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IMPLEMENTING WORK-FROM-HOME BENEFITS INTO THE WORKPLACE POST-COVID-19 PANDEMIC

A THESIS APPROVED FOR THE

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Abstract

The COVID-19 pandemic is something the world experienced together, yet altered our day-to-day lives in countless diverse ways. Some examples include how we attend school, how and where we exercise, and how we run our typical, weekly errands. For many, the biggest change caused by the pandemic was the impact on the workplace and its interior environment. Many of these changes directly impacted on full-time employees, for instance, the way work tasks were completed, as well as the location tasks were completed in. The purpose of this study is to recognize ways interior designers, architects, and even employers can help to improve employee satisfaction and productivity levels. The study compares similarities and differences of indoor environmental qualities (IEQ), as well as other interior factors like privacy and biophilic design elements, between home and workplace office environments for employees. The study focused solely on full-time employees over the age of eighteen years old who worked any amount of time at home before returning to their workplace. The method of this study used an online survey platform which made it easy to keep the data organized. Survey participants must be older than eighteen years, as well as a full-time employee. The goals of the survey included identifying positive and negative factors relating to the interior workplace environment in hopes of improving employee satisfaction and productivity. The results of this study have reassured that this topic on improving the post-pandemic workplace to better mimic the benefits found working from home is important and critical in the guaranteed improvements to employee satisfaction and productivity regarding the post-pandemic workplace environment.

Keywords: work-from-home, WFH, return-to-office, RTO, return-to-workplace, COVID-19, pandemic, post-pandemic, workplace, satisfaction, production, indoor environmental quality, biophilic design

Chapter 1: Introduction

Background and Problem Statement

“Research on people and the built environment is an investment in our future,” (Gensler, 2023). The statement by Gensler holds true always, however, the meaning is more prominent than ever for the return-to-workplace movement happening during the mid and post-COVID-19 pandemic. For the majority of the workforce, mood, motivation, and productivity are three key factors to take into consideration when designing for the workplace (Metcalf, 2022). Since the start of the pandemic, the ideal notion of the workplace has drastically changed for most companies and their employees. All of the United States workforce, and most of the world, have experienced significant adjustments to their daily work and personal schedules. Countless employees were stuck working within their homes during the first few months of the pandemic, while many continued working from home well into the first year of COVID-19. To this day, numerous companies have continued conducting their work remotely, while others have had to force employees to return to the workplace long ago.

While working from home for many employees evolved into a usual occurrence, it simultaneously revealed the positive and negative impacts, like more or less overall freedom and privacy and either better or worse indoor environmental quality (IEQ), that were discovered with work-from-home offices, and returning to their post-pandemic workplaces (Gensler, 2023). A 2023 Gensler article provides information about return-to-workplace trends, explaining that “work-from-home during the pandemic led to two simultaneous realizations: technology allows people to work from anywhere and the physical workplace matters more than ever,” (Gensler, 2023). The statement by the highly ranked design company appropriately described the most prominent predicament the world has seen regarding workplace returns. The workforce is stuck

in the middle between the good and bad of WFH and workplace environments, creating a complex situation involving employee's return to the workplace. A SmithGroup article raised a commonly asked question regarding office design impacts. Their question asked, "will the ways of work simply flip back to pre-pandemic modes years down the road?" (SmithGroup, 2020). SmithGroup responded with the following statement, "while we certainly don't have a crystal ball, our strategists and designers don't think so. The notion of returning to business as usual would mean a missed opportunity to gain experience from the advantages and challenges we've seen over the last several months" (SmithGroup, 2020).

In the 2021 article, *Neurodiversity and Biophilia: The Future of the Workspace in the Post-Pandemic Era* by Estudio G. Requena, the term 'neurodiversity' is brought up in relation to the coronavirus. Requena defined neurodiversity as "… the natural variations in the human brain of each individual in relation to sociability, learning, attention, mood, and other cognitive functions" (2021). He also explained how research started showing how people who contracted the coronavirus are considered "long-haulers-individuals" who could experience neurological side effects from the virus (Requena, 2021). Lastly, Requena brought to light research showing "… symptoms of depression and anxiety increased 4 times in June 2020 compared to 2019, increasing attention on the subject" (2021). It is vital, as more employees have returned to the workplace, that owners provide employees with healthy, inviting, interior environments. It is critical that architects, designers, and even business owners are fully aware of the effects the pandemic left on the workforce. It is also important to acknowledge any of the problems employees faced relating to contracting the virus or the loss of loved ones, the harsh lockdowns, the abrupt change to remote work, and the hardships of returning to the post-pandemic workplace.

Purpose of Study

The study's purpose was to help improve employee satisfaction and productivity after returning to the workplace post-COVID-19 pandemic. The study identified distinctive design changes for workplace environments that would provide similar work-from-home benefits. The study analyzed and compared a number of similarities and differences relating to indoor environmental qualities, as well as other interior factors like privacy, freedom, furniture, and biophilic design, between home and workplace office environments for employees. The study participants were over the age of eighteen years old and worked full-time.

