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The Discovery of Cortical Relief

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Foreword

Neuroeconomic studies undertake the task of examining the interaction between neurology and economics. The claim itself that the two fields should be associated may seem odd at first. But nevertheless in both disciplines man is at the center of attention. In neurology man is viewed primarily from the scientific perspective, in economics from the viewpoint of the humanities. Since it can be assumed, however, that in the end all human behavior is controlled by the brain, **brain research** can bridge the gap between the two different perspectives. “Neuroeconomics” as a line of research is thus actually the attempt to combine two fields and to gain new insights from the synthesis.

The first research report presented here outlines the procedure taken in a pilot project. The results were presented at a conference in Münster, Germany on November 29, 2002. The positive response of the audience met with there encouraged the authors to publish this first report. All the authors are aware that they are entering unknown territory, and the procedure can thus be only of an exploratory nature. The exploration has the disadvantage that, in the absence of comprehensive information, initial findings may be misinterpreted. We would like to point out to the reader here that in light of this fact the hypotheses are only temporarily valid, and, as POPPER has said, progress can only be made when hypotheses can be refuted (Popper 1995). With this in mind, we can only hope that the hypotheses presented in the following can soon be refuted. Until then, may the reader who is so inclined accept them as valid.

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1 Introduction

This report deals with the **brand phenomenon**. This phenomenon manifests itself in the willingness of consumers to pay more for a “branded” product or a “branded” service than for products or services that do not possess the distinguishing feature of a brand, even though they provide the same material benefits. In the branch of business administration that deals with marketing theory there is hardly any other phenomenon at the present time that captivates researchers more. There are at least two reasons for this. *Firstly*, the brand concept has gained enormously in importance in the past several years. Most markets are saturated, many products are interchangeable. This development is dangerous for marketing, because price becomes the main competitive factor as a result. The only way out of this dilemma is for marketing to use the possibilities of **emotional differentiation**. This is where brands play a crucial role.

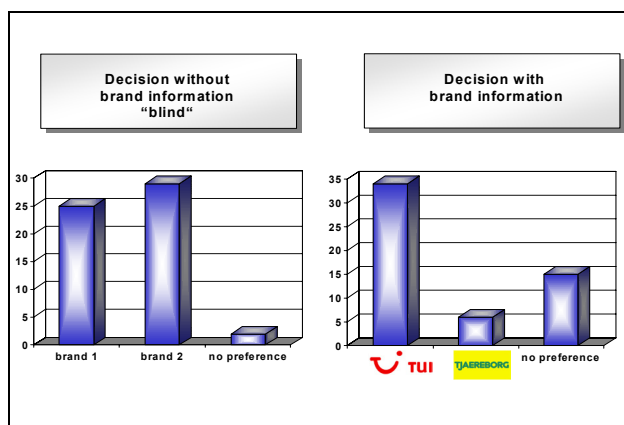
Secondly, many phenomena related to brand are very hard to explain in terms of traditional economic theory. It is true that the psychologically oriented studies by TVERSKY/KAHNEMANN, which helped expand the concept of rationality, were a start in a new direction (cf.. Tversky/Kahnemann, 1974, S. 1124 ff.). However, to this date research in business management has not managed to further develop this method into a valid **brand theory**. Thus brand management is ideal as the first field of research in neuroeconomics.

That is why, as the starting point of the neuroeconomic project “brand research”, the question was asked: do brands affect the human brain, and, if so, what are the effects? In the end, hopefully a contribution will be made to economics, or more precisely, to research on brands and buying behavior. The main idea consisted of interpreting the human brain as an organ of buying decisions.

2 The well-known, unexplained, economically relevant phenomenon

The first step of the research project consisted of a series of experiments comparable to those of the sufficiently well-known Coca-Cola test (cf. Cheratony/McDonald 1992, p. 9 ff.). These experiments generally comprise two stages.

In the first stage, the test person is offered two products and asked to judge them without knowing the identity of the respective company. In the second stage, the test person is faced with the same decision, but the brand information is no longer withheld. The objective of the experiment is to isolate the effect of brand names.



III. 1: Results of the blind test "travel brands" (Source: experiment conducted by authors)

This experiment was repeated a number of times with different products and services. The results gave proof of the positive influence of an allegedly strong brand name on the buying decision. This can be illustrated by the example of **two travel brands**. Decisions made without brand information turned out as follows (see III. 1). Of the 55 test persons, 25 chose brand 1, and 28 chose brand 2; two test persons either could not or did not want to decide. In the blind test both products seem to have been judged to be of about the same quality.

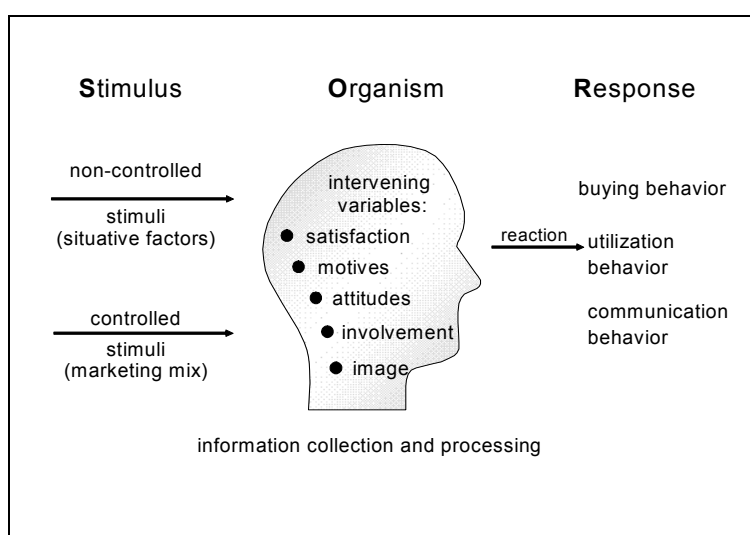
In the second stage of the experiment, the test persons were offered the same products - with the difference that testers were now given brand information. This time 34 test persons chose brand 1; brand 2, dominant in the first test phase, was preferred by only 6 - previously it had been 28! Finally, 15 test persons either could not or did not want to state a preference in the second test.

