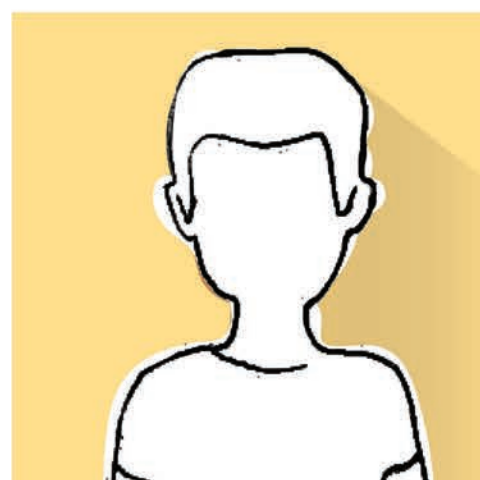
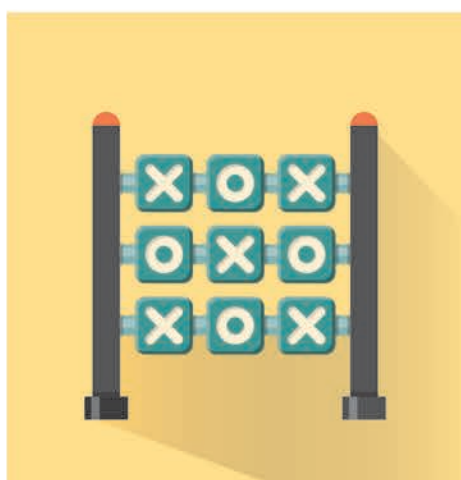


**NOT JUST CHILD'S PLAY:
HOW PLAYFUL ENVIRONMENTS
CONTRIBUTE TO INNOVATION**

**PERKINS —
EASTMAN**



How can we create environments that promote innovation? This question holds relevance across a range of industries, from business, science and technology to education, government and beyond. There is no one-size-fits-all solution for producing innovation, but understanding what innovation is and how it happens can help to inform the process of designing spaces that support it.

Innovation is a complex phenomenon that relies on a multitude of factors coming together in just the right way. But evidence suggests that play—engaging ourselves in an activity for the pure enjoyment of the process—is an important piece of the puzzle. A number of experts on the science of creativity and innovation, cited in this paper, believe that it is uniquely within a state of play that our minds are most receptive to discovery. Freedom from external pressures enables us to experiment and take risks, ultimately forming new connections between ideas. Play is also an effective social connector, helping to build trust and open up the channels of communication.

Some of the world's most innovative companies have benefited from infusing play into their work. The workspaces at Google, for example, look more like playgrounds than traditional offices. What can we learn from successful companies who are using play to produce innovation? How can we bring play into the context of other disciplines, and what will be the result? Informed by research on the science of play, principles of environmental psychology, and pertinent case studies, this paper seeks to identify strategies for creating environments that support innovation through play.

TABLE OF CONTENTS

Introduction	5
Innovation	9
Play	13
Playful Environments and Innovation	19
Design Solutions	25



INTRODUCTION

“When you play, play hard; when you work, don’t play at all.” The timeworn advice of Theodore Roosevelt reflects a view of play that is still held by many: there’s a time and place for it, and that place is not at work. Play is a distraction, a frivolity, a “reward” for good behavior—so it stands to reason that serious work should be guarded against it. Right? No offense to President Roosevelt, but we respectfully disagree. There is evidence that infusing work with play can provide important benefits well beyond simple fun, and that the right kind of play has an essential role in producing innovation.

In various ways, play is something that we have all been doing since infancy. Engaging in an activity for the pure enjoyment of the process elicits a feeling like no other; in play, we are blissfully free from the demands of work and life, motivated by our own curiosity, pleasure, and amusement. Whatever comes to mind when you hear the word “play,” one point we can all agree on is that play is *fun*. But how does play contribute to innovation? A number of experts believe that it is uniquely within a state of play that our minds are most receptive to unconventional thinking and the discovery of new combinations. When we aren’t afraid to make mistakes, we can escape fully into the creative process without having to think about where it will take us.

The sense of being removed from external pressures leaves us open to different perspectives and experiences. Equally important, play is an effective social connector, helping to form trusting relationships or to open up lines of communication.

A number of creative companies have capitalized on the link between play and innovation. Particularly in Silicon Valley, where the ability to innovate is nothing less than a matter of survival, it is common to find workspaces that look more like playgrounds and preschool classrooms than traditional offices. Industry leaders like Google have taken play to the extreme, equipping their offices with features like indoor putting greens, pool tables, tube slides, and themed conference rooms. The message to employees is clear: here, it’s not only okay to play—it is fundamental to the way of doing things. Companies like these have taken efforts to arrange every aspect of the employee experience to support innovation, and play is an essential piece of that puzzle.