Research Questions

1. How can interior designers and architects implement the most common benefits full-time employees discovered while working from home during COVID-19 into the post-pandemic workplace?
2. After returning to the post-pandemic workplace, what are the most common interior environmental complaints raised by employees in terms of their satisfaction and production levels?
3. How can future workplace design ideas continue improving, in terms of employee satisfaction and production levels, after returning to the post-pandemic workplace?

Scope of the Study

The study focused on the various aspects, such as, indoor environmental quality (IEQ), privacy, freedom, furniture, and biophilic design relating to indoor office environments, and the effects they may have had on the satisfaction and production levels of full-time employees. The first part of the study focused on issues relating to the indoor environmental quality (IEQ) of

office spaces, such as, the lighting, noise levels, acoustics, thermal temperature, and odor. The second part of the study identified employee preferences on privacy, freedom, furniture, and overall functionality. The third factor covered in the study evaluated biophilic design elements and their implementation into office space. The dependent variables in this study were employee satisfaction and production. The independent variables were indoor environmental quality (IEQ), privacy, freedom, furniture, and biophilic design elements.

Table 1

Study's Independent and Dependent Variables

Independent Variables	Dependent Variables
Indoor Environmental Quality (IEQ)	Employee satisfaction
Privacy	Employee production
Freedom	
Furniture	
Biophilic Design Elements	

According to the Centers for Disease Control and Prevention (CDC), indoor environmental quality is the condition of a building's interior that relates to occupant health (Center for Disease Control and Prevention, 2022). The IEQ factors encompassed within a building include the air quality, lighting, thermal conditions, and ergonomics (USGBC, 2014). One of the main concerns relating to poor IEQ is that workers may experience symptoms or illnesses brought on by continued exposure to the building (CDC, 2022). IEQ control has been easier for employees to manipulate within their home office space as compared to workplace environment. This could be something many employees dread when returning to the workplace post-pandemic, knowing they may not have the ability to control the indoor temperature, as well

as other IEQ factors like the amount of natural daylight allotted within a space, or odor issues throughout a building. The research focuses on collecting employee opinions regarding IEQ experiences at home and upon returning to the workplace. These opinions can help form new ideas for designers and architects as the future of the workplace continues to evolve.

In addition to IEQ, other important aspects relating to the design and functionality of the workplace have held significant roles in the return-to-office experience. These design factors include level of freedom in terms of how the interior environment supports certain activities like moving around workspaces or where and when an employee chooses to eat, as well as privacy, ergonomic furniture, and the functionality of spaces. It can be assumed that, while working from home, many employees felt they had more freedom to move around, listen to their own choice of music or podcasts, eat when they wanted to, and more. In addition to having more interior environmental freedom at home, many employees found they had more privacy throughout their workday. When it comes to home office furniture, employees may have felt a higher level of comfort, or at least a greater sense of choice, as they were able to establish which furniture, they wanted to use to complete work tasks compared to the more-stationary furniture set-up found in many commercial offices. Employees may have taken it upon themselves to buy new piece(s) of office-specific furniture(s) that best suited their personal preferences and work-related needs for the unknown amount of time they would be conducting work from within their home. In other words, the functionality of space while WFH could be manipulated however the employee preferred since it is their own space. These four factors are critical points for employers and building owners to consider upon returning to the office as each factor can directly affect occupant health and satisfaction.

The third major factor highlighted in this study is related to the benefits of biophilic design, as well as the negative affects employees face when a lack of biophilia is present in a workspace. The term biophilia is described as the innate connection human beings have between nature and other living things (McCain, 2020). Biophilic design incorporates the use of natural materials, patterns, and phenomena to continue strengthening bonds between nature and the built environment (McCain, 2020). Biophilic design has been linked to support cognitive function, physical health, and psychological well-being (McCain, 2020). There are many approaches designers can take to incorporate these elements into the workplace to benefit the employees. For example, employers adding greenery, such as easy-to-care for succulents could vastly improve energy levels and mood in employees (Rana, 2022).

With this said, the study aims to welcome the voice of employees from all over to share their opinions, both positive and negative, towards the workplace and share their ideas on how to improve these types of spaces going forward.

Method

The method of this mixed methods study was implemented with a thoroughly constructed online survey. The URL link, as well as a brief description of the study's intention, was posted by the PI on LinkedIn, an online social media platform used by all types of professionals. These standards included participants over the age of eighteen years old working full-time or, at least, forty hours a week.

The purpose of the survey was to learn any positive or negative factors discovered while working from home during any part of the COVID-19 pandemic, as well as returning to the post-pandemic workplace. In addition, the survey allowed participants to share their opinions and

ideas regarding changes to the workplace, post-pandemic return. These ideas could allow a deeper insight into considering all factors that take place with the indefinite movement of workplace return. The survey was created with heavy influence from the literature reviewed. The literature review discusses the study's main interior environmental factors, which included IEQ, biophilic design elements, privacy, functionality, furniture comfortability, and more.