A closer look at the brands is revealing. Brand 2 is in reality the brand "Tjaereborg". The actual identity of the product labeled "brand 1" is the much better known brand "TUI".

Apparently the brand “TUI” generates such an increase in value that **services considered equivalent when viewed objectively** are assessed to be quite different **after brand information** has been given.

We observed similar results in the cases of many other brands (automobile clubs, banking services, bakery products, beer, energy drinks, etc.). In conclusion, brand information clearly can have a significant influence on decisions made by consumers. What remains unclear is why this effect occurs and what theoretical framework it is based on.

In the search for an answer to this question, marketing research has been turning to the findings of behavioral science for about the last 20 years. Various paradigms have been developed in the scope of research on buying behavior. Certainly the soundest paradigm at this time is the so-called **S-O-R Paradigm**. (cf. among others Howard/Sheth 1969, p. 24ff.). It has **three components**: stimulus – organism – response (cf. Ill. 2).



Ill. 2: Research on buying behavior, the S-O-R Paradigm (Source: following Howard/Sheth 1969, p. 30)

Regarding stimulus, there is a distinction made between controlled and non-controlled stimuli. These stimuli are processed in the consumer’s organism. This processing leads to various forms of behavior, of which buying behavior is the most important where economics is concerned.

Whether or not a stimulus leads to a buying decision depends on so-called “intervening variables”. “Satisfaction” or “image” are two examples. The **goal in buying behavior research** is to theoretically explain as much of the observed buying behavior as possible. The

main difficulty lies in the ability to explain and identify the central constructs. Consumer satisfaction, for example, is very difficult to measure objectively by observation, and as a result is usually measured by interviewing customers. This method, however, has a number of inherent weaknesses, which are dealt with in studies to a greater or lesser degree, depending on the author. Not surprisingly, research work based on the S-O-R Paradigm can only explain a part of the observed buying behavior (cf. Chart 1), at the most 50%. In other words, more than 50% of the buying behavior measured cannot be explained, even when approaches from behavioral science are applied. Here we see an **urgent need for research** (cf. concerning this: Lehmann, 1999, p. 14).

Author	Branch	Method	Explanatory variables	Explained variance
Foxall/Goldsmith/Brown (1998), p. 162	Ford/Chevrolet	interview	11 personality traits	13%
Monhemius (1993), p.185	drug store products	interview	6 factors (environmental awareness)	16%
Henning-Thurau (2001), p.147	service (restaurant)	interview	3 factors (relationship quality)	34% (customer retention)
Kollat/Blackwell/Engel (1970), p. 165	food (coffee)	interview and observation	1 demographic, 10 personality traits	36%
Honsel (1984), p. 136	antiques	interview and observation	9 factors	50%
Homburg/Giering (2000), p. 89	various products and services	interview	1 factor (customer satisfaction)	approx. 50% (repeat buy)

Chart 1: Selected studies explaining buying behavior (Source: compiled by authors)

This gap can be filled in several ways. First of all, it is possible to **combine existing methods**. This has been done successfully in the works of KOLLAT ET AL. and HONSEL.

A second approach could be to **develop a new method**, as has been done in the scope of research on relationship management.

In addition we have the possibility of integrating methods into research on buying behavior that are **established but taken from other fields of research**; methods from sciences that attempt to explain human behavior. Exactly this approach, as applied in the research project “Neuroeconomics”, will be explained in chapter 3 following.

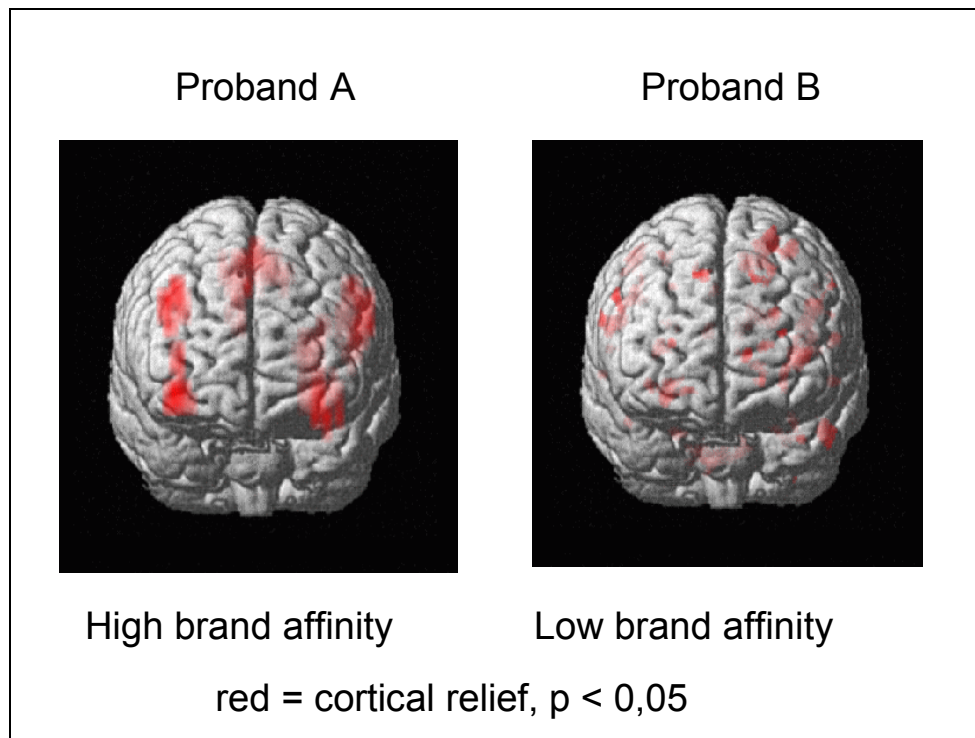
3 The unknown, explanatory, neurologically discovered phenomenon