As a paradigm of the play-innovation connection, Google’s monumental success speaks for itself—the company’s innovative products and services have shaped our world in countless ways. So, what can we learn from their example? Outside of technology, creative, and entrepreneurial industries, many companies still regard play as an

Left: Academic Center

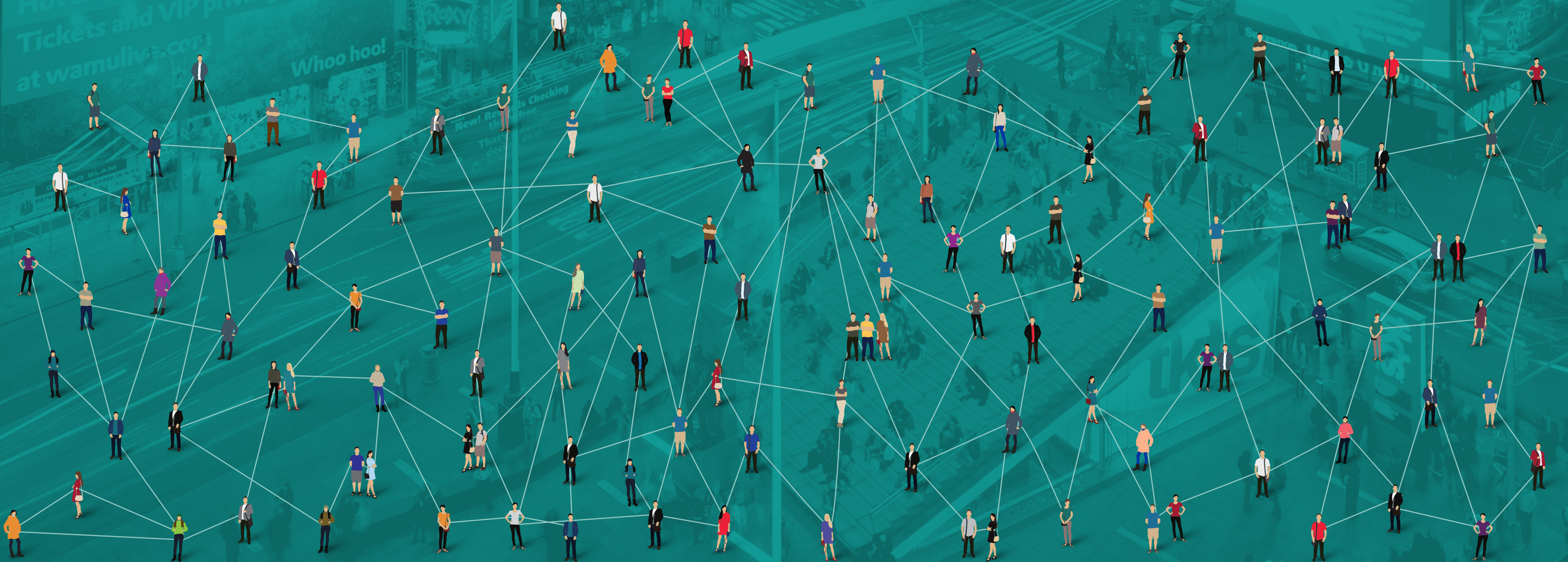
“IN PLAY, WE ARE BLISSFULLY FREE
from the demands of work and life,
motivated by our own curiosity,
pleasure and amusement.”

activity that takes time away from serious work. In spite of wanting to be more innovative, they adhere to a traditional separation between work and play. How can we bring play into the context of other disciplines, and what will be the result? As architects, understanding the connection between play and the creative process can inform how best to design environments that support and enhance innovation.

Right: Playground |



“MANY EXPERTS SEEM TO AGREE
that innovation equals connection;
connections between people, and
connections between ideas.”





PLAY

Play is something we do outside the routine of normal activity. It offers a temporary escape from the obligations of daily life, a chance to set aside the rules and just have fun. As infants, toddlers, and then children, we learn to navigate the physical and social world through play. With every interaction we test the limits of our surroundings, throwing ourselves into games of trial and error as we try to figure out how things work. Play is an intuitive way of

learning; it is absorbing, pleasurable, and unique to each person. Similar to the concept of “flow”—a term coined in the 1970s by the Hungarian psychologist Mihaly Csikszentmihalyi to describe an “optimal experience” in which an individual is fully and happily absorbed in a given task—play provides just the right balance of challenge and reward to keep us wanting more (Brown, 2009).



Left: Incubator Workspace

Few would dispute that play is an essential part of childhood. In fact, play is so important that it is recognized by the United Nations as a fundamental right for every child (Ginsburg, 2007). Countless studies have shown the positive impact of play on children in terms of social, emotional, and cognitive development. In their paper, “Why Play=Learning,” child development experts Kathy Hirsh-Pasek and Roberta Michnick-Golinkoff report that various types of play have been linked to parts of the brain responsible for behavioral and cognitive control, as well as “executive function” skills like attention, problem solving, and inhibition (Hirsh-Pasek & Michnick-Golinkoff, 2008). Other qualities that have been linked to childhood play include resilience, empathy, and creativity. These traits are particularly important in developing the ability to adapt and solve problems, which could help to explain why children who play more are likely to perform better academically (Bergen, 2009).

But the benefits of play extend well beyond childhood. Stuart Brown, M.D., founder of the National Institute for Play, has built his career around the idea that play is an essential part of the human experience—not only in the early years of growth and development, but throughout adulthood. In his book *Play: How it Shapes the Brain, Opens the Imagination, and Invigorates the Soul*, Brown writes that “Humans are

built to play and built through play,” and “the ability to play is critical not only to being happy, but also to sustaining social relationships and being a creative, innovative person” (Brown, 2009).

