

Zumtobel Research

Laboratory Study

Limbic® Lighting – target group-lighting of shop and retail areas

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Research Study

Limbic® Lighting – higher turnover through target-group specific lighting solutions

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**Emotions are what really
drive human behaviour.**

**Limbic® Lighting –
target group-lighting of shop and retail areas**

1 Summary	6
2 Background	7
3 Method	8
4 Study details	10
a. Participants	12
b. Realisation	13
5 Data analysis	14
6 Results	16
a. Target group-specific results	17
b. Summary of results and discussion	20
7 Next steps	21

**Limbic® Lighting –
higher turnover through target-group specific lighting solutions**

1 Summary	24
2 Background	25
3 Survey details	
3.1 Target group research	26
3.2 Development of a target group-specific lighting design	26
3.3 Recruitment	26
3.4 Method	27
3.5 Comparison of existing vs. new Limbic® Lighting scenario	28
4 Data analysis	
4.1 Limbic® Emotional Assessment	30
4.2 Economic analysis	30
5 Results	31
6 Summary of results and discussion	32
Brief profile of the partners	40



Laboratory Study

Limbic® Lighting – target group-lighting of
shop and retail areas

1 Summary

Light impacts on mood and emotions – both in positive and negative ways. The question so far is, which lighting parameters, in a retail environment, possess the greatest effect, and which lighting scenarios have a positive impact on emotional perception. Neither these situations nor the question if different target groups have individual preferences with respect to light have ever been investigated yet.

Using methods from neuroscience and psychophysiology, several of these questions have now been answered in the course of this study. For instance, valuable clues were found as to which lighting parameters most strongly affect people's emotions and which composition of lighting parameters will influence the customers' mood most positively. Additionally, the lighting preferences of seven different target groups were analysed using the neuropsychological target group model Limbic® Type.

The results show that there are clear differences with respect to lighting preferences between the individual target groups. In turn, accordingly, there is no single scenario that triggers the same positive emotions in all target groups. Rather, each target group seems to have its own requirements regarding light. The target group-specific results of this study have allowed sectioning into three large target group clusters, with target group preferences being similar within each individual cluster.

In developing lighting concepts for the retail sphere, the findings obtained may help to increase customers' wellbeing during general shopping, and accordingly also the amount of time they spend in a store.

Over the past two decades, neuroscientists have been able to prove that emotions are the main drivers of the way we act and behave. Only people, situations and products that trigger our emotions are of any importance to the brain. Thus, it is only our emotions that infuse our everyday environment with meaning.

It is now a known fact that more than 95 per cent of human decisions are made unconsciously. Purchasing decisions are also made on the basis of emotional processes, and not by our intellect, as had been assumed so far. Brain science, accordingly, has dropped the concept of rational and conscious homo sapiens long ago.

These findings suggest that classic tools of market research, based on explicit surveys, should be questioned. Verbally requested assessments do not always coincide with what customers feel on an emotional level and with how they ultimately behave.

For some time now, we have come to consider the customer as an “emotional consumer”. This is where neuromarketing comes in, taking advantage of recent findings from brain research, as well as, from equipment-based, neuroscientific methods in order to decode unconscious decision-making processes and emotional events.

This “neuroscientific” approach addresses numerous issues. For instance, brands, products, retail outlets, and other topics have been examined using the methods from neuromarketing.

Light is another topic that is highly relevant in the context of the marketing of products, especially in the area of shop&retail; it is a well established fact that light is able to influence the mood of people in a positive, as well as, negative way, and that it may accordingly have an impact on (purchasing) behaviour. However, formerly there had not been any investigation into precisely which lighting parameters have which influence on human emotions.

In this complex study, the type of emotional reactions that people will display to various lighting scenarios has now been investigated. Specifically, the investigators looked into the question of what kind of interaction between different lighting parameters will trigger the most positive emotions in customers and whether there is any, one lighting scenario that affects all people equally positively, or if different target groups have very special lighting preferences.

For this purpose, a novel method developed by Gruppe Nymphenburg Consult AG was applied: Limbic® Emotional Assessment, or LEA in brief.

For the present study, the LEA served the purpose of understanding target group specific lighting preferences even better and help provide some insights into the development of target group specific lighting solutions and lighting technologies.

