

# HUMAN SPACES REPORT: Biophilic Design in the Workplace

As work psychologists we have an enduring interest in both the individual and environmental factors that influence business outcomes. In particular, the interaction between an individual and their work environment can be a crucial determinant of both an employee's success and happiness in his or her role.

The concept of biophilia highlights an innate connection between humans and nature, which more recently has been recognised as a key consideration when designing and developing workspaces. The idea of incorporating nature into the built environment through biophilic design is less often seen as a luxury in the modern workplace, but rather as a sound economic investment into employees' health, well-being and performance.



# A message from Professor Sir Cary Cooper

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*The work environment has always been recognised as essential to employee well-being and performance but often purely as a ‘hygiene factor’ – an element which can only have a negative impact if organisations get it wrong. It’s no coincidence that the most modern employers now take a different view, designing environments to help people thrive, collaborate and be creative. Being connected to nature and the outside world is a big part of that, and research is struggling to keep pace with the best practice that organisations are adopting to make that connection happen at work. This new research report is an important and practical piece, summarising existing research on the different approaches to biophilic design and their impact, and building on it with a new study of real employee perspectives on what inspires them in their work environments across EMEA countries.*

# **Design in the workplace – the biophilia imperative**

# Design in the workplace – the biophilia imperative

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What makes work feel good? For modern organisations and their people, it's about much more than the end goal of productivity and profit. How we gain meaning, a sense of well-being and of purpose in the workplace is just as vital, not only to feel good but to perform effectively too. Increasingly, employers and employees themselves are engaging in this debate about a more comprehensive view of work and the role it plays in our lives, as are governments and societies with the growth of projects measuring national well-being across the world. A connection with the natural world is a big part of that discussion however we frame it – escaping the concrete jungle, achieving a better level of balance or simply being in a space that is enjoyable.

The increasing academic and organisational interest in biophilia and biophilic design is driven by the positive outcomes that it can help create for individuals and businesses, many of which are discussed at length in this report. The timing behind this burgeoning interest lies in the wider socio-historical context of a major movement of populations globally into urban areas – we are as disconnected from nature as we have ever been. Figures show<sup>1</sup> a remarkable shift during the 60 years between 1950 and 2010 with some countries seeing over 40% of their population residing in urban areas compared with non-urban areas. In France that figure is 22.6%, in the Netherlands, 26.8%, in the United Arab Emirates, 22.4%, in Switzerland a massive 32.7% and in Turkey, an even greater 44.8%.

# Design in the workplace – the biophilia imperative

## Increases in percentage of population living in urban areas in EMEA countries

Country	Percentage in urban areas (2010)	Percentage in urban areas (1950)	Percentage increase
Central African Republic	38.9	14.4	24.5
China	44.9	13.0	31.9
Croatia	57.8	22.3	36505
Czech Republic	73.5	40.9	32.6
Denmark	86.2	68.0	18.2
Egypt	43.7	31.9	11.8
France	77.8	55.2	22.6
Germany	75.6	64.7	10.9
Greece	59.7	37.3	22.4
Hungary	68.3	53.0	15.3
India	30.1	17.0	13.1
Ireland	62.0	40.1	21.9
Italy	68.4	54.1	14.3
Malaysia	71.8	20.4	51.4
Netherlands	82.9	56.1	26.8
Norway	77.9	50.5	27.4
Pakistan	37.0	17.5	19.5
Portugal	60.7	31.2	29.5
Russia	72.6	44.2	28.4
Sweden	84.5	65.7	18.8
Switzerland	77.0	44.3	32.7
Turkey	69.6	24.8	44.8
Ukraine	68.9	35.5	33.4
United Arab Emirates	76.9	54.5	22.4
United Kingdom	90.1	79.0	11.1

# Design in the workplace – the biophilia imperative

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At a time when organisations have more knowledge than ever before about the effect of work environments on their people – physically, psychologically and socially – it's perhaps surprising that the biophilia agenda is still in its nascent form. Despite the number of clinical studies in existence on the impact of biophilia on a range of human behaviours, there are relatively few studies conducted outside the lab linking the field with organisational psychology. With this review and the new research contained within it, the aim is to kick-start the discussion within organisations about workspace design and its role in organisational well-being, performance and culture, as well as the possibilities that biophilic design can create.

## A background to biophilia

*The 'Biophilia Hypothesis'<sup>2</sup> suggests that there is an instinctive bond between human beings and other living systems. It literally means a love of nature, and suggests an ingrained affinity between humans and the natural world. Therefore, biophilic design is a response to this human need and works to re-establish this contact with nature in the built environment<sup>3</sup>. Ultimately, biophilic design is the theory, science and practice of bringing buildings to life and aims to continue the individual's connection with nature in the environments that we live and work in everyday<sup>4</sup>.*

*In today's contemporary built environment, people are increasingly isolated from the beneficial experience of natural systems and processes<sup>4</sup>. Yet it is often natural settings that people find particularly appealing and aesthetically pleasing. So by mimicking these natural environments within the workplace, we can create workspaces that are imbued with positive emotional experiences. It is often the case that we don't take enough time to immerse ourselves in nature, or appreciate the living systems that exist everywhere around us, making it vital for us to incorporate nature into our day-to-day environments.*

**Unique  
research  
into biophilic  
design**

# Unique research into biophilic design

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Led by Professor Sir Cary Cooper, Robertson Cooper has studied the impact of work environments for the past 15 years, collecting a significant weight of research and real data from within organisations that links job conditions to performance and well-being. Just as management styles and workloads determine people's experience at work, so can their physical surroundings. For businesses looking to perfect that experience, biophilia is increasingly a clear area of focus and investment.