The case for lifelong play is strongly supported by recent developments in neuroscience and behavioral psychology. Until the latter part of the twentieth century, it was widely believed that the human brain stopped growing after adolescence. But brain imaging technologies have allowed scientists to study the process of neurogenesis (the growth and development of neurons), and it is now understood that the human brain has the capacity to grow and change well into adulthood. What’s more, certain activities—such as play—have been shown to have a positive impact on brain development and growth. According to Brown, engaging in play is one of the most powerful ways to promote neural connectivity and optimize brain health in both children and adults. Among other studies, Brown cites the work of neuroscientist and psychobiologist Jaak Panskepp, who found that “active play selectively stimulates brain-derived neurotrophic factor (which stimulates nerve growth) in the amygdala (where emotions get processed) and the dorsolateral prefrontal cortex (where executive decisions are processed)” (Brown, 2009).

While the evidence of its positive impact on brain development builds a strong case for play, its role in producing innovation is perhaps even more compelling. Part of its effectiveness could lie in what is notably missing in a state of play: fear of failure. In play, we are free from external pressures like time, money, and the pursuit of an end goal. We don’t feel threatened, so our physiological response to perceived dangers—also known as the fight-or-flight response—is switched off. Without the burden of external threats, we feel clear-headed and more open to experimenting

“AS INFANTS, TODDLERS, AND THEN children, we learn to navigate the physical and social world through play. With every interaction we test the limits of our surroundings, throwing ourselves into games of trial and error as we try to figure out how things work.”

with new combinations. As Brown puts it, play presents a scenario in which “testing [can be] done safely, when survival is not at stake” (Brown, 2009).

Particularly in business, where the greatest value is often placed on a successful (i.e., profitable) end product, our natural tendency is to work more and harder. Taking time out to play might seem especially counterintuitive when the stakes are high—a potential waste of time and other valuable resources. But evidence points in the opposite direction. In fact, some experts believe that focusing all of one’s mental energy on a given problem could be the surest way to shut down creative channels. Mihaly Csikszentmihalyi advocates this position in his acclaimed book, *Creativity: Flow and the Psychology of Discovery and Invention*, citing numerous examples of innovations in art and science that came about as a result of specifically *not* focusing on work. When thoughts and ideas are allowed to exist in the periphery of our attention, Csikszentmihalyi writes, “there is no need to direct them, to criticize them prematurely, to make them do hard work” ... “and it is just this freedom and playfulness that makes it possible for leisurely thinking to come up with original formulations and solutions” (Csikszentmihalyi, 1997).

Victoria Stevens builds on this argument, noting that “at a particular point, forcing attention and not truncating the space and time for mental play actually inhibits insight and creativity” (Stevens, 2014).



This isn't to say that hard work doesn't have its place; on the contrary, it is vitally important to build up a critical mass of knowledge and skills before innovation can happen. But continuing to exert effort beyond a certain point will result in less value and less productivity; it is only in releasing the problem and allowing our minds to play that true innovation will occur. Ransom Stephens, in his book *The Left Brain Speaks, The Right Brain Laughs: A Look at the Neuroscience of Innovation & Creativity in Art, Science & Life*, aptly calls this phenomenon “defocusing into insight” (Stephens, 2016).

The popular belief that play equals idleness is flatly contradicted by science. In fact, it has been found that the brain is significantly *more* active while at play than when it is engaged in the focused study of a specific problem (Stevens, 2014). As Stuart Brown puts it, it is “paradoxical that a little bit of “non-productive” activity can make one enormously more productive and invigorated in other aspects of life” (Brown, 2009). That said, the right *kind* of play is important when innovation is the desired result.

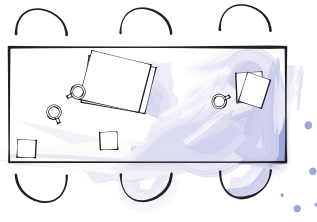
Workspace kit-of-parts: spaces where play can be introduce



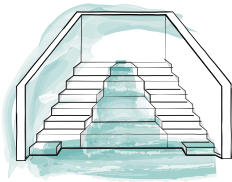
IDEATION



PERSONALIZED WORKSPACE



COLLABORATION



TOWN HALL

Bruce Nussbaum, author and Professor of Innovation and Design at Parsons The New School of Design, cautions that “simple silly play on its own doesn't lead to innovation” (Nussbaum, 2013). In his book *Creative Intelligence: Harnessing the Power to Create, Connect, and Inspire*, Nussbaum introduces the concept of “serious play.” According to Nussbaum, this kind of play is most effective in producing innovative results. Not quite a free-for-all, serious play is guided by basic parameters and an established end goal. Most importantly, it requires the right mix of people, hand-selected for their unique perspectives, knowledge, and skill sets. Nussbaum writes, “The kind of play I'm talking about isn't picking the right color for your offices or shouting out hundreds of ideas about things you don't know very much about. In serious play there are rules, there is competition, there are winners and losers. Above all, there is learning, the kind of learning that allows you to navigate unknown areas, make unusual connections, and achieve new goals in unforeseen ways” (Nussbaum, 2013).

