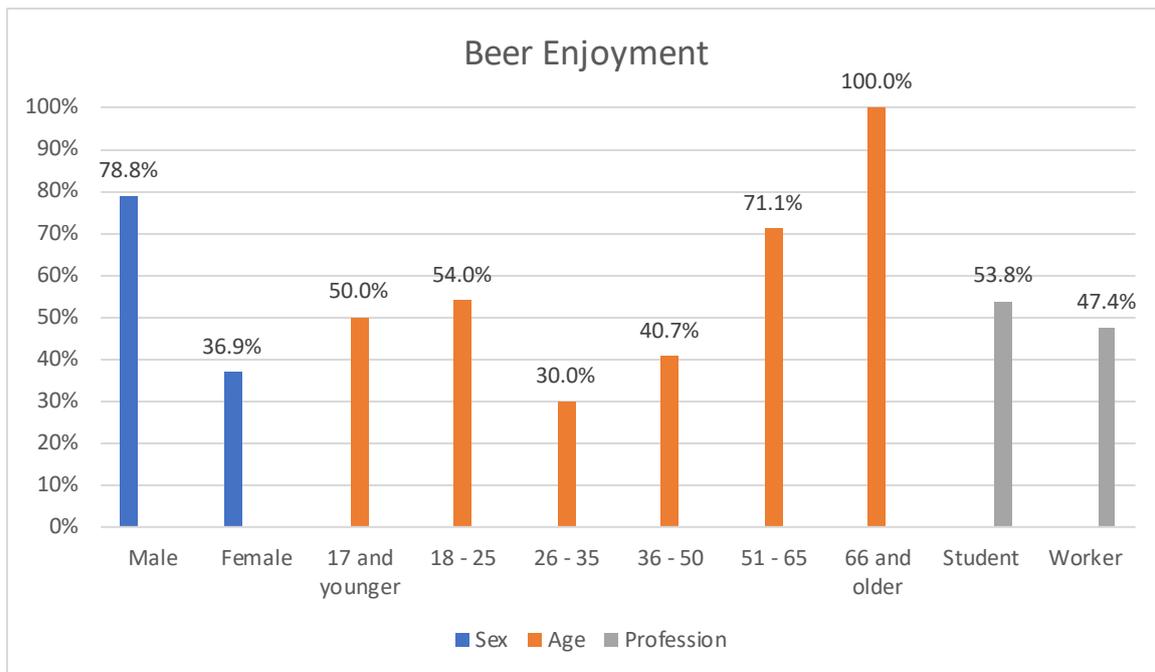
persons with one smoker, although this cannot be considered meaningful due to the small number of only 4 participants. In the group of 51 - 65 year-olds, 3 persons indicated to be smokers, in the group of 26 - 35 year-olds 2 persons, in the group of 36 - 50 year-olds 5 test persons and of the participating seniors none smokes, although this group is also not representative due to the small number of only two participants. The smokers are divided equally between the two sexes, with 10 women and 10 men, with the percentage of smokers among the men at 19.2% being distinctively higher than among the women at 10.8%, while not being significantly higher ( $\chi^2 = 0.16$ ).

The 90 chocolate consumers are divided between 67 women and 23 men. For women, this corresponds to a share of 72.8%, for men 44.2%, which results in a highly significant higher ( $\chi^2 = 0.0007$ ) proportion among women. Among the minors, 100% of those questioned said they consumed chocolate regularly, while the figure was only 50% for people over 51. Of the 18 – 35-year-olds, almost 60% consume chocolate, while among the 36 – 50-year-olds it was 70%.



**Figure 10: Breakdown of alcohol consuming test persons by selected characteristics**

54.2% of the test persons regularly consume alcohol, 37 women and 41 men. As shown in *Figure 10*, the share of women, 40%, is highly significantly lower ( $\chi^2 = 0.000008$ ) than for men with 79%. The proportion of students who regularly consume alcohol, 63%, is also significantly higher ( $\chi^2 = 0.03$ ) than that of professionals, 44%. The age group with the proportionally highest alcohol consumption is accordingly the group of 18 - 25-year-olds with nearly 61%, followed by the 51 - 65-year-olds with 57%.



**Figure 11: Breakdown of beer loving test persons by selected characteristics**

When asked about their liking of beer, only 34 women answered positively. Among the men, however, 41 subjects answered positively. Again, a highly significant difference between the two sexes is evident ( $\chi^2 = 0.000001$ ), as shown in *Figure 11*. In contrast, the difference between students and working people decreased compared to alcohol consumption. While only about 54% of the students stated to like beer, 47% of the working people confirmed this. The proportion of 18-25% of the population aged 18-25 years who like beer also decreased to 54%, whereas the group of 51-65 years heads the list with 71 % positive answers.

Regular alcohol consumption and a preference for beer was shown by 60 subjects or 42%, while neither alcohol nor beer was consumed by 51 subjects or 35%. The difference between the two sexes is also particularly noteworthy here. For example, 42 women (45.6%) stated that they neither consumed alcohol nor beer, whereas only 9 men (17.3%) did. 27.2% of women and 67.3% of men answered both questions positively.

The knowledge gained about the preferences and distribution of the test persons will be used in the further progress of the study to analyze the respective results more specifically. The cross-references between the characteristics and the aspects of age group and gender will be of particular importance.

### 6.2.2.2 Brand perception

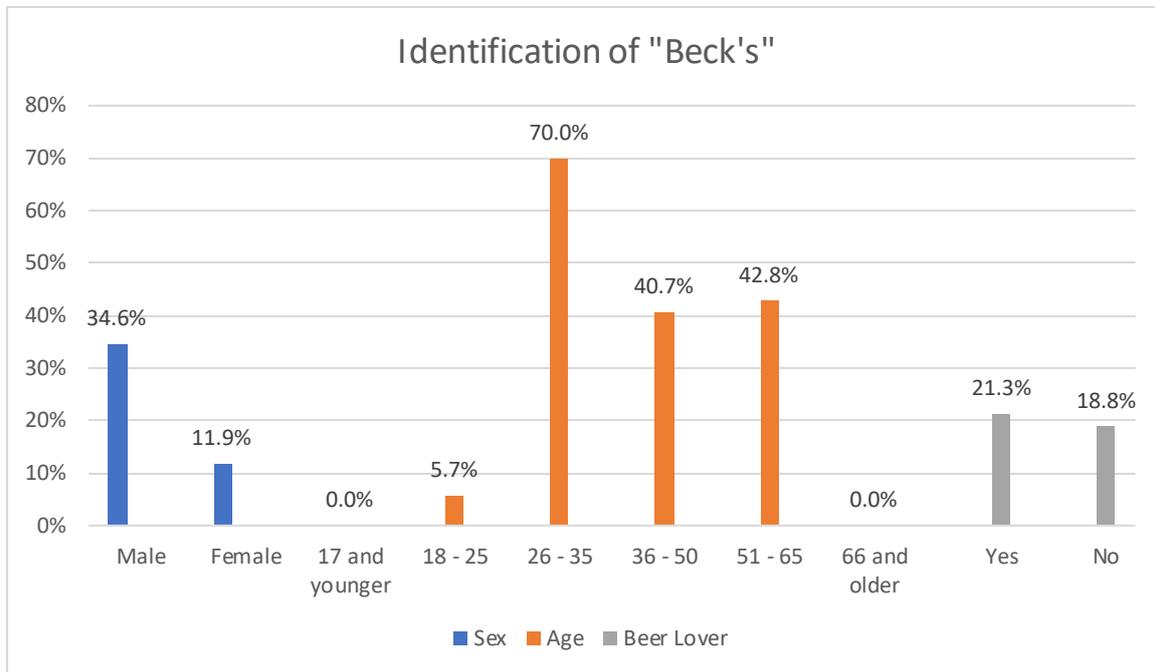
The aim of the second part was to investigate the significance of the codes for the brand network in the minds of consumers. For the test setup, four advertisements from different industries (alcohol/beer, chocolate, tobacco and telecommunications), which can be seen in *Figure 12*, were selected and their brand name and slogan were then removed. The focus of the test was to determine whether the test subjects recognized the brand solely by the codes that now remained, predominantly the code *Symbolism*. Since these are placative advertisements, the codes *Story* and *Sensory* are rather secondary for brand recognition. In addition, it was examined whether test persons who stated to have a higher affinity to the respective industry in advance were able to identify the respective advertised brand significantly more often.



**Figure 12: Tested advertisements for brand identification (Scheier & Held, 2006, p. 37)**

The first advertisement promotes a beer product of the Beck's brand and shows a three-master with emerald green sails near the beach on the sea. In addition, the company's corporate color is displayed in the form of a color stripe at the bottom of the screen to contrast with other company ads in similar settings. With regard to the distribution of test persons and their queried characteristics, it is of interest whether men, as well as the groups of the 18 - 25-year-olds and the 51 - 65-year-olds, identify the advertised brand Beck's significantly more often correctly according to their higher affinity to alcohol and beer. In total, only 29.9% of the test persons identified the advertised brand. However, about 1/3 of these persons linked the advertisement to another brand than Beck's. The brands mentioned were mainly Beck's competitors, more specifically the beer brands Jever, Warsteiner and Heineken. Accordingly, it can be concluded that, while Beck's ad activates the neural network for alcohol/beer, it subsequently has problems differentiating itself from competitors who use a similar corporate color and/or similar scenery for their advertisements. The fact that about 70% of the test persons did not recognize the brand at all

shows how important product images, brand name or slogan are for recognition. The distribution of the 29 participants (20.1 %) who correctly identified Beck's, in relation to the respective group of characteristics, can be seen in the following *Figure 13*.

