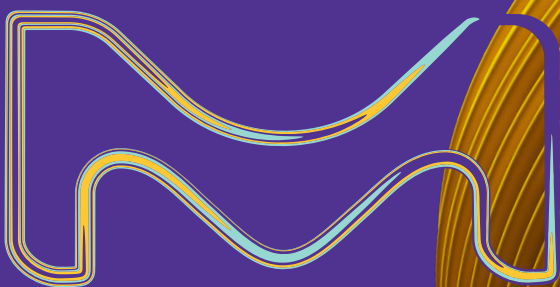


Merck KGaA
Darmstadt, Germany

STATE OF
CURIO
SITY

Report 2018



state of curiosity Report 2018

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Foreword

In the pursuit of human progress, the single most important trait is curiosity – the desire to learn, explore, and discover. It is the driving force for new possibilities.

For the last 350 years, curiosity has fuelled our company's growth beyond horizons. It has forged paths that have led to scientific and technological breakthroughs; many of which have not only driven our economic growth, but also addressed significant societal challenges.

We believe that cultivating a culture of curiosity leads to open, innovation-friendly environments where passionate teams can contribute effectively to business success. This belief catalyzed our ambition to define the role and value of curiosity in the workplace.

In 2016, we sought to define a precise concept of curiosity and to evaluate its impact in different markets and across different industries, with leading curiosity experts in the field. We published our findings in our **State of Curiosity Report**—the first-ever broad look at the impact of curiosity in the contemporary workplace. We learned that 20% of the 3,000 employees surveyed identify as curious, with the highly curious demonstrating qualities, such as being organized, collaborative, and detail-oriented themselves—all traits required for high-performance. Over 80% of those surveyed felt that curious colleagues were most likely to bring an idea to life at work.

But as is always the case at our company, answers lead to more questions. We remain eager to understand which countries believe strongly that promoting curiosity to drive innovation is a sound investment. Does the size of the organization influence the state of curiosity in the workplace? Which generation is the most curious and eager to innovate? How can we foster curiosity in support of innovation?

In 2018, the year of our 350th anniversary, we have looked deeper. Ground-breaking technologies, such as CRISPR/Cas, 3D printing, robotics, and artificial intelligence are fundamentally changing how businesses operate, and doing so at break-neck speed. Those businesses that can adapt quickly will thrive. The importance of cultivating a culture of innovation fuelled by curiosity cannot be underestimated. To this end, we have built on our previous work and leveraged the latest scientific research to evolve our model for measuring curiosity. We are excited to share our findings. This report showcases results from the survey conducted with over 3,000 workers from China, Germany, and the United States across five industries to provide clues to unlock further the potential of curiosity to drive innovation.

In essence, our report shows what we have always believed: No business can afford to ignore the power of curiosity in the workplace. With our results we can see the gaps in workplace curiosity, but also the potential for improvement. In pursuit of innovation, we must dare to seek more knowledge and open ourselves to new ideas to improve our future actively and responsibly.

We invite you to join us as we continue this exciting journey to propel curiosity-driven innovation.

Stefan Oschmann, Chairman of the Executive Board and CEO of Merck KGaA, Darmstadt, Germany



ALWAYS CURIOUS
Organization size matters.

Chapter 1

Why does Organizational Curiosity Matter?

“Being curious means being open to new information and actively seeking it out. It means embracing facts that don’t fit your worldview and trying to understand their implications. It means letting your mistakes trigger curiosity instead of embarrassment. “How on earth could I be so wrong about that fact? What can I learn from that mistake? Those people are not stupid, so why are they using that solution?” It is quite exciting being curious, because it means you are always discovering something interesting.”

- Hans Rosling, Ola Rosling & Anna Rosling Rönnlund, *Factfulness: Ten Reasons We’re Wrong About the World – and Why Things are Better Than You Think* (New York: Flatiron Books, 2018), 249.

A spark of curiosity may translate into a revolutionary idea or product.

The best employees are curious. They are learners, constantly discovering new and better ways of doing things. The most successful organizations are those that not only survive, but also thrive, in uncertain, rapidly-evolving times. They nurture working environments that encourage continuous learning and exploration to help them adapt. They are more likely to question existing routines and explore different vantage points by asking the following questions:

- How can we do this better?
- What challenges might we face?
- Who can help us with this?
- How can our work support the work of others?
- How do we prepare for workforce changes driven by AI-automation?
- What might the world need 20 years from today? Why? Why not?

This line of questioning is exactly what is needed to outpace the changing world to gain and maintain competitive advantage.

“What differentiates us from our competitors? Curiosity and innovation are pre-requisites to always renew our business; those aren’t just words; it’s part of how we operate and drive strategic thinking. Within our sectors, in the Innovation Center or our digitalization initiatives—innovation and curiosity are always at the heart of every strategy across our company. We’ve learned that finding time and having the audacity for curiosity is a worthwhile investment that will show returns for our employees and our business.”

- Isabel de Paoli, Chief Strategy Officer, Merck KGaA, Darmstadt, Germany

From precision medicine that unlocks the promise of cutting-edge cancer therapies for patients worldwide, to heat-reflecting blinds that offers energy efficiency, we have survived and thrived for 350 years. Our innovations have improved the lives of millions around the world. The unique driver of this success? Curiosity. A trait that has enabled us to cultivate a strong culture of innovation.

“Cognitive flexibility, a gift from evolution, offers us endless innovations; however, it is curiosity that drives us to harness its full power.”

- Dr. Kunlin Wei, Associate Professor, Department of Psychology, Peking University



ALWAYS CURIOUS

Did you know that your date of birth could determine your curiosity levels?

CRITICAL CURIOSITY

In 2016, research published in our first **State of Curiosity** report showed that 84% of the more than 3,000 workers surveyed felt that a curious colleague is most likely to bring an idea to life at work.

So, what makes a curious person critical in the workforce?

Curiosity, by nature, induces behaviors, such as information seeking, which plays a meaningful role in workplace learning

(Reio and Wiswell, 2000). It is also strongly associated with an enhanced ability to learn from training (Hassan et al., 2015), a propensity to ask more unprompted questions, and an increased ability to make use of ambiguous information (Peters, 1978). Theorists also agree that curiosity enables individuals to react to events with open, non-defensive attitudes and effortful thinking. This can be of benefit in an ever-changing and unpredictable work environment, as individuals are less likely to perceive change as stressful and more likely to adapt effectively.

Extensive research shows a strong association between increased curiosity and increased innovation—business leaders worldwide are recognizing and embracing curiosity as a mechanism to drive success. In a **2018 Harvard Business Review report** developed in collaboration with our company, 1,000 business leaders in sectors such as technology, healthcare, and manufacturing were asked “what makes an innovation culture?” The leading answer for every sector? Encouraging and rewarding curiosity.

The Superpowers: Unlocking organizational curiosity

What are the inputs that drive curiosity? Does the possession of specific characteristics, or superpowers, determine an employee’s ability to be curious? Can curiosity be taught?

We are born with an innate curiosity that allows us, as children, to explore our new world. As we learn to crawl, walk, and talk, childhood curiosity ignites a passion to learn. Maintaining this passion to learn is the fundamental basis of curiosity. Our research shows that the highly curious, those high-performers with the greatest potential to innovate in our organizations, possess four distinct characteristics, or Curiosity dimensions, which together form the basis of our new Multi-dimensional Work-Related Curiosity Scale:

JOYOUS EXPLORATION

Gaining great pleasure from recognizing and seeking out new knowledge and information at work, and the subsequent joy of learning and growing.

DEPRIVATION SENSITIVITY

Recognizing a gap in knowledge and pondering abstract or complex ideas to try to solve the problem and reduce the gap (offers a sense of relief when solved).

OPENNESS TO PEOPLE'S IDEAS

Valuing diverse perspectives and ideas from others, and intentionally seeking out different approaches at work.

DISTRESS TOLERANCE

Willingness to embrace the anxiety and discomfort that come from exploring the new, unfamiliar and uncertain.