Right: Classroom



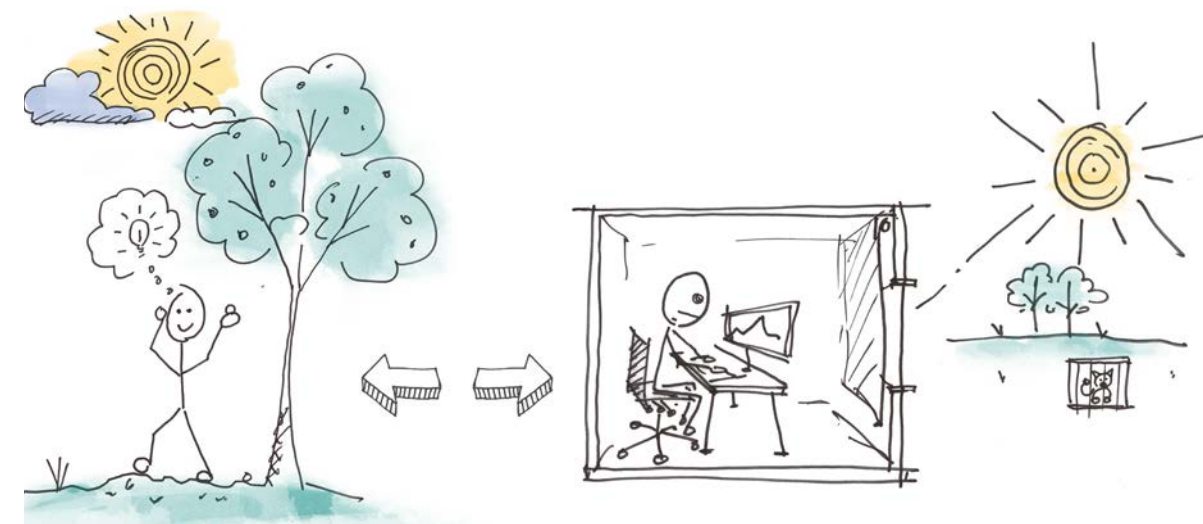


PLAYFUL ENVIRONMENTS AND INNOVATION

For better or worse, the physical environment has a profound influence on our thoughts, behavior, and health. Numerous studies have shown that an individual's surroundings can induce stress or relaxation, encourage or inhibit social connectivity, and increase or suppress motivation. Scientists have even found that the environment can physically shape our brains, measurably affecting the growth (or shrinkage) of the cerebral cortex (Brown, 2009). In his book about play, Stuart Brown cites a landmark study conducted by neuroanatomist Marian Diamond in the 1960s that was the first to establish a “strong positive connection” between the environment and brain growth. Diamond’s initial work studied three dozen rats under various environmental conditions over a period of 30 days. One group of rats was placed in an “enriched” environment, a roomy cage with a

changing selection of toys. The second group was placed in a “standard” environment, in which three rats shared a small cage with no toys. The remaining rats were placed in an “impoverished” environment, condemned to isolation in a toy-less cage. An analysis of the rats’ brains at the conclusion of the study found that the animals in the “enriched” environment had experienced measurable brain growth. As Brown notes, the rats’ brains were “larger and more complex, with a thicker and more developed cortex—the ‘gray matter’ where the brain’s real data processing takes place.” Conversely, the rats subjected to an impoverished environment suffered a measurable decrease in the thickness of the cortex; in other words, their brains actually shrunk (Brown, 2009).

Environment + human behavior: physical environment’s effect on human behavior & creativity



Left: Playground



In addition to boosting (or stunting) brain growth, there is evidence that our surroundings have the ability to influence innovation in a more direct way. Csikszentmihalyi discusses the relationship between our physical surroundings and creativity, noting that certain environments have the ability to stimulate the flow of new ideas and encourage playful experimentation (Csikszentmihalyi, 1997).

The idea that the built environment can increase creative output has brought architecture to the forefront for a number of companies wishing to gain an edge in innovation. IDEO, one of the most innovative design and consulting firms in the world, offers a prime example of playful environments in action. In the past three decades, IDEO has produced a vast number of innovative products spanning a range of applications, from clean-squeeze toothpaste caps to bioengineered skin tissue used for treating burn victims. Tom Kelley, a longtime partner of IDEO, credits a culture of playfulness and collaboration

for a large part of the company’s success. Play is so integral to the way of doing things at IDEO that nearly every aspect of the office environment is designed to support it. Kelley describes IDEO’s offices as “greenhouses” for growing and cultivating innovation. Space is viewed as a strategic asset—a tool to inspire playfulness, collaboration, and creativity (Kelley, 2007).

How do they do it? Each of IDEO’s offices is crafted with the goal of creating work environments that don’t feel like typical office spaces. You won’t find dreary cubicles, hierarchical private office structures, desk-bound workers or rigid dress codes at IDEO. Instead, wide-open floor plans provide a flexible backdrop for communal tables and various types of meeting areas. Displays of Post-it-covered walls, outlandish prototyping experiments, and bicycles suspended from the ceiling send the collective message to employees that here, anything goes. In the words of Duane Bray, a partner and Head of Global Talent

at IDEO, employees are given “permission to play” (Bray, 2015). In an environment where failure is embraced as an essential part of the creative process, IDEO’s designers feel free to knock around ideas, take risks, and try new things.