Existing research into the impact of biophilia in the workplace demonstrates tangible benefits for individuals and their organisations. Contact with nature and design elements which mimic natural materials have been shown to positively impact health, job performance and concentration, and to reduce anxiety and stress. **In turn, there are proven links between work environments exhibiting biophilic design and lower staff turnover and sickness absence rates.**

Although these benefits have all been comprehensively proven in isolated studies, there are few if any cross-country studies that examine the preferences of individual employees in terms of biophilic design and the impact of meeting those preferences. Building on Robertson Cooper's expertise in workplace psychology, this new research study examines real perspectives from real people, making tangible links between natural elements in the workplace and the way they make us feel.

The new study is also significant in surveying employees from across EMEA nations. Collecting responses from the UK, Dubai, France, Germany, the Netherlands, Spain, Sweden and Denmark, the research quantifies the benefits of biophilic design, specifically for well-being and productivity, and also provides a practical introduction to how to achieve those benefits. In doing so, the study adds to the existing evidence base and provides a blueprint for natural, high performing organisations.

## Sample Demographics

- *3600 employees from eight countries (UK, France, Germany, Netherlands, Spain, Sweden, Denmark and Dubai)*
- *52% of the sample were female*
- *Largest proportion of respondents worked for the government or in public services (23%)*
- *Most respondents worked in either a town (32%) or a city centre (31%)*
- *Largest proportion of respondents fell in the age bracket of 35-44 (30%)*
- *Largest proportion of respondents spent 30-39 hours a week at work (38%)*

# Unique research into biophilic design

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## Headline EMEA stats

- 30% of EMEA office workers said their workspace does not provide a sense of light and space
- A third (33%) of respondents reported they do not have a quiet space to work in when at the office
- 40% of EMEA office workers said they felt most productive at work at their own desk in a solitary office
- 31% of respondents said they felt most productive at work at their own desk in a open plan office
- Over two thirds (67%) of respondents said the design of a company's office would not affect their decision to work there but researchers suggest that there is a subconscious draw towards natural environments
- Sustainable (30%) and minimalist (29%) were the building designs EMEA office workers reported to inspire them the most
- 7% of respondents had no window view in their workspace
- White and grey were the most commonly used office colours
- Only 45% of EMEA office workers had live plants in the office

## Comment from Cary:

***We can see here a general deficiency in the provision of nature contact in the workplace with many EMEA office workers going without what we can consider the basics such as windows and natural light. This is concerning in the modern work environment where the employee's workspace is recognised as essential to their well-being and performance. In the existing literature we can see the positive impact that natural elements can have on individuals and so here we intend to summarise this research and combine it with real employee insights into how these connections are presented in the workplace.***

# Unique research into biophilic design

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## **Integrating Nature into the Workplace**

We know there is an instinctive bond between human beings and other living systems, so how does integrating nature into the workplace lead to positive organisational, psychological and physical health benefits? Biophilic design brings offices to life, and goes far beyond the practical benefits of a single plant recycling air behind the reception desk of a high-rise building.

Much research into biophilia supports the positive impact that this nature contact can have. Studies have shown the diversity of that impact includes increasing a customer's willingness to spend more in a retail environment, increasing academic performance amongst school children and even reducing anxiety and stress before medical procedures.

In the workplace we are concerned with biophilic design in relation to employee outcomes, specifically in the areas of well-being, productivity and creativity. Our cross-country findings show that natural elements in the workplace are determinants of these three aspects. The research has shown that overall, those with natural elements present in their workspace report higher levels of creativity, motivation and well-being. The findings can be integrated to provide practical insights into modern workspace design, for example internal green space and natural light are positively linked to greater productivity and those with live plants in the office reported higher levels of well-being than those without. These findings are reflected by the top five elements that EMEA office workers reported as desired additions to their workspace.

# Unique research into biophilic design

## NEW RESEARCH FINDINGS



***'Sustainable' (30%) was most often cited as the style of building design that would inspire at work***

Incorporating natural elements into the built environment not only reflects the aesthetic benefits of the outside world, it provides a rich environment for individuals that encourages interaction. Existing research on biophilia shows that people exposed to natural elements are more energised by their surroundings, feel less stressed and have improved attention spans<sup>5</sup>. Recently, white papers such as 'The Economics of Biophilia'<sup>15</sup> have demonstrated that using natural materials and evoking nature within a workspace are not extravagances, but a way to increase profits and make hard cost-savings.

To examine this existing evidence base in detail, and to supplement it with our own new research, the paper will split into sections, each focussing on one of three key business outcomes that can be leveraged with biophilic design; well-being, productivity and creativity. In addition, we will draw links with elements of organisational psychology and behaviour that can help organisations to place biophilic design within their wider strategies for people and performance.

# The impact of biophilia

# The impact of biophilia

## 1. Biophilia and the well-being advantage

The great management theorist Maslow was examining the aesthetics of the workplace, and their impact, as long ago as the 1950s. His studies found that the quality of office design influenced office workers, with aesthetically pleasing spaces having a positive impact on energy levels and well-being<sup>6</sup>. Further to this, research shows that the presence of natural elements indoors can evoke the same benefits as the outdoor environment<sup>7</sup>, supporting the case for biophilic office design.