The survey data was analyzed by comparing means of satisfaction, as well as evaluating responses for a comparative analysis. The data showed a range of similarities, as well as differences relating to the way employees felt about their post-pandemic workplace environment and what the environment did or did not offer after their experiences working from home during the pandemic.

Significance of the Study

This research explored the differences and similarities of opinions regarding IEQ and other key factors of full-time employees working from home during the COVID-19 pandemic and who have now returned to the workplace. The results of this study could help foster future design ideas for workplace designers and architects, providing possibilities of increasing employee satisfaction and well-being. Implementing innovative design ideas could increase work productivity, as well as workplace and job satisfaction for employees.

Limitations

Although there were only a few limitations found within this study, one pertained to the short amount of time the study was open for participants to engage with the online survey. The survey was briefly conducted for a total of two months. This was due to the fact that the survey's results needed to be organized and then thoroughly analyzed within a six-month time limit. This

limited the total number of responses received. Another limitation of this study was that only full-time, or employees working at least forty hours per week could take part in the survey. This left out any part-time employees willing to participate. In addition, another limitation for the study was the inability to explain any confusion that participants may have had while completing the questionnaire, leading to some less reliable answers.

Conclusion

In conclusion, this study focused on a collection of survey responses from full-time employees regarding their preferences on a variety of indoor environmental factors relating to office spaces they have occupied. Analyzing these preferences, along with conducting research on an extensive list of literature, awareness was raised regarding different ways employees now view the functionality of their workplace upon returning post-COVID-19 pandemic.

Chapter II: Literature Review

Introduction

This literature review explored topics relating to potential impacts work-from-home had on the workforce during and after the worst months of the COVID-19 pandemic. This section will discuss the workplace environment throughout different years, which would be pre-pandemic, during the pandemic, and post-pandemic. With the study's topic, it is critical to understand how the workplace has changed through this era of uncertainty brought on by the pandemic.

The main topics investigated throughout this specific chapter are the following: indoor environmental quality (IEQ), privacy, flexibility, ergonomic furniture, and biophilic design. In the article, *2023 Workplace Trends: Supporting Mental Health in the Workplace,* by Regan Donoghue, significance relating to employee satisfaction is explained, "if an employer can create a space in which employees can feel truly productive, that's incentive to come back into the office on a regular basis" (Donoghue, R., 2023). By providing a sense of care and importance for each employee, even within professional settings, proprietors could help create better bonds between themselves and their employees. When employees feel valued within their company, they are more likely to succeed in their work-related tasks. It is probable to believe employees who feel valued are inspired to work with more passion and purpose for their company, instead of completing tasks solely because of requirement and expectation.

- **Indoor environmental quality**: an explanation regarding the main IEQ factors will be given, the effects poor IEQ can have on occupants, and ways to combat these effects so that occupants can flourish.

- **Privacy, furniture, and overall functionality**: a look into how these design factors coincide with one another, as workplace environments need to provide a healthy balance between both privacy and freedom. This section will explain the importance of balancing these design factors, as well as other factors like ergonomics, and how they all impact the overall functionality of a workplace.
- **Biophilic design**: an overview of biophilia and biophilic design is stated in this section, as well as how occupants can benefit from the direct presence of biophilic design elements.

Table 2

List of Reviewed Literature

Title	Authors/Year
Indoor Environmental Quality (IEQ)	
Impact of indoor environmental quality on occupant well-being and comfort: A review of the literature	Al horr, Yousef; Arif, Mohammed; Elsarrag, Esam; Katafygiotou, Martha; Kaushik, Amit; Mazroei, Ahmed (2016)
About ASHRAE	ASHRAE (n.d.)
Green building 101: What is Indoor Environmental Quality?	Benjamin, Heather (n.d.)
Creating Office Environments That Evoke Health & Happiness	Bleacher, Brendan & Patel, Sanjeev (2023)
Identifying interior design strategies for Healthy Workplaces	Colenberg, S., & Jylha, T. (2021)
The Value of the Invisible in Workplace Design	Daisey, Dennis & Kohout, Nancy (2023)
Sick Building Syndrome by Indoor Air Pollution in Dalian, China	Guo, P., Yokoyama, K., Piao, F., Sakai, K., Khalequzzaman, M., Kamijima, M., Nakajima, T., & Kitamura, F. (2013)
COVID-19's toll on mental health	Hayward, Ed (2021)
Exploring the Disparity Between Lighting Conditions in the Hybrid Work Model	McGahan, K. A. D., & Gonzalez-Bode, A. (2022)
Interior Design Elements that Enhance Comfort and Productivity in the Workplace	Montjoy, Valeria (2022)
Designing Post COVID-19 Buildings: Approaches for Achieving Healthy Buildings	Navaratnam, Satheeskumar; Nguyen, Kate; Selvaranjan, Kajanan; Zhang, Guomin; Mendis, Priyan (2022)
Psychology-Approved Design Strategies for Return-to-Work	Peditto, Kati Ph.D. (2023)