Chapter 2 pointed out the necessity of examining more closely the neuronal processes that determine buying behavior. The method of functional magnetic resonance imaging (fmri), used to measure cerebral activity, provides an adequate means for investigating these processes. The application of this method to problems in marketing is the basis for the neuroeconomic research presented here.

In order to prove the underlying thesis that there is a significant connection between processes in the human brain and buying behavior, we developed the following test design in an initial pilot project.

The basis of the test was the diagram of an extremely simplified buying situation using the two stimuli “product” and “brand”. To test isolated the effect of brand stimulus, the factor “product” (in this case coffee) was kept constant. The actual test was conducted as follows: test persons were presented with various brands of coffee. The testers were then asked to choose one of the brands offered. At the same time brain activity was measured with the help of fmri. The measurement was done with a high frequency magnetic resonance scanner from the manufacturer Philips. The scanner provided images showing in which parts of the brain increased or reduced neuronal activity had occurred as a result of brand stimulus. Essentially the scanner measures the flow of blood in the brain on the basis of the BOLD effect (cf. Kwong, 1992; Ogawa/Tank et al. 1992). The modulation of the blood flow reflects changes in brain activity in different areas of the brain.

The left side of Ill. 3 gives a first impression of the effect of brand on brain activity. The picture shows neuronal activation in a test person with a relatively high brand affinity, designated as “tester A” in the following.



III. 3: The cortical relief effect (Source: authors' representation)

Tester A's picture, however, does *not* show all the areas of the brain involved in the brand decision. The image shows only those areas which **experience relief** after the tester has been exposed to a **strong brand**. The strength of the brand for the tester was determined by questioning at a later time, and was validated with the aid of the panel observation method over a period of 6 months. Illustration 3 thus focuses on the “cortical relief” that can be observed in the case when a preferred brand (seen subjectively) plays a role in the decision-making process. The relevance of cortical relief becomes especially evident when the image of tester A is compared to that of tester B. The right side of Ill. 3 makes the second test person's reaction to coffee brand information visible. Here we see that when there is a low brand affinity, there is also much less relief. Questions answered by the tester later and observation of buying behavior showed that indeed this test person only rarely drinks or buys coffee. The effect shown was validated in a study with 22 further test persons.

In summary it can be ascertained that apparently there is a positive connection between brand affinity and cortical relief.

4 Consequences for neurology and economics

It has been shown that the neurological impact of brand stimulus can be observed with the aid of functional Magnetic Resonance Imaging (fMRI). Obviously, the scope of methods in brand research can be broadened with the addition of a new tool. This raises the question of what the extension of research methods will actually **imply for brand research and leadership**.

Answering this question is difficult at this early stage of research. Nevertheless, the following areas of application are at least basically conceivable:

1. Determination of brand potential (for brand revitalization, if necessary)
2. Analysis of brand transfer strategies
3. Planning of brand internationalization strategies
4. Control of brand licensing
5. Favorability analysis of brand modification (operative)
6. Efficiency control of brand communication
7. Neurological brand evaluation as a preliminary to monetarization

The fields of research numbered 1-4 belong to the area of analysis and evaluation of strategic options in brand leadership, 5 and 6 support decision-making in the area of operative development of brand policy, and number 7 belongs to a comprehensive area that reaches from control of brand leadership, to enterprise controlling, to accounting. It should be noted, however, that these areas **do overlap**; they are mutually conditional and have an influence on each other. For example, determining brand potential is an important first step of analysis when deciding on the favorability of a brand transfer. Brand internationalization and licensing strategies, on the other hand, are specific manifestations of brand transfer strategies. In the following chapter, interdependence notwithstanding, we plan to follow the order presented and to show the relevance of neuroeconomics for the particular field.

4.1 Determination of brand potential

In the course of this research project the following phenomenon was discovered, revealed by the observation of buying behavior: in his daily life, the test person does not always buy according to brands. However, the neurological examination showed that the brand was nevertheless preferred in the simulated buying situation. This result can be interpreted in two ways. On the one hand, the brand in question may not have been available at the particular point of sale. On the other hand, it is conceivable that the brand may be the preferred brand in the mind of the test person, but was not bought for reasons such as budget restrictions. In the

last and more likely case, it can be assumed that there is **brand potential** in the mind of the test person, since the brand seems to be fixed there already.