If an enabling environment is fostered and supportive tools are provided, can these characteristics be exhibited by all employees? Driven by the desire to answer this question, we conducted a six-month feasibility study in 2017 to assess the potential to increase workplace curiosity and achieve defined

innovation goals. In collaboration with teams from Porsche Consulting, the Weizmann Institute, and a team within our organization, we measured baseline curiosity and then guided teams through interventions designed to unlock specific Curiosity dimensions over a six-month period. At the end of the study all teams reported that the interventions of the program had not only enhanced their curiosity levels, but also helped them reach their innovation goals (see quotes below).

“For companies to tap into their full potential, they don’t need new technologies, but a new culture of working. A culture of togetherness, where people build on the ideas of others. A culture of openness, where it’s more important to ask questions than to give answers. In short: a culture of curiosity. The CEO of the future is thus a Curiosity Enhancing Officer.”

- Andreas Steinle, Managing Director of Zukunftsinstitut Workshop & Curiosity Council Member

Organizational curiosity can be encouraged and with the right working environment no employee should be left behind. The results from this study have inspired us to create a more robust curiosity-enhancing toolset that seeks to unlock the power of organizational curiosity. We believe that the innovations of tomorrow will be determined by our organization’s most curious employees today. An organization’s corporate survival lies in the hands (and hungry minds) of its employees.



ALWAYS CURIOUS

One’s appetite for technology, digitalization and innovation is shaped by the country one resides in.

TRAINING CURIOSITY

“They ask more, they have ideas they wouldn’t have before, because before maybe they would have been afraid of criticism.”

- Weizmann Institute team lead

“The way the team approaches a new area has totally shifted to look forward to new things and hunt for new things.”

- Merck KGaA, Darmstadt, Germany team lead

“The team is more aware of curiosity for sure. Now, if there’s a task I need to work on, curiosity comes naturally. Before the program I would have tackled it by brainstorming with the team, but now I have more useful tools at hand.”

- Porsche Consulting team lead

Chapter 2

Evolving for Success – New Learning, New Insight

In our never-ending exploration of curiosity, we have evolved our critical understanding of this important trait. In collaboration with experts, researchers, and business leaders in the fields of psychology, business, and innovation, we have developed a more sophisticated and rigorous model to measure the four distinct Curiosity dimensions that enable curiosity.

“Curiosity is not only about finding new ideas. It is about being able to deal with the new, the complex. It is about being able and willing to continue even if the new brings unpleasant feelings with it. That is the real strength of the Multidimensional Curiosity Scale: It combines all the pieces you really need for curiosity to function as fuel for innovation.”

- Carl Naughton, Ph.D., Linguistics and Educational Science, Executive Lecturer at European Business School Wiesbaden, co-founder of Braincheck GmbH & Merck KGaA, Darmstadt, Germany Curiosity Council Member

Using our new Curiosity scale, we aim to answer a few central questions: Where are the curious? How old are the curious? Which industries have the most curious employees? Does size matter?

We launched our Curiosity survey in Germany, China, and the US and asked over 3,000 employees, across five industries, to respond to questions regarding the role of curiosity in their workplaces, and the enhancers and barriers to curiosity (see appendix for full study methodology).

“The 2018 State of Curiosity research highlights the similarities and differences in curiosity across countries and industries. It’s an important update for understanding the characteristics of today’s workforce.”

- Sophie von Stumm, Ph.D., Director Hungry Mind Lab, Department of Education, University of York & Merck KGaA, Darmstadt, Germany Curiosity Council Member

And our results have left us more curious than ever. This is what we learned.

The Overall Scores

- The overall Employee Curiosity Index score for the total 3,004 survey respondents is **70.3**.
- The overall Employee Curiosity scores are:
 - Deprivation Sensitivity score: 69.8
 - Joyous Exploration score: 69.9
 - Distress Tolerance score: 67.4
 - Openness to People’s Ideas score: 74.2
- Average employee Openness to People’s Ideas is higher than all other dimensions at **74.2**.
- Average employee Distress Tolerance is lower than all other dimensions at **67.4**.

Our research looks closer at curiosity in four distinct areas:

- Geographies
- Generations
- Industry Sectors
- Organization Sizes

Figure 1

OVERALL EMPLOYEE CURIOSITY SCORES

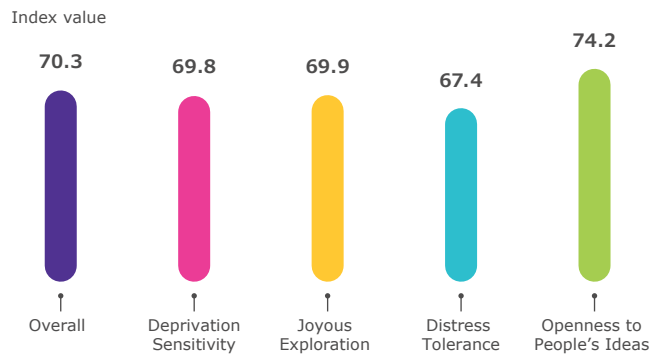


Figure 2

TOTAL THRESHOLD INDEX VALUES



*Important to note, gender differences had no significant impact on Overall Curiosity Index score.

Where are the Curious?

In looking at the landscape of curiosity we wanted to know, where do the curious reside? Do culture and environment influence how workers practice their curiosity? How does this relate to the trends of global innovation?

The Country Scores

- Survey respondents from Germany had the highest Employee Curiosity Index score at **71.9** compared to scores of 70.4 and 68.6 for respondents from the US and China, respectively (Figure 3).
- Germany has the fewest employees with low curiosity with only **27%** of the German cohort with a low Curiosity index score compared to 35% and 38% for the US and China cohorts, respectively (Figure 3).
- The dimension scores across the three markets reflect the same trend as seen in the overall Employee dimensions scores
 - **Openness to People’s ideas** is rated highest and **Distress Tolerance** is lowest in all three markets.
 - In general, dimension scores in Germany tend to be the highest, and in China the lowest.
 - An exception is **Distress Tolerance**, which is lowest in the US.

“Curiosity is the driving force for innovation. Here at our company, more than 51,000 employees worldwide work every day on developing, producing and selling advances in science and technology for a better life. We are convinced that curiosity is one of the core competencies with which we are well prepared for the challenges that are ahead of us. But curiosity does not just happen by chance. This is where HR comes in. We work with leaders in the business to promote a corporate culture in which curiosity and the drive to discover new things are supported, including the acceptance of failures. Our recruiting teams pay specific attention to the expectations of future employees in R&D or product development, e.g. what type of work environment they need – and work with the business teams to ensure this is provided. In addition, we deliver training and development solutions with a focus on innovative working techniques, risk management or biases in decision making.”

- Dietmar Eidens, Head of Group Human Resources, Merck KGaA, Darmstadt, Germany

Spotlight on Germany

Germany had the highest overall Curiosity score. In Germany we saw the fewest employees with low Curiosity scores (27% compared to 35% in US and 38% in China) (Figure 3.). All of the German employees’ dimension scores were higher than those of China and US.

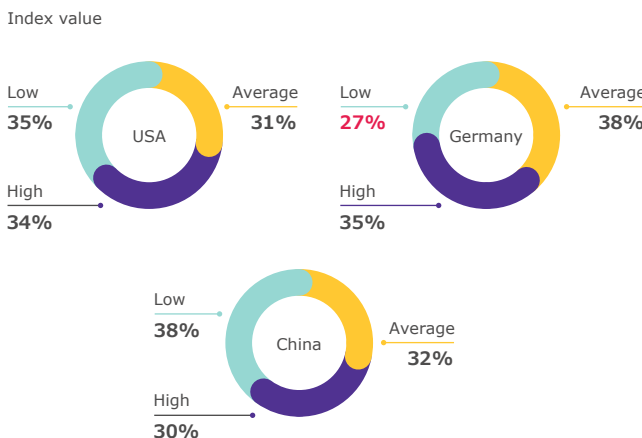
Figure 3

OVERALL EMPLOYEE CURIOSITY SCORES AND THRESHOLD VALUES BY COUNTRY



With the highest Curiosity score among the three countries surveyed, German respondents have a great desire to seek out new knowledge and information, coping well with stimuli that are uncertain, complex, and conflict-laden. This may be attributed to how many employees feel autonomous (48% said they were offered personal ownership of their projects versus 38% in the US. and 33% in China) and do not feel restricted by their environment (only 14% said they were highly supervised in their work versus 19% in the US. And 33% in China).