Title	Authors/Year
Indoor Environmental Quality (IEQ)	
Design Of Smart Office Spaces in The Post-Pandemic World	Sengupta, Shaon Sikta (2022)
Privacy, Freedom, and Functionality	
2023 Trends: Creating Places for Privacy in the Collaborative Office	Bartlett, Inger (2022)
Bringing Features of Home into the Workplace	Douglass, Kimberly (2023)
Designing Healthy Workplaces That Foster Employee Happiness	Gardner, Lauren (2023)
History of Office Design: From the 1700's to Today: K2 Space	K2 Space (2022)
Definition of Function	Merriam-Webster (n.d.)
Neurodiversity and Biophilia: The Future of the Workspace in the Post-Pandemic Era	Requena, Estudio G. (2021)
Biophilic Design	
Biophilia – What is it and why is it important?	Anderson, Jackie (2020)
Biophilic Design in architecture and its contributions to health, well-being, and sustainability: A critical review	Bekkering, Juliette; Schroder, Torsten; Zhong, Weijie (2021)
Biophilia in the Workplace	BOS (2022)
Create Access to Nature Through Biophilic Architecture and Design Principles	HMC Architects (2021)
With People in Mind	Kaplan, Rachel (1998)
Bringing the Outdoors In: The Benefits of Biophilia	McCain, Maria (2020)
Biophilia	Sussex Publishers (n.d)
6 Principles of Biophilic Design	theConstructor.org (2022)
14 Patterns of Biophilic Design	Terrapin Bright Green (2014)
4 Benefits of Biophilic Design in the Office	Young, Rachel (2022)

Review of Literature

Indoor Environmental Quality (IEQ)

Overview of IEQ

Indoor environmental quality, or IEQ, is critical in promoting the mental health and well-being of building occupants. The Centers for Disease Control and Prevention have listed IEQ factors, such as lighting, air quality, and damp conditions (CDC, 2022). Acoustics and odor are also a part of the five main factors. The effects these factors have on humans vary between both short and long-term periods (Al horr, Y. et al., 2016). The American Society of Heating, Refrigerating, and Air-Conditioning Engineers, typically known as ASHRAE, is a global society helping to advance human well-being through sustainable design (ASHRAE.org, n.d.). ASHRAE guidelines, which relate closely to IEQ, have concluded that people spend roughly 80-90% of their time indoors (Al horr, Y. et al.).

When poor IEQ is discovered within a building, the occupants are often directly affected. Sick building syndrome (SBS) is described in a study as "… a medical condition in which people in a building suffer from symptoms of illness or feeling unwell for no apparent reasons" (Guo, P. et al., 2013). SBS is one of the most common effects occupants of buildings with poor IEQ typically experience. Furthermore, SBS symptoms tend to increase in severity as more time is spent by occupants in these types of buildings, as well as disappear when occupants spend less or no more of their time in spaces with poor IEQ (Guo, P. et al., 2013). The nervous system and respiratory organs of occupants suffering from SBS are commonly seen (Guo, P. et al., 2013). Now, more than ever, employees should be assured that their workplace provides sufficient IEQ at all times.

IEQ in the Post-Pandemic Workplace

According to multiple post-pandemic research studies, there are still a considerable number of employees that prefer working at home, or at least hybrid. Unfortunately, many companies have continued to return to fully in-person schedules, leaving many employees dreading their workplace return due to certain aspects they find lack within the workplace compared to their home office. Dr. Kati Peditto, author of *Psychology-Approved Design Strategies for Return-to-Work*, said "employees with a lack of control over their workspace can experience learned helplessness and a lack of motivation" (2023). In the article, *Creating Office Environments That Evoke Health & Happiness*, authors Brendan Beachler and Sanjeev Patel summarized how "today's workplaces can combine the best aspects of working from home with the features employees miss about going to the office. Adjustable controls for temperature, humidity and acoustics let individuals and teams personalize space" (2023). As the return-to-workplace movement continues, employee comfortably and satisfaction should remain the upmost priority for designers and architects designing future workplaces. Bleacher and Patel stated how "creating a happy and healthy work environment is of paramount importance to employers, designers and architects who have witnessed employees' uneasy transition to the office after months, or even years, of working from home" (2023). The two authors also acknowledged the fact that "office spaces should be designed for employees to be their best selves and do their best work, meaning spaces cannot be too dark, too hot or cold, or too noisy. Each of these qualities relates to one's physical comfort. Ensuring optimal lighting, a comfortable thermal environment, and good sound control enables people to feel good and be productive" (2023). The most successfully designed and inhabited workplaces will accommodate

all employee preferences to improve their mental health and well-being and simultaneously strengthen company cohesion and inclusion. With anxiety and depression rates six times higher than in 2019, exemplary IEQ in the workplace is essential for the mental health and well-being of all employees (Hayward, 2021).