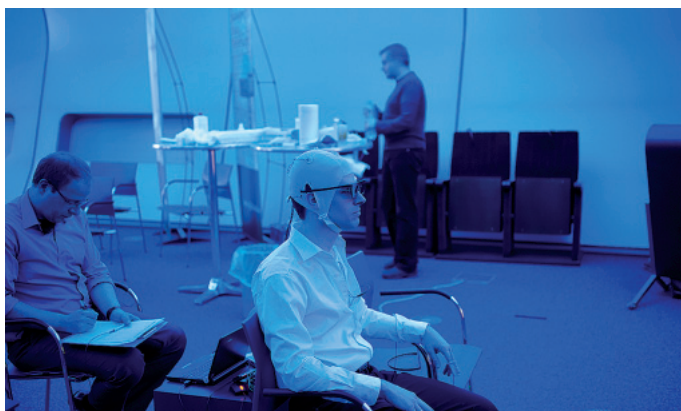
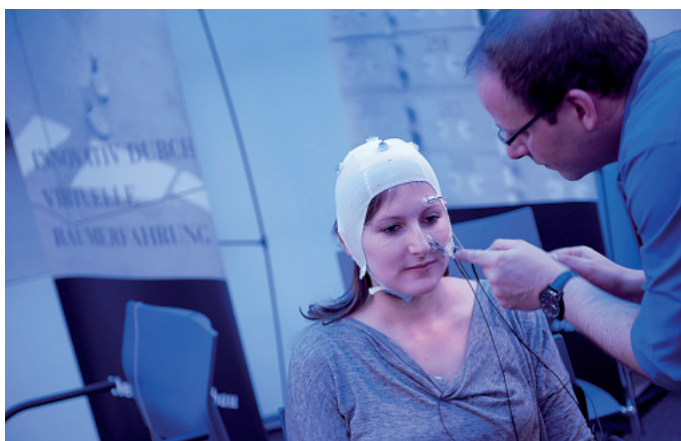


Fig. 1 + 2: Utilization of LEA

4 Study details

In order to model the reality of shops or retailers as accurately as possible, a 3D simulation of a fashion store was installed at Terminal V in Lauterach (Austria) in January 2013 (see Fig. 3).

This complex installation, conveyed to the test subjects the illusion of actually being at the POS. At the same time, a standardised laboratory setting was created to ensure valid comparisons of the reactions of all participants.



Fig. 3: 3D visualisation of a fashion store at Terminal V in Lauterach, Austria

Within this 3D visualisation, a total of 20 different lighting scenarios featuring various combinations of 6 lighting parameters were tested.

The parameters were the following:

- Light colour
- Light output
- Light distribution diffuse/directional
- Light distribution/beam pattern
- Contrasts/brightness
- Contrasts/light colour

Overall, three lighting scenarios per parameter 1–5 and five lighting scenarios for parameter 6 were developed (Fig. 4).



Fig. 4: 3D illustration of the lighting scenarios tested

a. Participants

For this study, 48 test subjects (25 women and 23 men between 19 and 62 years of age) were recruited.

Before the test, the participants were categorised and selected according to different target groups, the so-called Limbic® Types (see Graphic 2), using a questionnaire.

The Limbic® Types form a segmentation within the Limbic® model and focus on the complex emotional personality structures of consumers. Sociodemographic details such as age, sex and income are negligible in this context.

The Limbic® Types enable us to obtain a great variety of analysis across all areas of consumer and media usage behaviour.

There are great differences among consumers in terms of purchasing and consumer behaviour. The differences between their individual personalities are of utmost importance for consumer behaviour and they are primarily due to different characteristics of the system of emotions and motivations in the brain.

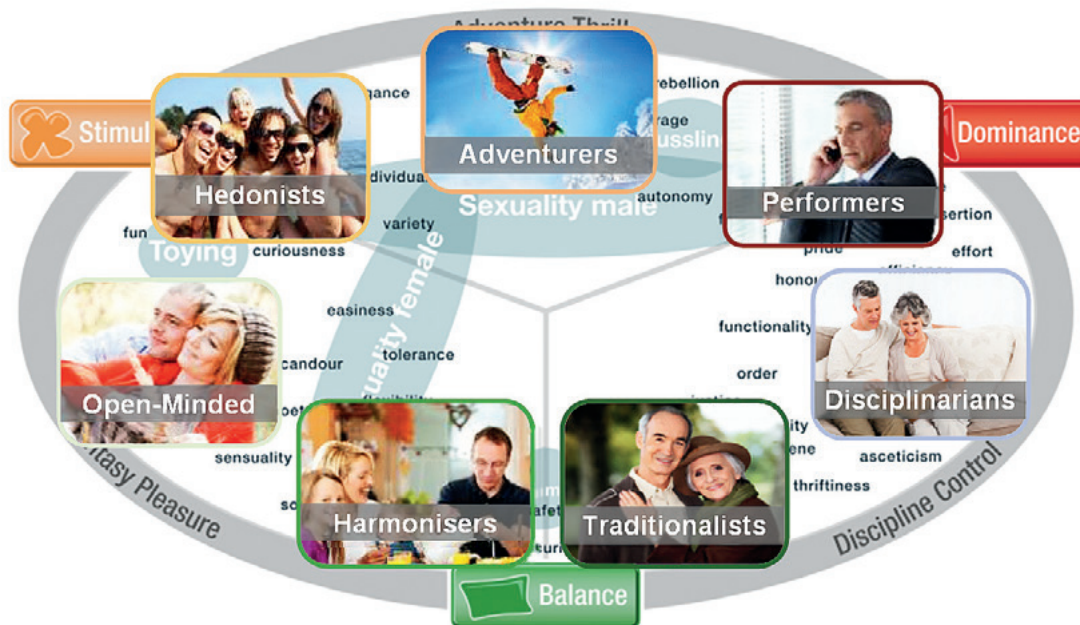
According to the Limbic® model, there are essentially three major emotional systems in human beings: the balance, the stimulance and the dominance system. Beyond that, there are also mixed forms such as imagination/pleasure, adventure/thrill, as well as discipline/control.