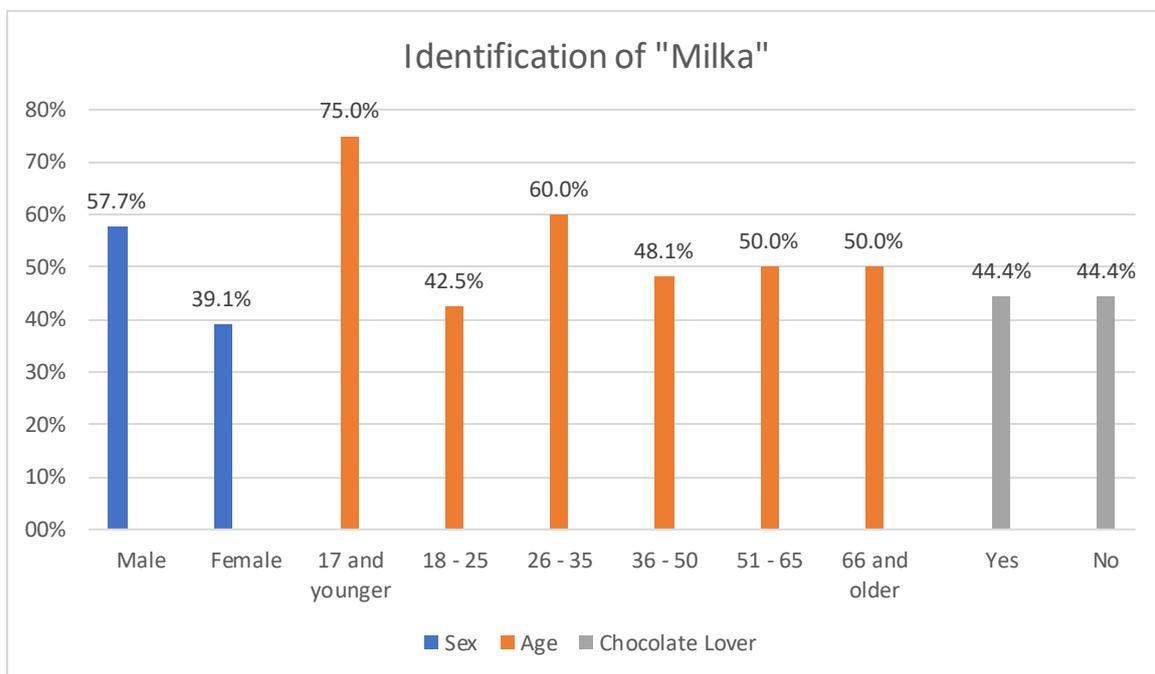


**Figure 13: Breakdown of test person by prior tested characteristics regarding the identification of Beck's**

The test resulted in a highly significantly higher proportion ( $\chi^2 = 0.001$ ) of men identifying Beck's correctly compared to the women. This corresponds with the result that the male test persons showed a significantly higher affinity to alcohol and beer than the female ones. In total, however, only 16 of the 75 people who like beer correctly identified the Beck's brand. While more than 50% of the 18-25-year-olds and students liked beer, only 5% of these groups could correctly identify Beck's. If the group of the over 65-year-olds is ignored due to the small number of only 2 participants, the 51 - 65-year-olds were the group with the most people who said they liked beer (over 70%). In the end, however, only 43% correctly detected Beck's, whereas 70% of the 26 - 35-year-olds correctly identified Beck's, even though only 30% liked beer.

The second advertisement promotes a Milka brand chocolate and shows a picnic with fresh milk in an Alpine panorama. In addition, the company's corporate color is shown in the form of a color stripe at the bottom of the screen to contrast with other company ads in similar settings. With regard to the distribution of respondents and their characteristics, it is interesting to investigate whether women in particular are able to identify Milka more frequently, in accordance with their significantly higher affinity to chocolate compared to

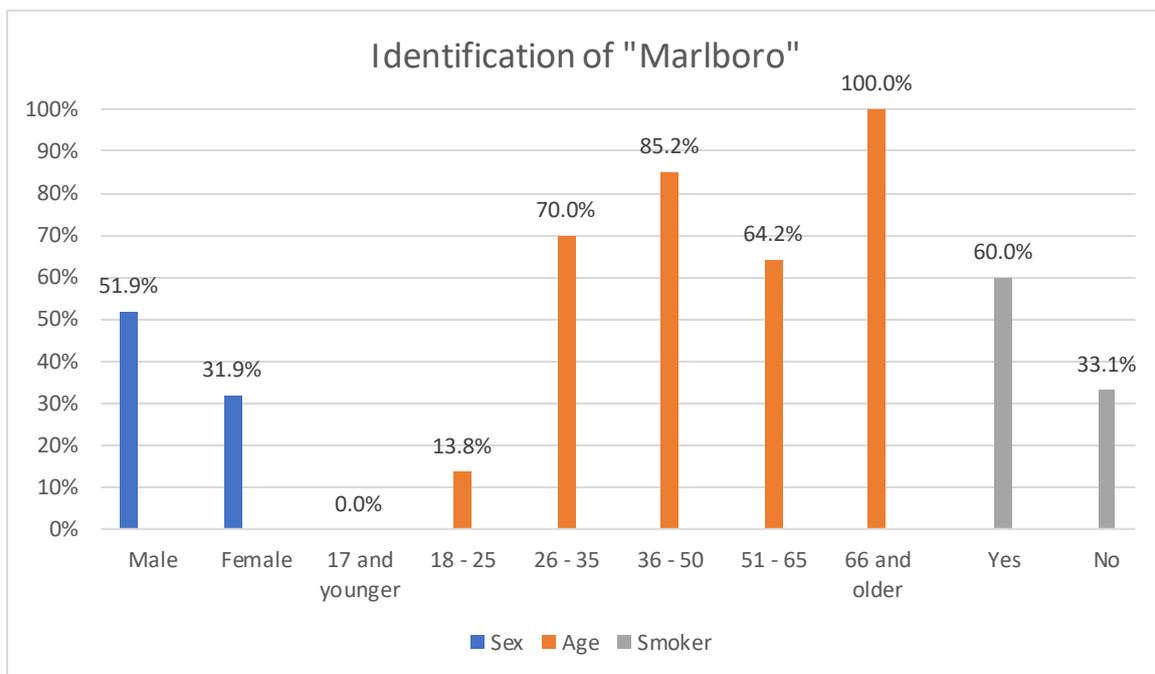
male respondents. The affinity for chocolate was between 50% and 70% for each age group, with only the underage respondents all stating to like chocolate. Due to the small number of samples, this group is not meaningful. A total of 66.7% of the test persons indicated that they recognized the brand. Of these 96 people, 66 people ultimately correctly assigned the ad to Milka, which corresponds to a recognition rate of 46% of all test persons. The remaining 30% linked the ad to other well-known brands such as Bärenmarke, Weihenstephan or Landliebe, which all produce dairy products and also advertise them in the Alpine scenery. 48 people could not link the ad to any brand. The distribution of the 66 participants who correctly identified Milka, in relation to the respective group of characteristics, can be seen in the following *Figure 14*.



**Figure 14: Breakdown of test person by prior tested characteristics regarding the identification of Milka**

Although women, with a share of 73%, had a significantly higher affinity for chocolate than men with 44%, the brand was recognized significantly ( $\chi^2 = 0.03$ ) by proportionately more men than women. While between 50% and 70% of the respective test persons in all age groups showed an affinity for chocolate, all age groups were in a similar range when identifying Milka. Even if it is not meaningful due to the small number of stings, it is nevertheless remarkable that 4 out of 4 minors stated that they liked chocolate and 3 of these 4 actually identified Milka correctly. If this age group is excluded, it is noticeable that again test persons between 26 - 35 years of age identified the brand correctly more often than the rest and the 18 - 25 years of age again came off least well. Of a total of 90 people who had an affinity for chocolate, only 40 identified the Milka brand.

The third advertisement promotes the Marlboro tobacco brand and shows a horde of horses riding through a dusty landscape. With regards to the distribution of test persons and their characteristics, it is interesting to examine whether people under 26 identify the brand significantly less often than older test persons, as this age group has fewer smokers. Furthermore, this group has not received access to tobacco advertisements, as since 2007 the advertising of tobacco products in TV, newspaper and radio is prohibited in Germany according to directives of the European Union in 2003 (Bundeszentrale für gesundheitliche Aufklärung, n.d.). In total, 41% of the respondents identified the brand. Of these 59 people, 53 people actually correctly attributed the ad to Marlboro, which represents a percentage of 89% and a recognition rate of 37% of all respondents. The remaining 6% linked the ad to the tobacco brand Lucky Strikes and the cars Dacia and Mustang. 85 people were unable to link the ad to any brand. The distribution of the 53 participants who correctly identified Marlboro in relation to the respective feature group can be seen in the following *Figure 15*.

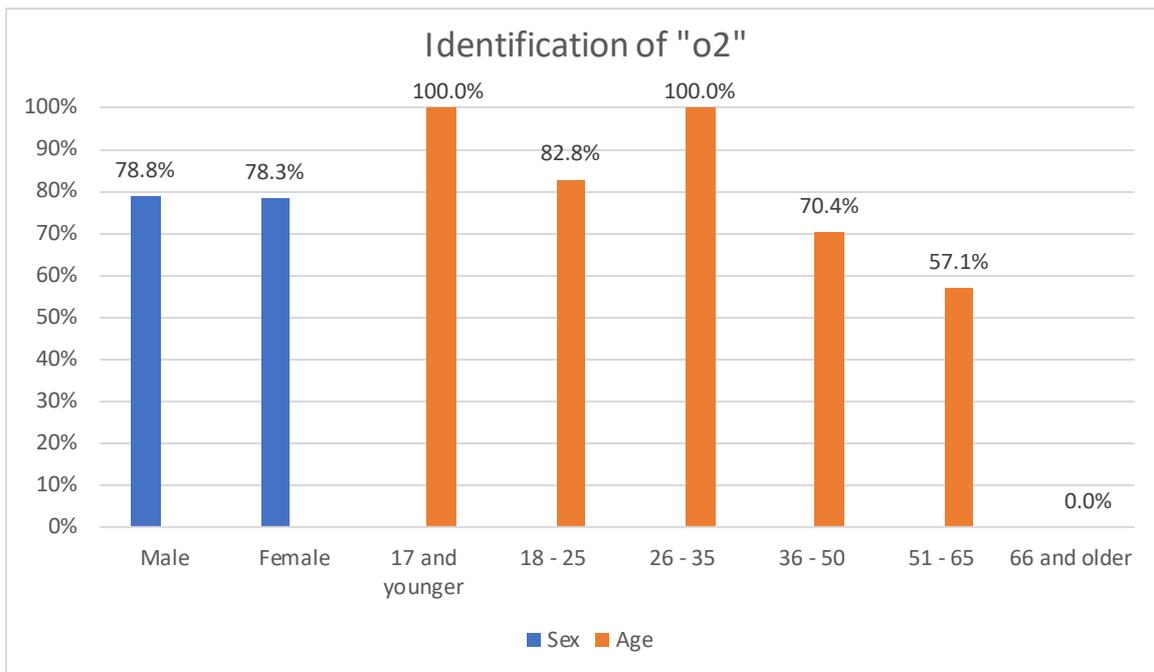


**Figure 15: Breakdown of test person by prior tested characteristics regarding the identification of Marlboro**

The test resulted in a significantly higher ( $\chi^2 = 0.02$ ) proportion of men correctly identifying Marlboro than of women. This corresponds with the result that the male test persons have a higher proportion of smokers than the female test persons. In total, 12 of the 20 smoking test persons correctly identified the brand, which corresponds to a rate of 60%. In the distribution of the identification rate among the age groups, as expected in advance, there was a highly significant difference ( $\chi^2 = 0.000000000000001$ ) between test persons under 26 and the test persons aged 26 and over. Whereas not a single person among the underage participants

identified the tobacco brand and only 14% among the 18-25-year-olds, in all other groups more than half of the test persons did. Among the seniors even both test persons identified Marlboro, although they are non-smokers. The proportion of smokers in the remaining groups was around 20%. Only the smoking proportion of the 18 – 25-year-olds deviated remarkably with about 10%.