“THE IDEA THAT THE BUILT environment can increase creative output has brought architecture to the forefront for a number of companies wishing to gain an edge in innovation.”

Google’s offices are often likened to children’s playgrounds, and it’s not hard to see why. The company’s Mountain View, CA, headquarters is a virtual amusement park for the 11,000+ employees that occupy the campus, with activities ranging from sand volleyball and bike-riding to vegetable gardening and “nap pods.” The playful setting is enhanced by whimsical features like life-size cartoon-figure statues, themed cafes, and eclectic lounge areas. Google’s Manhattan office projects an equally lighthearted vibe, with offbeat play spaces and unconventional meeting rooms (one is designed to look like a mid-century New York City apartment, complete with family photos on the wall and claw-foot bathtubs fashioned into sofas). Employees ride through the office on razor scooters and use ladders to climb from one floor to another (Stewart, 2013). But Google’s quirky amenities are more than just perks to attract and retain the brightest workers—they are measured strategies to inspire a culture of playfulness and innovation (Stewart, 2013).

Offices like those of IDEO and Google aren’t the only places where inspiration for play can be found. Looking at the original constructed play environments—children’s playgrounds—can offer valuable insight into the fundamentals of spaces designed for play. The Project for Public Spaces, a nonprofit planning organization comprising architects, designers, urban planners, environmental psychologists and other professionals committed to the improvement of public places, outlines the features of a successful play environment in “Elements of a Successful Playspace: Enhancing Physical, Cognitive and Social Experience.” While the article’s guidelines are geared towards play spaces for children, many of the points could be applied to the design of corporate play environments as well. The article considers three overarching concepts in the design of play spaces: physical, social, and cognitive.

“A PLAYGROUND DOESN’T NEED TO have the most expensive equipment to be loved by children. In fact, the simplest solutions are often the most successful ones.”

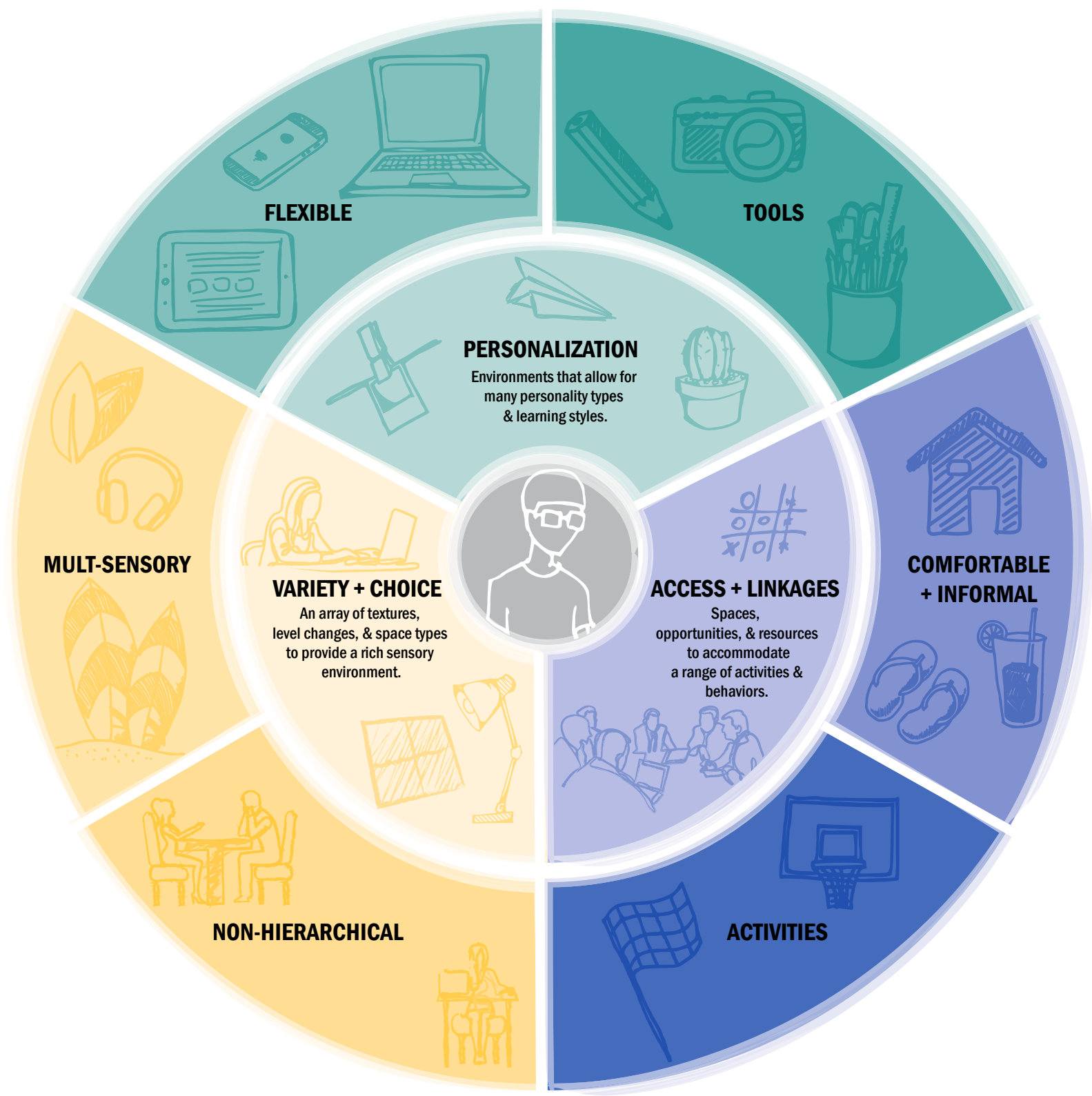
In terms of physical development, an optimal play space incorporates flexibility and variety. The authors note the importance of providing “loose parts,” or changeable features that can be manipulated by the users in a variety of ways. Elements like water and greenery provide visual interest and connection to nature. In addition, it is important to provide “a variety of small spaces, changes in level, changes in surface, stair seats...” (Project for Public Spaces, 2009). A play space that offers