These individual emotional focuses, influence the customer's purchasing behaviour and buying decisions mostly on an unconscious level.

A total of seven limbic types were derived from the above-mentioned motivational and emotional spheres; they are the following:

- Disciplinarians
- Traditionalists
- Harmonisers
- Open-minded
- Hedonists
- Adventurers
- Performers

All seven Limbic® Types were represented in the study described herein by at least 6 participants per type.



Graphic 2: The 7 Limbic® Types

b. Realisation

On the day of the study, the test subjects were welcomed by the investigator one after the other; they were informed about the study and given instructions. Electrodes were then placed on the participants' heads, fingers, on the insides of their wrists, their chests and faces, after which they were installed in front of the 3D installation. To enable them to see the 3D effect, the test subjects were also given 3D spectacles.

Subsequently, a one-minute baseline measurement was carried out to record the participants' physical reactions at rest, and to allow for meaningful comparisons between test subjects.

After that, the participants were shown the various lighting scenarios (20 in total) in randomised sequence, alternating in each case with a control scenario. Each lighting scenario was displayed for a period of 20 seconds. In order to watch the lighting scenarios undisturbed, the participants were not given any other tasks during data collection.

Finally, the wiring was removed from the test subjects, after which they were seen off by the investigator.

A complete trial took 45 minutes.

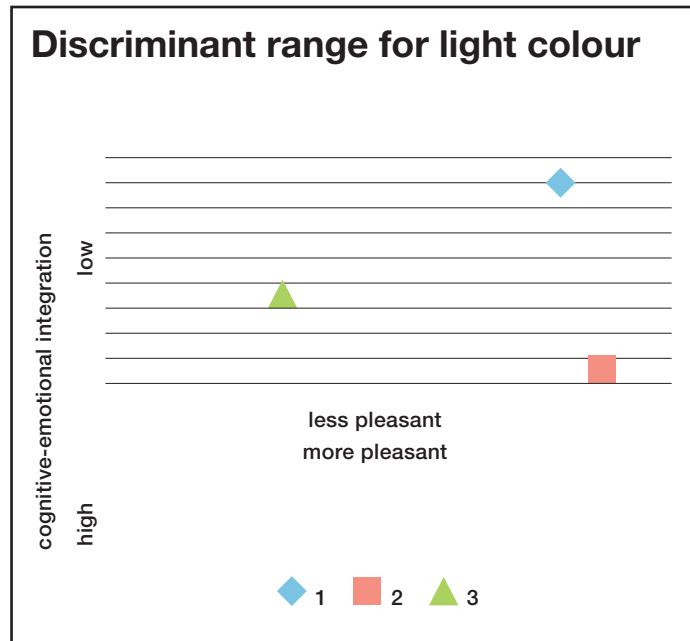
5 Data analysis

The data was evaluated by means of a complex discriminant analysis. In concrete terms, this means that the changes of all participants' physical responses to the lighting scenarios tested were processed in a joint multi-variable statistical analysis.

Thus, an emotional "response range" was defined where the locations of the test subjects' emotional reactions to each lighting scenario tested were identified. This emotional space consisted of two axes defined by the loading pattern of the individual physical reactions.

If, for instance, the participants' facial muscle activity had a particularly strong influence on their emotional state, this LEA parameter would determine one axis in the coordinate system. On the other hand, the second axis describes, for instance, the level of physical excitement, determined by the test subjects' heart rate variability and brain waves. Therefore, the arrangement of the lighting scenarios along the two axes ultimately also describes their specific emotional effect.

For each varying lighting parameter, separate discriminant analysis was carried out in order to explore the emotional effect of changes to individual lighting parameters (see Graphic 3 as a sample representation of a discriminant range for the "light colour" parameter).



Graphic 3: Discriminant range for the "light colour" parameter. Localisation of lighting scenarios 1–3.

At the end of the analysis, each scenario was evaluated by parameter and target group, according to cognitive and emotional load in each case.

6 Results

As mentioned already, major differences were observed with respect to the lighting preferences of the individual target groups. For instance, it was clearly shown that there is no single lighting scenario that is preferred by all target groups in equal measure. While a least common denominator was defined across all target groups, there were nevertheless clear differences as to the target groups' individual lighting preferences.

These findings open up huge potential for developing lighting concepts customised to meet the needs of the target groups.