TOTAL SCORE THRESHOLDS



“Individuals who believe they can cope with volatile, uncertain, complex, and ambiguous environments are more likely to gain the best positions and be most competitive in the world of ideas. The ability to tolerate the anxiety of dealing with the new is a new dimension to understand which people are prepared to be both successful and fulfilled in work and in life.”

- Todd Kashdan, Ph.D., professor and senior scientist at George Mason University and author of Curious? and The Upside of Your Dark Side & Merck KGaA, Darmstadt, Germany Curiosity Council Member

Figure 4

OVERALL EMPLOYEE CURIOSITY SCORES / AND BY DIMENSION ON A SCALE OF 0-100



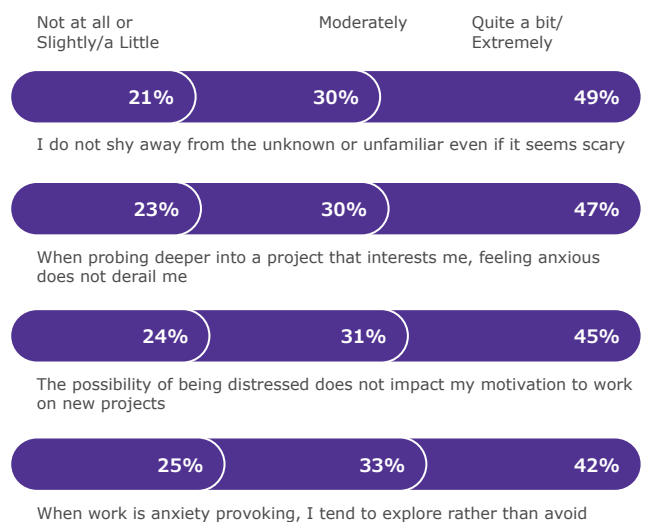
Spotlight on the US

The US did not fall far behind Germany with an overall Curiosity score of 70.4. However, US employees who were surveyed scored lowest in Distress Tolerance when compared to other Curiosity dimensions and compared to employees in Germany and China. The US employees surveyed tended to avoid anxiety-provoking work or felt their motivation was affected by distress (Figure 5).

The importance of this dimension cannot be underestimated. How we cope with the discomfort of exploring the new is crucial to expressing and acting on curiosity. Even if a US employee exhibits high levels of **Joyous Exploration, Deprivation Sensitivity, or Openness to People's Ideas**, their overall curiosity can be hindered by his or her lack of **Distress Tolerance**.

Figure 5

TOTAL DISTRESS MEASUREMENTS FOR US RESPONDENTS



Spotlight on China

China had an overall Curiosity score of 68.6%. Four in ten (42%) Chinese employees felt their organization provides them time to explore new ideas and allows them to choose their own means to accomplish assigned tasks; however only 33% of the employees surveyed felt that their organization offers them personal ownership of their projects compared to 48% of the German cohort – who enjoyed greater autonomy. The Chinese employees also scored significantly lower on the **Openness to People's Ideas** dimension, at 70.3 when compared to the US (76.1) and German (76.3) cohorts. This is not a surprise as nearly 30% of employees from China highlighted that they are rarely able to communicate with individuals outside their own project teams – reducing diversity of perspectives and the opportunity for collaborative generation of ideas.

How old are the curious?

'The youth are the future' is a universal doctrine that has shaped growth strategies across economies and businesses worldwide. As stewards of future innovations, there is an expectation that they are the embodiment of curiosity and innovation within the workplace. Bringing bold, fresh thinking that disrupts established norms and delivers against the promise of tomorrow's successes. The war for young talent rages across most business sectors.

We explored Curiosity Index scores by generation to assess the impact of age difference on curiosity levels.

The Generational Scores

- Millennials have the highest overall Employee Curiosity Index score and highest curiosity dimensions scores for **Deprivation Sensitivity**, **Joyous Exploration** and **Distress Tolerance**, when compared with Generation Z, Generation X and baby boomers.
- Generation Z had the lowest overall Employee Curiosity Index score and lowest scores for **Deprivation Sensitivity** and **Distress Tolerance** curiosity dimensions when compared with all other generations.
- Baby boomers had the lowest Joyous Exploration score and highest **Openness to People's Ideas** score when compared to other generations.

Millennials had the highest curiosity scores when compared to other generations. Surprisingly, the youngest generation, Generation Z, is falling short on curiosity. Millennials thrived in their **Deprivation Sensitivity**, meaning that they are motivated to seek knowledge to fill a gap. They also reported feeling as though they have more support for curiosity than any other generation. For example, 46% of millennials feel that they can choose their own means to accomplish a task (as opposed to 29% of Generation Z).



LESSONS LEARNED

The articulated factors that enhance and prevent curiosity vary across the three countries, providing insight into the workplace environments that encourage, enable, and reward curiosity. Undoubtedly, cross-cultural differences play a significant role in determining the culture in these workplace environments. The value systems of one's society is present in organizational life, and can shape hierarchical attitudes, behaviours and communication styles. These cultural tenants can have an impact on the different practices of curiosity in the workplace, for example, determining whether employees are given the autonomy to drive innovation or encouraged to communicate with individuals outside their teams to garner diverse perspectives.

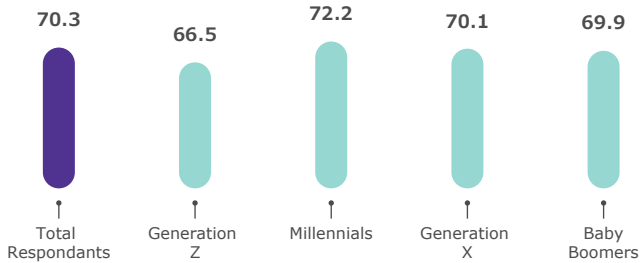
DIGITALIZATION AND INNOVATION AT THE FOREFRONT IN CHINA

Out of the three countries we surveyed, one stood out with regard to its view on the role of innovation and digitalization in the workplace: China. More employees in China compared to those in the US and Germany invested in a more innovative culture and placed a higher emphasis on digitalization. This is most likely driven by an intentional drive by their government to invest and spend in these areas. This meant that they were more likely to actively search for new ideas and innovations at all stages of product service development (52% of employees in China, verses 39% in the US and 37% in Germany). They are also more likely to work in companies that have defined goals and objectives related to digitalization (50% of employees in China, verses 39% in the US and 41% in Germany). While China may have lower scores in curiosity, they are more likely to place an emphasis on innovation and digitalization in order to transform their work. In the coming years, we will see if China's focus on developing business-critical ideas and recognizing the role of digitalization in their organization puts them at an advantage. To learn about the influence of cross-cultural differences on curiosity and innovation levels between the three markets investigated, see 'Exploring the Power of Culture' in the Appendix.