Lighting

Lighting plays a vital role in occupant satisfaction and productivity. In fact, natural lighting is critical for healthy circadian rhythm, which is vital for a person's eating and sleeping patterns (McGahan, 2022). The article, *Design of Smart Office Spaces in the Post-Pandemic World*, suggested "specialized smart office lighting solutions that automatically adjust indoor lighting based on circadian rhythms help in achieving peak performance around the clock" (Sengupta, 2022).

It is important to be aware that while working from home, the lighting conditions within home offices could vary significantly to the type of lighting found within the workplace (McGahan, 2022). With this said, designers should be the ones most aware of the possible lighting differences and how they may affect employees who have continued working a hybrid schedule. McGahan (2022) also suggested workplace environments begin to include "…more strategies to create more vertically illuminated surfaces, improve views to daylight, and implement finishes that are conducive to a bright and luminous appearance." In addition, McGahan (2022) has encouraged that "workplace design should consider the integration of lighting controls with scene changes throughout the time of day as integral to any holistic design."

Understanding the importance of human-centric lighting is now more important than ever with the on-going return to the post-pandemic workplace. McGahan (2022) included a recent framework "…proposed by Houser and Esposito's 2021 study, *Human-Centric Lighting: Foundational Considerations and a Five-Step Design Process,* which prioritizes occupant needs within the context of current guidance by outlining the following:

1. Characterize the lighting application.
2. Determine the likely sleep-wake cycle(s) of occupants.
3. Determine the sleep needs of the occupants.
4. Review published guidance to develop goals and design criteria that support visual and non-visual outcomes.
5. Deploy this information to establish design criteria that will guide decisions in the latter stages of the design process" (McGahan, 2022).

Designers must continue seeking new knowledge from lighting design practitioners as light continues to be one of the most crucial factors in successful workplace design in the post-pandemic era.

Air Quality

The COVID-19 pandemic raised awareness regarding the quality of air humans are breathing, especially in terms of the indoor air quality within shared spaces. Research has revealed that one of the more common concerns shared amongst employees returning to the workplace is the quality of indoor air the office provides. Due to air transmission of COVID-19, fresh solutions to building equipment are now vital. Authors Bleacher and Patel, of the article, *Creating Office Environments That Evoke Health & Happiness*, suggested improvements to indoor air-purification strategies, such that "upgrading a workspace's mechanical and filtration

systems, installing operable windows, and offering direct access to outdoor spaces can greatly improve employees' ability to get fresh air" (2023). Another study, *Designing Post COVID-19 Buildings: Approaches for Achieving Healthy Buildings*, discussed "the air cleansing technique using air ionization, which includes the injection of ions into a room, has the capability to improve the indoor air quality and reduce the transmission of coronavirus. Bipolar ionization appears to be one of the most commonly utilized ionization techniques to avoid the spread of the virus in air" (Navaratnam, S. et al., 2022). In addition, Navaratnam, S. et al. (2022) recommended implementing green plants inside of building walls since plants are capable of absorbing and catabolizing harmful environmental chemicals. The study also suggested "to improve the indoor air quality, the spatial layout should be considered during building design. Spatial design is a conceptual design approach that accounts for both the interior design and service design" (Navaratnam, S. et al., 2022). The post-pandemic spatial layouts of workplaces are something designers should continue studying for future projects as constant studies with new findings are being published. Dennis Daisey and Nancy Kohout discussed solutions to problems of air quality in their article, *The Value of the Invisible in Workplace Design*, suggesting to "increase the amount of outdoor air to the spaces over and above the requirements of the ASHRAE 62.1 ventilation standard" and "provide pre-occupancy flush-out with outside air" (2023). Furthermore, constantly measuring indoor air quality of buildings can be of benefit, as they provide up-to-date levels of air quality.

Thermal Comfort

While working from home during the lockdown, employees had a greater say in where the thermostat was set since they were within their own residence. The article, *The Value of the Invisible in Workplace Design,* has offered ideas for solutions pertaining to thermal discomfort in

the workplace (Daisey & Kohout, 2023). One of the solutions stated that "more zone equipment and thermostats or opting for a system like underfloor air distribution (UFAD) or active chilled beams, versus traditional variable air terminal units, would allow occupants to have more adjustability" (Daisey & Kohout, 2023). Daisey and Kohout also recommended designing "…for a temperature variation across open office work areas and allow free address so that occupants can choose to sit in a location that is comfortable for them" (2023).

Acoustics

The article, *Identifying Interior Design Strategies for Healthy Workplaces*, identified study results, "a well-known source of discomfort and stress in offices is noise. An elevated level of background noise was found to increase physiological stress, yawning and psychological discomfort" (Jahncke et al., 2011; Lamb and Kwok, 2016; Schlittmeier and Liebl, 2015; Shafiee Motlagh et al., 2018; Thayer et al., 2010). Better sound absorption was related to a lower level of perceived disturbances and cognitive stress (Seddigh et al., 2015)" (Colenberg & Jylha, 2021). It is vital that appropriate measures are taken with workplace acoustics as poor implementation can lead to stressed and less-productive employees. Furthermore, the awareness that employees experienced minimal issues relating to acoustics while working from home is vital in understanding the importance of post-pandemic workplace acoustics.