a wide range of play opportunities is likely to appeal to a larger group of players.

On the social front, a successful play space supports group activities as well as individual ones. The guidelines suggest “offering interconnected play environments with more diverse activities” in order to attract a more diverse range of players (Project for Public Spaces, 2009).

Concerning cognitive development, the Project for Public Spaces highlights the importance of creativity, sense of accomplishment, and participation. The most effective play spaces allow the players to shape their own surroundings. This also means seeking the input of the playground’s users in the design process—in selecting the type and location of play equipment. Front-end involvement increases a sense of ownership among users; they are more likely to use and maintain the play space if they have been included in its development (Project for Public Spaces, 2009).

A playground doesn’t need to have the most expensive equipment to be loved by children. In fact, the simplest solutions are often the most successful ones. Is there anything better than sticks, sand, water, or mud to provide seemingly endless entertainment for a child? In the same way, a corporate environment doesn’t have to feature the newest equipment or high-end finishes. It is far more important to operate strategically, to involve employees in the design process, and to exercise an understanding of how the environment impacts human behavior.



Above: Elements of innovation-producing play spaces



DESIGN SOLUTIONS

In work settings, productive play relies on the right physical environment combined with a supportive organizational culture. For architects and designers, creating a successful play space requires an applied understanding of how and why people play. Our research suggests that the following elements are essential to the design of productive, innovation-producing play spaces:

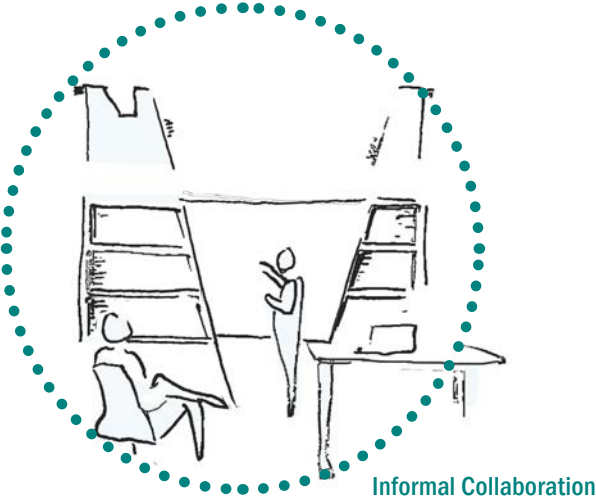
Personalization

When we play, we are motivated by our own interest and enjoyment, free to follow whatever path we choose. For companies that want to promote creativity and innovation through play, giving employees the freedom to personalize their workspaces can be an effective strategy. At IDEO's offices, employees are empowered to determine the details of their surroundings. In creating a new office space, IDEO's studio heads develop a basic framework "and then let team members mold their own nooks and crannies as they see fit." What's more, the company uses literal "building blocks"—in the form of foam cubes—dispersed throughout the office to be used to make anything from impromptu meeting spaces, acoustical "clouds" and even prototyping exercises (Kelley, 2001).

Google takes a similar approach at its Manhattan office, allowing software engineers to design their own workstations with pieces that resemble "oversize Tinker Toys" (Stewart, 2013). And employees aren't limited to standard task chairs; instead of sitting at a computer, they might opt for exercise balls, standing-height workstations, or treadmill desks. This level of personalization improves the physical comfort of employees and also helps to improve productivity, engagement, and happiness. An environment that is created with input from the people using it—where employees feel comfortable, relaxed and happy—is a more effective play space.