### NEW RESEARCH FINDINGS

European office workers who work in environments with natural elements, such as greenery and sunlight,

report a  
**13%**  
higher level  
of well-being

Across Europe, research has shown that the simple presence of natural elements in the work environment can act as a buffer against the negative impact of job stress and positively impact general well-being<sup>8</sup>. It's a connection which has been made in many settings, including the healthcare profession. For example, in patient waiting rooms with murals depicting natural scenes such as mountains, sunset, grassy areas and stone paths patients felt significantly calmer and less tense than those sat in a waiting room with plain white walls<sup>9</sup>. In the work environment our research presents similar findings, showing that the use of

mute colours (brown and grey specifically) were associated with greater reported levels of stress. In contrast, employees in offices with bright accent colours (red, yellow, purple, orange, green and blue) reported lower levels of stress. Ultimately it is important for organisations to recognise the particular colours that have the best impact in terms of employee well-being and consider how these colours can reflect the natural elements that inspire us.

### The restorative effects of nature

*When EMEA office workers' attention is focused on demanding tasks, disruptive environmental factors may lead to mental fatigue, whereas environments that provide a possibility for more effortless attention, such as one with natural elements, offer an opportunity to restore mental capacity. These surroundings, dominated by elements of nature, are thought to be restorative<sup>10</sup>*

In the work environment, the benefits of nature have also been recognised, with research in Norway finding that natural elements within an office space, such as plants, can prevent fatigue when completing tasks that demand high concentration or attention<sup>11</sup>.

Similarly, we found that across countries, the presence of natural elements was consistently associated with higher reported levels of happiness at work, in comparison to work environments void of nature. Further to this, employees working in offices with both internal and external green spaces along with plenty of natural light reported higher levels of well-being, in comparison to those working in environments without these natural features. Our study reported levels of well-being and productivity that were 13% and 8% higher, respectively, for those

# The impact of biophilia

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EMEA office workers in environments containing natural elements. However, despite the benefits that natural light and space can provide, it was found that 30% of workers do not work in environments that provide this sense of light and space. Findings such as this should urge organisations and designers to consider how existing and future workspaces can be built or modified to provide light and space and in turn increase levels of well-being and productivity within the workforce.

Other studies have suggested that such natural elements do not necessarily have to be “real”. Research has shown the positive effects of even an image of greenery over other aspects of the obvious workspace such as walls, furniture and flooring can also have positive benefits if elements of the outdoor environment are effectively re-created indoors<sup>12</sup>.

## Natural elements positively linked to well-being at work:

- *UK: Light, wood and stone materials*
- *France: Views of nature and open water*
- *Netherlands: Views of trees*
- *Denmark: Natural light and green space*
- *Dubai: Views of water such as the ocean, lakes or ponds*
- *Sweden: Natural light had a positive impact on levels of happiness at work. However, the use of grey colours was significantly linked to greater levels of stress in the office*

These findings show that there are specific design elements linked to workplace well-being which provide organisations with another lever to pull to create a positive work environment. The recent upward trend in so-called ‘presenteeism’ – the tendency of employees to report to work, but be less focused due to low well-being or disengagement with their role – presents employers with an imperative to consider biophilic design as an option which can boost well-being and provide areas in the workspace for respite and renewal.

Presenteeism is a relatively new area of study. Global figures to estimate its cost to employers do not yet exist, but figures from the UK suggest the scale of the issue, costing businesses £1 billion a year according to the significant Foresight study into mental capital and well-being<sup>13</sup>. This cost is estimated at 1.3 times that of absenteeism, a clear indicator of the benefit for businesses who can tackle the issue through a range of measures, including workplace design.

A concept related to presenteeism and engagement in a job role is that of employee perceptions. Specifically, an employee’s perception of how valued and supported they are by their employer can be a key determinant of well-being at work. This perception is accounted for in many validated psychological tools that seek to measure well-being in the workplace and it represents a possible inherent benefit of biophilic design - that the act of providing a purpose-designed environment for employees can boost those perceptions of value and support and in turn impact well-being.

Given the economic imperative for organisations to provide positive work environments, and the wealth of academic evidence that shows the impact of biophilia, surprising percentages of EMEA office workers still have no natural light (42%), greenery

# The impact of biophilia

(55%) or window view (7%) within their environment. Such findings highlight a relatively simple opportunity to improve workspaces and increase well-being. Our research suggests that the simple incorporation of natural elements into the workplace can substantially impact employees' reported well-being in a positive way. For organisations, this represents an opportunity to integrate a consideration of the natural environment and the provision of 'green' spaces with other initiatives that form part of their health and well-being strategies. This could, for example, mean linking biophilic design with health and fitness programmes at work or with simply encouraging more movement for those in predominantly sedentary roles. Improving the integration of the work environment with the outside world, and encouraging employees to move between different purposely-designed spaces, has the potential to break the inactivity which is an ingrained element of many desk-bound roles.

## NEW RESEARCH FINDINGS

### In European offices



**42%**  
of employees  
have no natural light



**55%**  
of employees don't have  
access to any greenery



**7%**  
of employees  
have no windows

### Genzyme Corporation case study

*World-leaders in bio-technology, Genzyme Corporation recently designed a new corporate headquarters that when it was built was only the third building to achieve LEED (Leadership in Energy and Environmental Design) Platinum status.*

*Features of the building include natural light; a clear glass exterior; a central atrium with chandeliers at the base, which reflect sunlight; indoor gardens, and windows.*

### **18 months after the structure opened, a survey found that:**

- *88% said having direct views and access to the natural elements indoors improved their sense of well-being*
- *75% said the building's design increased their feeling of connection to their other office workers*

# The impact of biophilia

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## A window on the world

Across Europe, it has been shown that viewing urban landscapes has a less positive and in some cases negative effect on health, whereas scenes of natural elements, such as lakes or mountains, are shown to have positive health effects and improve people's long term health and well-being<sup>8</sup>.

