HOW DESIGN AND FUNCTION IMPACT AESTHETIC PERCEPTION

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A report by Ideal Standard

Ideal STANDARD

A BEAUTIFUL USE OF SPACE

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Neuroscientist

Dr. Jack Lewis received a PhD in neuroscience in 2005 and did his post-doctoral research at the Max Planck Institute for Biological Cybernetics in Germany. His post-doctoral research was published in the prestigious Journal of Neuroscience.

Dr. Lewis has spent many years analysing neurological function, exploring psychology, psychiatric, medical and technology topics. Recently, Dr. Lewis has focussed on science communication, his goal being to bring the latest neuroscience research to the attention of a wider audience.

Dick Powell
Designer

World-renowned, award-winning designer Dick Powell is Founder of leading industrial design firm Seymourpowell and Chairman of D&AD. Together with Co-Founder Richard Seymour, Dick has helped create some of the most iconic industrial products of the modern consumer age.

With over 30 years of experience, Dick believes passionately that design is not just about being different or more stylish, but about being better - better for people, better for business and better for the world.

INTRODUCTION

At ISH 2013 Ideal Standard revealed how people really use their bathroom space. We knew what people *said* about their bathroom experiences but no-one had ever demonstrated what actually happens in the bathroom.

The study we presented two years ago gave us insights into human behaviour and how those insights can be used to create the most ergonomic and beautiful bathroom spaces.

Now we have gone one step further. Or more accurately, one step back.

Our new study, launched at ISH 2015, reveals what goes through our minds when we encounter objects for the first time.

Specifically, it shows how our brains respond to products which may be considered beautiful but which then perform poorly from a functional point of view.

This is a subject close to our hearts at Ideal Standard. We have always sought to marry form with function.

This new study gives us fresh insight into how form and function interact at the neurological level. We consider the implications for designers, manufacturers and retailers alike.

Jordi Cazorla, Vice President - Commercial at Ideal Standard International

Research Partners

How Design and Function Impact Aesthetic Perception is based on primary research conducted by Mindlab, a neuromarketing research laboratory based in Brighton, England. The results of Mindlab's Electroencephalography (EEG) and online studies have been analysed by neuroscientist Dr Jack Lewis, an expert in brain imaging.

Commentary on the implications of the study is provided by Dick Powell of Seymourpowell. Dick is a world renowned designer who has worked closely with Ideal Standard for many years.

About Ideal Standard

The application of our expertise has a very clear purpose – to help people get the best out of their bathroom, so that they can feel their best – everyday. From our basins to baths, toilets to taps, we strive to create bathroom solutions that deliver the ideal combination of premium quality and aesthetics, total comfort and exceptional functionality.

For us, that's 'A Beautiful Use of Space'.

THE STUDY
DR. JACK LEWIS

Overview

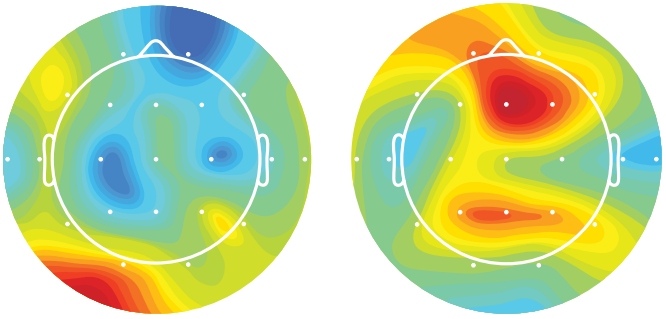
Whenever our expectations are not met we can feel disappointed, frustrated, outraged even. There is little more annoying than spending hard earned cash on something that promises to improve your life, only for it to ultimately make life more difficult.

For example that stylish, top-of-the-range shower unit that ends up delivering a pathetic trickle of water instead of the powerful, steaming torrent that you envisaged; or that ultra-modern designer basin so shallow that, once you've finally worked out how to operate the tap, the jet of water splashes back all over your new outfit. Such experiences are maddening to say the least.

In this paper, we call the psychological impact of such contradictions in form and function *aesthetic dissonance*. We describe studies undertaken with over 800 individuals from three European nations (Germany, Italy, UK) who were exposed to aesthetically-pleasing but functionally poor products in order to examine the impact such conflicts have on our sense of beauty.

A large body of academic investigation from the worlds of philosophy, psychology and neuroscience have been referenced to place these findings into context.

First the basic principles regarding what our brains are designed to do are outlined and how, in particular, they create the perception of beauty. The empirical data generated in this study is then considered to establish how knowledge of an object's functionality can impact our aesthetic valuations. Finally we consider evidence from numerous brain imaging studies to describe the likely mechanisms that enable information relating to function to influence a judgement that, logically, should really be governed only by appearance.



Non-functional Functional

An initial EEG study measured the difference in brain activity when participants were presented with objects that functioned well or poorly. The results showed differences in brain activations across brain areas known to be involved in aesthetic evaluation. These findings encouraged more comprehensive large scale investigations detailed in studies 1, 2 and 3.

"LOGICALLY THERE SHOULD BE NO CONNECTION BETWEEN HOW BEAUTIFUL WE CONSIDER AN OBJECT AND HOW WELL THAT OBJECT FUNCTIONS.

BUT WHAT THIS STUDY SHOWS IS THAT WHEN AN OBJECT WE RATE AS BEAUTIFUL TURNS OUT TO PERFORM POORLY, THE ACTIVITY IN THE PART OF THE BRAIN ASSOCIATED WITH AESTHETIC APPRECIATION REDUCES."

Dr. Jack Lewis

YOUR BRAIN: CONSTANTLY PREDICTING THE FUTURE

As unpleasant as feelings of displeasure and frustration may be, they are in fact invaluable to us. They help to focus our attention on problems, establish their causes and compel us either to eliminate the cause or simply avoid similar situations altogether. Negative experiences steer us away from repeated disappointments towards more positive outcomes in the future. Many thousands of years of human brain evolution have culminated in our ability to predict the future. Without it we would make the same mistakes over and over again.

The purpose of the senses is to acquire knowledge about our environment, but the usefulness of this knowledge varies over time.

All potentially relevant information is passed to the areas of the brain at the front of the head for higher-level cognitive processing. Having identified what an object is and where it is in space, decisions need to be made about whether it has any bearing on our current needs. If deemed relevant to our needs further brain areas can be engaged to coordinate muscle movements to enable us to move closer and interact with the object in question.

According to a lifetime's experience with any given type of object, working models are automatically generated in our brains relating to how we can best get what we need from our environment: Where to find water when thirsty? The best places to find shelter when it starts to rain? Which bathroom manufacturer to turn to for reliable fixtures? These mental models are used to make predictions about what will happen next in any given situation and they are constantly updated and improved upon according to our experiences; both positive and negative.

Products that function badly make us angry and steer us away from similar choices in the future.

The internal brain models are updated through experience: steering us towards experiences that were rewarding in the past and away from those that punished us. This is one of the most profound, universally applicable and useful insights that the field of neuroeconomics has contributed so far.

VISUAL AESTHETIC VALUATION

Vision does not happen in the eyes but in the brain. The eyes are merely devices for detecting light that reflects off objects in the outside world converting it into electrical impulses that the brain can work with. This is passed on for further processing and information extraction in specific brain areas devoted to creating vision. Each brain area isolates different types of information from the patterns of light that hit the back of the eye.