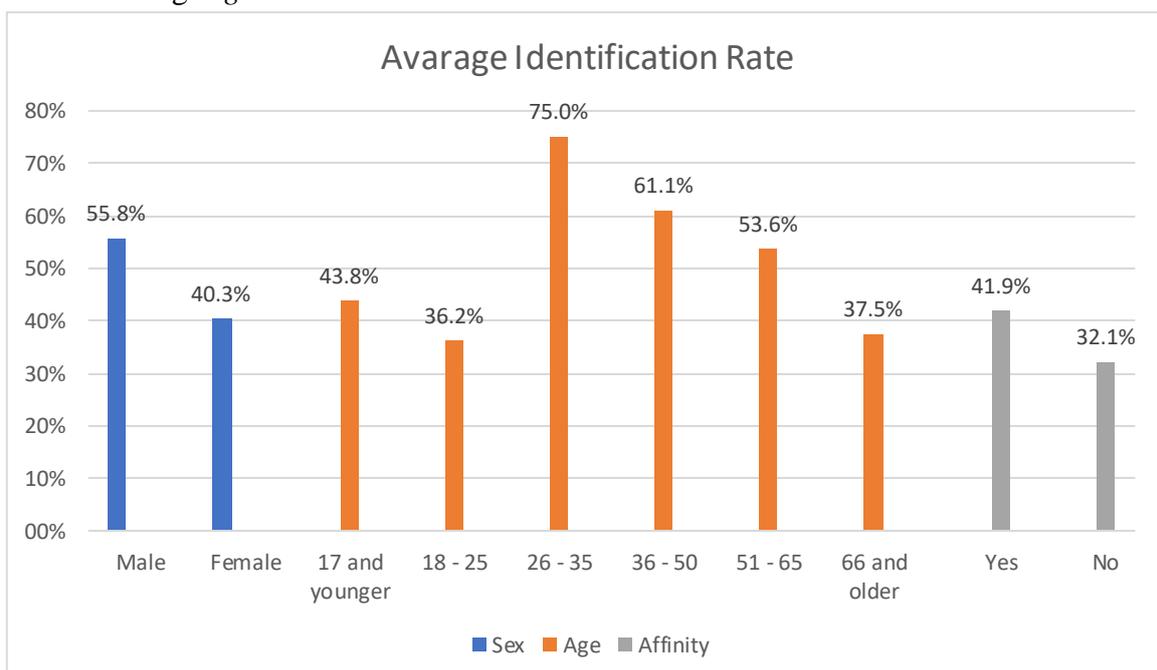
The fourth advertisement promotes the telecommunications brand o2 and acts as a kind of cross-check with the other three companies in the test series. Unlike the other three brands, o2 does not rely on any kind of landscape scenery in the creation of its ads, but focuses on backgrounds mostly in blue gradients and the use of air bubbles as a symbol for o2, which is also the chemical code of air. Due to the resulting unique selling point within the German advertising landscape, o2 should be recognized significantly more often, even if the name, logo and slogan are missing. The telecommunications industry appeals to men and women in equal measure and, although it affects all age groups due to general mobile phone and internet use, younger people could be more familiar with it due to more intensive use. Accordingly, the question of gender and age distribution is particularly interesting and whether o2 is generally correctly identified more often than the other brands. Indeed, 83% of the test persons identified the brand, which is by far the highest value among the ads tested (Milka: 67%, Marlboro: 41%, Beck's: 30%). Furthermore, 113 of these 119 test persons also correctly identified the brand o2, which corresponds to a recognition rate of 95%. In total, 78% of the test participants were thus able to correctly name the brand. Both the total value and the recognition rate among the test persons who thought they recognized the brand are thus far ahead of the other brands. Only 25 test persons could not make a connection between the advertisement and a brand, 6 associated the advertisement with other brands, mainly from the water industry. The distribution of the 113 participants who correctly identified o2 in relation to the respective feature group can be seen in the following *Figure 16*.



**Figure 16: Breakdown of test person by prior tested characteristics regarding the identification of o2**

As a consequence of the general recognition level of o2, the breakdown by gender and age also shows a very high level of identification. As expected in advance, approximately equal proportions of both sexes were able to correctly assign the display to o2. A decrease in identification is also shown with increasing age. The higher identification rate of minors and 26 - 35-year-olds compared to 18 - 25-year-olds can be explained by the distinctively lower number of stitches. The same applies to the seniors.

Overall, the experiment shows a strong imbalance in the identification rate of brands based on classic advertisements between age groups. The same applies to the sexes, as shown in the following *Figure 17*.



**Figure 17: Breakdown of the average identification rate by different characteristics of the test persons**

While on average 56% of men were able to identify the brand, only 40.3% of women were able to do so. Women also scored worse regarding each tested ad, even though they had a significantly higher affinity to the advertised industry than the male respondents. Accordingly, the poorer performance cannot be attributed to a general lack of interest on the part of the female test subjects in the product world tested. One possible explanation could be that men may look at advertising media more attentively and therefore build stronger links in the brain. In general, the overall result also contradicts the test persons' self-assessment of their advertising affinity, in which male test persons gave themselves an average value of 2.75 on a scale of 1 - 5 and female test persons gave themselves a score of 3.11.

With regard to the age distribution, it can be seen that the Generation Z, the todays 10 – 25-year-olds (Duncan, 2012), have a highly significantly lower ( $\chi^2 = 0.005$ ) identification rate than the older generations. This could be due to the general advertising consumption behavior of the generations concerned. The brand perception was tested on the basis of classical advertisements as used in traditional media such as print media. However, the traditional media are less and less frequented by the younger generations. These young age groups can be better reached by using Internet and social media advertising. While the advertisements shown here focus primarily on the codes *Language* and *Symbolism*, products on social media are increasingly advertised in the form of short videos. This creates a link from all four codes, Language, Story, Symbolism and Sensory, to the respective brand in the internal brand network of the younger generation, which is why a single stimulus may not be sufficient to activate the targeted network. The high identification rate of 26-35-year-olds could be ascribed to the comparatively low sample size of only 10 test persons. Nevertheless, this group also estimated itself to have the highest affinity for advertising of all age groups. However, since all groups scored between 2.86 and 3.1 the advertising affinity in general is likely to have a rather smaller effect on the performance of each group.

Furthermore, it can be deduced that the affinity of a respondent to the searched product generally shows an influence on the identification of the respective brand. Overall, the identification rate of the test persons with a product affinity was merely 42%. On average, however, only 32% of the test persons without the corresponding affinity recognized the respective brand. This could be explained by the more active information search for products and the resulting stronger links between the stimuli used by the brands in the consumer's brain. Nevertheless, the difference of 10% is mainly due to the significantly higher ( $\chi^2 = 0.04$ ) identification rate of Marlboro by smokers. Accordingly, it could be assumed that in rarely advertised sectors such as tobacco, the influence of an affinity to the general product

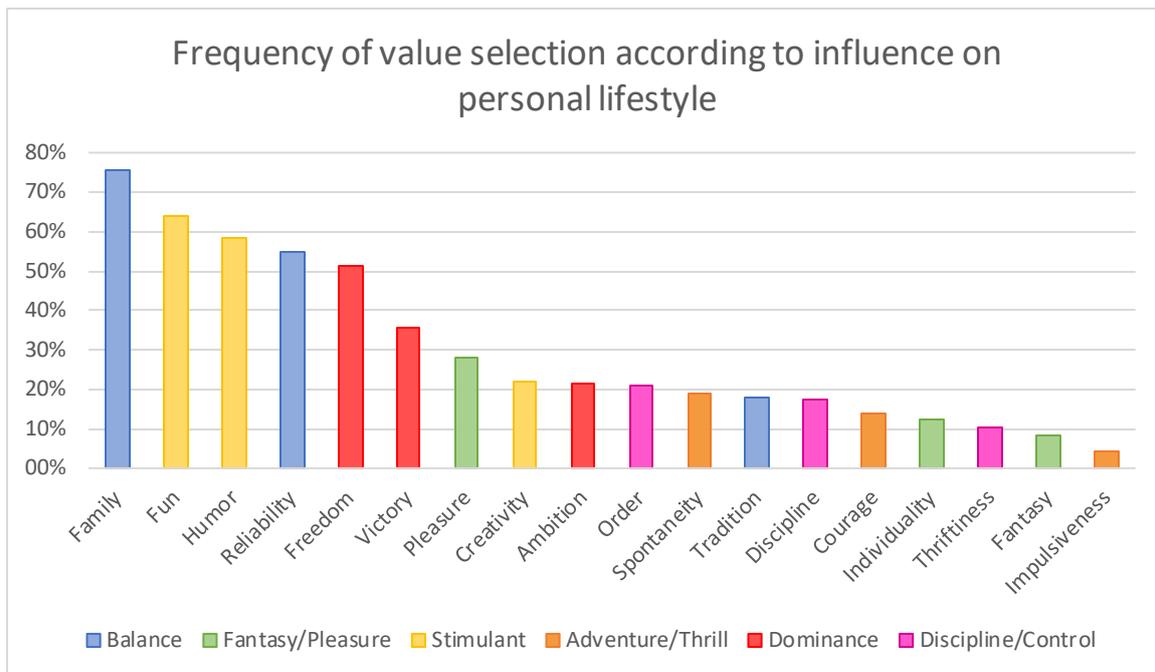
has a much greater effect on brand recognition than in frequently advertised sectors such as chocolate and beer.