In the same way, the impact of a green window view in a work environment also poses many benefits. Research shows positive psychological well-being was greater amongst employees who had a window view of natural elements such as trees or green landscapes, over those who had views of nearby buildings<sup>14</sup>.

Just 58% of EMEA office workers have natural light and 7% have no windows at all. The impact of a view of the outside world (or lack of) isn't just confined to how people feel at work, it can also influence whether they turn up at all.

In an existing research study conducted in 2010 on office workers<sup>15</sup> in an administrative office building, it was found that, for those 39% of employees with no outdoor view, 10% of their absence could be attributed to the impact of office design providing no contact with nature.

Our analysis has shown that people with a view of natural elements such as trees, water or countryside reported greater levels of well-being than those with views of buildings, roads and construction sites. Further to this, those with a window view that regularly sees nature, were found to have the greatest levels of well-being overall. Finally, when it came to the motivation of EMEA office workers, any window view was found to be more beneficial than no view at all.

However, it may not always be feasible to provide each employee with outdoor views. In these cases, studies have suggested that those who do work in a windowless office should have a workspace that contains visual décor, dominated by materials with natural elements to replace the reduced or complete lack of nature contact<sup>16</sup>.

## Well-being summary

Although investigation into the benefits of biophilia for individual well-being is relatively new, there is clearly mounting evidence that biophilic design can have a positive impact, from reducing stress and anxiety, to improving the quality and availability of respite from work and in increasing levels of self-reported well-being. There are clear links between these findings and areas of organisational psychology which merit biophilia as a consideration within organisations' wider well-being strategies.

# The impact of biophilia

## 2. Productivity

Feeling good often equates to being able to do more. In addition to the abundance of research that confirms the relationship between well-being and productivity (Robertson & Cooper, 2011), there is also clear evidence directly linking biophilia with an organisation's output.

Productivity has been found to increase amongst employees in environments that complement humans biophilic needs<sup>17</sup>. In a study of call centre EMEA office workers, the number of calls handled per hour was 6-7% greater for those with a view of the outdoor environment, in comparison to those with no view. In this situation, it is clear that with large numbers of employees, profit margins can grow significantly.

Researchers at Cardiff University reported similar relationships between nature and productivity in the work environment in a European study<sup>18</sup>. Comparing productivity in two offices, one with natural elements and one without, they found that the offices with natural elements saw a 15% rise in output amongst employees after three months.

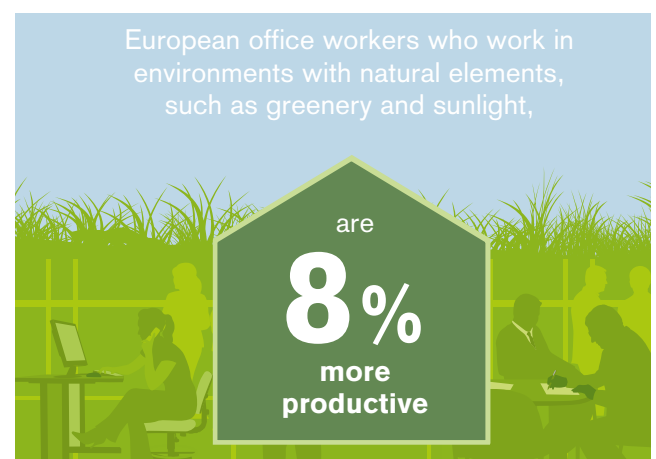
### Natural elements and task performance

*A Japanese study from 2004 explained the differences in task performance between employees by the presence of natural elements within the individual's workspace<sup>19</sup>.*

*45% of EMEA survey respondents did not have any natural elements in their office currently.*

Our research both confirms and furthers such findings, showing that indeed natural elements within the work environment are predictive of greater levels of productivity. In addition, the research has identified cross-country differences in the specific natural elements that are associated with productivity. For example, in the UK and Netherlands indoor plants were positively associated with productivity, whereas in Germany the use of stone in the office environment had a stronger impact. Further to this, the view from EMEA office workers windows also had an impact on levels of productivity. Overall, it was shown that EMEA office workers with a window view were more productive than those with no view at all. In Sweden, views of nature were most strongly linked to EMEA office workers productivity, yet in Dubai it was found that views of water were most beneficial to employees.

### NEW RESEARCH FINDINGS



# The impact of biophilia

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## Natural elements linked to increased productivity at work:

*Spain: the use of blue colours and shades within the office had a positive impact on productivity*

*France: orange colours in the office positively influenced EMEA office workers' productivity*

*Netherlands: natural elements such as indoor plants and natural light were associated with greater levels of productivity*

*Sweden: EMEA office workers with a window in their office with views of nature had greater levels of productivity*

*Denmark: shades of blue were associated with greater productivity*

The scale of business benefits achievable by promoting biophilia is reflected in the number of organisations which have begun to embrace it. This is a new movement in an office design practice which has been adopted across various industries, from technology to banking. A 2007 study from Norway found that these design efforts can in some cases have a greater impact on sickness absence and productivity levels than psychosocial workplace factors such as job demands, control and social support<sup>20</sup>. The physical environment then is not simply a 'hygiene factor' that can only have a negative impact - it's an opportunity to drive performance, just as, say, management styles are. With regards to productivity, we found that 31% of respondents felt most productive at work when at their own desk in an open plan office. Such findings present key areas for organisations to

increase productivity across a workforce. However, it is equally necessary to recognise the importance of quiet working spaces which are often essential when working in these free-flowing, open spaces. Interestingly, a third (33%) of respondents said that they do not currently have a quiet space where they can go to work within their office.