A more thorough examination and conversion of this potential could, from the viewpoint of economics, lead to an increase in the brand's share of the market and thus to an increase in profit associated with it. In addition, the determination of potential can obviously be put to good use in the **revitalization** of "old" brands. What is meant by the term brand revitalization in this instance is the reviving of a brand that is either very weak, or no longer existent on the market. Examples of successful brand revitalization can be found over and over again in diverse product markets. Whether it is the brand AEG, which "died" with the end of the AEG concern in 1996 and, as a "lively" virtual brand today, is among the front runners regarding familiarity, popularity and use of household appliances (cf. no author 2002); or the brand "Dual", revitalized by the KarstadtQuelle AG; or, from the food sector, the brands "Bluna" and "Afri-Cola", once of cult status, which had disappeared from the market and today are once again successful market competitors.

In literature on this subject, KAPFERER and KELLER deal with the **development of brand revitalization strategies** (cf. Kapferer 2001, p. 419 ff., Keller 1998, p. 519 ff.).

KAPFERER elaborates on different kinds of brand revitalization in the course of a brand's life cycle using benchmarks. KELLER proceeds in a similar manner, describing successful brand revitalization exemplified by cases like Adidas or Ovaltine. In the end, both authors pinpoint the **necessary prerequisites** for a revitalization strategy. For KELLER, determining if the former resources of brand equity (to borrow from behavioral science) - strength, favorability and uniqueness of the brand associations - are still in the minds of the consumers is a central issue. As success factors in revitalization KAPFERER identifies the following: that a no-longer-existing brand should still have an existent, high degree of familiarity, and that positive associations with the core of the brand are still present in the minds of the brand clientele. Through a vitalizing modification of the brand at the right time, the brand can be reintroduced to the market using appropriate, identity-oriented marketing methods. KAPFERER works on the development of a revitalization strategy primarily from the standpoint of marketing theory. An analysis "des potentialités latentes, non exploitées" (Kapferer 2001, p. 424) - that is, of **latent and not yet discovered potential** - is considered by both KELLER and KAPFERER to be a **black box** and is not pursued further.

4.2 Analysis of brand transfer strategies

The decision about an **extension** of the existing brand(s) plays an important role in brand leadership. In the past years, flop rates of new product launches ranged from 85 to 90%, depending on the product field (cf. Esch/Wicke 2001, p. 7). In order to handle this risk, increasingly brand stretching strategies were pursued for new product launches. Successful examples include brands like Nivea and Virgin, who could extend their brand onto other product areas - Virgin from a record brand to a brand for an airline and for financial services (cf. Aaker/Joachimsthaler 1999, p. 18 ff.). However, there were also flops and failures, as the example of Levi's shows (cf. Vasek 2002, p. 75). In the 1980s, the jeans manufacturer tried to brand noble fashion products and men's suits with its name. This brand extension was hardly accepted by the brand audience, though: the introduction led to a 10-percent decline in sales in core business and to a damaged image of the original brand. Thus, brand stretching provides **no guarantee** for the **success of new product launches**. SATTLER placed the average probability of success in different product markets of the food sector between 45 and 72% (cf. Sattler 1997, p. 226 ff). The costs of brand extension in the surveyed markets were figured to amount to an average € 33.5 or € 35 million respectively. Obviously, brand extensions can turn into a million-Euro gamble. On the other hand, saving potential lies in marketing costs, a higher consumer buying disposition and a reduction of market entry barriers – in short, these are potentials for an increase in marketing effectiveness and efficiency.

The question arises whether **brand stretching is *the* answer for new product launches** in saturated markets, and how a successful brand stretching strategy must be designed.

Many authors have dealt with this topic (e.g. Esch/Fuchs/Bräutigam/Redler 2001, p. 755; Keller 2001, p. 793 ff.; Kapferer 2001, p. 279 ff.). Different kinds of brand stretching are distinguished. For the present research project, only direct brand stretchings in the narrower sense, i.e. brand stretchings into new product categories, the so-called brand transfers, are of interest. Direct brand stretchings in a wider sense also include the so-called line-extensions, which merely comprise the stretching of brand products, not, however, of the brands themselves. **Brand transfer** is thus understood as the **transfer of the “brand effect” which has been detached from an existing (flagship) product into new product markets**.

The state of the art in the relevant literature refers

1. on a normative level to the analysis and explanation of brand transfers through attitude-theoretical and memory-psychological approaches,

2. on a descriptive level to the (empirical) research on different defining or success factors of brand transfer strategies.

Ad 1. Behavioral science research attempting to explain and analyze brand extensions is, firstly, based on so-called memory-psychological pattern- and categorization theories and, secondly, on theories of image and attitude. These different theoretical approaches do not contradict each other, since the mnemonic-psychological approach can be considered a fundament for the explanation of attitude theories (cf. Casper 2002, p. 240 ff.).

According to the **pattern- and categorization theories**, new stimuli in a person's memory are not processed in an entirely new way. Rather, a classification takes place in the brain. Some authors have applied this simplified explanation of information processing in the human brain to the processing of brand information (cf. e.g. Keller 1998, p. 474 f., Boush 2001, p. 809 ff., Esch et al. p.782 ff.). According to this approach, brand associations, or brand knowledge, are stored and processed in the memory in a mental network or mind map, so-to-speak, with the help of different categories. During a brand transfer, there is the attempt to apply existing categorical knowledge onto the transfer product in order to reduce mental complexity. ESCH adds to this approach by examining psychological involvement, which supposedly influences the **processing depth** (cf. Esch et al., p. 783 ff.). The pattern- and categorization theories are problematic insofar as the implied kind of information processing is strongly simplified. Today, innovations especially in the field of neurology make it possible to research and explain such processes in a more detailed manner.