Privacy, Furniture, and Functionality

Background on the 'Open Office' and Workplace Privacy

The term *privacy* can be described as "the quality or state of being apart from company or observation" (Merriam-Webster). Workplace privacy became outdated during the mid-20th century from a result of 'Taylorism' (K2 Space, 2022). Frank Taylor, a well-known mechanical

engineer, created Taylorism, which is known as a scientific methodology maximizing industrial efficiency (K2 Space, 2022). Taylorism failed to take into consideration anything relating to employee satisfaction and socialization, creating a substantial decrease in workplace collaboration (K2 Space, 2022). The open office concept has continued to evolve since its origination, but has it truly been successful?

Design considerations to create an open office plan are to create an inviting, collaborative environment for employees while keeping design solutions cost-effective and still providing efficient levels of privacy throughout the building. While the pandemic created positive outlooks on the office as a place to reconnect with colleagues and other benefiting factors, it simultaneously created a more difficult way to find privacy for individual and virtual work (Gensler, 2022). Once the return-to-workplace movement began a few years ago, employees went from one extreme to another with little-to-no time for adaptation. The pandemic forced employees to WFH for weeks, months, and even years where privacy was significantly easier to find and sustain. However, once the height of COVID-19 infectious rates started dropping, employees were thrown back into their workplace where many experienced difficulties adapting back to the open office plan. Furthermore, designers must continue to prioritize the ways in which they can accommodate employee preferences regarding open office plans to help workplace improvisation.

Flexibility in the Workplace

Flexibility in the workplace relates to many things such as scheduling office and personal appointments, how and where employees conduct their work, or deciding to fit in a workout during the middle of the workday. In the article, *Bringing Features of Home into the Workplace*, author Kimberly Douglass (2023) states, “it has become clear that employees value flexibility

but that doesn't only pertain to the ability to work remotely. Flexibility with scheduling and with how employees work while in the office are also critical elements." It is vital that designers acknowledge and understand the preferences that employees are sharing in regard to workplace flexibility. Overall, individuals often seek to discover what they believe is an appropriate work-life balance, though many have continued struggling committing to this type of balance. An appropriate amount of flexibility in a workplace could aid in employees finding their own versions of a balance between their work lives and personal lives.

A survey created by Airtasker, an outsourcing company, dealt with looking at over 1,000 workers' daily habits (SmithGroup, 2020). These results showed an increase in work productivity from those employees who were working remotely due to the ability to take more breaks from their daily work tasks (SmithGroup, 2020). The Airtasker survey revealed that "only 39% of remote workers sought out work distractions, compared to 56% of in-office workers" (SmithGroup, 2020). In the article, *Neurodiversity and Biophilia: The Future of the Workspace in the Post-Pandemic Era*, the article's author, Estudio G. Requena, described how demographic studies discovered "only 50% of people feel that their offices support them, and a worrying 78% say they would like more flexibility in their work options, driven by the desire to increase productivity and achieve a better balance between life and work" (2021).

A factor relating to workplace flexibility occurs in the form of office furniture. Kimberly Douglass, author of, *Bringing Features of Home into the Workplace*, wrote in her article that "all too often, the discussion surrounding workplace design focuses more on the layout and configuration than the furnishings, which are of equal — and sometimes greater — importance. The aesthetics, comfort, and variety of office furniture can boost employee productivity by as much as 32 percent," (2023). Douglass pointed to the fact that, although the space plan of

workplaces is sought out as the main focus, the furniture is equally important in regard to employee satisfaction and productivity. Douglass (2023) also stated, “by including features that meet employees’ needs and bring the comforts of home into the workplace, leaders can create environments that motivate, reduce productivity drains, and make employees want to spend time in the office.” While lots of WFH employees found it simple to include comfortability during their workday through the use of their furniture, it can be assumed that workplaces could easily incorporate additional furniture comfort throughout the building.

It can be assumed that many of the workforce strive to find their *perfect* version of what they have determined is work-life balance. Lauren Gardner, author of *Designing Healthy Workplaces That Foster Employee Happiness,* brought up how “workplace wellness is more important than ever as people return to the office and transition from their home work environments to spaces that may not offer the same flexibility” (2023). Influenced from the work-from-home era, designers have continued to improve and add on to amenity spaces in workplaces. It is especially important for designers to approach future design solutions in ways that can uniquely strengthen each company’s culture and sense of community. A newer workplace approach focused on the wellness of occupants is inspired through residential and hospitality design, which simultaneously creates a combination of the best aspects of working from home, as well as “third spaces” such as coffee shops and libraries (Gardner, 2023). Other amenity spaces to incorporate into the workplace could be mother’s and wellness rooms, gyms, and flexible or “flex” spaces for yoga, meditation, game rooms, and even places to conduct prayer (Gardner, 2023). A balance between the types of activities conducted in amenity spaces is important so that all types of employees can use and benefit from the different spaces. Gardner

believes that implementing these amenity spaces in the post-pandemic workplace "…with flexible work options can make a difference in mood and behavior" (2023).