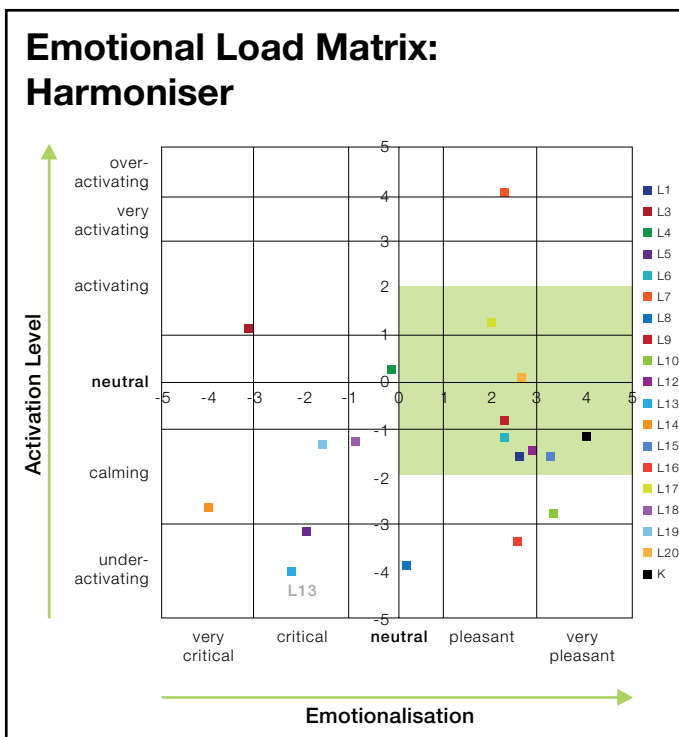
On a superordinate level, three groups each consisting of 2–3 Limbic® Types with similar preferences as to the combination of lighting parameters were identified.

a. Target group-specific results

Group 1 – BALANCE: persons looking for harmony and relaxation (Harmonisers, Traditionalists, Open-minded)

The first identified group, “BALANCE”, is dominated by the largest group among the Limbic® Types, the Harmonisers; but this scenario was also concluded to be the most positive one for Traditionalists and Open-minded.

This rather quiet, harmony-focused family type showed particularly positive responses to moderate accent lighting. The lighting solution was dominated by a mixture of medium flood beam angles (20–30°) at the POS and directly on the goods displayed. Within the solution, highly uniform vertical lighting on shelves, in peripheral zones and around displays, as well as integrated and dimmed accent lighting in coves and display cabinets proved to be a key factor of success. The ambient lighting was generated by reflection of the medium flood accent lighting. The proportion of diffuse light by downlights is very low. The horizontal general lighting level is 800 lx on average, the colour temperature is 3000 K for the most part.



Graphic 4: Emotional load Harmonisers. The green zone marks the range of acceptance of this target group.

Group 2 – STIMULANCE: unconventional persons (Hedonists, Adventurers)

The second group comprises the fun-loving Hedonists and the risk-loving Adventurers. Especially Hedonists get bored quickly, they need variety and challenges in their lives. Lighting scenarios should facilitate a positive state of relaxation, but still keep a certain level of stimulance to avoid boring the target group. Here, for instance, scenarios offering high contrasts, with a reduced horizontal level of general lighting, will prove beneficial.

Specifically, it was found that these two Limbic® Types show extremely positive responses to lighting scenarios with marked contrasts, generated through accent lighting and a combination of various different spots. Spotlights with beam patterns between 12°–16° (without Superspot < 10 %) at the POS and directly on the goods displayed, as well as dimmed, uniform vertical lighting on shelves and displays were key in this respect. Moreover, to stimulate these two Limbic® Types, fully integrated accent lighting in coves, display cabinets and on shelves is important. The ambient lighting in circulation areas and the generally diffuse lighting level provided by downlights or coves are the lowest of the three groups in STIMULANCE. Accordingly, ambient lighting is only used for decorative purposes, for instance when cove lighting. The horizontal general lighting level is approximately ~ 500 lx. The amount of vertical light and the amount of light at the POS, on the other hand, are the highest among the three groups, thus providing for the required stimulation. The colour temperature clearly tends towards cool white, with 4000 K prevailing.

Group 3 – DOMINANCE: Critical persons (Performers, Disciplinarians)

The third group is characterised by the sceptics among the Limbic® Types, in other words those that are easily unsatisfied and turn away from situations if they do not meet their expectations. This basically sceptical target group is sensitive to unbalanced lighting concepts and is best loaded with positive emotions through well-balanced, moderate lighting effects. For both types, accordingly, it is all the more important to achieve the emotional optimum, since adequate lighting is considered basic.

Both types showed the best responses to balanced light distribution, but were also susceptible to discreetly mood-enhancing lighting effects. Over stimulation through narrow-beam lighting with extreme contrasts should be avoided.

These target groups showed particularly positive responses to lighting solutions featuring high uniformity as well as a combination of wideflood accent lighting with beam angles of $> 35^\circ$ at the POS and directly on the goods displayed. Moreover, a high proportion of uniform vertical lighting on shelves and displays as well as integrated and dimmed accent lighting in coves and display cabinets were decisive to stimulate these subjects. The focus of accent lighting in this context is on uniform vertical lighting in peripheral areas. The general lighting level is made complete by downlights and backlit coves. The proportion of diffuse ambient lighting is the highest among the three groups. The colour temperature of the scenario with the highest stimulation potential ranges between warm white and intermediate, with a tendency towards 4000 K.

b. Summary of results and discussion

The analysis clearly shows that each target group has its own optimum lighting scenarios. Overall, three major groups were identified, each with their own requirements as to the lighting solution: those looking for harmony and relaxation, the unconventional ones and the sceptical ones.

Designing the lighting scenarios along the lines of target group specific requirements is explicitly recommended in order to provide for the customer actually feeling at ease in the shop, perceiving positive emotions and being put into high-awareness states of mind.