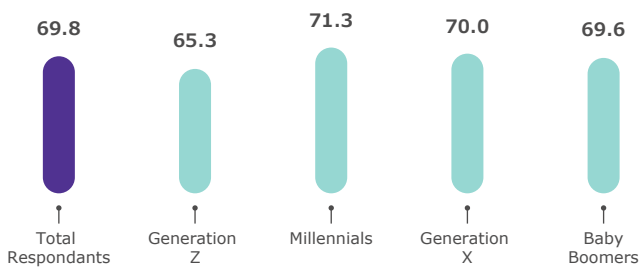
Figure 6

OVERALL EMPLOYEE CURIOSITY SCORES BY GENERATION

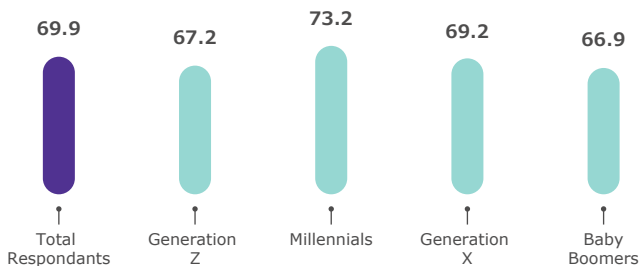
Overall



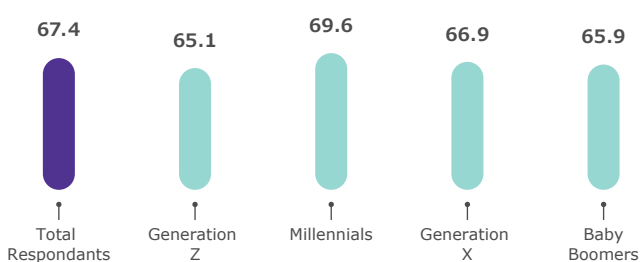
Deprivation Sensitivity



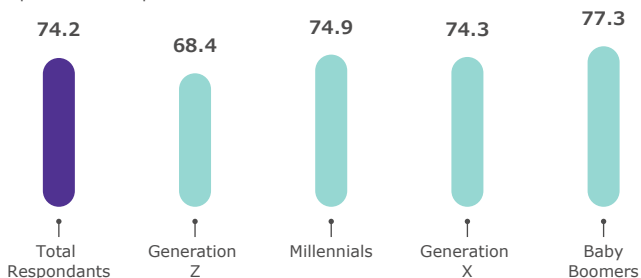
Joyous Exploration



Distress Tolerance



Openness to People's ideas



On the opposite end, why are we seeing the lowest Curiosity scores among our youngest generation? How do we foster their curiosity, such that they have greater opportunity to innovate within our organizations? Can we unlock their inner superpowers using curiosity-enhancing tools?

When asked about how their employer encourages their curiosity, fewer Generation Z employees said they felt supported. For example, only 23% felt that they were given time to explore new ideas and just 31% said they were offered personal ownership of projects. The youngest employees also showed the lowest scores in **Distress Tolerance**, which means they are less likely to explore a new idea for fear of negative consequences.

DIGITALIZATION AND INNOVATION AT THE FOREFRONT IN CHINA

When looking at how employees value the role of innovation in the workplace, millennials are consistently more positive about the importance of innovation. 61% of surveyed millennials highly agreed that investing in curiosity to drive innovation is a sound investment whereas only 43% of Generation Z believed the same.

Baby boomers were generally more negative about the role of innovation in workplace culture. Only 30% of baby boomers (verses 55% of millennials) believe that innovation is an underlying culture and not just a word in the workplace



LESSONS LEARNED

Curiosity can and should be taught to all generations, however, Generation Z are prime candidates. With the right curiosity interventions and working environments, these newcomers to the workforce can offer their fresh perspectives and be as curious as their millennial counterparts sooner. Organizations can support these employees by creating a workplace culture where risk – and even failure – is encouraged in the pursuit of new ideas and innovation.

Which industries have the most curious employees? Do certain industry sectors employ the intellectually curious, or serve as fertile breeding grounds to cultivate curiosity and innovation?

We explore how employees scored on the Curiosity Index across five industry sectors: Scientific R&D, Manufacturing, Technology, Healthcare, and Public Administration.

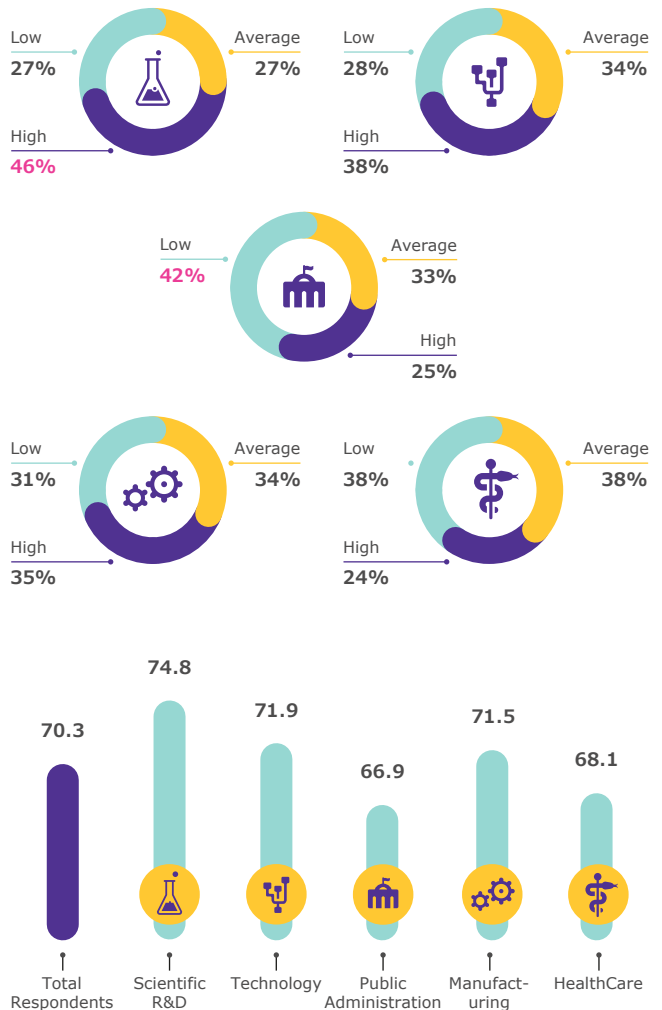
The Sector Scores

- Scientific R&D, Technology and Manufacturing employees have higher Employee Curiosity Index scores than the overall, or average, score for employees (**70.3**)
- Healthcare (68.1 Curiosity Index score) and Public Administration (66.9 Curiosity Index score) are somewhat lower than average.
- **46%** of Scientific R&D employees are highly curious, which is significantly higher than employees in all other sectors. This sector also has the lowest percentage of employees with low Curiosity (27%) when compared to other sectors.

A scientist is innately driven to discover the undiscovered. They pursue what they believe to be their mission: to try to better understand the world in which we live. It is unsurprising therefore, that this sector has the largest percentage of highly curious employees. 41% of Scientific R&D employees feel that their organization encourages curiosity by employing creative individuals. In addition, a higher percentage of employees in this sector are provided with time to explore new ideas (47%), to have personal ownership of their projects (43%), and to choose their own means to accomplish assigned tasks (48%).