Attitudes are an individual's learned predisposition to react to specific stimuli in a consistently positive or negative manner (cf. Meffert 1992, p. 55). The image of a brand is understood to be a multidimensional construct of attitude. There are different models which deal with the phenomenon of **image transfer** that is allegedly initiated by the brand transfer. The models by SCHWEIGER and MEFFERT/HEINEMANN are widely known.

SCHWEIGER has developed a **distance measure in a multidimensional space** to determine the suitability of a product class for a transfer and also the transfer potential of a brand (Schweiger 1982, p. 321ff.). The proximity within the perceived space is determined by the emotional affinity between brand and transfer product and existing and new product as well as by the technological affinity between existing product and new product. Unfortunately, to date Schweiger's model has not been empirically verified and behavioral science has not provided a foundation (cf. Esch et al. p. 692 f.). Moreover, the integration of denotative and connotative constituents of images is neglected.

Basing their work on SCHWEIGER'S model, MEFFERT and HEINEMANN have developed a measuring model which closely follows the **ideal-point model** by TROMMSDORFF (cf. Trommsdorff 1998, p. 70 ff.) and is intended to reveal the transfer potential by measuring the distance of a brand from an ideal hypothetical transfer product. This model can be criticized for its underlying assumption of a one-dimensionality between brand, product and feature, although in reality there are multidimensional network relations. Furthermore, the employed method of interviewing neglects sub- or preconscious issues.

Ad 2.: In the relevant literature, the following conditions have emerged as prerequisites for a successful brand transfer strategy: firstly, the brand must be known and it must evoke positive associations. Secondly, at least some of these positive associations must also be evoked by the transfer product.

The degree of transfer suitability depends on the salience, the favorability and the uniqueness of the brand associations (cf. e.g. Keller 1998, p. 472 f.). Many empirical studies have been conducted to determine the success factors of brand transfer strategies. The following Chart 2 provides an overview of the best-known studies without claiming to be complete.

Survey	Objects	Subjects	Procedure	Success factors	Results
Aaker/Keller (1990): Consumer Evaluations of Brand Extensions	1. beer, sun glasses, ice cream, shampoo, tooth paste 2. advertising information	107 students	1. 6 known brands and 20 hypothetical extensions in different product categories are rated on a scale 2. influence of advertising information	- fit - quality - technical complexity/competence - information policy	- the fit between a brand and BE has a direct positive influence if the consumers make out similarities in the production process - a quality transfer is supported by increasing similarity - no direct connection between quality of the brand and BE - success probability of the BE is assessed higher when the transfer product is not trivial in production - a preventive information policy concerning the BE product's characteristics has a positive influence on the BE's evaluation
Barone/Minard/Romeo (2000): The Influence of positive mood on BE Evaluation	electronic articles	74 students	3 BEs with varying distances are rated on a scale after previous influences on the mood	- mood	- a positive mood leads to the result that BEs in mid-distant product categories are rated better than close or distant transfers - a positive mood leads to the result that positive associations with brands are increased - the effect of a positive mood is influenced by the perceived fit
Boush/Loken (1991): A process-tracing Study of BE Evaluation	watches, jewelry, frozen food, steak, sauce	144 students	hypothetical BEs with varying distances are rated on a scale, answering time is measured	- fit - image/brand equity - width of product range/past transfers	- similar BEs are rated better than BEs without similarities - specific brand associations improve the success probability of BE, if transferable - associations have a stronger influence than functional similarities - in the case of BEs of brands with a wide product range, the transfer product's categorical affiliation is of lesser importance in the assessment - the scope for BE is narrower for small product ranges than for larger ones
Broniarczyk/Alba	1.beer and	176	1. 2 brands from different	- level of	- consumers with a low level of information