Only if the customers find the atmosphere in a shop acceptable and even pleasant, they will also be motivated to stay a little longer. Ultimately, more time spent in the shop means that the customer is provided with more opportunities to notice the products and brands on display and to buy them.

The study has demonstrated that target groups respond to even the smallest changes in very different ways. While hardly noticeable with the naked eye, minor differences in the surroundings are perceived strongly by customers at an unconscious level, as the psychophysiological data have shown.

Each brand, product and shop has its specific target group. The analysis clearly shows that these target groups respond in different ways, and that they have quite individual needs, especially with respect to the lighting solution.

Accordingly, any lighting scenario needs to suit not only the brand or product advertised, but it also needs to match the target group. The unique findings of the present study allow for this next step to be taken towards improved and more targeted stimulation of different target groups. Moreover, it offers the opportunity to develop optimised lighting scenarios, luminaires and lighting technology with a view to a perfect brand and target group fit.

With the findings generated here, Zumtobel as a professional consultant and provider of lighting solutions is in a position to make a contribution towards customers feeling more at ease in the store and staying there longer. More time spent in the store ultimately means a positive impact on sales trends in retail shops.

Zumtobel tested the results of the laboratory study in a field study with the fashion company, Gerry Weber, from which meaningful results were obtained, which were then presented within the following White Paper.



Research Study

Limbic® Lighting – higher turnover through
target-group specific lighting solutions

1 Summary

¹ Damasio, 1994, 1996

Motivated by the work of the Portuguese scientist, Antonio Damasio, numerous scientific studies from the last two decades have proved that the decisions that people make are heavily influenced by emotions.¹ Accordingly, both internal and external factors control our emotions and thus ultimately the decisions that we make on a daily basis as well. Therefore, the results from the Limbic® Lighting baseline study were transferred to a real fashion environment in cooperation with Gerry Weber. As a first step, Zumtobel developed their own lighting solution tailored to the fashion company's target group. The emotional reaction to the new lighting concept was then tested in a store by means of scientifically substantiated implicit and explicit measures. Furthermore, the influence of the target group-specific lighting concept on the turnover was checked. The Gerry Weber store optimised with the Limbic® Lighting in Herford, Germany was compared to a reference space in the same time period.

The results

Implicit measurements showed how GERRY WEBER customers exhibited positive emotions in response to the newly installed Limbic® Lighting concept, especially when compared to the existing lighting solution. Customers also noted a significant improvement in the general atmosphere in the shop due to Limbic® Lighting in the explicit part of the study. The new lighting design resulted in more active perception of the store, higher levels of interest and less stress for customers. In the economic analysis, the target group-optimised lighting concept led to a significant increase in turnover (approximately 10 percent more turnover) as well as higher average sales at the test shop. The GERRY WEBER shop in Herford with the optimised Limbic® Lighting concept was compared over the same period with a reference store with equivalent demographics, purchase power, average turnover, floor space and design layout.

Fashion company Gerry Weber in Halle (Westphalia) was acquired as a project partner in mid-2014. The basis for the lighting plans were the requirements from the target group cluster *Balance*, which had been explored in the first part of the study in 2013. This target group-specific planning basis made it possible to design a lighting scenario tailored towards the Gerry Weber brand and shop concept, and to measure the customers' emotional reactions from the existing design versus the new lighting design. Firstly, it was tested whether the target group-specific lighting design, optimised with Limbic® Lighting, actually evokes more positive emotions than those lighting designs that were not explicitly tailored to the target group. In addition, the effects of Limbic® Lighting on the test store's turnover was examined.

Since the emotional conditions can only be partially determined with the help of customer surveys, the implied methods in this study again served as the basis for examining emotions. The Limbic® Emotional Assessment (LEA) method used here, developed by Gruppe Nymphenburg, describes a merger of different survey parameters for measuring the body's reactions and thus ultimately emotions. Using this approach, emotions from the Gerry Weber target group in reaction to the old and new lighting design could be examined in the field. Furthermore, turnover analyses helped to examine changes in turnover.

The study took place at the fashion company's store in Herford, Germany. Consequently, the transferability of the results from the Limbic® Lighting study could be tested in a real sales context. Furthermore, reliable sales figures were obtained which made the influence of the changes in lighting design on the store's turnover transparent.

3 Survey details

³ The attachment contains a detailed description of the Limbic® types.

3.1 Target group research

Before the start of the study, the main GERRY WEBER target group was identified according to the Limbic® Types model using analysis of the latest customer data from best4planning, a major market media survey based on over 30,000 customer interviews.

The Limbic® Types³ represent an aggregation of complex emotional personality structures. Consumers are assigned to a specific Limbic® Types through the primary emotion field of their emotional personality structure. By integrating a special Limbic® Type measurement process into best4planning, more than 45,000 consumers have been categorised, helping to recognise perceivable patterns of Limbic® Types in the Limbic® German population. As GERRY WEBER was also surveyed as part of best4planning research, the Limbic® Types for this brand could be precisely identified.