Linking these findings back to organisational psychology, it's possible to draw a line through the emergent 'whole person' perspective on well-being and performance, and the concept of providing a fulfilling work environment. The extent to which organisations consider the full range of human interests and motivations in their conception of people management and of work is key to developing sustainable high performance. Rather than viewing staff as a resource, the whole person approach takes a broader perspective, part of which could include people's interest in and need for contact with nature, which is clearly evident from our survey findings. Just as we mentioned the idea of employee perceptions in the previous well-being section, the physical environment is a part of setting a positive psychological contract; the environment doesn't just impact of itself, but engenders trust and discretionary effort when employees recognise it as a symbol of how highly they are valued.

The work environment is already an established part of the expected psychological contract between employer and employee and has even become a differentiator for employer brands. Consider the biggest firms in the technology sector – Facebook, Apple, Google – these are all at the vanguard of providing great working environments, of which many are linked to nature through biophilic design and the campus layout of the main offices. With this backdrop of increased awareness amongst employees about leading companies'

# The impact of biophilia

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approach to designing work environments, it's possible to envisage biophilic design as a crucial component in 'the war for talent' – how companies attract and retain the most skilled, productive workforces with great competition. Although we found over three quarters (77%) of respondents reporting that the design of an office would not affect their decision to work for that company, it is likely that as the awareness of the positive impact of good design grows, we will see a decrease in this figure and more people holding a greater expectation of office design that is stimulating and provokes positive feelings.

# The impact of biophilia

## 3. Creativity

### NEW RESEARCH FINDINGS

#### Natural elements linked to increased creativity at work:

*Spain: Natural materials, such as plants*

*Germany: The presence of greenery inside, along with wood and water*

*Sweden: Window views*

*UK: Purple and green colours*

*Dubai: Natural light*

*France: Wood elements and man-made landmarks*

*Netherlands: Yellow, blue and white colours*

*Denmark: Natural elements such as plants, wood, stone and natural light*

Some offices offer more creative potential than others. Walk into a low-ceilinged workspace with no natural light and 100% man-made materials and it's more than likely that your creative capacity will be dampened. This is supported by our findings that sustainable (30%) and minimalist (29%) were the styles of building designs that EMEA office workers found most inspiring.

Research shows that offices differ in terms of their creative potential with varying effects on those who work within them. Offices with low creativity potential are those with: dim lighting, few natural elements,

dim colours and complex design. Offices rated as having high creativity potential by contrast are simple in design, brightly lit, with warm, bright colours and natural elements<sup>21</sup>. Our research has supported these differences in office style and EMEA office workers creativity, finding that those who work in a light and spacious environment with greenery had the greatest levels of enthusiasm and creativity across countries.

### NEW RESEARCH FINDINGS

#### Colour and creativity

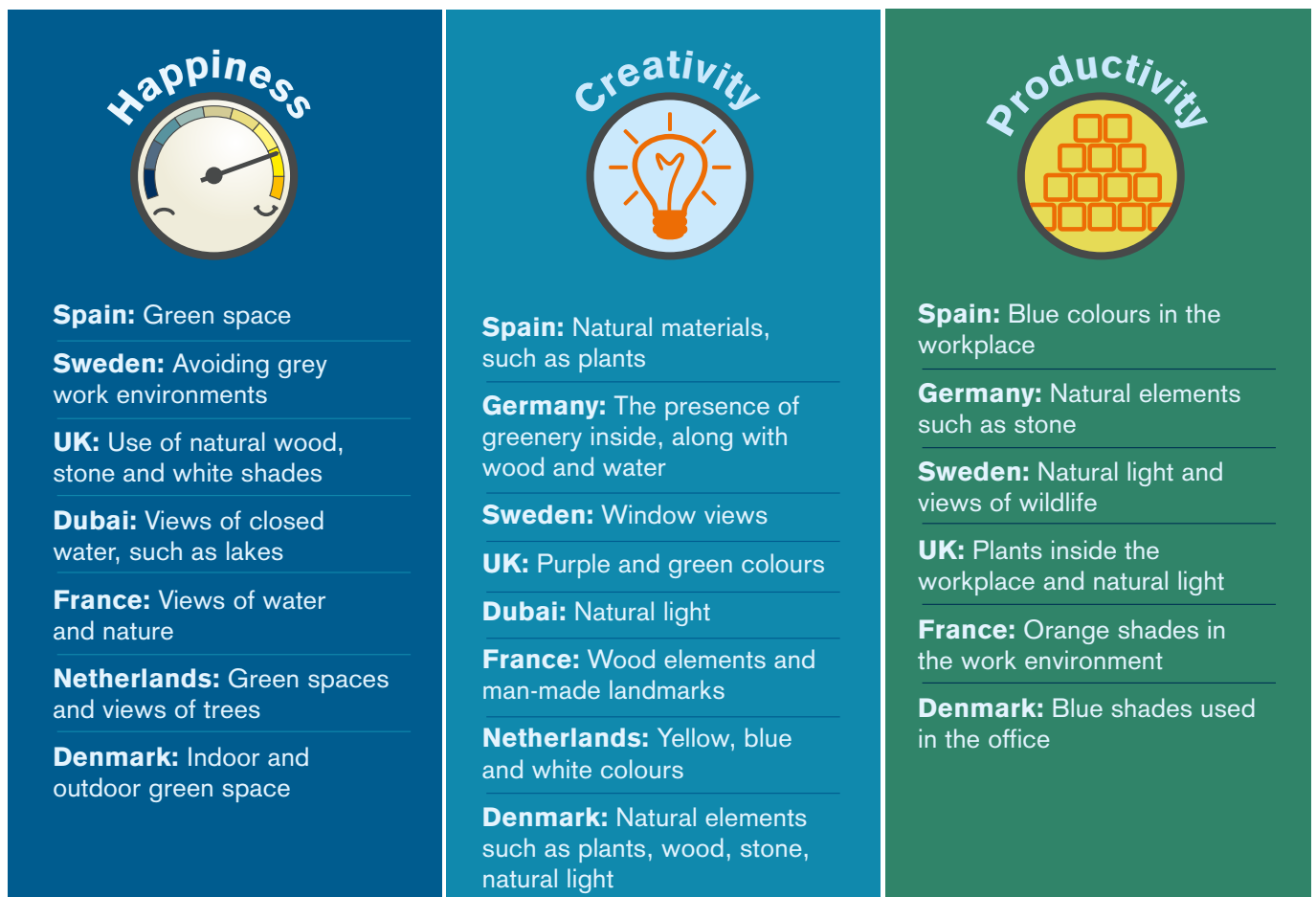
*Colours: For EMEA office employees wanting a creative environment, yellow, blue, green and white would be the chosen workspace colours.*