(1994): The Importance of Brand in BE	muesli, soap, tooth paste, deodorant 2. soap, muesli, shoes, watches, 3.PC	students 2159 students 345 students	product groups and with different associations are provided with different hypothetical BEs, respectively 2. like 1. with BEs varying in distance 3. like above with expert interviews	information	model their assessment more strongly on brand-specific associations
Dacin/Smith (1994): The Effect of Brand Portfolio Characteristics on Consumer Evaluations of BE	electronic household appliances	1186 280 398 persons	1. assessment on rating scales of hypothetical BEs of imaginary brands with different-sized product ranges 2. like 1. but with variable product portfolios 3. written surveys on 1. and 2.	- quality - width of product range/past transfers	- with increasing variance in quality of the product range, the trust in future BEs is affected negatively - the larger the brand's product range, the better the consumers' predicted success for BE - the more heterogeneous the product range and the better the product quality, the less important the fit
Han (1999): Effects of Competitive Targets and Product Attitude Typicality on perceived Quality	1. ice cream, beer, tooth paste 2. ice cream, sports wear, razors	1120 students 2240 students	1. assessment of hypothetical BEs of varying distance under influence of advertising 2. like 1. with emphasis on same product qualities	- fit	- if there is a strong fit between brand and transfer product, a non-comparative advertising strategy is more suitable than a comparative advertising strategy
Harris (1997): The Effects of promotional Bundling on Cons.' Evaluation on Prod. Quality and Risk of Purchase	muesli, pasta sauce, trash bags, coupons	153 students	bundling of hypothetical BE with high degree of brand familiarity; price advantage through coupon. Buying decision was made once with and once without coupon and then compared	- marketing mix	- promotional bundling of BE with an established brand product harms the transfer product's quality assessment
Jun/Mazumdar/Raj (1999): Effects of technological Hierarchy on BE	high-tech and low-tech products	258 students	assessment of hypothetical BEs from low- (high)-tech to high-(low)-tech products	- technical complexity/competence	- BEs from high-tech to low-tech products are rated more positively than vice versa - if there is a high technological similarity between the old and the new products, the aforementioned effect is even stronger - strong variances in quality on the market also support the aforementioned effect
Keller/Aaker (1992): The Effects of sequential Introduction of BE	chips, crackers, ice cream	430 university employees	assessment of hypothetical BEs on a rating scale; information about past BEs	- quality - width of product range/past transfers	- high-quality brands can be extended more easily and further than lower-quality brands - successful BEs of average-quality brands have a positive impact on the assessment of future BEs - unsuccessful BEs affect only high-quality brands' new BEs negatively
Lane (2000): The Impact of Ad Repetition and Ad Content on Consumer Perceptions of incongruent Extensions	beer, juice, tires, tooth paste	109 students	assessment of different hypothetical BEs influenced by repeated contact with ads	- marketing mix	- repeated ad contact leads to a positive assessment, a better recognition of fit and a suppression of negative associations for incongruent BEs - in the case of strongly incongruent BEs, only ads that communicate product utility have an effect. In the case of middle-rate incongruent BEs, information on peripheral similarities still has a positive effect.
Lee (1995): Role of Attitude toward Brand Advertising on Consumer perception of a BE	Jeans	132 students	assessment of hypothetical BEs of imaginary brands in different product categories; partly influenced by ads	- marketing mix	- consumers' attitude towards brand advertising influenced assessment of a BE - a positive attitude led to a better transfer of associations
Muthukrishnan/Weitz (1991): Role of Product Knowledge in Evaluation of BE	sports goods	106 students	assessment of hypothetical BEs by persons with good/poor knowledge of the product via written survey	- level of information	- when assessing BEs, experienced customers tended to refer to product parallels which rested on more profound similarities - inexperienced consumers tended to relate to more superficial similarities
Park/Milberg/Lawson (1991): The Role of Product Feature Similarity and Brand Concept Consistency	watches	195 students	assessment of hypothetical BEs of two real brands and one imaginary brand along with a consistent/new brand concept	-fit -image / brand equity	- BEs are rated more positively when there is concept consistency - prestige brand concepts have a higher probability of success than functional brand concepts

Rangaswamy/Burke/ Olivia (1992): Brand Equity and the Extendibility of Brand Names	yogurt, muesli, mouthwash	225 students	4 different familiar brands with 3 hypothetical BEs each, survey on buying probability	- quality - image/brand equity	- the brand quality has a significant influence on success of the brand transfer - on average, familiar brands are rated more highly - BE's probability of success increases if brands are connected with values and not only functional attributes
Smith/Park (1992): The Effects of BE on Market Share and Advertising Efficiency	children's toys, cosmetics, tools	188 product managers, 1383 persons	experts' survey on marketing strategies, product ranges, competitive environment, market share, advertising costs for their brands consumer survey drawn from results of experts' survey	- fit - quality - level of information - brand confidence	- the similarity between brand, old and new products has no large influence on the market share - with increasing brand quality, the BE's probability of success increases - with a higher informational asymmetry the probability of a successful transfer increases - the BE's probability of success rises with an increasing share of experience- and trust qualities
Sullivan (1990): BE: When to use them	soft drinks, coffee, soap, - detergent, sanitary products		evaluation of market data from printed media concerning different BEs	-timing strategy	- late entry into young markets is the preferred strategy for BE - chances of success seem higher with late entry - in the case of an early market entry, BE's reach a lower market share than new brands
Sunde/Brodie (1992): Consumer Evaluation of BE	beer, sports shoes, tea, ice cream, shampoo, McDonald's menu	157 students	assessment through rating scales of 6 familiar brands, 20 hypothetical BEs in product fields of varying distances	- fit - quality - technical complexity/ competence	- a perceived fit between brand and BE has a positive influence on the probability of success - higher brand quality estimations have a positive effect on the BE - a quality transfer is supported by the increasing fit - BE's probability of success is rated higher if the transfer product is not trivial in production

(BE=brand extension)

Chart 2: Overview of research on factors contributing to the success of brand transfer strategies (Source: compiled by authors)

In sum, the following success factors should be kept in mind:

- There should be a **function-oriented** and/or a **value-oriented fit**, so that the brand substance can be transferred onto new product areas without the brand audience suffering cognitive irritation. The brand substance should be detached as much as possible from the existing (flagship) product.
- There should be **concept coherency** and **consistency**. This means that the transfer product should solve the same conflict and employ the same brainscripts (on this term, cf. Gutjahr 2002) for the symbolism and history used by the brand.
- There should be a **uniqueness** of the transfer product, distinguishing it from competing products and from the brand's already existent products.