Overall, the results of the survey confirm the effectiveness of brand-specific codes. Especially the case o2 shows the importance of brand-specific codes to contrast the brand with competing products. The sooner a company creates a unique selling point in marketing, the easier it is for potential customers to identify the brand. In contrast, if the marketing scenery is used by several companies, the risk of confusion increases. The effectiveness of advertising itself could also be demonstrated by the Marlboro brand. While test persons which started to actively follow advertising after the German ban on tobacco advertising were not able to identify the Marlboro brand at all or hardly, the identification rate was significantly higher among test persons who still actively watched Marlboro advertising.

### **6.2.2.3 Limbic® Types and Limbic® Map**

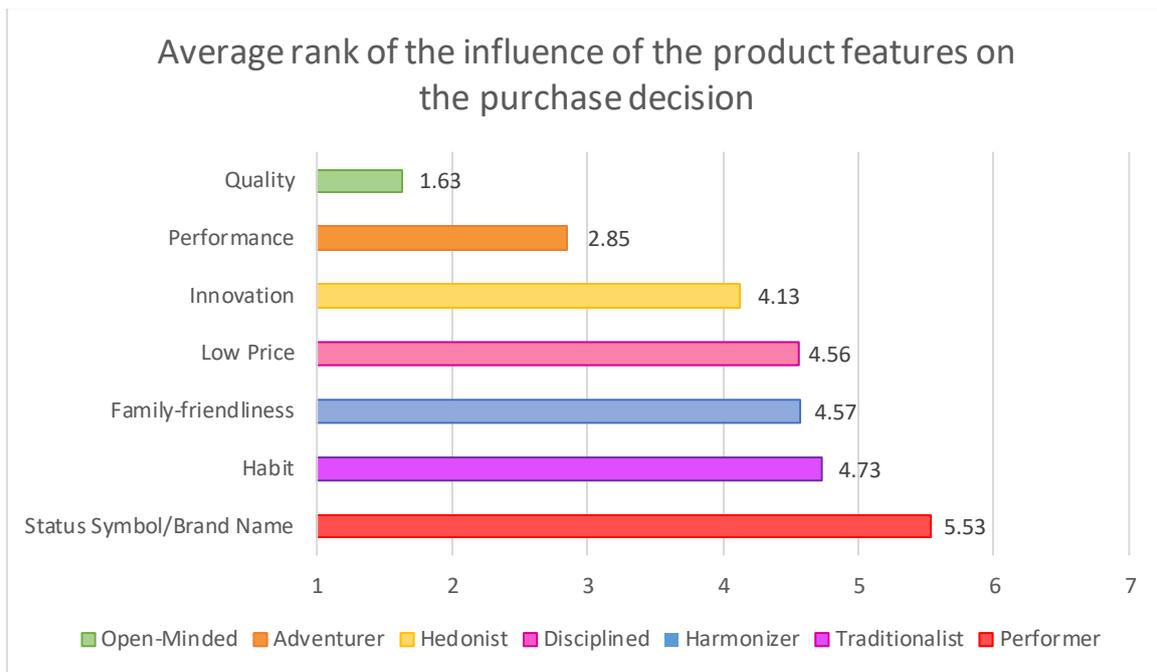
The aim of the third part of the task was to review the theoretical concepts *Limbic® Types* and *Limbic® Map* and to validate the results of the preceding case study. Therefore, the tasks were divided into 3 parts. The first part refers to the concept of the Limbic® Types, the second part to the validation of the case study and the effect of the shown commercials on the test persons in connection with the Limbic® Map and the last part checks a theoretical correlation of the results of part 1 and 2.

The first two questions were used to categorize the test persons into the Limbic® Types. The test persons were asked to choose up to 5 terms from a list of 18 values on the Limbic® Map, which are of utmost importance for their lives. When selecting the terms, care was taken to map each emotional and motivational system equally frequently. In addition, the test persons were asked to rank seven terms, each characteristic of one of the seven Limbic® types, according to their personal importance when buying a product. The results are examined in more detail in the following.



**Figure 18: Frequency of value selection according to influence on personal lifestyle of the test persons and allocation of the values into the respective motive systems**

The *Figure 18* displays the frequency of selection of the different values by the test persons. Furthermore, it is clarified to which emotion and motif system the respective values can be assigned. As a result, it is evident that values of the three main systems Balance, Stimulant and Dominance are highly significantly ( $t = 0.0002$ ) more important to the test persons than their three mixed forms, as these were selected much more frequently. Overall, the values of the Stimulant system are positioned best on average, whereas one value of the Balance System is of the greatest importance for the test persons. The most important values for the test persons are family, fun and humor, the least important are thriftiness, fantasy and impulsiveness. Based on the distribution, it can be concluded that the test persons are likely to prefer products whose marketing activates the Stimulant and Balance systems. The insights gained in connection with the findings of the second task, shown in the following diagram, enable the test persons to be classified as Limbic® Types.

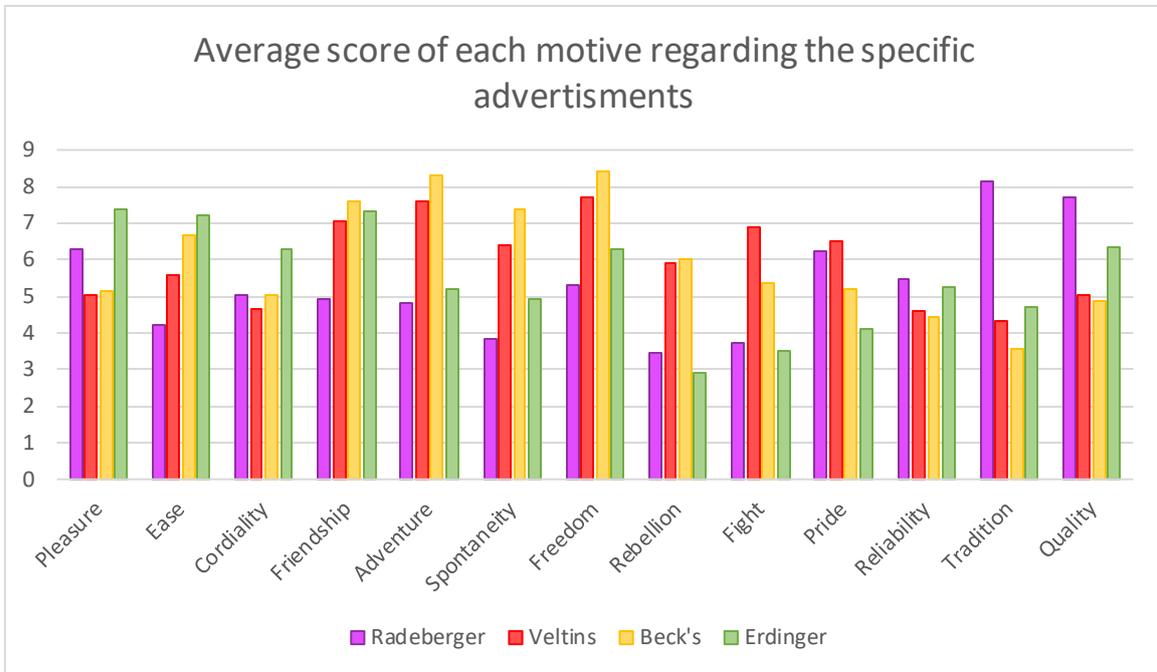


**Figure 19: Average rank of the influence of the product features on the purchase decision of the test persons**

In contrast to the influence of the different values on the lives of the test persons, mainly influenced by the three main systems, the respondents prioritize motives characteristic of the Limbic® Types that are assigned to the mixed forms on the Limbic® Map, as can be seen in *Figure 19*. The product feature quality, ranked on average at 1.64, clearly leads the ranking, the brand name or the status associated with the product does not play a decisive role in the respondents' purchase decisions. Of decisive importance with regard to this task is above all the fact that test persons rank highest in the three limbic types that show a decisive influence of the Stimulant system (Open-Minded, Adventurer and Hedonist). This is consistent with the results of the previous task, in which two aspects of the Stimulant system were among the top 3. Also, that the ranking is led by the type open-minded, a type mainly influenced by stimulant and balance system, correlates with the previous result. The next step was an analysis of the commercials, which were already discussed in the case study, by the test persons.

Main focus of this section was the mediated effect of previously selected values through the TV spots. The previous case study and the Limbic® Map were used to select the values. Again, attention was paid to an equal distribution of the various values across the motivational and emotional systems. The aim of the test is to check the targeted use of the codes for the corresponding message with regard to the desired effect using the Limbic®

Map and the subsequent validation of the results of the case study. For this purpose, each commercial was evaluated by the test subjects using the same values on a scale of 1 - 10, whereby a value of 1 indicates that the motif viewed is not conveyed at all by the TV spot and a value of 10 certifies that the motif viewed is in the focus of the commercial. The results can be seen in the following *Figure 20*.