Research into the use of colour in the work environment has shown that the use of colour can elicit positive emotions amongst employees. However, it is less clear which colours specifically have the best impact. Some research has shown that in colourful work environments, employees report higher levels of emotional well-being, in comparison to those in neutral coloured offices. With this said, other studies suggest that the use of strong and vibrant colours in the workplace can elicit objectionable responses. Our findings have furthered the existing research by identifying the specific colours associated with creativity. Specifically, it is the use of bright, natural colours that have the strongest influence on EMEA office workers' creativity. Our preference for yellows, blues and greens within our workspace is possibly reflective of our biophilic connections with the natural world as these three colours in particular can be associated with the sun (yellow), sea (blue) and land (green).

# The impact of biophilia

The elements that combine to make a creative, productive and happy workspaces differ around the world. Our survey results show for example that, Germans have a preference for elements of stone and greenery (or those that mimic greenery) indoors, whereas in France the preference is for

wood elements and views of man-made landmarks. These nuances are also present when it comes to the links between natural elements, well-being and productivity – the infographic below summarises an EMEA approach to colour and natural elements in workplace design.



# The impact of biophilia

In addition to surveying employees about the elements which inspired creativity, we also asked people to report on their emotional state when entering the workplace. This enabled us to examine where the workplace engendered positive or negative emotions and linked those results to the presence or lack of natural materials. The results show clearly (see table below) that where there is internal green space, employees on average enter the workplace feeling happier, more creative and more motivated, and less anxious or bored.

## NEW RESEARCH FINDINGS

The table below highlights how individuals feel when they enter their workspace. It is important to note the increases in positive feelings and decreases in negative feelings for those with internal green spaces.

How do you feel when you enter the workplace?		Internal green space	
		Yes	No
Positive feelings	Happy	21.1%	11.4%
	Creative	7%	4.8%
	Motivated	32.7%	25.4
Negative feelings	Anxious	1.5%	3.9%
	Bored	9%	11.5%

Although these findings do not show actual increases in well-being, productivity or creativity, it is likely that individuals entering the workplace who feel more motivated are likely to be more productive. Similarly, those who enter the workplace feeling creative and happy are much more likely to be more creative and feel happy throughout the day.

# The impact of biophilia

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## **Biomimicry**

The human need to be connected to nature can be satisfied through biophilic design in two ways: either a direct connection to nature or a symbolic connection. Direct connections are sought through natural elements being incorporated into the workplace. But if these are not available individuals can have symbolic connections with nature that differ in that they are mimics of the natural environment. When design mimics the patterns, forms and textures of nature, this can provide these symbolic connections.

The importance of nature contact in the workplace is evident, yet, if organisations are not equipped to provide this contact directly, then it seems that symbolic connections are the ideal and necessary substitute. The findings of our study have identified a common deficiency of nature in the workplace. Of the 3600 EMEA office workers investigated in this research study, 42% reported having no natural light, 55% reported no natural elements being present and 7% said they had no view of the outdoor world.

Therefore, ways of mimicking the effect of nature indoors have been explored in order to identify if it poses the same benefits as true nature contact. Indeed, findings show that effectively re-creating the natural environment indoors can have the same impact in reducing stress and increasing energy levels as the real thing<sup>12</sup>.

Ultimately, the research in this area is indicating that bringing elements of nature into the workplace, whether real or artificial, is beneficial in terms of employee outcomes. As such, when thinking about office design and its impact on employees, we should take serious consideration of the amount of nature contact provided in the workspace in order to both maintain positive levels of well-being amongst employees but to also keep employee performance at an optimal level.

# The impact of biophilia

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## Summary of Findings across EMEA

### Impact of Office Colours

- Colours with a significant impact on workers' MOTIVATION: blue and white
  - Colours with a significant impact on workers' PRODUCTIVITY: blue, purple, yellow, grey and white
  - Colours with a significant impact on INSPIRING workers: yellow, purple and white
  - Colours with a significant impact on HAPPINESS in the workplace: green, blue and white
  - Colours that significantly impacted workers' CREATIVITY: yellow, blue, green and white
  - Colours that significantly impacted workers' ENTHUSIASM: orange, green, blue and white
  - Colours that significantly impacted feelings of STRESS: grey only
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### Impact of Window Views