Figure 7

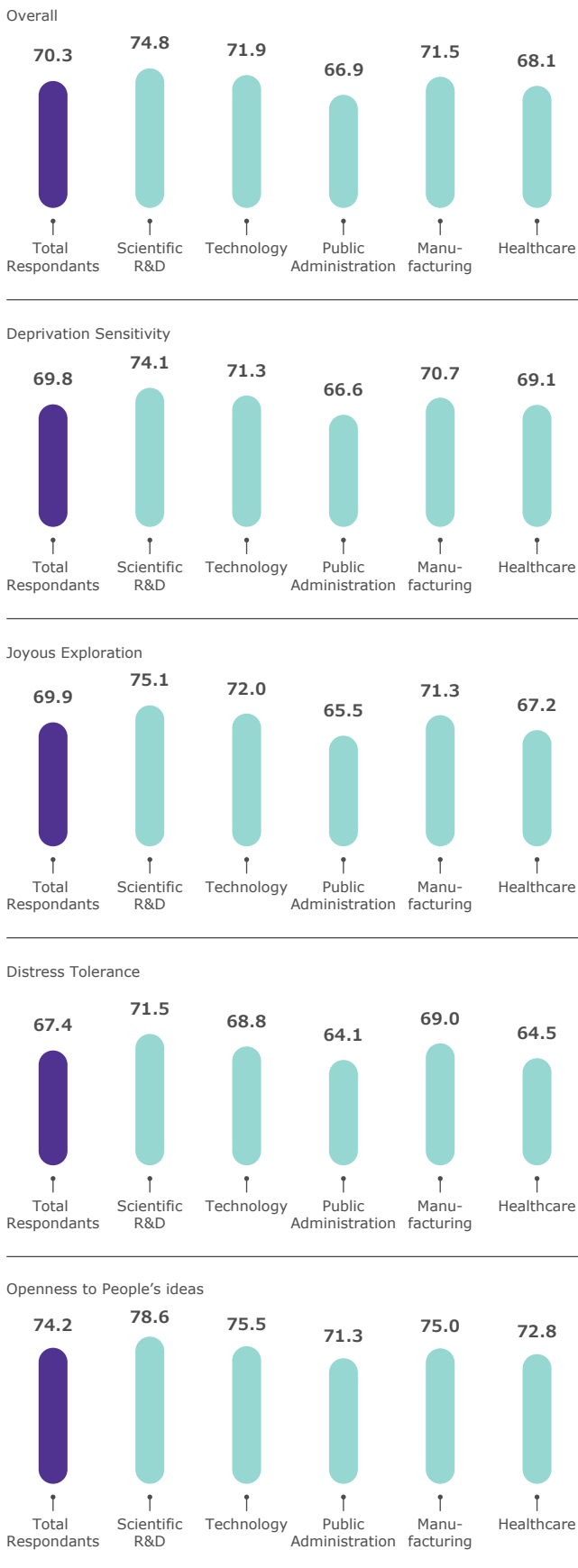
OVERALL EMPLOYEE CURIOSITY INDEX SCORES AND THRESHOLD VALUES BY INDUSTRY SECTOR



Employees working in Public Administration have the lowest overall Employee Curiosity Index score (66.9) and the highest percentage of employees with low curiosity (42%). Only 25% of Public Administration employees feel that their organization employs creative individuals – hiring more creatives would enhance their workplace curiosity. In addition, only one third of Public Administration employees believe their organization provides them with time to explore new ideas.

Figure 8

OVERALL EMPLOYEE CURIOSITY SCORES / AND BY DIMENSION ON A SCALE OF 0-100



INNOVATIVE DISCOVERY
 Employees working in Scientific R&D feel that their company is closely aligned with innovation, more so than any other industry, with 66% in high agreement that investing in curiosity to drive innovation is a sound investment and 51% believing that innovation is an underlying culture and not just a word. Again, these results are unsurprising due to the nature of Scientific R&D driven to discover the undiscovered.

LESSONS LEARNED
 Driven by a need to maintain competitiveness, all sectors, even ones that are not seen as innately curious as an R&D focused sector, need to invest in curiosity to thrive and survive. How do we change the narrative that curiosity is not exclusive to scientific R&D? With today's competitive environment, recognizing the importance of curiosity is a necessity—and an opportunity—for other sectors to begin to innovate in ways they never thought they would.

Does size matter?

There are arguments on either side regarding the relationship between organizational size and innovation. In large organizations, robust structures, investments in R&D, and quality of talent are important factors that influence an organization's readiness towards innovation (Frambbach and Schilleweart, 2002) (Lee and Xia, 2006). In small organizations, flexibility in structure, specialization, and strong ties with clients are innovation-influencing factors (Yusof et al., 2011). The Survey explores how employees scored on the Curiosity Index across organizations of different size: micro (0-9 employees), small (10-49 employees), medium (50-499 employees) and large (500+ employees).

The Organizational Size Scores

- Overall employee curiosity index score and the individual curiosity dimension indices increase proportionately as the size of the organization increases.
- Employees working in large organizations had a curiosity score of **71.6**
- Employees working in micro-size organizations had a curiosity score of **63.8**
- **37%** of employees working in large organizations are highly curious compared to just **20%** of employees working in micro-sized organizations.

“We have successfully spent the past 350 years working to make science faster due to our culture of curiosity. Our constant drive to do better for our customers has allowed us to be at the forefront of the convergence of science and technology. By leveraging technology, we are not only able to make the lives of our customers easier, but we are also able to give our customers and ourselves more time to do what makes us uniquely human: be curious.”

- James Kugler, Chief Digital Officer, Merck KGaA, Darmstadt, Germany

Figure 9

OVERALL EMPLOYEE CURIOSITY SCORES AND THRESHOLD VALUES BY ORGANIZATION SIZE

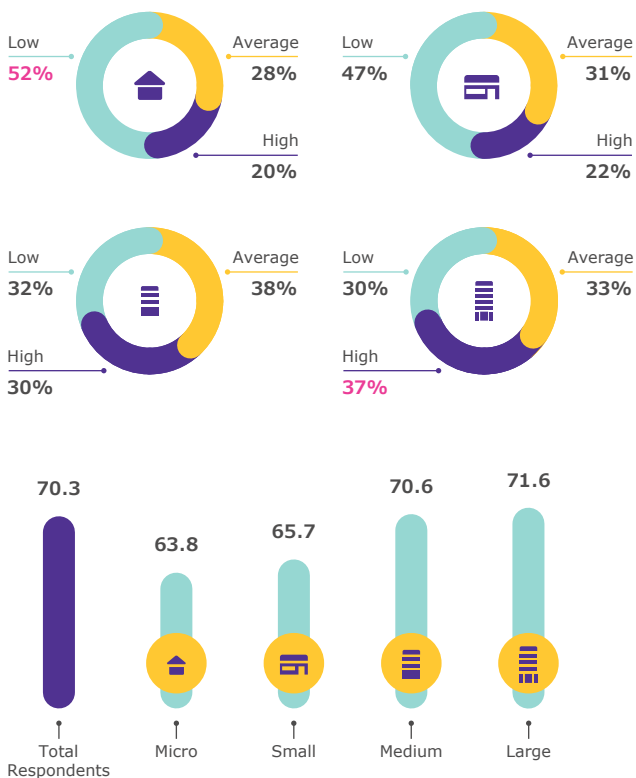


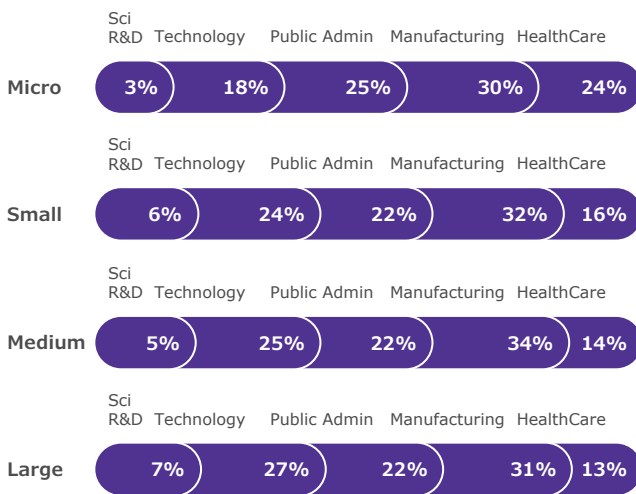
Figure 10

OVERALL EMPLOYEE CURIOSITY SCORES BY ORGANIZATION SIZE



Figure 11

INDUSTRY DISTRIBUTION BY ORGANIZATION SIZE



There is a direct, positive correlation between the number of employees in an organization and the level of support they receive for curiosity. Employees of larger organizations reported that they received higher levels of support for curiosity from their employers than employees in smaller organizations. Interestingly, the opposite is the case for barriers: the larger the organization, the more employees report that they encounter more curiosity barriers. For example, employees in the largest organizations reported receiving little time to work on curiosity, experienced less autonomy, and had fewer opportunities to communicate with others outside their team.

INNOVATION CONNECTION

The three types of employees who felt they were connected to an innovation movement in their organization and who knew how to personally contribute to innovation were:

- Employees in China
- Millennials
- Highly curious cohorts

These three types of employees also understand the role they can play towards innovation. Overall, the increase in employee curiosity correlates with how prepared they are to innovate and our findings on how employees value innovation supports this. Demographic groups who have a higher curiosity, such as millennials or employees in Scientific R&D, also tend to put a larger emphasis on the importance of innovation in the workplace and the role it plays in daily work.