**Figure 20: Resulting average score of each motive regarding the specific advertisements**

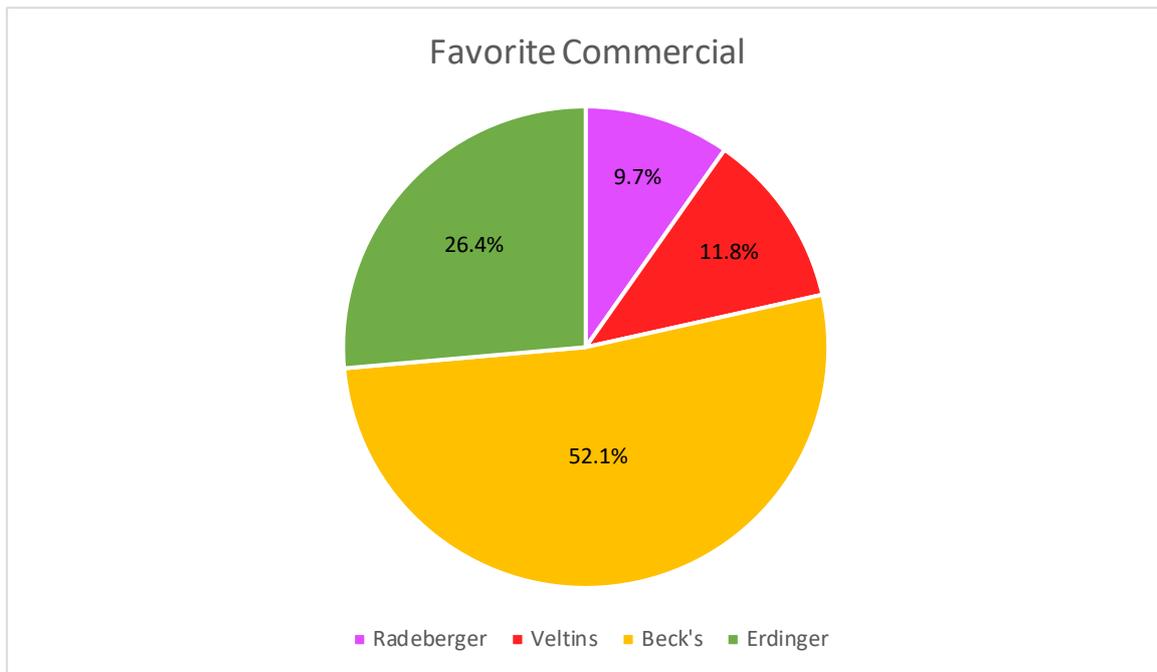
The results of the survey correlate with the findings of the case study and the positioning of the beer brand on the Limbic® Map, which can be seen in *Figure 21*.



**Figure 21: Positioning of Radeberger, Veltins, Beck's and Erdinger based on the case study (own compilation based on Wahid, 2019)**

In its commercial, Radeberger conveys values associated with the Balance System and the mixed form of Discipline/Control - reliability, tradition and quality. These motif worlds are associated with the Limbic® Types Disciplined and Traditionalist. The Radeberger spot also focuses on these motifs much more concisely than the competing brands, which have a lower average value in this area. The borderline motifs of the motif system targeted by Radeberger, pride and enjoyment, also show very high average ratings, each only surpassed by the brand that specializes in the respective motif system as its core motif. In the opinion of the test subjects, Veltins positions itself in the motif system of Dominance and appeals above all to the Limbic® Type Performer through the motifs chosen. Accordingly, Veltins has the highest average scores of all the brands examined for the motifs fight and pride, while scoring lowest of regarding the opposite motif, cordiality. The Beck's brand dominates those motifs that show a high influence of the Stimulant system. In the associated motifs Freedom, Spontaneity, Adventure and Friendship, the corresponding commercial is rated higher than the competitors. These motifs appeal above all to the Limbic® Types Hedonist and Adventurer. The least focus of the Beck's spot is the opposite values of tradition, quality and reliability. Erdinger's spot focuses on the motifs of the Balance system and the mixed form of Fantasy/Pleasure, which primarily appeal to the Limbic® Types Open-Minded and Harmonizer.

In the final task, the probands were first asked to name the commercial that appealed to them most personally. Then they were asked to indicate their general favorite beer brand. In addition to the four beer brands examined, the test persons had the choice of either not having a favorite beer brand or of indicating another beer brand as their favorite. In accordance with the previous analysis, the valid hypothesis can be stated that a large proportion of the test persons can be assigned to the Limbic® type associated with the Stimulant system according to the theorem of the Limbic® Map and the Limbic® Type, with a strong tendency towards the Balance System. If the theoretical principles can be transferred to reality, the final part of the survey should show a strong preference for the Beck's commercial, followed by the Erdinger commercial. With their previously determined choice of motifs, these brands primarily appeal to the motif systems Stimulant and Balance and the associated Limbic® types. The results can be seen in the following *Figure 22*.



**Figure 22: Favored commercial by the test persons**

The evaluation of the question shows that 75 of the 144 test persons considered the Beck's commercial to be the most appealing for them personally. 38 subjects preferred Erdinger, 17 Veltins and 14 Radeberger. About half of the participants favored the Beck's ad, another quarter of the test persons favored Erdinger's ad. This result correlates with the previous findings, which showed that a large proportion of the probands are controlled mainly by the Stimulant and Balance System. The hypothesis derived therefrom, that a majority of the test persons should prefer the Beck's commercial followed by Erdinger, is verified by the present result.

The analysis of the result broken down by age and gender is also similar to the overall result. Half of the men and women each, as well as most age groups, prefer the Beck's Spot and a quarter prefer the Erdinger Spot. Veltins is favored by a higher proportion of women (14%) than men (8%), while the opposite is the case for Radeberger (15% men vs. 7% women). Only the group of 26 - 35-year-olds shows deviations, as no respondent of this age prefers Beck's, but 50% chose Radeberger. 30% preferred the Erdinger spot and 20% the Veltins spot. This may be mainly due to the small number of stitches of only 10 persons. Furthermore, with a share of 60%, an above-average number of men belong to this age group, who are specifically addressed by the Radeberger spot. In this age group, many people are founding their own family, having their first job and working to build up financial security for themselves and their family. This phase of life thus runs completely counter to the spirit

of adventure and partying with friends that Beck's advertises. Correspondingly, more test persons seem to be attracted by the Radeberger spot, which accompanies a man on his way from child to successful man and symbolizes the hard work invested in a Radeberger.

The additional question about the respondent's favorite beer brand also showed that the survey was not distorted by the fact that most respondents generally prefer Beck's. 48.6% of the participants stated that they did not have a favorite beer brand and a further 34.7% named a different beer brand than the ones investigated. A total of 34 different brands were stated by the 50 test persons. 7.6% of the test persons favor Beck's, 6.3% Erdinger and 1.4% each Veltins or Radeberger.

However, with another distribution of the test persons, e.g. a changed gender balance with more men than women, the results could have seemed different with the majority possibly favoring Veltins and Radeberger instead of Beck's and Erdinger. Therefore, the prior analysis of the test persons could have potentially shown different outcomes about their corresponding Limbic® Types and thus, the hypothesis about the favored commercial would have changed in regard to these other respondents. This demonstrates the validity of the results is only given for this respective survey and test person distribution as there could be several reasons for the choices made by the probands. Accordingly, the survey is not representative for Germany, but could be seen as an indication for the possible and successful implementation of the neuroscientific methods within marketing and the German market.

### **6.2.3 Conclusion**

Overall, the survey confirms the effectiveness of the theoretical foundations of Code Management, the Limbic® Map and the Limbic® Types. On the one hand, it shows the importance of good code management and the resulting unique selling propositions in advertisements to contrast competitors and, on the other hand, how brands can use their codes successfully to convey the desired motifs and values in their spots and address the desired target group. Age could be identified as a decisive factor in neuromarketing. Depending on age, media use differs tremendously, which means that different people are reached by different advertising methods adapted to the medium, and thus the brand networks are composed differently. This was particularly evident in the example of Generation Z, who scored significantly worse than the older generations in brand recognition based on a classic advertisement. The survey also verified the theoretical concept of pilot and autopilot, which showed the unimportance of a preference for a certain product in the

context of recognizing a brand of the industry concerned. Through the mainly subconscious perception of information, people register the codes of advertisements, even if they do not show an active interest in the advertisement, brand or product. Only in industries where active advertising is prohibited it is of significant benefit if a person shows an affinity for the product. Furthermore, the example of Marlboro demonstrated the generally high relevance of advertising and marketing for brand recognition as well as for the neurological brand network. Without active marketing, consumers are much less able to recognize the company's codes than people who experience active marketing of the company's products. In addition, the connection between Limbic® Map and Limbic® Types could be clarified as well as their potential use in the segmentation of target groups and the screening for potential new customers.

In the upcoming section the application possibilities of neuromarketing for strategic brand management are presented. The duality of theory and empiric, consisting of case study and survey, provides insights from the perspective of companies and customers and allows a deep insight into neurological marketing concepts and gives conclusions for the strategic implementation in brand management.

## **7 Possible applications of neuromarketing in strategic brand management**

The following section focuses on the summary of important application possibilities of the knowledge gained about the methods and theoretical principles of neuromarketing for strategic brand management. For classification purposes, the areas of brand management, product management and brand communication will be examined more in detail.

Potential fields of application in brand management arise above all in brand positioning and brand architecture. In the present work it has been demonstrated that the values that consumers associate with a brand can be assigned to specific areas and systems in the brain. Accordingly, the brand in turn occupies positions in these areas in the consumer's brain, which can be localized with the help of imaging techniques and concepts such as the Limbic® Map. This knowledge allows brand management to identify values associated with the brand and important for customers, to segment the target groups precisely and to adapt this information in product features and advertising measures. In addition, repositioning strategies can also be identified via the brand-specific activation patterns in the brain and thus possible chances of success of a repositioning can be evaluated in advance. This enables brand managers to better adapt their own strategy to the ideas and circumstances of consumers and the market. The same principle could also be used to analyze competitor brands, whereby the results could be used to better contrast one's own brand. In addition, the imaging techniques could also be used to evaluate and adapt the own brand architecture. If a company is considering the launch of a new brand or a new product under the name of an existing brand, it is possible to test neuro-economically, even before the launch, whether the already familiar values of the existing brand can be transferred to the new product and thus generate similar neural activities in the consumer. The more matches the neuronal activities of the two brands or products show, the greater the transfer potential. This enables brand managers to plan more reliably when implementing the strategy and to better assess the chances of success of the launch than is possible with conventional market research methods. (Felix, 2008, pp. 76-77)

The imaging techniques could also be used in the product management for the development of new products and the implementation of product variations. Before market launch, test persons can be provided with prototypes of the product while measuring their brain activity during the test. With the help of fMRI, such brain centers could then be localized, which for example lead to cortical relief. If the desired neuronal effects occur, step-by-step

improvements in product design can be initiated in order to successfully launch the product on the market. The same principle could be applied to the design of product variation. In order to adapt the product to changing consumer needs or new market conditions, basic elements of the product are retained, and certain properties are adjusted, involving test persons under neuroeconomic conditions, until the desired effect is generated in the brains of the probands. (Felix, 2008, p. 77)

In the context of brand communication, the findings of neuromarketing could be applied above all in advertising effectiveness control. With the help of neuroeconomic methods, design elements of advertising measures and their influence on, for example, brand preference and memory effects can be examined. As has been shown in this thesis, economic success correlates strongly with the emotional impact of a brand and the processes of information absorption, processing and storage triggered by it. The better the communicated brand content is perceived and stored in the consumer's memory, the greater the chances of success for the brand. If the brands are linked to emotions, it is easier to activate the relevant neuronal network in the consumer by communicating less specific stimuli. To emotionalize a brand, good code management is required above all. If consumer senses are stimulated by the codes in the advertising measures, brand perception and brand storage in the brain can be linked and potentiated and the stimulation of one sense is sufficient to activate the entire neural network. Above all, the survey conducted in the frame of this thesis has shown the great importance of advertising for brand perception as well as the achievement of the desired target groups and the associated challenges for brand managers to implement appropriate advertising measures according to the brand-relevant target groups. (Felix, 2008, p. 78)

## **8 Conclusion**

After summarizing the most important aspects of neuromarketing with regards to its application in brand management, this concluding chapter includes a critical examination of the present bachelor's thesis as well as a reflection on the course of work processes and the achievement of objectives. The theoretical part as well as the empirical part is considered.