The brain area dedicated to seeing faces is the fusiform face area located on the underside of the brain (fig. 1). When activity levels are measured in this area when a person views human faces we see that it becomes more active when the face is deemed attractive than when deemed unattractive. The ventral striatum (fig. 1) sits on top of the densely connected switchboard at the centre of the brain called the thalamus. When we see a pretty face[1] the ventral striatum becomes more active, inducing feelings of pleasure as a direct result. It is a vital part of our brain's so-called "reward pathways."

These pleasant sensations usually compel people to view the faces they perceive to be beautiful for longer than those deemed to be average or unattractive. One key feature of faces that are considered to be attractive is symmetry. This is not specific to faces. Positive correlations between symmetry and attractiveness ratings have long been observed in aesthetic valuation of objects. The more symmetrical the object, the higher the beauty rating. This, along with other "collative" features (the way in which multiple elements fit together) e.g. complexity, harmony and orderliness, were long ago established in psychological models attempting to account for arrangements of visual features that led to positive aesthetic value.

Fig. 1

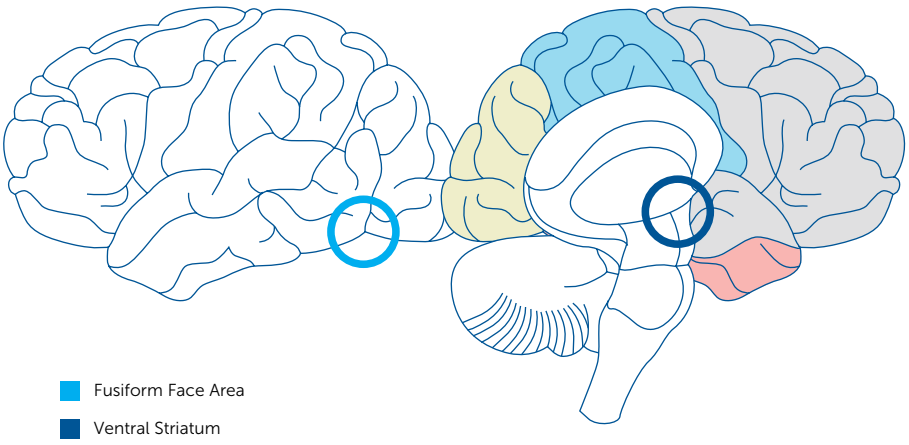


Fig. 1: The fusiform face area is an area of the visual brain dedicated to processing faces. It becomes more active when faces are deemed beautiful and parts of the rewards pathways such as the ventral striatum also become activated generating a sense of satisfaction.

[1] Kim *et al* (2007)

FUNCTIONAL UTILITY AND COGNITIVE BIASES

Our interaction with objects can vary from the smooth and uncomplicated to the erratic and frustrating. A lifetime of experience with a wide spectrum of design variations for every labour-saving device you have ever come across leads to strong implicit preferences and aversions. This is because your brain continuously adjusts its mental models of what looks good and what works well.

We have a strong preference for devices that work quickly, smoothly and efficiently. We have a powerful dislike for devices that are complicated to use, erratic in function and ultimately make using them more trouble than it is worth. We have a natural tendency to assume good things about anything that looks aesthetically pleasing. Humans are much more willing to ascribe positive character traits to a good-looking person than an ugly person, and vice versa. Attractive people are often assumed to possess good personality traits, but it is also true that a person known to have good personality traits is deemed to be more attractive[2]. In other words, form can influence perceptions of function, but function can also influence perceptions of form.

When an item is much more expensive than other comparable goods it usually means a higher quality of raw material has been used in its manufacture. If more thought, energy and money has been invested in its design it is reasonable to presume that it will result in a higher standard product.

Given these cognitive biases a novel study was devised to assess how perceptions of beauty might be influenced by testimonies of functionality in the context of bathroom fittings and other products. Could a negative product review impact upon an assessment of its aesthetic appeal?

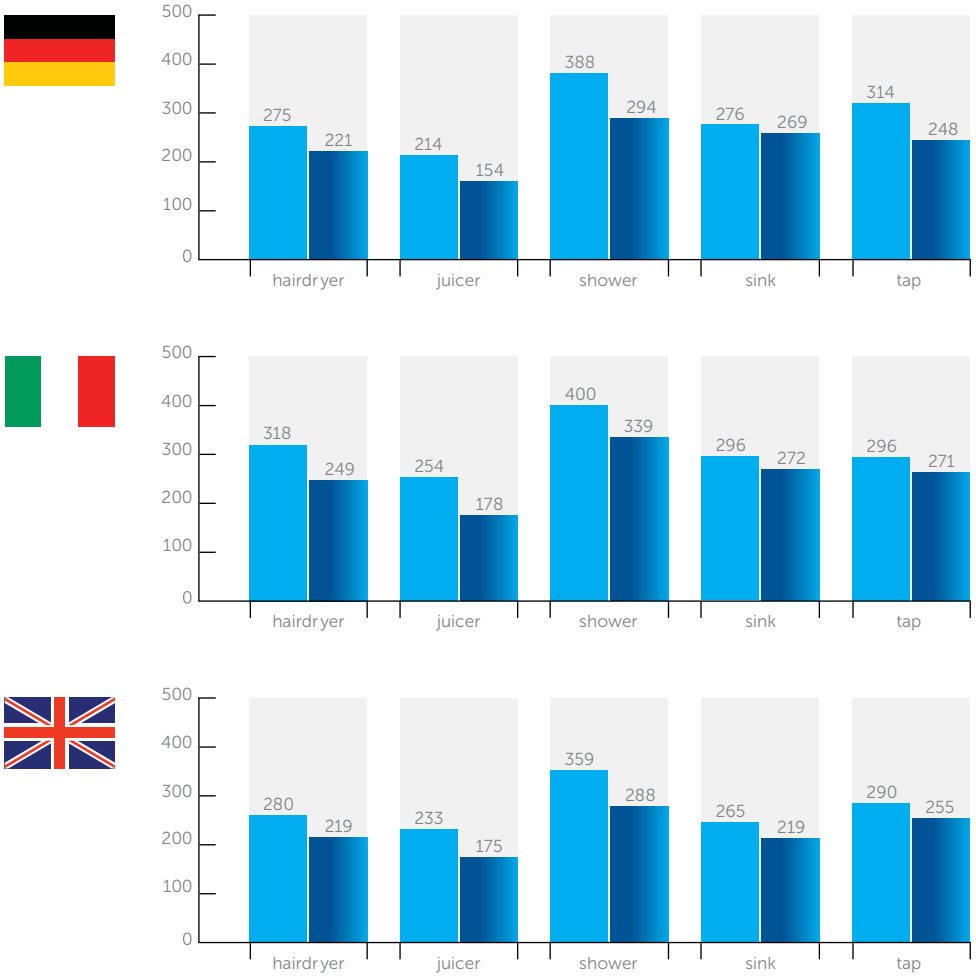
[2] http://bit.ly/1rk7lEt

AESTHETIC DISSONANCE

The word *dissonance* has several meanings all related to conflict and incongruity. *Cognitive dissonance* is a well-established psychological phenomenon[3] describing our tendency to reduce the discomfort induced when we are required to hold conflicting concepts in our mind. For instance, people often feel that politicians cannot be trusted so the idea of a "trustworthy politician" can be a difficult concept to accept.