To implement the afore-named success factors, the management process for the brand transfer strategy should proceed as follows:

1. Analysis of the **brand potential**

2. Analysis of the **brand substance's transfer potential**
3. Analysis of the **potential transfer category** according to the consumers' need pattern and to the brand fit
4. Analysis of the market conditions and company resources
5. Determination of the goals, strategies and design of the marketing mix for the brand transfer
6. Control

For the present research project, especially steps 1-3 are of importance.

Currently, the aforementioned steps of analysis are carried out with the help of brainstorming techniques, experts' and consumer interviews. However, these methods only seem partly suited for the brand phenomenon. The mental processes which are implicit in the brand transfer are – though deemed important by the current literature – still treated as a black box. This is where there are **different points of departure for neuroeconomic research**.

The application in the field of brand potential analysis has already been presented in the previous subchapter.

The use of neuroeconomics for the analysis of a **brand substance's transfer potential** could, first of all, be conceivable for the examination of the **brand substance's detachment** from existing brand products. In the case of brands like Tesa, Pampers or Tempo, which have practically become synonymous with their product category, the attachment of brand substance to the product is so strong that a brand transfer seems difficult. A counter-example is provided by the brand Nivea, which at one point stood for an all-purpose lotion but today has successfully expanded into a wide range of cosmetic products. Here, the cortical irritation of a hypothetical transfer onto new product areas could be analyzed. An interesting question and object of investigation could be, for example, whether the hypothetical transfer product leads to a similar cortical relief. The salience, the favorability and the uniqueness of the brand substance would need to be analyzed. Here, the fMRI method could provide valuable help.

4.3 Brand internationalization

Innumerable practical examples for the successful internationalization of brands exist. McDonald's, Coca-Cola or Harley Davidson are only a few examples. These brands have brought the American Dream to other countries (cf. Aaker/Joachimsthaler 2000, p. 307 f.). But German brands like Adidas or Obi, for example, have also successfully entered markets in foreign countries.

Nevertheless, many unsuccessful foreign market entries by nationally strong brands can be observed, too. Current examples include Wal Mart's and Marks & Spencer's entry into the German market. Wal Mart cannot keep up with its German discount competitors like Aldi, Plus and others. Only its great financial resources currently allow Wal Mart to remain in the German market. Marks & Spencer has already had to pull back out. Thus, the question arises which factors determine the success or failure of a "going international" of brands.

The term **brand internationalization** is generally understood as the **transfer of a brand to new geographical markets** (following Kapferer 2001, p. 431ff.). The aim is to realize **monetary sales growth** through the entry into a new market with existing products. Moreover, **potentials of cost reduction** and **economies of scale und scope** can be taken advantage of in the field of research and development, for example, or in marketing (cf. Keller 1998, p. 554 ff.). Barriers to brand internationalization consist in **differences in general frameworks** such as differences in consumer needs, in culture or in the political and legal system.

In the literature there is a lively discussion about the possible strategic options of brand internationalization (cf. for example Levitt 1983, Quelch/Hoff 1986, Kapferer 2001, p. 458 ff., Meffert 2001, p. 159). Principally two strategies can be distinguished: a **global brand strategy**, i.e. an internationally uniform brand concept, and a **multinational brand strategy**, i.e. a country-specific brand concept. In practice, often hybrid forms of these two strategic options exist. The quoted literature discusses the success factors relatively briefly. The success factors which were elaborated on above can be transferred:

- There should be a **function-oriented** and/or **value-oriented fit** of the market's framework conditions, so that the brand substance can be transferred onto new geographical markets. Here the appropriate brand positioning is presumed to be found in the area between a global brand, a hybrid form and a multinational brand.
- Depending on the chosen positioning, there should be **concept coherency** and **consistency**. This means that the global brand should solve the same consumer problem and assume the symbolism and history employed by the old brand.
- There should be a **uniqueness** of the brand, which differentiates it from competing products.

In order to implement these success factors, the management process for the brand internationalization strategy should proceed as follows:

1. Analysis of the **brand potential**
2. Analysis of the **brand substance's transfer potential**

3. Analysis of the **potential geographical market** with regard to the consumers' need patterns and the brand fit

The additional steps 4.-6. should follow the process described in the previous subchapter. Currently, there are hardly any publications on the research steps relevant here. However, it is probable that they are conducted via experts' and consumer interviews. The fMRI could help to develop more valid and more objective means of measurement.

4.4 Brand licensing

License brands are familiar to all of us – however, the marketing concept behind them often is not. In Germany currently about 750 licensing contracts exist, with which a turnover of approximately € 75 billion is generated (cf. here and in the following Binder 2001, p. 387 ff.). Mostly this method is applied in the field of fashion/design (BOSS, JOOP!, Porsche Design), sports articles (Adidas, HEAD) and luxury items (Mövenpick, Camel).

The term brand licensing is generally defined as the **right granted by the brand owner to use the brand for one's own products**. Thus, brand licensing is a form of brand extension where the extended product is not, however, manufactured by the actual brand owner. In bad economic times, which are marked by a high pressure to expand on the one hand and by lean management approaches on the other hand, concentrating on core competencies in the form of brand licensing seems to be a sensible alternative to traditional brand stretching strategies. The concept seems to work – in Germany annually only about 3% of licensing contracts are not renewed (cf. Binder 2001, p. 388).

In theory and in practice several forms of brand licensing are distinguished:

- brand extension licensing
- international brand licensing
- brand promotion licensing
- various special forms such as event- or person-brand licensing

The first three forms of brand licensing are relevant for this research project. The first two were already described in depth above and shall not be dealt with further here.