### **8.1 Critical review**

Overall, the bachelor's thesis can be considered a success. However, the comparison between the initial plans of the thesis and the final structure shows some changes. The initial plan of a focus on the entire neuroeconomics and the implementation of an international survey to identify and differentiate region-specific consumer habits yielded to a focus on neuromarketing in combination with brand management after a thorough literature analysis. This change was mainly driven by the initially underestimated scope of the field of neuroeconomics.

The main obstacle in working on the theoretical section was the literature research. Since the total number of valid sources in this young field is still very limited in comparison to other fields, the thesis is based on a few, but fundamental textbooks on neuromarketing, which are mostly written by German scientists in German and are therefore not available in Finland. This required the use of e-books in particular. However, it turned out that the university libraries for the majority of books only offer older editions of the textbooks in e-book format and the newer editions are only available as bound editions on site. As a result, the theory presented in this paper is based primarily on an older state of research. Although the reliability of the work was checked to ensure that the content reproduced is still relevant, it cannot be ruled out that in such a fast moving and lively field of science as neuroeconomics and neuromarketing, insights have already been gained which revise or supplement aspects of this work. Nevertheless, all statements are based on well-founded sources from respected scientists, which ensures the validity of the thesis.

The methods and concepts presented in the theoretical part of this thesis are often controversially discussed. One accusation, which is also generally directed against marketing, is that brand advertising manipulates the consumer on an unconscious level and thus creates new needs. Furthermore, neuroscientific research is claimed to transform the human being into a transparent consumer. In addition, the concepts of neuromarketing such as the Limbic® Map are considered too generalized. However, it is precisely the

neuroscientific findings discovered that human motives are biologically predetermined. In this respect, marketing does not create artificial needs, but rather shows different ways of satisfying these needs. In addition, a specific knowledge of the preferences of consumers contribute to the development of products adapted to their demands. Nevertheless, since the exact thoughts of the probands cannot be visualized by the imaging techniques either, it is incorrect to speak of transparent consumers in this context. The accusation of generalization in connection with the concepts of neuromarketing cannot be completely refuted. (Felix, 2008, pp. 81-82) Although very generalized, concepts as Limbic® Map and Limbic® Types are mostly determined based on an expert assessment by qualified psychologists as well as scientists and then empirically validated conducting a quantitative analyses of test subjects. This provides a generally valid level, which in practice can be adapted to individual needs due to their intentionally universal nature. This enables the concepts to be easily adapted to diverse circumstances such as different industries or cultures. (Häusel & Gruppe Nymphenburg, 2020)

The main difficulty of the empirical part was the structure design and the acquisition of test persons. While initially the implementation of a qualitative expert interview was considered, it appeared to be difficult to contact corresponding experts successfully. Therefore, a qualitative case study on the application of the theoretical concepts was implemented instead. This proved to be a decisive and important component, especially for the implementation of the quantitative survey, as the case study provided a deeper understanding of the theory and could be taken up by the survey. Thus, the two empirical parts acted as mutual validation of the results. In retrospect, the implementation of the survey proved to be successful. The questions and task types were well chosen and delivered satisfactory results. The relevance of the theoretical concepts could also be substantiated by the results of the individual tasks. A satisfactory number of participants could have been acquired, but the results can of course only be considered as indications for the German-speaking market and not as representative. In view of the comparatively high drop-out rate, there is a need for optimization of the survey. Although no exact time of termination can be identified, the evaluation of the commercials can be assumed to be the main reason for termination, since this task is by far the most complex and time-consuming. Nevertheless, there is no alternative to validating the case study and this task could only have been simplified by adjusting the rating scale, for example with a scale of 1-5 instead of 1-10. However, this could have resulted in a much less differentiated outcome. With regard to the distribution of test persons, a more even age distribution would have been desirable. This would have enabled a higher

representativeness of the results, as the findings for age groups with a comparatively low number of stitches could not be considered meaningful. Overall, however, the survey produced gratifying results, and thus, in conjunction with the case study, the empirical part can also be regarded as successful and satisfactory.

## **8.2 Reflection**

The main objective of this bachelor's thesis was to gain knowledge about the theoretical background and concepts of a modern economic research area and to generate insights into the decisive factors of brand perception. Both objectives were implemented very satisfactorily throughout the thesis and all in-depth research questions could be answered. Especially due to the fact that a completely new topic had been developed without any decisive previous university education, a fundamental literature research was carried out, which made it possible to generate in-depth knowledge on the topic of neuromarketing. These insights are in turn applicable in later professional life.

The second objective, the acquisition of new skills, was also achieved in a highly satisfactory manner. The knowledge and skills of developing, implementing and statistically evaluating a case study and a survey, as well as the scientific writing of articles and in-depth literature research of relevant sources will be of particular use on the further academic path and will also be applied in later professional life.

Altogether, the result of this bachelor's thesis can be regarded as very positive. By answering the research questions, the fields of neuromarketing and brand management could be linked to each other and the purpose of the thesis, to present the benefits of neuroscientific marketing concepts for brand management, could be fulfilled. Furthermore, all research questions could be answered, and all detailed objectives were achieved. The presented neuroscientific basics and concepts showed the relevance of the modern research field of neuromarketing and led to the illumination of the great influence of the human brain, emotions and feelings on the perception of brands. Thus, the paper demonstrates what big companies like Coca-Cola and Walter Landor realized a long time ago: Products are created in a factory, but the perception and image of the products and the brands are created solely in the minds of the consumers.

## References

Armstrong, T., 2019. *The Human Odyssey: Navigating the twelve stages of life*. Mineola: Dover Publications.

Beck's, 2017. *Beck's Advert 2017 'You Make It legendary'*. [Online]  
Available at: <https://www.youtube.com/watch?v=e7k-PYurDrE>  
[Accessed 25 März 2020].

Bielefeld, K., 2012. *Consumer Neuroscience: Neurowissenschaftliche Grundlagen für den Markenerfolg*. Wiesbaden: Springer Gabler.

Brauerei Beck & Co, n.d. *BECK'S*. [Online]  
Available at: <https://becks.de/#>  
[Accessed 25 März 2020].

Brauerei C. & A. VELTINS GmbH & Co. KG, 2020a. *Historie*. [Online]  
Available at: <https://www.veltins.de/frisches-veltins/historie/>  
[Accessed 24 März 2020].

Brauerei C. & A. VELTINS GmbH & Co. KG, 2020b. *Wintersport*. [Online]  
Available at: <https://www.veltins.de/veltins-erleben/sport/wintersport/>  
[Accessed 24 März 2020].

Bundeszentrale für gesundheitliche Aufklärung, n.d. *Tabakwerbung*. [Online]  
Available at: <https://www.rauch-frei.info/informier-dich/tabakwerbung.html>  
[Accessed 4 April 2020].

Burmann, C., Riley, N.-M., Halaszovich, T. & Schade, M., 2017. *Identity-Based Brand Management: Fundamentals - Strategy - Implementation - Controlling*. Wiesbaden: Springer Gabler.

Duncan, I., 2012. *Generation Z*. [Online]  
Available at: <https://www.urbandictionary.com/define.php?term=Generation%20Z>  
[Accessed 5 April 2020].

Erdinger Weißbräu, 2020a. *Geschichte*. [Online]  
Available at: <https://de.erdinger.de/brauerei/unternehmen.html>  
[Accessed 25 März 2020].

Erdinger Weißbräu, 2020b. *Highlights*. [Online]  
Available at: <https://de.erdinger.de/markenwelt/alkoholfrei/highlights.html>  
[Accessed 25 März 2020].

Erdinger, 2017. *ERDINGER Alkoholfrei - Für Dich - TV Spot 2017*. [Online]  
Available at: <https://www.youtube.com/watch?v=2HazbwdM0Gw>  
[Accessed 25 März 2020].

Farley, P., 2008. *A theory abandoned but still compelling*. [Online]  
Available at: <https://medicine.yale.edu/news/yale-medicine-magazine/a-theory-abandoned-but-still-compelling/>  
[Accessed 22 Februar 2020].

Felix, C., 2008. *Neuromarketing - Ein innovativer Ansatz zur Erklärung des Konsumentenverhaltens unter Berücksichtigung der Wirkung von Marken*. Hamburg: Diplomica® Verlag GmbH.

Gentner, F., 2012. *Neuromarketing in the B-to-B-Sector: Importance, potential and its implications for Brand Management*. Hamburg: Diplomica® Verlag GmbH.

Gillenkirch, R. et al., 2018. *Homo oeconomicus*. [Online]  
Available at: <https://wirtschaftslexikon.gabler.de/definition/homo-oeconomicus-34752/version-258248>  
[Accessed 19 Februar 2020].

Google, 2020. *Search Term "neuromarketing"*. [Online]  
Available at: <https://www.google.com/search?client=firefox-b-d&q=neuromarketing>  
[Accessed 11 April 2020].

Grant, M., 2019. *Brand Management*. [Online]  
Available at: <https://www.investopedia.com/terms/b/brand-management.asp>  
[Accessed 20 Februar 2020].

Häusel, H.-G., 2012. *Neuromarketing - Erkenntnisse der Hirnforschung für Markenführung, Werbung und Verkauf*. 2. ed. Freiburg: Haufe-Lexware GmbH & Co. KG.

Häusel, H.-G., 2016. *Brain View - Warum Kunden kaufen*. 4. ed. Freiburg: Haufe Mediengruppe.