DIGITALIZATION OF THE FUTURE

We are seeing a rise in the role of digitalization and technology to drive innovation in organizations. In our fast-paced

“Curiosity is a massive driver of intrapreneurship – that is, entrepreneurial behavior and actions on the inside of an established organization. Large organizations must culturally and systematically support the multiple dimensions of curiosity to help drive greater innovation and ultimately, sustainable growth for the future.”

- Dr. Simone Ahuja, innovation strategist and founder of consultancy Blood Orange, HBR.org contributor, and author of the forthcoming *Disrupt-It-Yourself: Eight Steps to Hacking a Better Business Before the Competition Does* (HarperCollins Leadership, 2019).



LESSONS LEARNED

While Curiosity increases among employees as organizational size grows, the research also shows that individuals in smaller organizations benefitted in ways different from their counterparts. While employees at smaller organizations are less likely to report receiving autonomy, personal ownership of projects or choosing their own means to accomplish tasks, they also are more likely to feel as though they can communicate with individuals outside their team or that they can act on a new idea. While these results give us a better sense of the experiences of employees, it also only fuels the debate further over the ideal organization environment for innovation.

business environments, increasingly shaped by technological advancements, digitalization is a necessary strategy for an organization to remain successful—and the employees we surveyed agreed.

Most surveyed employees highlighted that technology is essential for their organization's success.

While the majority see the role played by digitalization in their organizations, the results stand out when we look at its relationship with organizational size. There is a clear, positive correlation between the adoption of digitalization initiatives and the size of the organization—in our survey as the number of employees in an organization increased, so did the percentage of people who saw the value of digitalization. This correlation can be attributed to the idea that the larger the company, the more resources, operational structures, and adoption initiatives can be implemented to support uptake of technology.

Chapter 3

Reimagining the Future

“The future for all organizations and their employees is: change. We all will have to acquire new knowledge and adapt to new processes. In order for this not to be overwhelming, we need more curiosity. Curiosity helps to see change as positive. Curiosity is the glue that keeps companies together on their way to the future. Curiosity ensures their survival”

- Andreas Steinle, Managing Director of Zukunftsinstitut Workshop & Merck KGaA, Darmstadt, Germany Curiosity Council Member

Curiosity is more important now than ever before.

As the world of work continues to evolve, organizations seek novel technological advancements, and pursue breakthroughs that will drive expansion and innovations that offer economic benefits. Likewise, the way in which we achieve these goals will also evolve. Curiosity has been our mechanism at our organization to facilitate this change over 350 years and it has held a momentous role for us as we continue to fuel our journey as a leader in science and technology.

“Curiosity is one of the most important engines of working life. We almost never know the value a project will have when we start out, and many pivotal inventions have come about from pure curiosity without visibility on practical application. This study isolates important aspects of management-supervision, communication, credit, and team-working that allow all of us to bring our most creative and curious selves into the workplace.”

- Amy Whitaker, Author, Art Thinking and Assistant professor, New York University Steinhardt

The future is uncertain

At our company, we have long recognized the power that curiosity can have to establish an environment that cultivates innovation and our success can largely be attributed to the culture we have cultivated. With the emergence of disruptive technologies – artificial intelligence, big data - the future is ambiguous, but curiosity will ensure organizations can thrive amidst change. Again, how does this change our current approach to achieving success? What does this mean for the future of work?

There will be a shift in approaches to workplace learning, training and professional development

An organization's most valuable asset are its people. Within environments where continuous learning is a key component of progress, such as the workplace, curiosity holds increasing value. Curious workers learn faster, retain information better, seek out missing information and innovate more. Most importantly, studies have demonstrated that curiosity can indeed be fostered and developed. Our results have shown that

curiosity is highest among our millennials and lowest among Generation Z. If we truly are aware that ‘the youth are the future’, then organizations must recognize and take effective measures to evoke innovation in the youngest cohort.

“Megatrends such as Big Data, autonomous driving and artificial intelligence mean that the demand for increasingly small and powerful computer chips will continue to grow in the future. And all this also increases the need for innovative electronic materials. Our business sector Performance Materials is one of the leaders in this vast market for electronic materials and we will stay very curious to pursue future innovations in this area. Without our specialty chemicals, semiconductor technology could not have made such impressive progress over the past decades. In the future, our Semiconductor Solutions will continue to enable chip manufacturers to develop microchips with ever smaller structures, larger memory banks, higher processing speeds, and lower power consumption.”

- Kai Beckmann, CEO Performance Materials, Merck KGaA, Darmstadt, Germany

People generate ideas and resources brings them to fruition. Curiosity has been shown to be indicative of workplace progression. The integration of curiosity will see a shift in the way we attract the curious, the way we retain the curious, and the way we find the curious. As the results have demonstrated, it is no longer enough to hire the best, but to also retain the best, as the most curious amongst us seek stimulation within their working environments.

Development of innovation-friendly industries

As workplace curiosity cultivates momentum and organizations begin to recognize its potential, the dissemination of a curious culture at the organization level also increases. As organizations seek novel ways to address global challenges, curiosity and its packaging will continue to disseminate across industries, as a tool to accelerate an innovation-friendly environment.

“Curiosity is one of the keys relevant to unlock the innovative potential of corporations. We see that the overall score is a bit lower in the last generation than it has been in the generations before. I believe that corporations will have to invest more into personal development programs, into processes that are fostering human-centered approaches to solve global challenges and to accomplish global aspirations. I personally believe that Merck KGaA, Darmstadt, Germany, with its Innovation Center, has created an artifact that points in the right direction. However, an artifact without philosophy is not enough. The organization will also need to embrace the principles and processes in the right fields of application to stay successful in the future.”

- Oliver Kempkens, Managing Director, Adapt or Die Ventures Ltd

Curiosity is the future

The future is uncertain. Both global and organizational challenges are more apparent than ever. If our research has illustrated anything, it is that demographic characteristics determine curiosity and that there are visible gaps in workplace curiosity—but that is not where curiosity ends.

Curiosity is malleable; it can be taught and cultivated. This research has provided a better sense of what different demographic cohorts value, and how organizations can grow their curiosity to unlock their potential for innovation. With the right working environment, no employee should be left behind. If actively encouraged and nurtured throughout an organization, curiosity can accelerate idea generation and enable us to address global challenges and change with efficiency and precision. Curiosity will and should have an increasingly important role at all levels, and it is never too late to take a closer look at the curiosity around you and ask, what are we missing?

Always Curious

Addressing global challenges is a key focus for the future. Curiosity is a mechanism to fuel the development of innovative solutions. This has significant implications for the world of work, where addressing global challenges will remain a priority across industries and sectors.

Examples of key global challenges include addressing the rising burden of non-communicable diseases such as cancers, tackling pressing matters such as climate change, reducing the rate of infertility, increasing access to clean water, and finding a sustainable solution for world hunger. Now the question stands, does curiosity have the capacity to fuel the generation of solutions for these challenges?

We explored the future of work, by asking employees the extent to which they feel curiosity had a role to play in addressing global challenges. Overall, the results agree that curiosity plays a fundamental role in tackling that which lies ahead.

As can be seen in figure 12 approximately 70% of the highly curious agree that curiosity plays a large role across these global challenges, whilst between 28–41% of those low in curiosity agree with this notion.