Overall Functionality in the Workplace

The term *function* is described as "the action for which a person or thing is specially fitted or used or for which a thing exists," (Merriam-Webster, n.d.). When relating function to the current, post-pandemic workplace, it is important to acknowledge that many factors relating to COVID-19 have, and will continue, to change these interior environments. Lauren Gardner also shares her understanding that "a workplace with a great range of functionality for all employees can cultivate a dynamic company culture and boost employee satisfaction" (2023). The ultimate goal for workplace functionality is to aid in creating collaborative environments that provide senses of inclusivity and inspiration throughout all occupied spaces with the inclusion of adaptable and ergonomic furniture, while simultaneously providing adequate quantities of private spaces based on company needs.

Connection to Biophilia

Overview of Biophilia

"In every walk with nature, one receives far more than he seeks" (Muir, 1877). Biophilia comes from the Greek term 'philia' with the literal meaning 'love of' life or living things, further intending that human beings have a deeply engrained love of nature which is an intuitive and natural drive within our DNA (Anderson, 2020). Researchers have discovered that 90% of people would choose a natural setting when asked to describe an environment in which they would find themselves to be calm and relaxed (Anderson, 2020). The power nature has over individuals is extremely important in maintaining mental health, hobbies, and homes and

workplaces (PsychologyToday.com, n.d.) The concept of biophilic design journeys behind the meaning of biophilia, however, it is not limited to just this theory. With this said, the theoretical basis of biophilic design within environmental psychology includes the following perspectives: Biophilia, Habitat and Dwelling, Restoration, and Place (Bekkering et al., 2021). All four of these views have their own set of theories. Habitat and Dwelling pertain to evolutionary psychology, where an emotional need for 'nature' can be explained as an inherited affection from the experience of choosing habitats and building dwellings (Bekkering et al., 2021). The perspectives of Habitat and Dwelling rely on theories backing evolutionary psychology, such as, the Prospect-Refuge theory and the Savanna hypothesis, both dealing with survival tactics using resources within the built environment, such as, our planet's landscape (e.g., climbable trees, open views, etc.) (Bekkering et al., 2021). The Restoration perspective uses two theories, Stress Recovery and Attention Restoration, that both focus on the regenerative power nature can have on humans' mental health like stress levels and brain fatigue (Bekkering et al., 2021). The last perspective is known as 'Place,' which utilizes the Place Attachment theory that "…examines the emotional connections with places and argues that people tend to stay in more familiar places (Hidalgo and Hernández, 2001)," (Bekkering et al., 2021). Understanding the origin of biophilic design means to, first, understand these perspectives and their different theories.

Overview of Biophilic Design

HMC Architects described biophilic design as "…the way in which architects incorporate nature into building spaces to contribute to the health and well-being of occupants. By providing direct access to—and views of—nature, and using building materials and features that both mimic and respect the surrounding ecosystem, architects create spaces that speak to our innate attraction to the natural environment" (HMC Architects, 2021). Biophilic design consists of six

principles which include the following: Environmental features, natural shapes and forms, natural patterns and processes, light and space, plant-based relationships, and evolved human-nature relationships (*6 Principles of Biophilic Design*, 2022). HMC Architects also stated that biophilic design incorporation improves recovery rates for patients in hospitals, cognitive function of students in schools, and employee productivity rates in offices (HMC Architects, *2021*). In the article, *Bringing the Outdoors In: The Benefits of Biophilia*, by Maria McCain, explains three categories falling under the canopy of biophilic design which is the following: Nature in the space, natural analogues, and nature of the space. McCain (2020) described "the direct presence of nature in a space…" is found "…in the form of plants, animals, water, breeze, scents, light, shadows, and other natural elements." McCain (2020) described natural analogues as "the representational presence of natural materials, patterns, objects, colors, and shapes incorporated into building design, facade ornamentation, decor, and furniture." Lastly, McCain (2020) summarized nature of the space as "the incorporation of spatial elements commonly found in nature such as expansive views, places of sensory refuge (such as a quiet and dark room that simulates a cave), and a mild sense of risk (like steppingstones over a shallow pond)."

Biophilic Design in the Built Environment

During the pandemic, many WFH employees more than likely felt they had more say in the locations they worked in, for example, having the ability to conduct work outdoors and in the direct presence of nature. Even with extensive and relative research backing biophilic design, many workplace designs have not been centered behind the idea that employees are a top priority for any company. Ultimately, given what the world knows about COVID-19, it is vital to remember that "tenants feel safer and healthier outdoors, so buildings will need to provide easy connections and access to outdoor space" (Ambrose, 2021).