During a one day workshop with Zumtobel, the Gruppe Nymphenburg and GERRY WEBER, the current target group of the brand was once again summarised according to the Limbic® Types. The Harmonisers, Bon vivants and Traditionalists found in the *Balance* target group cluster were identified as the primary target group for GERRY WEBER.

3.2 Development of a target group-specific lighting design

The GERRY WEBER target group is completely contained within the *Balance* target group cluster from the Limbic® Lighting study. As a result, Zumtobel developed a lighting scenario specifically for GERRY WEBER in line with the *Balance* criteria.

Balance customers are characterised by a preference for harmony and relaxation. The family, leisure, tradition and pleasure are all important values. It was also clear from the original study that this target group responds positively to discreet accent lighting with a warmer light colour.

3.3 Recruitment

For the qualitative survey, a total of twelve GERRY WEBER customers aged between 43 and 79 years old who shop at least once every 18 months at GERRY WEBER were invited to take part (n = 9 at least once in 6-18 months, n = 3 at least once per month).

⁴ Schandry, 1981, Damasio, 1994, 1996, Schandry, 1981

3.4 Method

The Limbic® Emotional Assessment method applied here is based on research parameters taken from the field of psychophysiology. This discipline deals with the connections between emotional processes in the brain and the associated physical reactions.

A link to Limbic®, a practically tested brand and target group navigation model, also enables differentiation according to special target groups, the Limbic® types (see also: laboratory study – 3 methods, p. 8 et seq.).

The connection between physical and emotional conditions were proven in numerous scientific studies.⁴

In the case of this study, LEA was used to validate the light preferences of the GERRY WEBER target group within actual fashion retail surroundings and to compare emotional responses to the newly installed Limbic® Lighting with the equivalent reactions to the original solution in Herford.

Standardised preliminary and concluding interviews also helped with the analysis of the subjective impressions of the atmosphere in the store.

3.5 Comparison of existing vs. new Limbic® Lighting scenario

Comparison of emotional responses

To assess the emotional reactions to the existing lighting solution and to the target group-specific lighting design, participants were invited on two separate days to the GERRY WEBER shop in Herford.

On the first research day, participants were met individually by the test manager and briefed about the survey. The female participants were then wired up with electrodes on their fingers, inner wrists, chest and faces. A sample measurement was then carried out for one minute in a separate room to determine the basic activation level in an idle state and to facilitate comparisons between participants. They were also asked several questions about the GERRY WEBER brand.

The participants were then led individually through the different zones of the GERRY WEBER shop with the existing lighting design. Starting at the entrance, the route led through the retail area and towards the rear area of the store. At this point the direction was reversed and the view aimed towards the exit. Participants then approached the payment area (see Figure 1).

In each of four zones, ten second recordings were taken in an idle state as well as twenty second recordings during walking. Apart from observing the store, no further instructions were given during this time. Having walked through the store, the cables were removed and participants were subjected to a short concluding interview about the atmosphere in the shop and their current wellbeing. The complete test lasted around 45 minutes.

The second part took place two weeks later, with the same women carrying out the same test with the new, target group-specific lighting design. The concluding interview was designed to enable a comparison between the original lighting solution and the Limbic® Lighting-optimised concept.

Assessment of turnover

Turnover levels in the Herford branch were analysed over a total period of two months, both before and after installation of the new lighting solution.

A comparison continued to be made in the same time period between the Limbic® Lighting shop and the equivalent reference store, in order to exclude seasonal effects, weather conditions and other factors not influenced by lighting.

Study process in detail

- 1 Idle measurement looking into the shop from the entrance (10 sec.)
- 2 Going along the main aisle towards the rear of the store (20 sec.)
- 3 Idle measurement looking towards the rear of the store (10 sec.)
- 4 Passing through the rear part of the shop (20 sec.)
- 5 Idle measurement looking towards the entrance (10 sec.)
- 6 On the way to the payment area (20 sec.)
- 7 Idle measurement looking towards the payment area (10 sec.)