In this study the aim was to induce a very specific type of cognitive dissonance – ***aesthetic dissonance*** – whereby conflicting form and function information was provided relating to household items. In the first study subjects were required to assess five objects: a hairdryer, sink, tap, showerhead and juicer. Half assessed each object's relative aesthetic value with a beauty rating on a scale of 1 to 500 where 1 is the most ugly object imaginable and 500 is the most beautiful. These were the "control" subjects because they were not provided with any extra information beyond the photographs of the objects in question. Aesthetic dissonance was introduced in the remaining volunteers by getting them to read a negative review (see appendix) of the object in question before giving their beauty rating. The goal was to establish whether knowing that the object functioned poorly could influence how aesthetically pleasing they found it to be. The results below clearly indicate that across all objects pre-exposure to a highly critical product review led to a consistent decrease in beauty ratings. Thus in this study function *does* affect perceptions of form.

Explicit (self-reported) Beauty Ratings



People who saw the negative product reviews consistently rated the products as being less beautiful than those who saw no reviews.

Control

Reviews

Hairdryer

Juicer

Shower

Sink

Tap

[3] Festinger (1957)

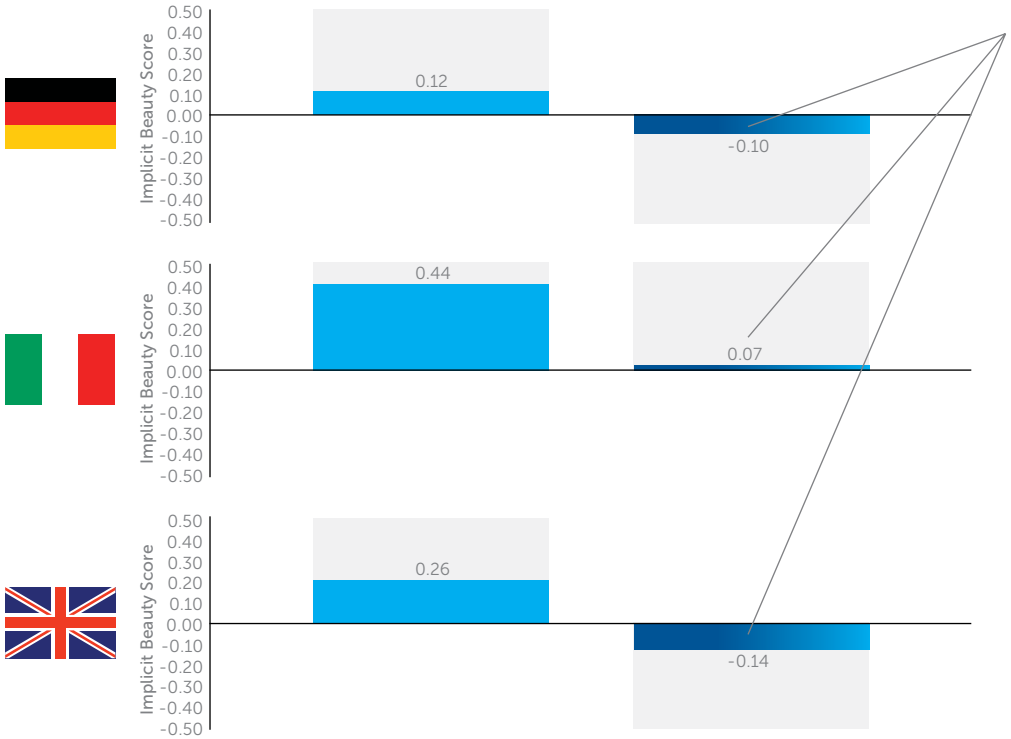
Averaging across all three countries and across all five objects the impact of the negative product reviews was a reduction of ~20% in aesthetic value. The designer sink seemed relatively resistant to this aesthetic dissonance effect with only an 8% reduction in Italy and a 2.5% reduction in the UK and Germany. However this appeared to be an exception as the aesthetic dissonance effect for all other products ranged from an average of 16.8% reduction (for the tap) to 28.7% reduction (for the juicer) in beauty rating upon reading the review.

To confirm this finding a procedure called the Implicit Association Test (IAT) was used in study 2 to assess the aesthetic dissonance effect at a subconscious level. 655 respondents took part in three countries (UK, Germany and Italy). In each country, one group was shown reviews of how five beautifully designed objects (a tap, hairdryer, sink, juicer and showerhead) function poorly. The second group performed the implicit task without any knowledge of the poor functionality of the object. In this implicit task, participants were told to respond with one key if they saw a word meaning 'beautiful' and with another key if they saw a word meaning 'ugly'. For half the test, they responded to images of the objects with the same key as the 'beautiful' words; and for half the test they responded to images of the objects with the same key as the 'ugly' words. As in study 1, half of the volunteers completed this process without seeing the negative product review (control group) and the other half performed the IAT after they had read the negative product review (review group). This enabled the impact of information about product functionality on aesthetic valuation to be clarified by comparing results of the review group against the control group. This test is sensitive to any aesthetic dissonance by detecting a very slight delay in selecting the appropriate button whenever the aesthetic value subconsciously attached to a particular object is in conflict with the concept of either "beauty" or "ugliness".

Comparing the results of the Implicit Association Test across the different countries, items were deemed to be significantly less beautiful when preceded by a negative consumer review than when no review was provided, despite the fact that exactly the same image was displayed under both circumstances. This effect was more pronounced with the British participants than the German and Italian participants, a finding particularly evident in results for the sink. This suggests that Brits are more susceptible to allowing evidence relating to functionality to bias their assessments of aesthetic beauty. That said, the effect was evident in all nationalities when responses to all the different items are considered together.

On the basis of studies 1 and 2 we argue that knowledge about a product's functionality does indeed impact on both conscious and subconscious evaluations of its aesthetic value. Before we move on to describe study 3, which investigated the reverse process – whether or not an object's appearance can influence perceptions of its functionality – we will briefly consider how the neuroscience of aesthetics might explain these findings.