Access + Linkages

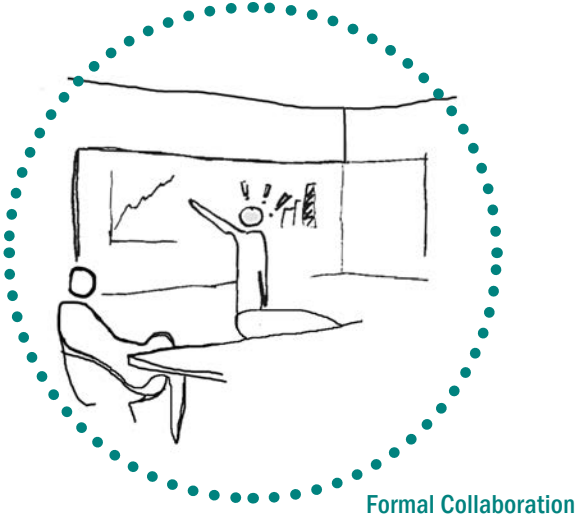
It is possible to play alone, but play as a social endeavor is more common and—evidently—more productive. According to Ransom Stephens in his book *The Left Brain Speaks, the Right Brain Laughs: A Look at the Neuroscience of Innovation & Creativity in Art, Science & Life*, research shows that while many people work best alone, the best results are achieved through collaboration (Stephens, 2016). Why is collaboration more effective than individual work when it comes to innovation? Jeff Dance, founder and CEO of the digital strategy firm Fresh Consulting, describes a number of ways in which collaboration provides a competitive advantage. For one, Dance writes, collaborative



efforts can increase the number of connections between ideas. Combining multiple perspectives and skill sets provides a deeper well of knowledge and experience to draw from, increasing the likelihood that fresh ideas will emerge. Collaboration can also increase the rate at which new ideas are generated and played out—an important competitive advantage when it comes to innovation. In addition, bringing people together can raise the level of enthusiasm surrounding new ideas, as well as increase the chances of follow-through (Dance, 2008).

“WHEN WORKERS HAVE A SENSE OF control over their time, resources and environment, they are more likely to engage in productive play.”

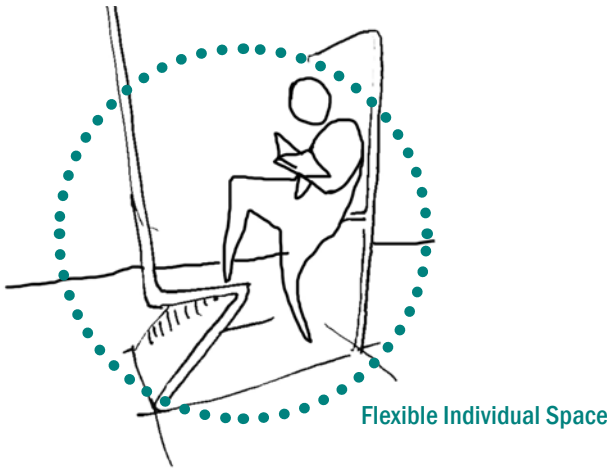
Collaboration is key to IDEO’s way of doing things, so the vast majority of space is allocated for team activities. In contrast to traditional office structures, which are divided into private offices or assigned cubicles, the open-plan studios at IDEO are arranged around large worktables. Conceived as “neighborhood parks,” the tables are intended to bring people together in an informal way and the open sightlines across the



space increase visual connections. Expanding on the community theme, Tom Kelley describes each IDEO office as a collection of “neighborhoods” where people are grouped together on a project-by-project basis (as opposed to skill set or expertise). IDEO’s focus on adaptability is key to this way of working; mobile furnishings, partitions, interactive activities and technology allow team members to work—and play—together in a variety of ways. As IDEO partner Brendan Boyle noted

in a recent interview with entrepreneur and writer Jake Cook for the consulting service 99U, “Space is one of the fundamental tools that can encourage and sustain a playful and collaborative culture” (Cook, n.d.).

Is it a coincidence that things like casual dress codes and flexible hours are common in the creative industries? An informal organizational culture can also help to encourage play by giving employees a sense of freedom. When workers have a sense of control over their time, resources, and environment, they are more likely and able to engage in productive play. In addition to policies that give employees more latitude, the right kind of physical environment is also important. At Google’s offices, care is taken to ensure that nothing appears too precious. Furnishings and decor have a playful vibe, and software engineers are even invited to “scribble” their ideas on the walls (Stewart, 2013). The message this sends to employees is that this is a safe place to loosen up, have fun, and dare to think outside the box.

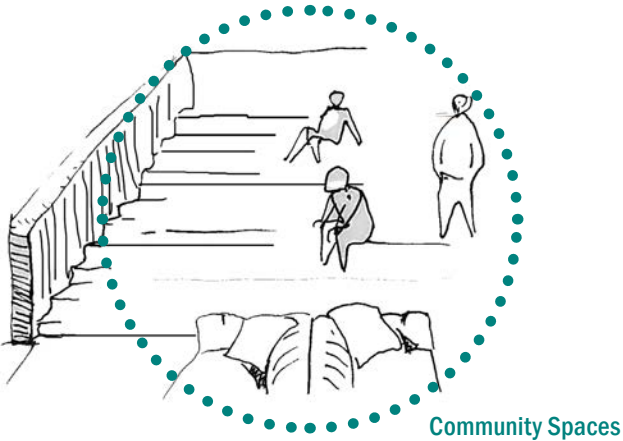
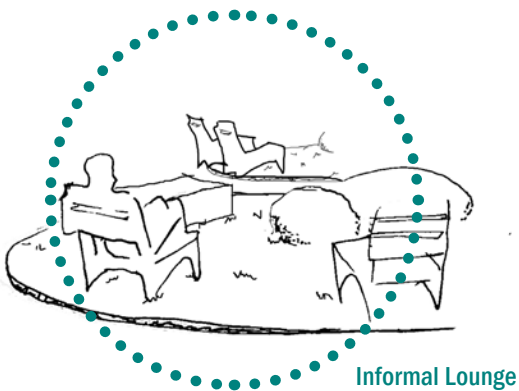