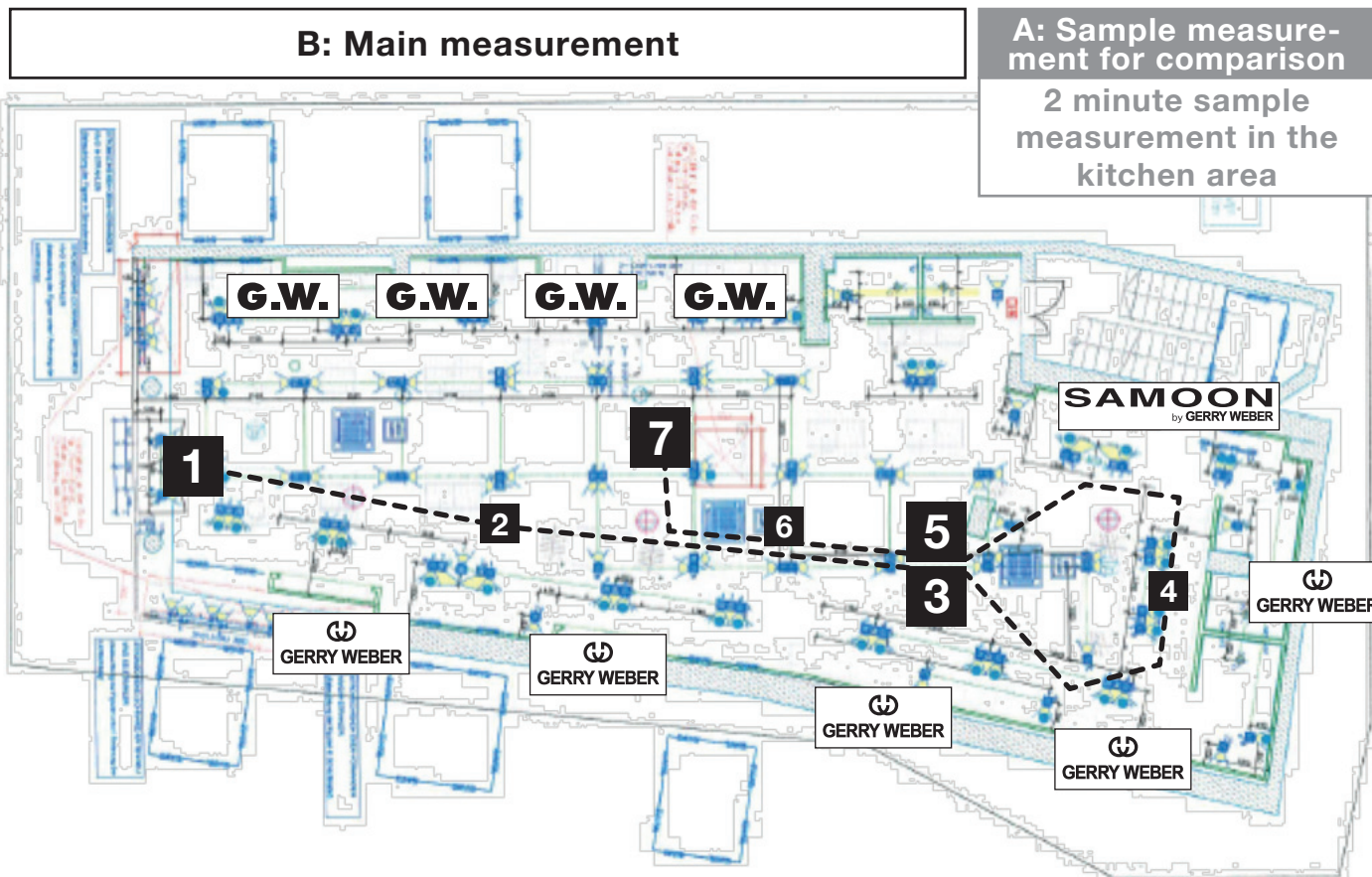


Image 1: Study process in detail

4 Data analysis

4.1 Limbic® Emotional Assessment

Changes in the physical responses of all participants to the two lighting scenarios were examined as part of a statistical analysis. Initially, a baseline value per LEA parameter was determined for each test person, taken from the basic activation level recorded at the start. Ten second measurement paths were subsequently analysed and a differential value was established within the measurement paths between the baseline value per parameter and the individual response to the shop. A differential value for the complete retail area was also determined for each test person. Finally, mean values were established for all participants for each of the lighting design scenarios – one for the single zones and one for the complete store. As a result, a comparison of the zones under the old and the new lighting solutions was possible, as well as a comparison of the emotional responses of participants to the original versus the redesigned total shop.

4.2 Economic analysis

Detailed KPI analysis was carried out to evaluate the influence of Limbic® Lighting on commercially relevant key performance indicators, such as turnover. For this purpose, general purchase behaviour in the test shop was observed over a period of two months, both before and after installation of the new lighting solution. Turnover was compared with the reference store. The GERRY WEBER store in Herford with the optimised Limbic® Lighting concept was compared over the same period with a reference store with equivalent demographics, purchase power, average turnover, floor space and design layout. The results were clear – adjustment of the lighting situation to reflect typical target group preferences delivered a 10 percent increase in turnover and higher sales compared to the reference store in the same time period.

The study described here concerned the emotional effect of the Limbic® Lighting concept developed by Zumtobel for the specific target group of the GERRY WEBER fashion retailer. Limbic® Lighting was developed in line with the findings of the original study of the same name, carried out by Zumtobel and the Gruppe Nymphenburg in 2013, which analysed the influence of various light parameters on the emotions of seven different target groups.

LEA was used for the recording of emotional responses to the existing light concept in the GERRY WEBER fashion outlets and to the new Limbic® Lighting solution developed by Zumtobel. LEA records psychophysiological parameters (i.e. physical reactions) to give an insight into emotional responses.

Both lighting concepts were tested in the GERRY WEBER outlets in Herford. In addition, analysis of turnover provided information about the influence of Limbic® Lighting on turnover in the Herford test outlet, compared to an equivalent reference outlet.

The evaluation shows that both the original GERRY WEBER lighting concept and the newly installed Limbic® Lighting solution stimulate positive emotions. However, implicit measurements proved that customers of the GERRY WEBER fashion brand responded even more positively to the new target group-specific Limbic® Lighting on an emotional level. Walking through the shop with the optimised Limbic® Lighting solution resulted in more active perception of the situation, higher levels of interest and less stress for the participants. Following the installation of Limbic® Lighting, the target group in general responded more positively on an emotional level, especially in the main area and in the rear section of the store.