Implicit Scores - Tap

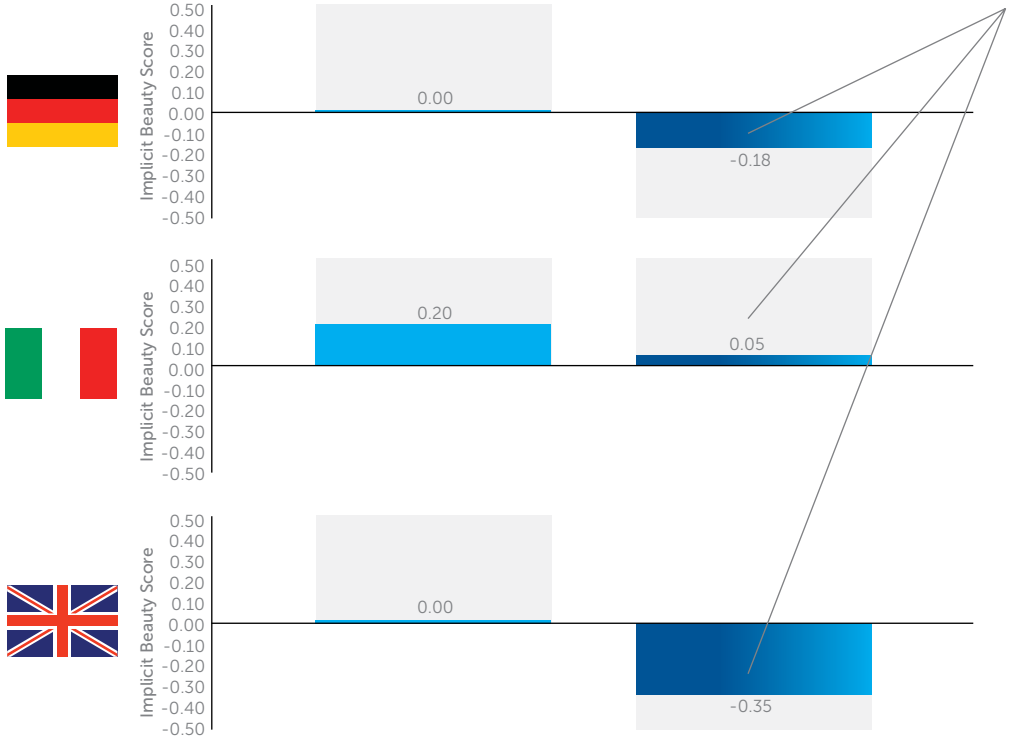


People who thought the tap functioned poorly implicitly thought the tap was less beautiful, suggesting that awareness of functionality impacts perceptions of beauty.

Control

Negative Reviews

Implicit Scores - Hairdryer



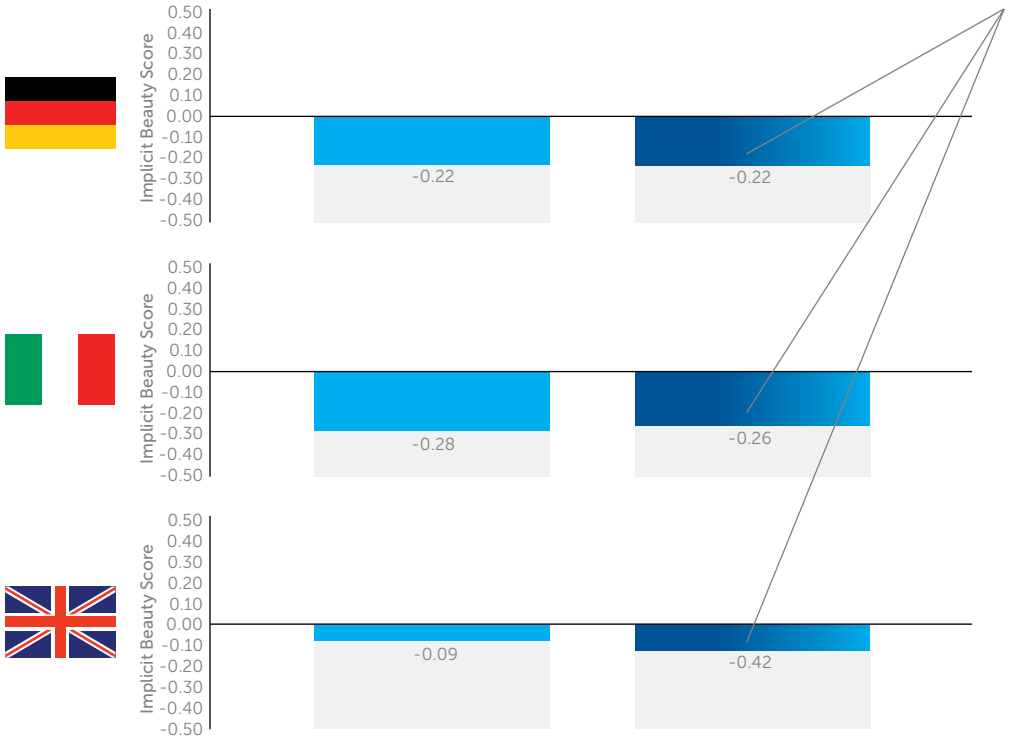
People who thought the hairdryer functioned poorly also subconsciously perceived the hairdryer as less beautiful, suggesting that awareness of functionality impacts perceptions of beauty.

Control

Negative Reviews

These graphs show how the level of perceived beauty differs between those who simply viewed the object (the 'control' group) and those who viewed the object after reading a negative review.

Implicit Scores - Sink

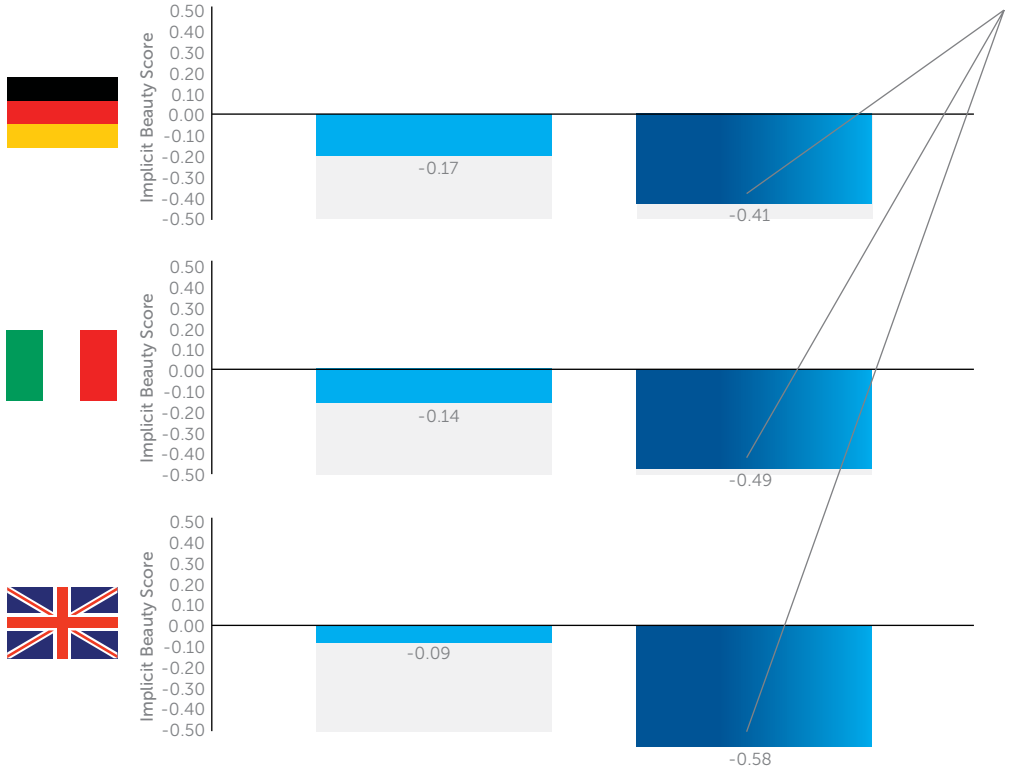


German and Italian participants who knew the sink functioned poorly did not implicitly feel that the sink was less beautiful. British participants who knew the sink functioned poorly also subconsciously perceived the sink as less beautiful.