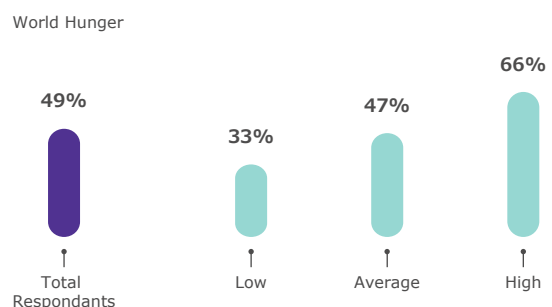
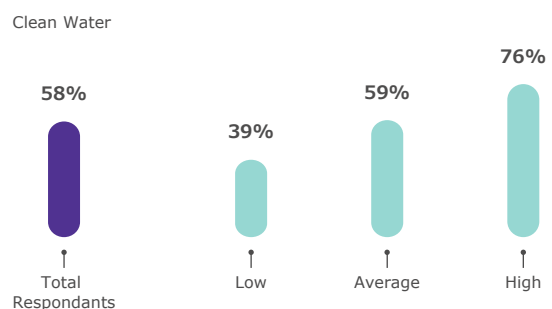
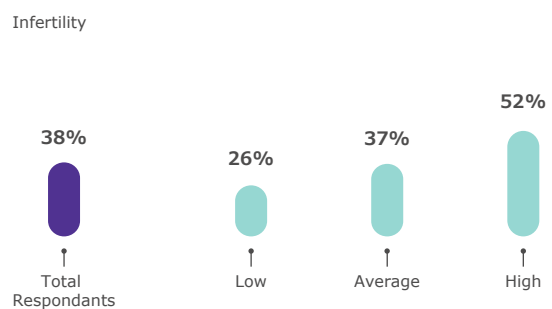
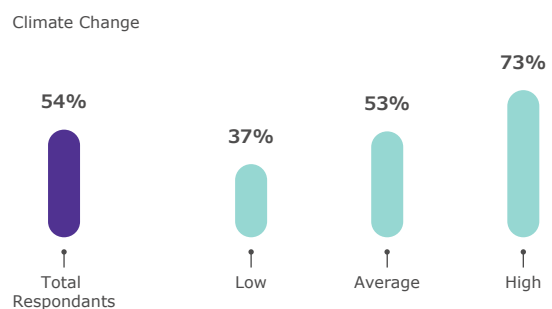
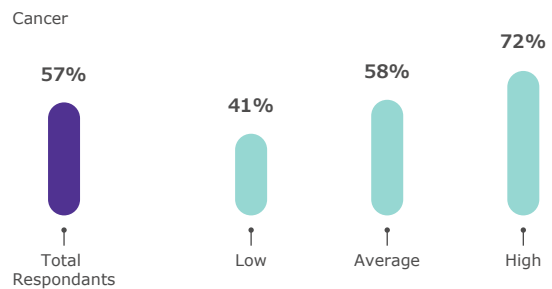
“At Healthcare we thrive on curiosity! Scientific breakthroughs that treat or cure disease are driven by three key qualities:

- A willingness to take intelligent risk unhampered by fear of failure
- An open-minded attitude towards non-consensus ideas that buck the trend
- The humility to be comfortable with the idea that you don't already have all the answers”

- Belén Garijo, CEO of Healthcare Business Sector, Merck KGaA, Darmstadt, Germany

Figure 12

CAN CURIOSITY ADDRESS THESE GLOBAL ISSUES?



Bibliography

1. Frambach, R.T., Schillewaert, N., 2002. Organizational innovation adoption: a multi-level framework of determinants and opportunities for future research. *Journal of Business Research* 55, 163–176. [https://doi.org/10.1016/S0148-2963\(00\)00152-1](https://doi.org/10.1016/S0148-2963(00)00152-1)
2. Hassan, M.M., Bashir, S., Mussel, P., 2015. Personality, learning, and the mediating role of epistemic curiosity: A case of continuing education in medical physicians. *Learning and Individual Differences* 42, 83–89. <https://doi.org/10.1016/j.lindif.2015.07.018>
3. Hofstede, G., 2001. *Culture's consequences: comparing values, behaviors, institutions, and organizations across nations*. 2 ed. thousand oaks, calif. : sage publications.
4. Kong-Seng and Lai and Nor'Aini Yusof, 2011. Organizational Culture and Innovation Adoption/Generation: A Proposed Model. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering* 5, 1231–1237.
5. Lee, G., Xia, W., 2006. Organizational size and IT innovation adoption: A meta-analysis. *Information & Management* 43, 975–985. <https://doi.org/10.1016/j.im.2006.09.003>
6. Northouse, P., 2007. *Leadership: Theory and Practice*, 4th ed. Sage Publications, Thousand Oaks, CA.
7. Peters, R.A., 1978. Effects of anxiety, curiosity, and perceived instructor threat on student verbal behavior in the college classroom. *Journal of Educational Psychology* 70, 388–395. <https://doi.org/10.1037/0022-0663.70.3.388>
8. Reio, T.G., Wiswell, A., 2000. Field investigation of the relationship among adult curiosity, workplace learning, and job performance. *Human Resource Development Quarterly* 11, 5–30. [https://doi.org/10.1002/15321096\(200021\)11:1<5::AID-HRDQ2>3.0.CO;2-A](https://doi.org/10.1002/15321096(200021)11:1<5::AID-HRDQ2>3.0.CO;2-A)

Appendix

From our 2016 Curiosity Model to our 2018 Multi-dimensional Work-Related Curiosity Scale

In collaboration with Todd Kashdan, Ph.D., professor and senior scientist at George Mason University and author of *Curious?* and *The Upside of Your Dark Side*, we broke down curiosity into four definitive dimensions: Inquisitiveness; Creativity in problem solving; Openness to other ideas; and Distress Tolerance. This framework became the foundation of our unique approach to measuring curiosity.

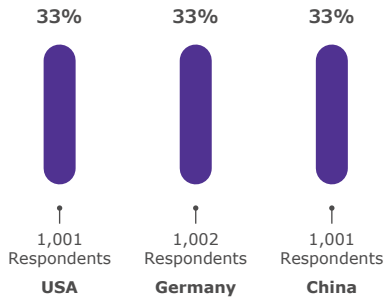
In 2018, there was an opportunity to evolve our Curiosity Model in line with developments in the curiosity research. Therefore, we assessed the robustness of our model to see what, if anything, has changed. Again, we worked closely with our experts, Todd Kashdan, Ph.D., Carl Naughton Ph.D., Linguistics and Educational Science, Executive Lecturer at European Business School Wiesbaden, co-founder of Braincheck GmbH, and Sophie von Stumm, Ph.D., Director Hungry Mind Lab, Department of Education, University of York, to understand curiosity across markets. The findings left us more curious than ever.

When looking at the evidence we found that our dimensions had evolved. The dimensions Openness to Other Ideas and Distress Tolerance were still central features of curiosity. However, we found that Creativity in Problem Solving no longer sat within curiosity but worked in parallel with it. Inquisitiveness remained a key trait of a curious worker, however, exploring deeper, we found that inquisitiveness was motivated by two very different factors—either joy or anxiety. When we analysed it further, we found that employees either pursue knowledge for the pure joy of learning—what we may think of as the prototype of curiosity—or to address the anxiety associated with not knowing, essentially to fill a missing gap in their understanding.

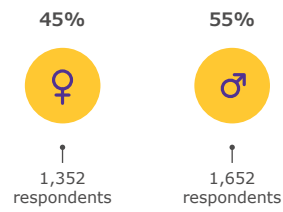
Survey Respondent Profile

A total of 3,004 respondents completed the survey. Demographic breakdown of total respondents can be found below. Limitations of this research include the number of country markets surveyed, and that the Curiosity Index has only been validated in the US and Germany.