- People who had no window view or had a view of a construction site spent significantly fewer hours per week at the office. In contrast, those with window views of trees, lakes or ponds spent significantly more hours per week in the office
  - Viewing nature regularly through a window in the office significantly impacted levels of worker productivity
  - Window views of construction sites were related to lower reported levels of happiness at work. In contrast views of natural trees significantly predicted happiness in workers
  - Construction site views significantly predicted high levels of stress
  - Those with no window views reported significantly lower levels of creativity
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### Impact of Natural Elements within the Office

- Those who worked in offices that provided natural light, live plants and water features had significantly higher levels of productivity
  - Outdoor green space and indoor live plants were associated with higher reported levels of happiness, creativity and motivation at work
  - An absence of outdoor green space and indoor plants was in fact associated with greater levels of stress
  - The absence of water, live plants and natural light was associated with greater absence from work due to illness
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### Impact of a Light and Spacious Work Environment

- Those who reported working in environments that were light and spacious had higher levels of productivity, enthusiasm, motivation and creativity

# The impact of biophilia

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## Specific Findings across Countries

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### Spain

**Happiness:** Workers' levels of happiness were positively impacted by external green space and natural light

**Creativity:** Live plants had a positive impact on workers' creativity

**Productivity:** Blue colours within the office had a significant positive impact on levels of productivity

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### Germany

**Happiness:** Having no window view in the office had a negative impact on levels of happiness

**Creativity:** Internal green space, water and wood elements positively impacted levels of creativity

**Productivity:** Natural light and elements of natural stone predicted greater productivity and regular views of nature outside also positively impacted productivity

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### Sweden

**Happiness:** Natural light had a positive impact on levels of happiness at work. The use of grey colours in the office was significantly related to greater levels of stress amongst workers

**Creativity:** Window views of the countryside had a positive impact on creativity

**Productivity:** Natural light and views of nature positively impacted productivity

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### UK

**Happiness:** Natural elements of light, wood and stone had a positive impact on levels of happiness. Plain white offices, were also associated with happiness at work

**Creativity:** The use of purple and green colours within the office, was associated with higher levels of creativity

**Productivity:** Live plants and natural light within the office space positively impacted creativity

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# The impact of biophilia

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## Dubai

**Happiness:** Natural light and window views of closed water, such as lakes, were positively associated with levels of happiness at work

**Creativity:** Natural light was also positively associated with creativity

**Productivity:** Neither office colour or the presence of natural elements had a direct impact on productivity

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## France

**Happiness:** Views that portray wildlife and open water (e.g. sea) were associated with greater levels of happiness. In contrast, window views of roads were associated with lower levels of happiness at work

**Creativity:** The use of wood within the office design was positively associated with creativity. Also, views of man-made landmarks were positively linked to creativity

**Productivity:** The use of orange colours within the office significantly predicted higher levels of productivity

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## Netherlands

**Happiness:** Natural light and external green space were associated with higher levels of staff happiness. Also, views of trees had a positive impact on reported happiness at work

**Creativity:** Yellow, blue and white office colours were associated with greater levels of creativity. Also, a non-natural window view (e.g construction site) had a negative impact on workers' levels of creativity

**Productivity:** Natural light and living indoor plants had a positive impact on productivity

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## Denmark

**Happiness:** The availability of natural light and green space within the office environment was associated with greater levels of happiness amongst staff

**Creativity:** Natural elements within the individuals' work space were associated with greater creativity. In addition, window views of nature and the colour blue in particular were also associated with high creativity

**Productivity:** The use of the colour blue within the office was predictive of greater levels of productivity

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# Summary

# Summary

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The research findings presented here highlight the dramatic influence of various natural elements on three employee outcomes: well-being, productivity and creativity. In more detail, our findings have uncovered some of the unique relationships between elements of biophilic design and employee outcomes in the workplace and also identified many cross-country differences in these relationships.

Further to these findings, it is natural to consider how these benefits emerge exactly. Although it would be useful to understand how the visual presence of natural elements indoors can have a positive effect on well-being and health, one should be open to the possibility that the natural environment influences subconscious parts of the brain in ways that cannot easily be described. Objects within the field of vision may in fact exert an influence even if the conscious brain does not recognise their existence. The classical example is the response evoked by a twig on the ground; if it remotely resembles a snake the feeling of fear is initiated prior to any visual inspection of the twig. In a similar way, natural elements may impact on brain processes through unconscious mechanisms even when they are not the object of focus. Therefore, the absence of such natural elements may suggest an unnatural, and thus potentially unsafe, environment<sup>10</sup>. This is interesting in light of the current research findings in which 77% of people said that the design of a company's office would not affect their decision to work there. In conclusion, it would suggest that the positive influence of natural elements within the workplace may well be subconscious. To put it simply, office workers may not consciously feel that design affects their workplace choice, but actually it does.

What we are able to confirm following this research is that nature contact in the workplace is certainly linked to employee outcomes and this is true across a number of countries. It is therefore important for organisations, designers and researchers to be aware of these connections and act accordingly. We know that people are being increasingly isolated from nature but the benefits of nature contact are clear, not only in the workplace but in any environment within which an individual spends time. We have confirmed this here through both the amalgamation of existing research in this area and also through contributing our own unique research findings that have investigated these relationships in the real working world.

It is crucial for employers to pay attention to the influences of nature on the individual not only to maintain positive levels of psychological well-being in the workforce but to also ensure that EMEA office workers are not disengaged and unproductive. It is equally important to keep having this discussion about the impact of the work environment on the individual. We cannot do this by looking purely at the existing literature, we need to take inspiration from the world's leading organisations and employers who are spearheading this movement in office design. This report hopes to contribute to the discussion surrounding biophilic design in the workplace through bringing unique research and insight into this area and help employers, architects, designers and builders create work environments that make employees happy, healthy and productive.