Control

Negative Reviews

Implicit Scores - Juicer

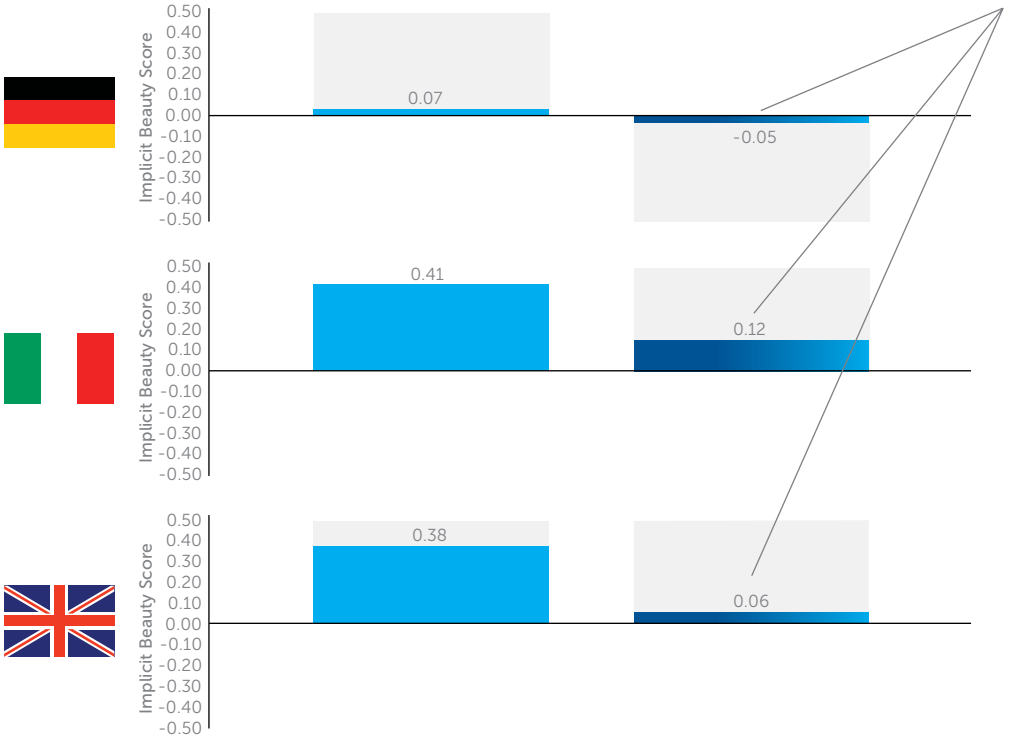


People who knew the juicer functioned poorly also subconsciously perceived the juicer as less beautiful, suggesting that awareness of functionality impacts perceptions of beauty.

Control

Negative Reviews

Implicit Scores - Showerhead



People who knew the showerhead functioned poorly also subciously perceived the showerhead as less beautiful, suggesting that awareness of functionality impacts perceptions of beauty.

Control

Negative Reviews

WHAT HAPPENS IN THE HUMAN BRAIN WHEN WE JUDGE AN OBJECT'S BEAUTY?

Since the turn of the millennium neuroscience has built on the psychological models of aesthetics developed over the course of the 20th century. The neuroscientific experiments of aesthetic contemplation, usually using brain imaging devices like Magnetic Resonance Imaging (MRI) scanners, has moved on significantly since its inception by University College London's Professor Semir Zeki.

Great progress is now being made towards characterising how the brain responds to objects according to variations in their aesthetic value[4], from geometric shapes[5], to works of art[6], objects of design and even the architecture of a car[7] and building interiors[8]. Here we extrapolate from the most recent, interesting and consistent findings to explain what was happening in the brains of our volunteers as they evaluated the relative beauty of each object.

Several studies have converged on the finding that there is a beauty-sensitive area of the brain. It is located just behind the forehead a couple of centimetres up from the bridge of the nose. The more beautiful an item is perceived to be, the greater the degree of activation in this brain area as measured by Magnetic Resonance Imaging. This area, known as the rostral prefrontal cortex (see fig. 2), is twice as big in humans as our great ape cousins[9]. We can extrapolate from these findings that when our subjects viewed objects having read the negative review, this "aesthetic beauty" region within the rostral prefrontal cortex was activated to a lesser degree than in the brains of control subjects who were not exposed to criticisms of its functionality.

From basic shapes to bathroom interiors, we constantly appraise the aesthetic value of objects and our surroundings
(Image of Tonic II basin)

[4] Chattergee & Vartanian (2015)
[5] Jacobsen et al (2006)
[6] Kirk et al (2009)
[7] Leder & Carbon (2005)
[8] Vartanian et al (2013)
[9] Semendeferei et al (2000)

Fig. 2

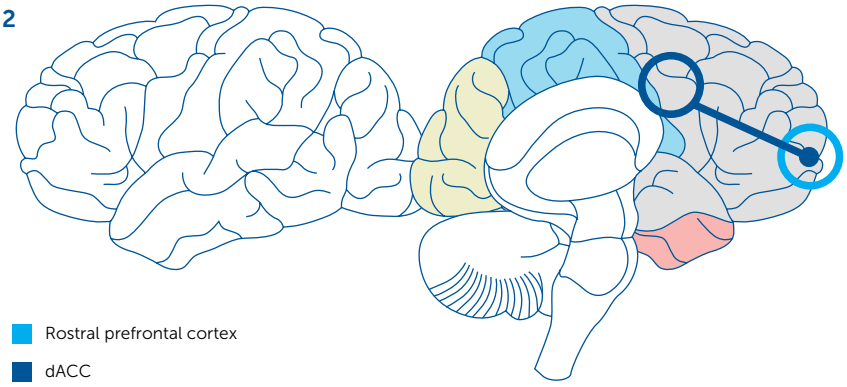


Fig. 2: The explanation for the reduction in aesthetic beauty ratings for participants exposed to negative product reviews versus others who saw no review is that brain areas known to detect cognitive dissonance (e.g. dACC) may have an inhibitory influence on brain areas known to be involved in making beauty judgments (e.g. rostral prefrontal cortex).