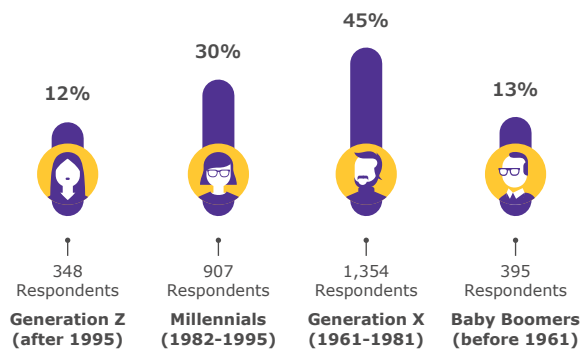
Geographies



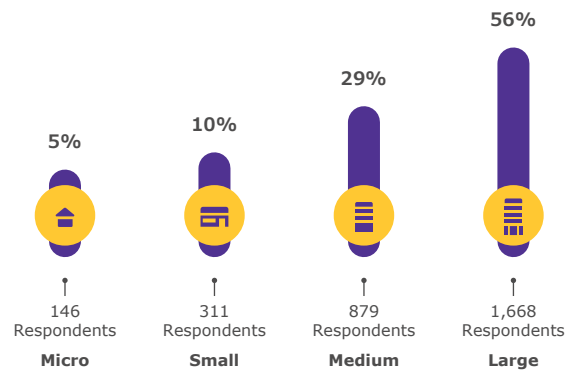
Gender



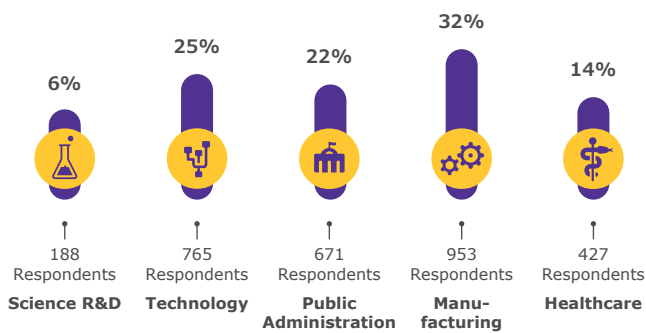
Generation



Size of Organisation



Industry Sectors



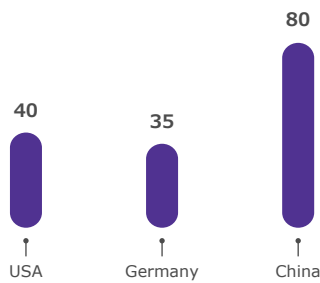
Exploring the Power of Culture

Culture is defined as the learned set of beliefs, values, rules, norms, symbols, and traditions that are common to a group of people (Northouse P, 2007). In the early 1980s, the world-renowned Professor Geert Hofstede, conducted one of the most comprehensive cross-national studies of how values in the workplace are influenced by culture (Hofstede G, 2001). He determined patterns of similarities and differences across 53 countries, enabling him to develop the five measurable dimensions of culture (he has recently added a 6th dimension to his model).

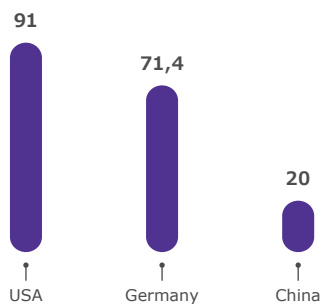
Figure 13

CROSS-NATIONAL COMPARISONS OF CULTURE

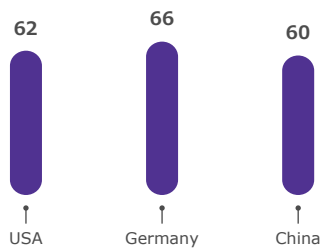
Power distance



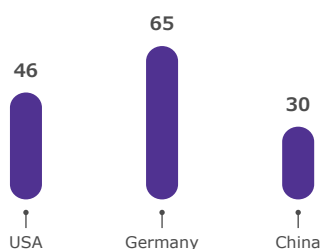
Individualism



Masculinity



Uncertainty Avoidance



Power Distance

is defined as the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally.

Individualism

is the degree of interdependence a society maintains among its members.

Masculinity

refers to the distribution of roles between the genders which is another fundamental issue for any society to which a range of solutions are found.

Uncertainty Avoidance

deals with a society's tolerance for uncertainty and ambiguity; it ultimately refers to a man's search for Truth.

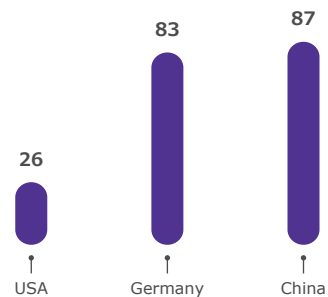
Long-Term Orientation

describes how every society has to maintain some links with its own past while dealing with the challenges of the present and future.

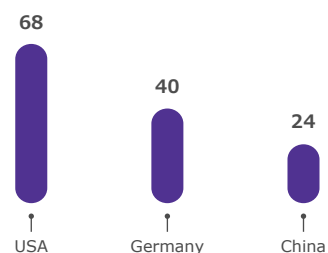
Indulgence

is defined as the extent to which people try to control their desires and impulses, based on the way they were raised.

Long-term Orientation



Indulgence



Using Professor Hofstede's model, we can identify cultural differences across our three countries that may influence the practice of curiosity in the workplace.

Power Distance (PD): At 80 China sits in the higher rankings of PD – indicating that individuals are highly influenced by formal authority and sanctions; and are in general optimistic about people's capacity for leadership. In contrast, a direct and participative communication and meeting style is common amongst the German population, control is disliked, and leadership is challenged to show expertise and best accepted when it's based on it. For the US, the fairly low score on Power Distance (40) in combination with one of the most Individualist (91) cultures in the world reflects explicit emphasis on equal rights in all aspects of American society and government. Within American organizations, hierarchy is established for convenience, superiors are accessible, and managers rely on individual employees and teams for their expertise. Both managers and employees expect to be consulted and information is shared frequently. At the same time, communication is informal, direct and participative to a degree.

Individualism: At a score of 20 China is a highly collectivist culture where people act in the interests of the group and not necessarily of themselves. Whereas relationships with colleagues are cooperative for in-groups, they are cold or even hostile to out-groups. Undoubtedly, this cultural dimension will impact how project teams collaborate within organizations. In contrast, The German society is a truly Individualist one (67). Communication is among the most direct in the world following the ideal to be "honest, even if it hurts" – and by this giving the counterpart a fair chance to learn from mistakes.

Uncertainty Avoidance: This dimension looks at way that a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? The extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these is reflected in the score on Uncertainty Avoidance. The US scores below average, with a low score of 46, on the Uncertainty Avoidance dimension. There is a fair degree of acceptance for new ideas, innovative products and a willingness to try something new or different, whether it pertains to technology, business practices or food. Americans generally tend to be more tolerant of ideas or opinions from anyone and allow the freedom of expression. Germany is among the uncertainty avoidant countries (65) so there is a slight preference for Uncertainty Avoidance. There is a strong preference for deductive rather than inductive approaches, be it in thinking, presenting or planning. This high uncertainty avoidance score may provide some insight into why German respondents had the highest Curiosity index score. To avoid uncertainty, one will recognize a knowledge gap and ponder the possibilities – which is in line with high **Deprivation Sensitivity** score from the German employee cohort. In contrast, survey respondents from China had low **Deprivation Sensitivity** scores – perhaps, aligned to the low Uncertainty Avoidance score (30). The Chinese are comfortable with ambiguity.

Methodology

Our 2018 State of Curiosity Report builds on research we first initiated in the United States in 2015 and later developed into the first State of Curiosity Report in 2016.

The initial work involved an online survey that engaged 2,606 employees in the United States who shared opinions about the role of curiosity in the places where they worked. The study was then expanded in 2016 to include two additional online surveys, engaging 1,002 workers in China and 1,000 in Germany. Data from these two later studies were analyzed and published in the 2016 State of Curiosity Report.

For the 2018 State of Curiosity Report, we developed a new survey with unique curiosity questions in collaboration with the Curiosity Council Members. The survey questions were then reviewed and validated by curiosity and business experts in the three markets, Germany, China, and the United States and then cross-validated in Germany and the United States. Once validated, the new survey was launched in the three markets in 2018. The new survey engaged 3,004 employees total with 1,001 in China, 1,001 in the United States and 1,002 in Germany. These employees were asked to answer questions on the role of curiosity in their workplaces, enhancers and barriers to curiosity, digitalization, and innovation. The employee's discrete answers were collected and analyzed for this report. The means were tested for indices (t-test) and the proportions were tested for percent distributions (z-test).

For additional insight on the research, we reached out to a number of academic and business leaders in multiple countries, including China, Germany and the United States, asking them to share their insights into the results and the role of curiosity and innovation in the field. Many of their ideas were incorporated into this report.

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