Brand promotion licensing offers another interesting approach. With this form of brand licensing, licensees produce advertising and fan products, gifts or souvenirs representing the brand. Examples include mugs, t-shirts, pins, jewelry and watches of brands such as the Lufthansa Sky Shop, promotional assortments of beer- and beverage brands and the BMW M

Style assortment. Only secondarily do such products satisfy a physical need – primarily they satisfy the consumers' psychological need for identification with the brand.

To analyze the favorability of such a brand licensing strategy, neuroeconomics can be applied. Within the scope of the already discussed analysis of **unconscious brand potential** it could be found out whether the brand is sufficiently endowed with prestigious components so that an introduction of promotional products would make sense.

4.5 Brand modification

This is a field in which to date only few research projects can be found. A possible question to pursue could concern the extent to which a brand is able to endure changes in the course of a brand relaunch, for example. Here, neurology has provided some project work which is discussed under the heading of “pattern recognition”. Nevertheless, marketing research has hardly paid attention to these projects so far. Still, this work can be used as a starting point. The existing findings would need to be tested for their transferability onto brand problems. For example, a test person could be presented with various brand design drafts. Then their effect on cortical relief could be examined. A possible hypothesis in this context could be that the brand relaunch is all the more dangerous the less cortical relief the new brand transports.

4.6 Efficiency control of brand communication

In the year 2001, the general expenditure for traditional brand communication in Germany amounted to approximately € 17 billion (cf. Esch/Wicke 2001, p. 16). This means that spending for brand communication has doubled, the supported recall values, however, have remained constant. This result is enhanced by an inflation of communicative measures on the one hand and an inflation in communication media on the other hand.

Many authors deal with the different methods of efficiency control of communicative measures, especially advertising efficiency control. Of special importance is the work of the research group Consumption and Behavior (cf. for example Kroeber-Riel/Weinberg 1996, p. 559 ff.; Rehorn 1988, p. 66 ff.; Unger 1994, p. 146 ff.; Schub von Bossiazky 1991, p. 40 ff.; Berekoven et al. 1991, p. 125 ff.). An exemplary survey of common methods and instruments in this context is given by Chart 3:

Based on interviews:	Based on observations:
Unsupported recall tests, e.g.: <ul style="list-style-type: none"> • Folder/spot test • TV/radio DAR • Waiting room tests 	Psychobiological procedures, e.g.: <ul style="list-style-type: none"> • Electroencephalogram • Pupillometry • Voice frequency analysis • Psychogalvanometry • Thermography
Recall/recognition tests, e.g.: <ul style="list-style-type: none"> • Starch-Test • Controlled recognition test • Impact test • Mask test 	Comganon procedure
Psychological market research, e.g.: <ul style="list-style-type: none"> • Depth interviews • Experts' interviews • Association methods/list tests • Picture frustration test • EQ-scale 	Apparative test procedures, e.g.: <ul style="list-style-type: none"> • Remote eye tracking • Tachistoskopie-Test
Comprehension tests, e.g.: <ul style="list-style-type: none"> • Completion exercises • Text comprehension formulas 	Program analyzer
Scaling techniques, e.g.: <ul style="list-style-type: none"> • Semantic differentials • Likert • Multi-attribute models 	Pre-post-choice <ul style="list-style-type: none"> • Schwerin test
	Magnitude scaling

Chart 3: Overview of methods for testing the impact of advertising (Source: compiled by authors)

Despite this abundance of methodical procedures, neither theory nor practice seem to be able to find a valid, reliable and objective instrument for the efficiency control of communicative measures.

A possible reason for this is that irrespective of the communication object, the following connection between advertising and effect is implied (following Kroeber-Riel/Weinberg 1996, p. 586 ff.). The advertising contact leads to a stimulation or rather an activation of attention. Depending on the kind of advertising contact, cognitive or emotional processes can be triggered, resulting in a positive, negative or neutral attitude. This, in the end, influences the consumer's buying behavior.

This line of effect seems to make sense, especially in the case of the advertising of new products.

The first results of the present neuroeconomic research, however, showed that brands lead to cortical relief and thus do *not* activate neuronally.

4.7 Neurological brand evaluation as a preliminary to monetarization

Finally, with the problem of brand evaluation, brand research presents a further interesting field of research. At the core of the discussion about brand evaluation there is always the question of what value can be assigned to a brand. To answer this question, many models

were developed which shall not be the object of closer study at this point, however (cf. Kriegbaum 2001 and Kranz 2002). What is problematic about most of these models is the fact that they have been proven to have serious deficits concerning objectivization. From the accountants' point of view, redressing these deficits is indispensable for adding a brand to the balance sheet as an asset. The fMRI method could help to solve these problems since to a great extent it is safe from manipulation. The reason for this is that most test persons are *not* conscious of neuronal processes. Thus, the results are at least partly protected from manipulation (by the interviewer, for example). At this point it must be explicitly emphasized, though, that the modeled connection between the phenomenon of cortical relief and brand equity surely will pose many other problems which cannot yet be anticipated.

5 Conclusion

It has been the aim of this first neuroeconomic research project firstly to point out areas where neurology and economics meet. Secondly, the first result of the research group Neuro-marketing – the discovery of cortical relief – was to be presented in a brief, comprehensible form. In the end, however, both goals only served the higher purpose of arousing the reader's interest in the forthcoming research reports. If this goal has been attained, the present paper has fulfilled its purpose.

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