Fig. 3

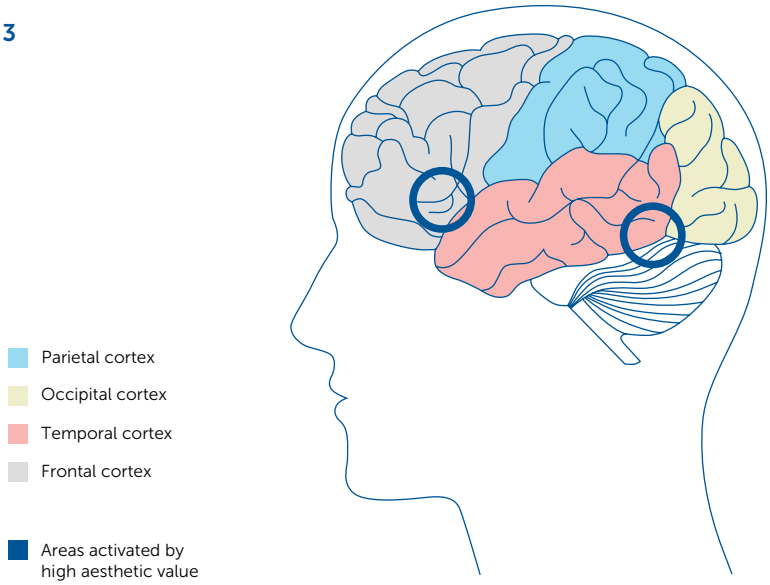
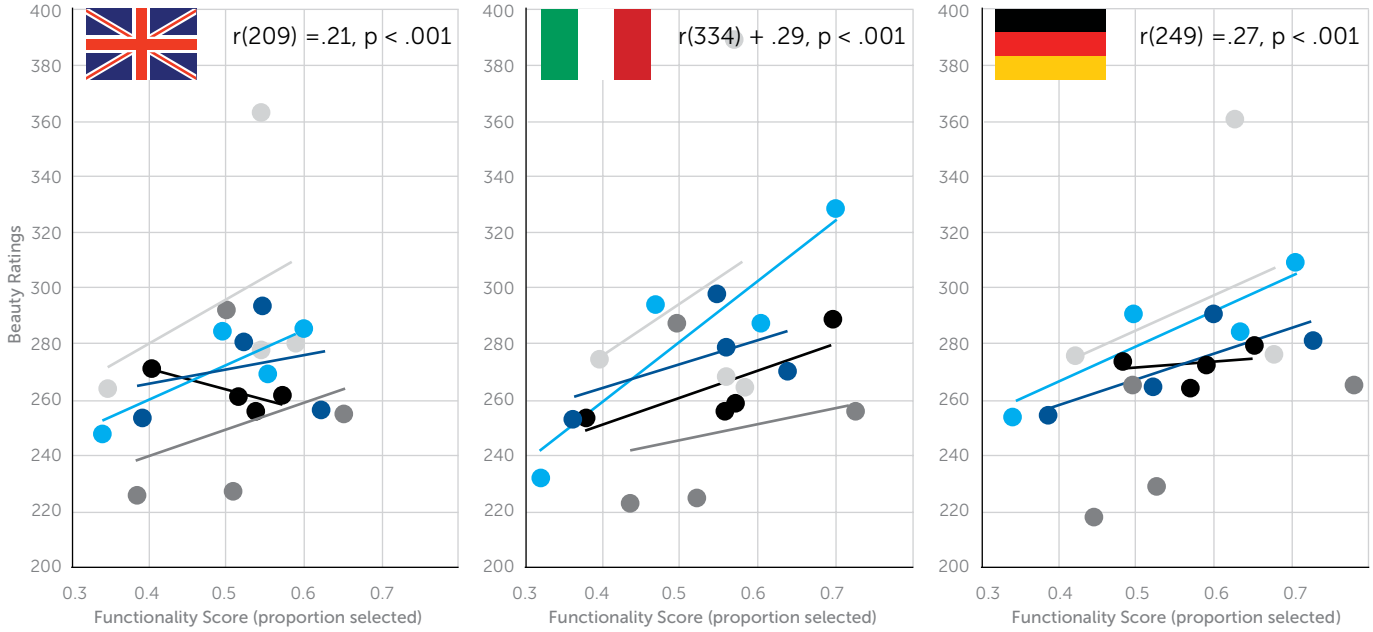


Fig. 3: When people view objects that they consider to be high in aesthetic value parts of the Default Mode Network (inferior frontal cortex on the left, inferior temporal sulcus on the right) become active. This is thought to reflect the internal contemplation of how art feels when it really "resonates".

A network of brain areas known as the Default Mode Network (DMN) is consistently activated any time a person in the MRI scanner rests between tasks. Of course when a person is asked to rest, their brain doesn't just switch off. Instead the mind will tend to wander. They will reflect on what has happened so far that day, and think about what is coming up next in the experiment or later on in the day. In other words the latest theories suggest that the DMN is the site of the ego; the voice in your head that narrates your day, reflecting on experiences, feelings and emotional state. A very recent finding in neuroaesthetics is that when an item is rated as *very* beautiful the DMN is activated. This has been interpreted as the brain's response to an object which really "resonates" with an individual's personal taste as it induces greater activity in brain areas thought to generate our sense of " self-contemplation". In study 1, looking across all countries, the item rated as much more aesthetically pleasing than all the others was the showerhead and so we would predict that exposure to this product would have generated a greater degree in DMN activity than all the others (see fig. 3).

For study 3, a brand new group of 798 respondents was recruited, once again from the same three countries. This time they were presented with a pair of items from each category from the 1st and 2nd studies i.e. hairdryers, juicers, taps, showerheads and sinks and were required to select the one that looked like it would function the best. These volunteers were then asked to view each object again, providing a beauty rating for each. This enabled a correlation analysis to be performed on each object to establish whether there was any relationship between the magnitudes of the beauty and function ratings.

Does function follow form?



These results suggest that perceptions of beauty influence perceptions of functionality; with more beautiful objects appearing to be more functional.

These results are plotted on a graph with perceived function increasing on the x-axis from left to right and increasing perceived beauty on the y-axis from bottom to top. The data showed that, for the vast majority of rated objects, if the function rating was low then the beauty rating was also low and if the function rating was high then the beauty rating was also high. Despite it being impossible to *prove* causation with any correlation analysis the fact that beauty ratings and function ratings seemed to mirror each other consistently (albeit weakly) indicates that it is certainly possible that high ratings on both measures are related. Whether high perceived beauty has a positive influence on the object's perceived function, or high perceived function makes an object seem more beautiful is not clear but our data certainly argue for a direct relationship.

The results demonstrate that aesthetic dissonance - i.e. the conflict between an object's visual appeal and its stated function - does not go unnoticed by the human brain.

"THE RESEARCH EXAMINED THE CONFLICT THE BRAIN EXPERIENCES WHEN PRESENTED WITH AESTHETICALLY PLEASING BUT FUNCTIONALLY POOR PRODUCTS; A PHENOMENON NEWLY TERMED 'AESTHETIC DISSONANCE'."

Dr. Jack Lewis

HOW THE BRAIN DEALS WITH AESTHETIC DISSONANCE

Several studies have converged on the finding that the right prefrontal cortex (PFC) becomes activated whenever conflicts in reasoning are detected[10]. Other studies have found that brain areas such as the dorsal Anterior Cingulate Cortex (dACC) detect other conflicts between incompatible streams of information[11]. In our study, either of these brain areas could have been involved in generating the signal that ultimately led to the drop in beauty ratings observed across all studies.

It seems fair to assume that, on the basis of each object's high aesthetic value, our subjects would have reasoned that much time and effort is likely to have gone into designing such objects and therefore its function would also be expected to be of a high standard. Hence the positive correlation in study 3 could indeed be explained by beauty influencing perceived function. Conversely, upon learning that an aesthetically-pleasing object functions badly, the conflict induced between the expectation and the testimony might also result in activation of dACC or right PFC. This conflict between qualities is very likely to produce a less powerful activation in the ventral striatum (resulting in a diminished sense of reward) and the "beauty area" in the rostral PFC (resulting in a reduced aesthetic rating).