Häusel, H.-G. & Gruppe Nymphenburg, C. A., 2020. *Die Welt der Motive und Werte hinter Ihrer Marke auf einen Blick*. [Online]  
Available at: <https://www.nymphenburg.de/limbic-map.html>  
[Accessed 24 Februar 2020].

Hemmerich, W., 2019. *t-Test*. [Online]  
Available at: <https://matheguru.com/stochastik/t-test.html>  
[Accessed 9 April 2020].

Hemmerich, W., 2020a. *Chi-Quadrat-Test*. [Online]  
Available at: <https://matheguru.com/stochastik/chi-quadrat-test.html>  
[Zugriff am 9 April 2020].

Hemmerich, W., 2020b. *Signifikanz, Signifikanzniveau*. [Online]  
Available at: <https://matheguru.com/stochastik/signifikanz-signifikanzniveau.html>  
[Accessed 9 April 2020].

Henrich, P., 2020. *Anzahl der Brauereien in Deutschland bis 2019*. [Online]  
Available at:  
<https://de.statista.com/statistik/daten/studie/161074/umfrage/anzahl-der-brauereien-in-deutschland/>  
[Accessed 10 März 2020].

Hundschell, C., 2011. *Neuromarketing: Erkenntnisse und Auswirkungen auf das Marketing*. Augsburg: University of Augsburg.

Jackson, N., 2008. *Neuromarketing als Teil der Marktforschung zur Beeinflussung des Konsumentenverhaltens*. Hamburg: Diplomica Verlag.

Jaworski, B., Lutz, R. & Price, L., 2017. *Definitions of Marketing*. [Online]  
Available at: <https://www.ama.org/the-definition-of-marketing-what-is-marketing/>  
[Accessed 20 Februar 2020].

Lowen, A., 2019. *Humans are Emotional Beings: How This Influences Pain*. [Online]  
Available at: <https://sportslab.net.nz/how-emotion-influences-pain/>  
[Accessed 20 Februar 2020].

McLeod, S., 2018. *Erik Erikson's Stages of Psychosocial Development*. [Online]  
Available at: <https://www.simplypsychology.org/Erik-Erikson.html>  
[Accessed 18 März 2020].

Neuromarketing Science and Business Association, n.d. *NMSBA Code of Ethics*.  
[Online]  
Available at: <https://www.nmsba.com/buying-neuromarketing/code-of-ethics>  
[Accessed 20 Februar 2020].

Neuromarketing Science and Business Association, n.d. *What is Neuromarketing*.  
[Online]  
Available at: <https://nmsba.com/neuromarketing/what-is-neuromarketing>  
[Accessed 20 Februar 2020].

Nufer, G. & Wallmeier, M., 2010. *Neuromarketing*. Reutlingen: University of Applied Sciences Reutlingen.

Pickenhain, L., 2000. *Lexikon der Neurowissenschaft*. [Online]  
Available at:  
<https://www.spektrum.de/lexikon/neurowissenschaft/neurowissenschaft/8773>  
[Accessed 19 Februar 2020].

Pispers, R. & Dabrowski, J., 2011. *Neuromarketing im Internet: Erfolgreiche und gehirngerechte Kundenansprache im E-Commerce*. 1. ed. Freiburg: Haufe Mediengruppe.

Pispers, R., Rode, J. & Fischer, B., 2018. *Neuromarketing im Internet: Gehirngerechtes Kundenerlebnis in der digitalen Welt*. 3. ed. Freiburg: Haufe Mediengruppe.

Pritzel, M., Brand, M. & Markowitsch, H., 2003. *Gehirn und Verhalten: Ein Grundkurs der physiologischen Psychologie*. Heidelberg: Spektrum Akademischer Verlag.

Raab, G., Gernsheimer, O. & Schindler, M., 2009. *Neuromarketing: Grundlagen – Erkenntnisse – Anwendungen*. 2. ed. Wiesbaden: Gabler Research.

Radeberger Exportbierbrauerei GmbH, n.d. *Eine besondere Geschichte*. [Online]  
Available at: <https://www.radeberger.de/geschichte/>  
[Accessed 24 März 2020].

Radeberger, 2017. *RADEBERGER Werbung Frühling 2017*. [Online]  
Available at: <https://www.youtube.com/watch?v=zTbj1LgQgT8>  
[Accessed 24 März 2020].

Reimann, M. & Weber, B., 2011. *Neuroökonomie: Grundlagen - Methoden - Anwendungen*. Wiesbaden: Gabler Verlag.

- Robens, S., 2019. *Das sind Deutschlands größte Brauereien*. [Online]  
Available at: <https://www.agrarzeitung.de/nachrichten/wirtschaft/ranking-das-sind-deutschlands-groesste-brauereien-86652>  
[Accessed 24 März 2020].
- Roth, V. A., 2013. *The Potential of Neuromarketing as a Marketing Tool*. Twente: University of Twente.
- Sammer, P., 2014. *Storytelling - Die Zukunft von PR und Marketing*. 1. ed. Köln: O'Reilly Verlag.
- Scheier, C. & Held, D., 2006. *Wie Werbung wirkt: Erkenntnisse des Neuromarketings*. Planegg : Haufe Mediengruppe.
- Scheier, C. & Held, D., 2012. *Wie Werbung wirkt: Erkenntnisse des Neuromarketing*. 2. ed. Freiburg: Haufe Mediengruppe.
- Scheier, C. & Held, D., 2018. *Wie Werbung wirkt: Erkenntnisse aus dem Neuromarketing*. 3. ed. Freiburg: Haufe Mediengruppe.
- Sirotzki, D., 2019. *Veltins: Lied aus der Werbung*. [Online]  
Available at: <https://popkultur.de/veltins-lied-aus-der-werbung/>  
[Accessed 24 März 2020].
- Strang, A., 2009. *Neuromarketing: Transparenz im Konsumentenverhalten und Einsatzmöglichkeiten in der Markenführung*. Hamburg: Diplomica Verlag.
- Szymik, B., 2011. *What Are the Regions of the Brain and What Do They Do?*. [Online]  
Available at: <https://askabiologist.asu.edu/brain-regions>  
[Accessed 20 Februar 2020].
- Taub, B., 2016. *Man Missing Most Of His Brain Challenges Everything We Thought We Knew About Consciousness*. [Online]  
Available at: <https://www.iflscience.com/brain/man-missing-most-of-his-brain-challenges-everything-we-thought-we-knew-about-consciousness/all/>  
[Accessed 20 Februar 2020].
- Twemlow, A., 2004. *Walter Landor*. [Online]  
Available at: <https://www.aiga.org/aiga/content/inspiration/aiga-medalist/medalist-walter-landor/>  
[Accessed 7 April 2020].
- Veltins, 2019. *VELTINS TV-Spot 2019 "Heartbeat"*. [Online]  
Available at: <https://www.youtube.com/watch?v=3WuZAe8mlhs>  
[Accessed 24 März 2020].
- Vogt, O., 2015. *Der Biermarkt im Norden: Konzern- oder Privat-Pils?*. [Online]  
Available at: <https://www.ln-online.de/Nachrichten/Wirtschaft/Wirtschaft-im-Norden/Der-Biermarkt-im-Norden-Konzern-oder-Privat-Pils>  
[Accessed 25 März 2020].
- Wahid, N., 2019. *How to create emotionally resonant marketing experiences for your shoppers*. [Online]  
Available at: <https://www.widerfunnel.com/emotional-relevance-marketing/>  
[Accessed 25 März 2020].

Wheeler, A., 2018. *Designing Brand Identity: An essential guide for the whole branding team*. 5. ed. Hoboken: John Wiley & Sons, Inc..

Zaltman, G., 2003. *How customers think: Essential insights into the mind of the market*. Boston: Harvard Business School Press.

# Appendices

## Appendix A: Original survey

----- (+) -----

**I. Allgemeine Informationen zu Ihrer Person:**

----- (+) -----

**1. Geschlecht\***

Wählen Sie eine Antwort

Männlich
Weiblich
Keine Angabe

**2. Alter\***

Wählen Sie eine Antwort

17 oder jünger	18 - 25
26 - 35	36 - 50
51 - 65	66 oder älter

----- (+) -----

**3. Beruf\***

Wählen Sie eine Antwort

Schüler/in	Auszubildende/r
Student/in	Berufstätig
Rentner/in	Arbeitssuchend

#### 4. Haben Sie Kinder?\*

Wählen Sie eine Antwort

 Ja Nein

#### 5. Sind Sie Raucher?\*

Wählen Sie eine Antwort

 Ja Nein

#### 6. Essen Sie regelmäßig Schokolade?\*

Wählen Sie eine Antwort

 Ja Nein

#### 7. Konsumieren Sie regelmäßig Alkohol?\*

Wählen Sie eine Antwort

 Ja Nein

#### 8. Trinken Sie gerne Bier?\*

Wählen Sie eine Antwort

 Ja Nein

#### 9. Für wie werbeaffin halten Sie sich?

1

2

3

4

5



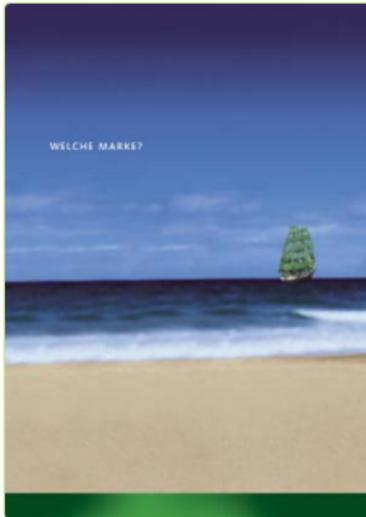
Überhaupt nicht  
werbeaffin

Sehr werbeaffin

## II. Markenerkennung



### 10. Erkennen Sie, um welche Marke es sich handelt?\*

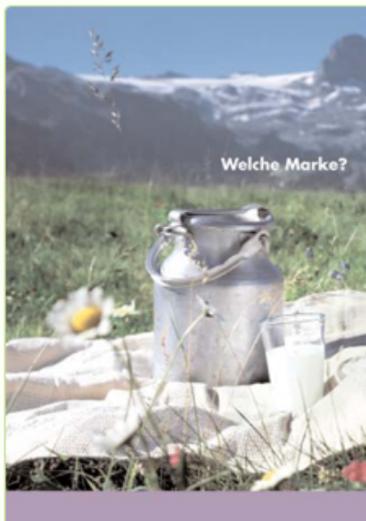


Nein

Ja, es handelt sich um:



### 11. Erkennen Sie, um welche Marke es sich handelt?\*



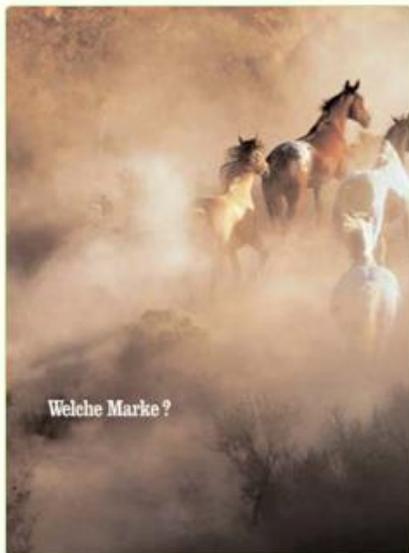
Wählen Sie eine Antwort

Nein

Ja, es handelt sich um:



## 12. Erkennen Sie, um welche Marke es sich handelt?\*



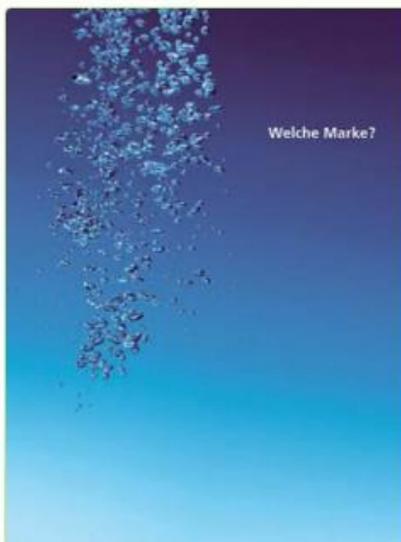
Wählen Sie eine Antwort

Nein

Ja, es handelt sich um:



## 13. Erkennen Sie, um welche Marke es sich handelt?\*



Wählen Sie eine Antwort

Nein

Ja, es handelt sich um:



## 14. Welche der folgenden Werte und Begriffe sind für Ihr Leben von der größten Bedeutung?\*

Wählen Sie bis zu 5 Antworten

Tradition	Familie
Genuss	Fantasie
Humor	Kreativität
Spaß	Mut
Erfolg	Ehrgeiz
Disziplin	Sparsamkeit
Ordnung	Verlässlichkeit
Individualität	Freiheit
Spontanität	Risikofreudigkeit

## 15. Wie wichtig sind Ihnen folgenden Produktmerkmale für Ihre Kaufentscheidungen?

Ändern Sie die Reihenfolge der Positionen nach Ihren Präferenzen. (die erste – die wichtigste, die letzte – am wenigsten wichtig)

- ◇ 1. Familienfreundlichkeit
- ◇ 2. Qualität
- ◇ 3. niedriger Preis
- ◇ 4. Leistung
- ◇ 5. Bekannter Markenname/ Statussymbol
- ◇ 6. Gewohnheit
- ◇ 7. Innovation









#### IV. Abschließende Fragen



### 20. Welcher Werbespot hat Sie am meisten angesprochen?\*

Wählen Sie eine Antwort

Radeberger

Veltins

Beck's

Erdinger

### 21. Welche ist ihre favorisierte Biermarke\*

Wählen Sie eine Antwort

Radeberger

Veltins

Beck's

Erdinger

Eine andere Biermarke:



Ich habe keine favorisierte Biermarke

**Appendix B: Transcription of the survey****1. Sex:**

Male / Female / No specification

**2. Age:**

17 and younger / 18-25 / 26-35 / 36-50 / 51-65 / 66 and older

**3. Profession:**

Pupil / Trainee / Student / Professional / Pensioner / Job Seeking

**4. Do you have children?**

Yes / No

**5. Do you smoke?**

Yes / No

**6. Do you regularly eat chocolate?**

Yes / No

**7. Do you regularly consume alcohol?**

Yes / No

**8. Do you like beer?**

Yes / No

**9. How affectionate are you to advertising?**

(not at all advertising oriented) 1 / 2 / 3 / 4 / 5 (highly advertising oriented)

**10. Can you identify this brand?**

No / Yes, it is:

**11. Can you identify this brand?**

No / Yes, it is:

**12. Can you identify this brand?**

No / Yes, it is:

**13. Can you identify this brand?**

No / Yes, it is:

**14. Which of the following values and terms are most important for your life?**

Choose up to 5 answers:

Tradition / Family / Pleasure / Fantasy / Humor / Creativity / Fun / Courage / Success  
/ Ambition / Discipline / Thriftiness / Order / Reliability / Individuality / Freedom /  
Spontaneity / Risk appetite

**15. How important are the following product features for your buying decisions?**

Change the order of the items according to your preferences. (the first - the most important, the last - the least important):

Family-friendliness / Quality / Low price / Performance / Known brand name or  
Status symbol / Habit / Innovation

**16. To what extent are the following motives in the focus of the TV commercial?**

Select a score on a scale from 1 ("Not in focus at all") to 10 ("In focus completely")  
for each motive:

Pleasure / Ease / Cordiality / Friendship / Adventure / Spontaneity / Freedom /  
Rebellion / Victory / Pride / Reliability / Tradition / Quality

**17. To what extent are the following motives in the focus of the TV commercial?**

Select a score on a scale from 1 ("Not in focus at all") to 10 ("In focus completely") for each motive:

Pleasure / Ease / Cordiality / Friendship / Adventure / Spontaneity / Freedom / Rebellion / Victory / Pride / Reliability / Tradition / Quality

**18. To what extent are the following motives in the focus of the TV commercial?**

Select a score on a scale from 1 ("Not in focus at all") to 10 ("In focus completely") for each motive:

Pleasure / Ease / Cordiality / Friendship / Adventure / Spontaneity / Freedom / Rebellion / Victory / Pride / Reliability / Tradition / Quality

**19. To what extent are the following motives in the focus of the TV commercial?**

Select a score on a scale from 1 ("Not in focus at all") to 10 ("In focus completely") for each motive:

Pleasure / Ease / Cordiality / Friendship / Adventure / Spontaneity / Freedom / Rebellion / Victory / Pride / Reliability / Tradition / Quality

**20. Which commercial appealed to you the most?**

Radeberger / Veltins / Beck's / Erdinger

**21. Which is your favorite beer brand?**

Radeberger / Veltins / Beck's / Erdinger / Another beer brand: / I have no favored beer brand

## Appendix C: Exemplary calculations of significance tests via Excel

### 1. Chi-Square-Test:

Chi2-Test	$\alpha = 5\% = 0,05$		
Smoker	Yes	No	Total
Male	10	42	52
Female	10	82	92
Total	20	124	144
Smoker	Yes	No	Total
Male	$=H249/J249 * J247$		52
Female	12.77777778	79.222222	92
Total	20	124	144
Signifikanz:	0.163456197	> 0.05	No correlation

Chi2-Test	$\alpha = 5\% = 0,05$		
Smoker	Yes	No	Total
Male	10	42	52
Female	10	82	92
Total	20	124	144
Smoker	Yes	No	Total
Male	7.222222222	$=I249/J249 * J247$	
Female	12.77777778	79.222222	92
Total	20	124	144
Signifikanz:	0.163456197	> 0.05	No correlation

$\times$ $\checkmark$ $f_x$ $=\text{CHISQ.TEST}(H247:I248;H252:I253)$			
G	H	I	J
Chi2-Test	$\alpha = 5\% = 0,05$		
Smoker	Yes	No	Total
Male	10	42	52
Female	10	82	92
Total	20	124	144
Smoker	Yes	No	Total
Male	7.222222222	44.77778	52
Female	12.77777778	79.22222	92
Total	20	124	144
Signifikanz:	0.163456197	> 0.05	No correlation

2. T-Test:

<b>T-Test:</b>	$\alpha = 5\% = 0,05$	N=144
	<b>Hauptssysteme</b>	<b>Mischsysteme</b>
	109.01	40.03
	92.02	29.95
	83.95	27.07
	79.06	25.06
	74.02	20.02
	50.98	18.00
	31.97	14.98
	30.96	11.95
	26.06	6.05
<b>Significance:</b>	0.00024123 < 0.05 -> Correlation	

	A	B	C	D	E	F	G
1		Balance	Fantasy/Pleasure	Stimulant	Adventure/Thrill	Dominance	Discipline/Control
2	Family	75.7%					
3	Fun			63.9%			
4	Humor			58.3%			
5	Reliability	54.9%					
6	Freedom					51.4%	
7	Victory					35.4%	
8	Pleasure		27.8%				
9	Creativity			22.2%			
10	Ambition					21.5%	
11	Order						20.8%
12	Spontaneity				18.8%		
13	Tradition	18.1%					
14	Discipline						17.4%
15	Courage				13.9%		
16	Individuality		12.5%				
17	Thriftiness						10.4%
18	Fantasy		8.3%				
19	Impulsiveness				4.2%		
20							
21							
22			<b>T-Test:</b>	$\alpha = 5\% = 0,05$	N=144		

SUMME :  $\times$   $\checkmark$   $f_x$  =144\*C18

	A	B	C	D	E	F	G
16	Individuality		12.5%				
17	Thriftiness						10.4%
18	Fantasy		8.3%				
19	Impulsiveness				4.2%		
20							
21							
22			<b>T-Test:</b>	$\alpha = 5\% = 0,05$	N=144		
23							
24			<b>Hauptssysteme</b>	<b>Mischsysteme</b>			
25			109.01	40.03			
26			92.02	29.95			
27			83.95	27.07			
28			79.06	25.06			
29			74.02	20.02			
30			50.98	18.00			
31			31.97	14.98			
32			30.96	=144*C18			
33			26.06	6.05			
34							
35			<b>Significance:</b>	0.00024123	< 0.05 -> Correlation		

<b>T-Test:</b>	$\alpha = 5\% = 0,05$	N=144
	<b>Hauptssysteme</b>	<b>Mischsysteme</b>
	109.01	40.03
	92.02	29.95
	83.95	27.07
	79.06	25.06
	74.02	20.02
	50.98	18.00
	31.97	14.98
	30.96	11.95
	26.06	6.05
<b>Significance:</b>	=TTEST(D25:D33;E25:E33;2;1)	
	TTEST(Matrix1; Matrix2; Seiten; Typ)	