Variety + Choice

The kinds of activities that constitute play are as unique as each person’s character traits and preferences. Something that is fun and energizing for one person might be uncomfortable or even distressing

for another (Brown, 2009). This is why, in a working environment, it’s important to provide opportunities for different kinds of play. Introverted

“IT IS POSSIBLE TO PLAY ALONE, but play as a social endeavor is more common and—evidently—more productive. ”



workers might prefer to tinker with their ideas in solitude, while extroverted employees might play better in a group where they can bounce ideas off of colleagues.

Google has leveraged the art of variety in its many locations around the world. Every one of the company’s offices provides an array of play opportunities, from high-energy to low-energy, social to solitary. At the company’s Mountain View headquarters, employees seeking solitude can putter in the garden or escape for a nap in one of the company’s high-tech “nap pods.” Those who desire a more lively diversion might go for a round of pool, sand volleyball, arcade games or fooseball. A wide range of meeting areas, themed cafes and coffee bars, and private areas for heads-down work are designed to suit a variety of personality types and preferences.

In *The Art of Innovation*, IDEO’s Tom Kelley emphasizes that hierarchy is the enemy of playful and productive work environments. A company culture that communicates that everyone’s ideas are important is a fertile environment for innovation. It is for this reason that IDEO has strived from its beginning to maintain a flattened corporate structure. As much as practicality allows, employees at all levels are treated as equals, their input sought and considered by senior leadership. Rather than the typical corporate rungs (associate, principal, director, etc.), IDEO employees are categorized by four “levels of impact” based on their skills and responsibilities (Hutson, 2014). The design of the company’s offices helps to reinforce the company’s non-hierarchical corporate structure. Employees at all levels consort on wide-open floor

plans with barrier-free workstations. Shared tables, ample meeting areas, and communal kitchens ensure that employees come together for working and socializing.

Play is an important part of the human experience. An expanding collection of scientific and anecdotal evidence shows that play is essential to our health, happiness, and development throughout childhood and beyond. Play is fun, but it’s not *just* fun. The right kind of play connects people, builds our brains, and boosts creativity. Some companies, particularly in creative and entrepreneurial fields, have achieved great success in using playful practices to produce innovation. But across many industries, play has yet to be accepted as a tool for cultivating innovation. How could scientists in a laboratory, students in a classroom, or analysts at a financial institution benefit from play? And what would play look like in these types of environments? Understanding the psychology of play and the elements of successful play environments can inform the design of playful and innovative spaces across a broader context, helping to create high-performing environments that drive innovation through play.

Right: Workspace



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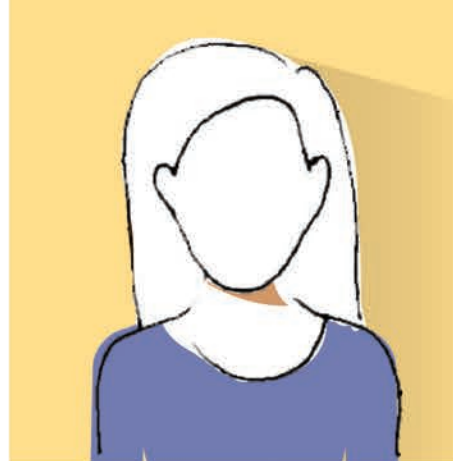
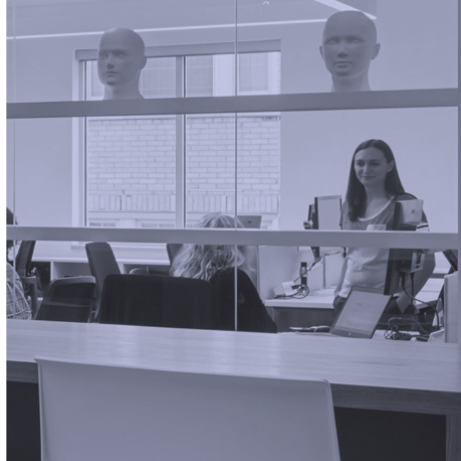
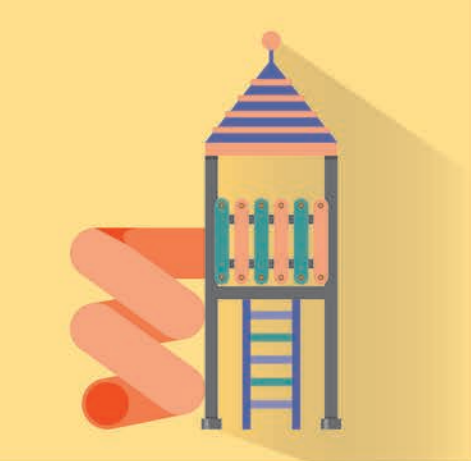
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NOT JUST CHILD'S PLAY: HOW PLAYFUL ENVIRONMENTS CONTRIBUTE TO INNOVATION

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