In the three studies presented here cognitive conflict was induced in the groups who read the negative review because it clashed with the positive aesthetic evaluation. This essentially changed the context in which the aesthetic evaluation was made. Previous experiments have achieved similar results by changing the context in different ways. A decrease in aesthetic rating has been achieved by indicating that a work of art was computer-generated rather than being produced by an artist[12]. As these reductions in aesthetic valuation were reflected in reductions in activation of the rostral prefrontal cortex (the "beauty area" of the brain) we feel confident that the same effect is likely to have occurred in our study when the context was changed by allowing subjects to read the negative reviews.

Specifically, it is proposed that the conflict between appearance and function may trigger responses in the dACC, which in turn may have an inhibiting impact on activity in the rostral prefrontal cortex (see fig. 2). The perception of beauty is thereby diminished any time objects known to function badly are encountered and in this way the perception of aesthetic dissonance may guide us towards better choices in the future.

[10] Goel *et al* (2000); Goel and Dolan (2003); Aron *et al* (2004); Prado and Noveck (2007); Stollstorff et al (2011)
[11] van Veen et al (2006, 2009); Botvinick et al (2001, 2004)
[12] Noguchi & Murota (2013) [7] Leder & Carbon (2005)

RESEARCH APPENDIX

"Slowly, over the space of a year, this unit started to overheat, seriously damaging my hair. Just after a year of use I noticed that even on low setting the inside of the dryer had started melting.

At the back of my head, my hair had started to break off in noticeable chunks and I panicked and sent the unit back. This hairdryer is the worst I've ever used and is dangerous as it broke so slowly over time I didn't notice the damage setting in till my hair was breaking off.

Wouldn't recommend to anyone, too much to risk!"

"I hate this thing. It is incredibly difficult and uncomfortable to use. It is a danger to surfaces you use it on as it can slip. I'm still waiting for reports from the first person to stab themselves with one of these things. It makes a mess and it's slower and harder to use than alternatives.

"Starck even said his squeezer was, 'not meant to squeeze lemons' but 'to start conversations'. Oh really? Then why the hell is it a lemon squeezer? Why isn't it called, 'conversation starting ornament?."

This may be the worst product ever made."

"This shower head is unbelievably bad. This shower head only 'works' when you turn it on slightly. Then, a tiny stream comes out that you can theoretically wash with if you're happy to spend 20 minutes moving around the shower to rinse off.

Should you desire better water pressure, the water does not flow downwards anymore, but instead all the water ends up on the walls of your shower, with none of it on your body.

0/10, would not recommend."

"This sink is just awful. The surface of the sink is quite rough, similar to concrete. As a result of this, water stains form in the sink, and lime scale builds up extremely quickly.

It is an absolute pain to clean. If you want to scrub your sink with a toothbrush every few days, then this sink is the perfect choice for you. Another thing that really annoys me about this sink is that in the few weeks I've been using it, the drain has already clogged up twice.

Looks great, but nightmare to use."

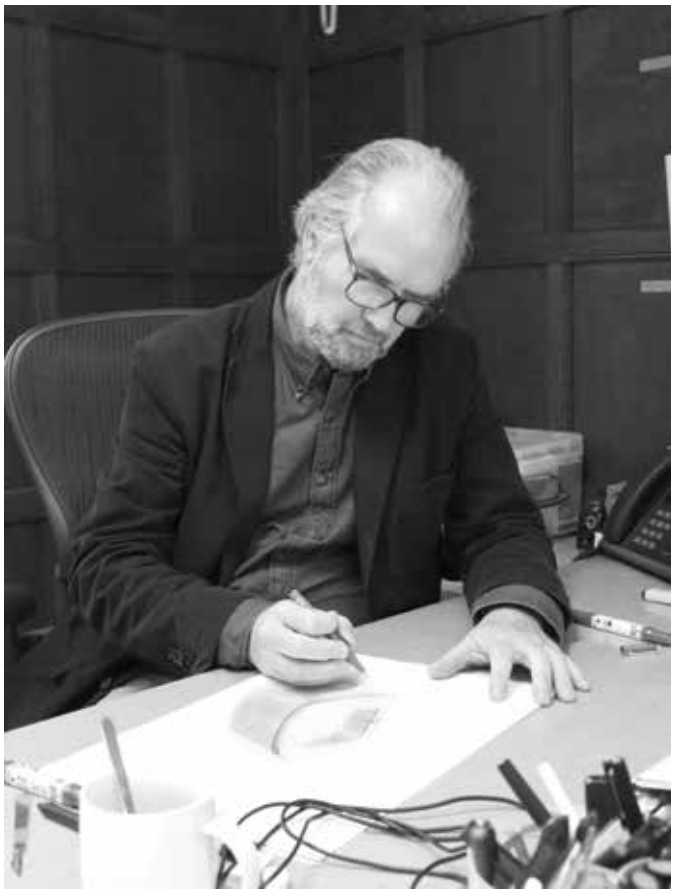
"I don't even know where to start with this tap. The main problem is that it is really stiff, and difficult to smoothly adjust the water pressure. It's also easy to accidentally turn the water pressure up or down while adjusting the temperature.

If the pressure is quite low, the water just flows down like a mini waterfall and hits the back of the sink, making it impossible to wash your hands. If you try to turn it up a bit more, the water will splash all over your clothes. Our guests inevitably get covered in water.

It's absolutely ridiculous."

Comments sourced from customer reviews on online retail websites

ANALYSIS
DICK POWELL



Why the findings are interesting to designers

The study described in this paper suggests a direct and demonstrable relationship between how we perceive a product's beauty and our understanding of its functionality. It explored the hypothesis that, if we know something to be functionally compromised, then we perceive it as 'less beautiful'; conversely, if we know something to be functionally superior, our perception of its beauty and appeal is raised. This notion is summed up by a phrase which engineers used to use before the advent of computers: "if it looks right, it is right".

Designers have always understood and championed the close relationship between form and function. The architect Mies van der Rohe famously said that "Form follows Function". This worked as a principle for design in a largely mechanical age when the exterior shape was entirely separable from the underlying mechanics. However, that particular universal truth for design started to fall apart when electronic and digital products emerged. Creating an external form which expressed inner functionality became impossible, leading to an explosion in styles and an ever tightening focus on designing for specific types of people.

Designers have therefore repurposed Mies van der Rohe's axiom from 'Form follows Function' to 'Form IS Function', especially where the inside and outside of the product flow seamlessly one into the other, as in many bathroom products.

Better by Design

An additional component of design is that it is principally about making things better; better for people, better for business and better for the world. We make things 'Better by Design'. This is the design equivalent of the doctor's Hippocratic Oath. It is particularly important for functionally critical products (again like bathroom products) where it is unthinkable to sacrifice function on the altar of style. Yet sadly, as markets become saturated and products become increasingly similar so designers seek out difference. Different designs stand out and that which is distinctive becomes desirable. Inevitably, this leads to function becoming compromised.

Frankly, I find that lazy, because to compromise function in pursuit of distinctive style implies that it is too difficult to find a good balance between them, as if they were somehow mutually exclusive. Moreover, creating something which is better by design is never just a straight fight between function and style. There are many other variables which have to be factored in such as cost, investment, brand, manufacture, assembly, materials, shipping, market, trends, intellectual property and, critically in the bathroom, ergonomy.