# Summary

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This report has begun the conversation around the importance of biophilic design in European workplaces. There are a series of key considerations and take-away points for designers, architects, employers and business suppliers to consider when creating effective and efficient workspaces that attract the best and most productive talent.

**1. MEASUREABLE IMPACT** – Biophilic design in the workplace has a clear, measurable impact on employee outcomes including productivity, well-being and creativity

**2. THE POWER OF PERCEPTION** – Employees state office design would not consciously affect their decision to work for a company but their subconscious perceptions and impression of the business responds differently – is this something for employers to address?

**3. NO CONTACT WITH NATURE IN THE WORKPLACE** – Given the positive impact of biophilic design on productivity, creativity and well-being, surprisingly large numbers of employees reported having little or no contact with nature in their workplace

**4. EUROPEANS DESIRE NATURE INSPIRED DESIGN INSIDE** – Bringing nature indoors can have numerous benefits for organisations in terms of employee outcomes. We found a 13% increase in well-being levels and an 8% increase in productivity for those working in offices that incorporate elements of biophilic design

**5. NATURE MOTIVATES YOUR WORKFORCE** – When people enter a workplace that incorporates nature, they are more likely to feel happy and motivated for the day ahead

**6. PSYCHOLOGICAL CONTRACTS ARE AFFECTED BY THE WORK ENVIRONMENT** – The work environment is also a key part of the psychological contract between employer and employee. Employees who feel their expectations have not been met may feel undervalued and disengaged

**7. NATURE INSPIRES INDUSTRY LEADING WORKPLACES** – Don't be left behind. The agenda for biophilic design in the workplace is developing quickly in the field, with a number of leading organisations providing employees with nature inspired environments

# History of office design

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Over the past century, it's not just our relationship with work that has changed; the spaces we inhabit have been in constant evolution too. What started out, in the early 20th century, as a design exercise in extracting maximum efficiency from an organisation and its staff has now become a much more cultured process – one that takes into account our inherent motivations and preferences as people, not resources.

So, how did we end up getting back to nature? We picked out some highlights from a century of workspace evolution...

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## ■ 1900s: steeled for a revolution

A time of 'Scientific Management' and offices like production lines, but it was the humble steel girder that set work on the road to what we know as the modern open plan. The material allowed for much bigger internal spaces to be opened up, a key feature of the Larkin Administration building – considered by many to be the first purpose-designed environment for a specific business.

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## ■ 1960s: Bürolandschaft and the dawn of office landscapes

The sixties were a time when the workplace went political. The challenge was to get away from top-down power to a more socially democratic layout, encouraging interaction and more human behaviour. The answer was Bürolandschaft. A concept from Germany, translated as 'office-landscape', it used organic groupings of desks and plants as partitions, in an effort to move away from the blunting regimen of scientific management. Many of the architect Quickborner's plans bear a resemblance to cell structures under a microscope, something which wasn't accidental and hinted at what was to come in the future.

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## ■ 1980s: Into the box

The twentieth century wasn't a straight procession towards biophilic design and office space enlightenment, there were some bumps along the way. The ubiquitous cubicle is one such example. Whilst open plan, organic spaces had emerged by the 1960s, many organisations eventually reacted to this new model by looking to gain back a degree of privacy on the office floor. The cubicle was implemented across many businesses – a way to stay open but also to have some personal space. It became widespread, particularly in the US, although now is increasingly looked on as an anachronism which provides neither open space nor privacy.

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## ■ 2000s: Coffee shops and fun

With the new millennium came a realisation that, perhaps, nobody needs to be in the office at all. The rise of coffee shops and wireless technology were just two of the ways in which employees felt freed from their cubicles, with over 95% of UK employers offering flexible working. The reaction inside the office was to make things more fun, appeal to our non-work self and gamify the environment to create work and leisure time in one space. So came the

# History of office design

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stereotypes of creative companies filled with pinball machines, beanbags and pool tables.

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## ■ 2010s: Biophilia and collaboration

Employers and their staff realised quite quickly that there's more to well-designed offices than a games room. The most modern workplaces are high concept, encouraging a sense of community, collective problem solving and well-being. And it's biophilic design that can complement all of these ideas – not just because nature has an impact on our health and performance, but it encourages a 'whole person' view of people at work. Increasingly, workplaces are being designed with nature in mind. From some of the most impressive vertical gardens in Singapore to the green campuses at leading companies like Google and Apple, the benefits have been embraced across the working world. High performance is becoming synonymous with environments that are well connected with nature, and allow us to connect with each other.

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# Professor Sir Cary Cooper, CBE

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## **Professor Sir Cary Cooper, CBE**

*Professor of Organisational Psychology and Health,  
Lancaster University,  
Founding Director, Robertson Cooper*

Cary is recognised as one of the world's leading experts on well being and stress at work and is the media's first choice for comment on workplace issues. He is a Fellow of the British Psychological Society, The Royal Society of Arts, The Royal Society of Medicine, The Royal Society of Health and an Honorary Fellow of the Royal College of Physicians, Editor-in-Chief of the Blackwell Encyclopaedia of Management and the author/editor of over 120 books.

Cary was awarded the Lifetime Practitioner Award from the British Psychology Society in recognition of his services to the profession. He acted as Lead Scientist in the 'Foresight Review of Mental Capital and Well Being' which influenced government policy regarding well-being in all aspects of society. He is

an active member of the Robertson Cooper team, focusing on strategy, external relations and PR activity. In June 2014 he was awarded a Knighthood in the Queen's Birthday Honours list and was also voted the 1st Most Influential HR Thinker of 2014 by HR Magazine.

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