Following installation of Limbic® Lighting in the main area, participants generally displayed significantly higher levels of attention for the retail outlet. In the rear section of the shop space, Limbic® Lighting also brought about more active situational perception and increased interest in the overall experience. The emotional state of customers became significantly more positive in most of the individual shop zones.

Within the explicit survey, customers also commented on the marked improvement of the atmosphere and reported an increase in their feeling of wellbeing in the Herford shop as a result of the new lighting concept developed by Zumtobel.

The increase in attention levels, interest and positive emotions coupled with the reduction of stress caused by the new target group-relevant lighting design also resulted in a significant increase in turnover. Within just a few weeks, Limbic® Lighting led to a 10 percent increase in turnover in the Herford test outlet, as well as increased sales, compared to a reference store over the same time period.

6 Summary of results and discussion





The study described here once again substantiates the influence of light on customers' emotional conditions as well as the relevance of target group-specific lighting solutions.

This research also demonstrates the clear effect of different lighting concepts on financially relevant parameters.

Each target group has its own needs – not only with regard to brands and products, but also in terms of the design of sales spaces and lighting conditions in a shop environment. As a consequence, the specific light requirements and preferences of seven different target groups were analysed and documented in the original Limbic® Lighting survey in 2013. Based on the findings, three target group-specific lighting concepts were developed – *Balance*, *Stimulation* and *Dominance*. These lighting concepts, which can be summarised under the name Limbic® Lighting, have now been confirmed by a practical test.

In the study summarised here, the positive influence of Limbic® Lighting on emotions and turnover was clearly demonstrated. In the practical test, conducted in the Herford store of the GERRY WEBER fashion brand, participants both implicitly and explicitly responded more positively to the target group-relevant lighting design, in line with Limbic® Lighting criteria, than to the original lighting solution. Furthermore, the new lighting design resulted in a ten percent increase in turnover in the test shop, as compared to a reference store with comparable retail space, customer frequency and turnover.

The results clearly demonstrated the importance of considering target group requirements in general and lighting design preferences in particular in shop applications. The research also proved the significant influence of lighting on turnover.

Companies should therefore not just target their brands and products towards the target group's needs, but also the lighting – and design the retail space appropriately.

Before

Gerry Weber store without
Limbic® Lighting design

Looking into the shop →

After

Gerry Weber store with
Limbic® Lighting design



Before

Gerry Weber store without
Limbic® Lighting design

Looking towards the rear of the store →

After

Gerry Weber store with
Limbic® Lighting design



Before

Gerry Weber store without
Limbic® Lighting design

Looking towards the payment area →

After

Gerry Weber store with
Limbic® Lighting design



Brief profile of the partners



ZUMTOBEL



GERRY WEBER

Zumtobel

Zumtobel, a leading international supplier of integral lighting solutions, enables people to experience the interplay of light and architecture. As a leader in innovation, Zumtobel provides a comprehensive range of high-quality luminaires and lighting management systems for professional interior lighting in the areas of offices, education, presentation & retail, hotel & wellness, health, art & culture as well as industry. Zumtobel is a brand of Zumtobel AG with its head office in Dornbirn, Vorarlberg (Austria).

Gerry Weber International AG

GERRY WEBER International AG is a German fashion retailer (ladies outerwear) with headquarters in Halle (Westphalia). Ralf Weber is the CEO. The company achieved a turnover of 852.1 million Euros in the business year 2013/2014, an increase of 0.012% compared to the previous year and the highest turnover in the history of the company. GERRY WEBER International AG has six strong fashion brands: GERRY WEBER, GERRY WEBER EDITION, GERRY WEBER ACCESSORIES, G.W., TAIFUN and SAMOON by GERRY WEBER. The focus of this study was the GERRY WEBER brand.



Gruppe Nymphenburg

For over 40 years, Gruppe Nymphenburg has provided consultancy and market research services to leading international manufacturers of branded articles and trading companies, encompassing issues ranging from brand positioning through to implementation at the POS. The consultancy is focused on unique consumer and shopper insights. Today, Gruppe Nymphenburg ranks as one of the leading international experts in neuromarketing. Gruppe Nymphenburg has been a pioneer in the field of psychological POS and consumer research for many years. The comprehensive expertise of Gruppe Nymphenburg opens up huge potential for enhancing customer activation throughout the value chain, thereby creating tangible added value for manufacturers, retailers and consumers.



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List of references

Damasio, A. R. (1994). *Descartes' Error: Emotion, reason, and the human brain*. New York: Grosset/ Putnam Books.

Damasio, A. R. (1996). The somatic marker hypothesis and the possible function of the prefrontal cortex. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 351, 1413-1420.

Zumtobel (2013) Limbic® Lighting – the target group-compliant lighting of shop and retail spaces

Schandry, R. (1981). Heart Beat Perception and Emotional Experience. *Psychophysiology*, 18 (4), 483-488.

List of terms

LEA – Limbic® Emotional Assessment

Legal information

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