Emotional Ergonomics

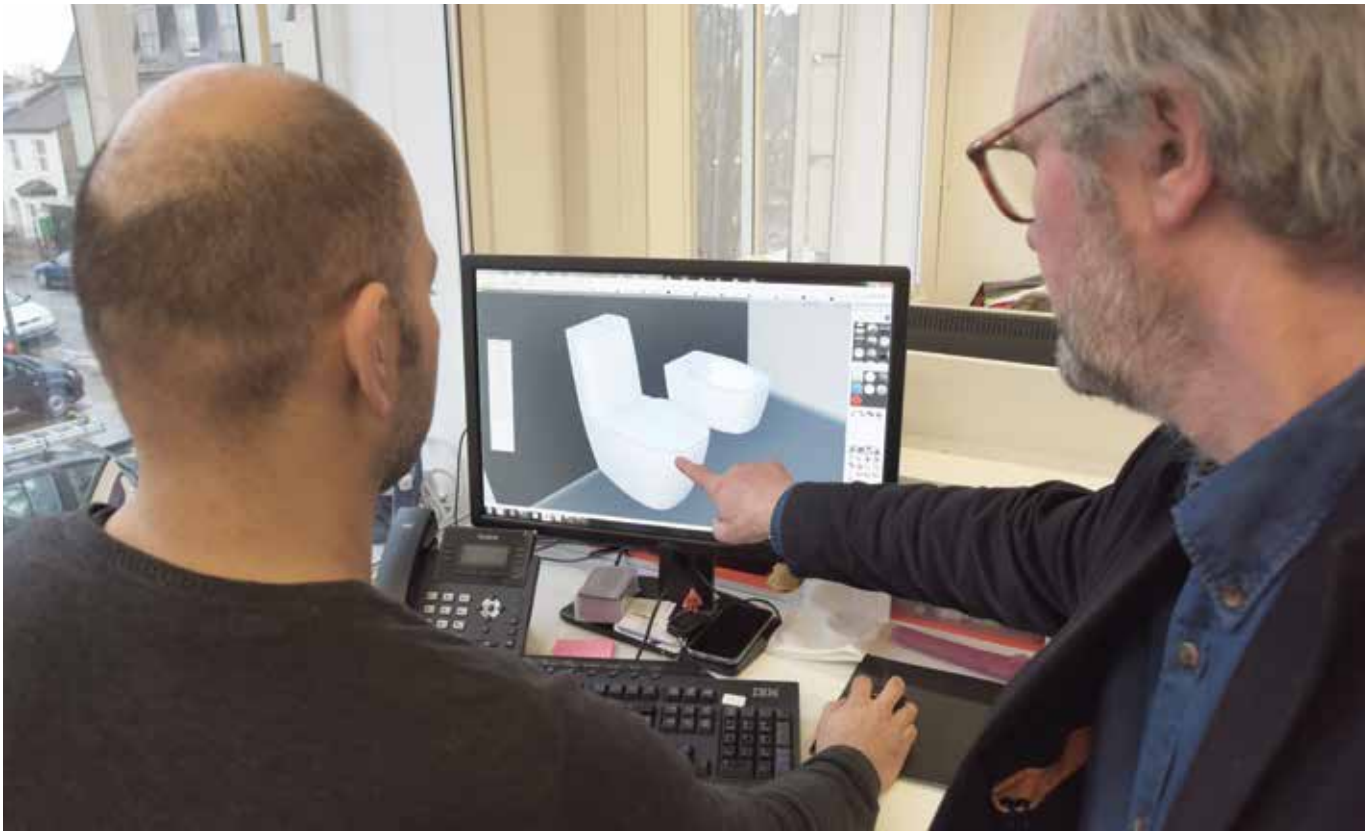
Ergonomy is the science of interaction between human beings and the man-made world. If something is ergonomic, we mean it is easy to use; it's comfortable and fits our physical needs perfectly. Emotional Ergonomics is how we feel emotionally about that interaction - it's the warm rosy glow we get when we slide the gearstick forward and it engages with a satisfying 'schnick' sound and feeling; it's the way the interior light dims gently to let our eyes acclimatise to the darkness, it's the soft closing toilet seat which cleverly avoids the old style crash bang; it's the weight and heft of the shower control knob which turns with a feeling of absolute precision.

So, as the study described in this paper suggests, our products must function well if we are to love them. That functionality is conditioned by effective ergonomy - products fit us, we can reach their controls, they are comfortable and easy to use. On top of that is how we feel emotionally about those interactions - seeing something which looks comfortable conditions us to think it's likely to be so. As an example, Ideal Standard's new AquaBlade looks elegant and contemporary and speaks visually of functional effectiveness and that conditions us to warm to the new aesthetic look it enables.

"WHAT DESIGNERS HAVE ALWAYS INTUITIVELY UNDERSTOOD — THAT THERE IS AN INTIMATE RELATIONSHIP BETWEEN THE FUNCTIONALITY OF A PRODUCT AND OUR AESTHETIC APPRECIATION OF IT — HAS NOW BEEN ESTABLISHED SCIENTIFICALLY."

Dick Powell, Seymourpowell Design

AquaBlade; a revolutionary bathroom product marrying sleek design and exceptional functionality



Conclusion

More than anything, I think this research will empower manufacturers and brands to challenge the aesthetic recommendations of their designers (no matter how famous they are) on the grounds of compromised functionality. Being different and distinctive, which can be desirable to get your products noticed, is too often just wackiness masquerading as originality and is no excuse for poor ergonomics and functional ineptitude!

The first time we see a product, or anything for that matter, we instantly make an emotional, non-rational judgement. It's the "I love it" or "I hate it" moment, which we instinctively feel before we think about it. Only after that does rational, cognitive enquiry kick in and mediate our initial response, conditioning it by what we may know of it, by our experience or by the views of others.

This two stage evaluation is exactly what we saw in the research. What happens within each of us is that, subconsciously, a debate rages between the visceral emotional initial reaction and the subsequent rational evaluation. It is via this process that we are sometimes willing to tolerate poor functionality in our products, because how much we love them overwhelms everything else! Why else would women ever wear beautiful, yet thoroughly impractical, stiletto heels?

Design has always been about finding the best balance between conflicting factors - between the emotional and the rational, between the aesthetic and the functional. Finding this balance is, I think, one of the designer's essential skills.

Apple's fabulous iPhone has won a plethora of design awards and is universally loved. You can see the care and love that has gone into its design - every detail painstakingly resolved to be as perfect as they can make it. We love it not just because of its aesthetic qualities, but because it works; it delivers on our needs and it is functionally outstanding. In short, it's a brilliant balance and would not have won all those awards had it functioned poorly.

Yes, that new basin tap may be stunningly beautiful, but if it's a nightmare to clean and your house guests will not be able to operate it, then it is functionally compromised, which, as we now know, will affect the buyer's view of it and a sale will be lost. Equally, that gorgeous shallow basin will seem less gorgeous when you learn that you can't cup your hands with water to wash, and that when you turn up the flow from the tap, it hoses down your front.

Worse still, functional compromise is a breach of the unspoken contract between buyer and brand. When we get that new bathroom installed at home and something doesn't work well, no matter how beautiful it is, it poisons our view of the brand. However the flip side of that is much more positive: if we designers get the functionality right, then the aesthetic perception of what we create can thereafter only be enhanced. So yes, Form **is** Function!

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