McCain (2020) addressed the fact that, when implementing biophilic design principles in workplaces, neither large budgets nor versatile spaces are required (McCain, 2020). These are common prenotions many business owners have towards incorporating any principles of biophilic design within their workplace. McCain helps to prevent these reoccurring presumptions, stating, "…there are many simple ways to apply biophilic principles to a space, whether it is leased or owned:

- Open curtains and windows so that occupants can be guided by the daily movement of light and allow dynamic air movement and natural fluctuations in temperature.
- If living in an area with high levels of air pollution, add a portable HEPA air purifier to the room to maintain healthy air quality.
- Place easy to care for indoor plants near frequently used areas.
- Incorporate auditory or olfactory elements, such as using a nature sounds playlist when falling asleep, or diffusing essential oils" (McCain, 2020).

It is critical that business owners understand the value of these principles and the effects they have on the mental health and well-being of their employees. Furthermore, as stated previously by HMC Architects, increases in employee productivity have been constantly observed in regard to implementing biophilic design principles into the workplace (2021).

A Terrapin Bright Green (2022) report, *The Economics of Biophilia*, highlighted the fact that 10% of employee absence could be attributed to a lack of access to nature within the office (BOS, 2022). In the article, *4 Benefits of Biophilic Design in the Office*, author Rachel Young discussed that a report by The Global Human Spaces discovered roughly 33% of office workers would base their decision on working for a company off of the office's design (2022). Using the same report, Young (2022) restated that when workers were asked what their top 5 most-wanted

elements within a workplace were, "…44% said natural light was important to them and 20% opted for plants around the office." Natural lighting continues to be a tremendous factor in employee satisfaction, well-being, and productivity (Young, 2022). Although the best solution to a lack of natural light would be the integration of large, glass windows, some buildings or spaces within a building may not have the budget or structure clearance for this type of biophilic addition. With this said, a renowned workplace furnishing company, BOS, suggested in their article, *Biophilia in the Workspace*, that the addition of natural light lamps in workstations can improve the connection employees have to natural lighting (2022). In the same article, BOS suggested the use of natural elements like wood and stone for furniture, walls, and flooring can help build biophilia (2022). In terms of incorporating the biophilic design principle, water, BOS (2022) suggested deploying features like aquariums, ponds, or even indoor waterfalls would give employees simple access to nature.

Research by Norway's Agricultural University in Oslo found that plants can remove harmful volatile organic compounds, or VOCs, such as formaldehyde and benzene that can be found in paint, carpet, and furniture in most buildings (Young, 2022). In addition, plants have been shown to improve air quality up to 75% (Young, 2022). These discoveries work hand-in-hand with IEQ since these harmful compounds can lead to irritations and sicknesses for employees (Young, 2022).

Conclusion

In conclusion, this chapter has aimed to summarize research from relevant articles and studies pertaining to the study's intention of improving employee satisfaction and productivity after returning to the workplace post-COVID-19 pandemic. Through an extensive literature review process, a myriad of design recommendations and ideas were identified. The literature

guided the development of survey questions focused on indoor environmental quality, privacy, freedom, functionality, and the elements of biophilic design. The different effects that poor IEQ has on occupants were described in this chapter, as well as ideas to combat these effects. The importance of providing balance between post-pandemic workplace return factors, such as, privacy, freedom, and overall functionality were discussed in their own section, as well. Lastly, a brief background on the origins of biophilic design principles was summarized towards the end of this chapter. In addition, research was conducted pertaining to the effects biophilic design has on the workforce, both positively and negatively, and how company owners can easily and affordably implement biophilic design throughout the office.

Chapter III: Methodology

Introduction

This chapter discusses the research methodology for this mixed methods research study. This approach was taken using an online survey questionnaire that featured both open and closed-ended questions. The questionnaire was completed using an online link. The study focused on full-time, 40 hour per-week, employees. The intention of the survey was to understand what employees found beneficial while working from home, as well as what may be lacking in their post-pandemic workplace return. The goal of the study was to understand these preferences so that they could be implemented into the post-COVID-19 pandemic workplace. The primary components to this chapter include the following: Research plan, methodology, study participants, procedures, analysis method, and limitations.

Research Questions

The intent of the study was to answer the primary question, which asked whether the most common work-from-home benefits experienced by full-time workers could be implemented into the post-pandemic workplace return to improve the satisfaction and productivity of employees. To help answer this main research question, the study asked the following three research questions:

RQ1: How can interior designers and architects implement the most common benefits full-time employees discovered while working from home during COVID-19 into the post-pandemic workplace?

RQ2: After returning to the post-pandemic workplace, what are the most common interior environmental complaints raised by employees in terms of their satisfaction and production levels?

RQ3: How can future workplace design ideas continue improving, in terms of employee satisfaction and production levels, after returning to the post-pandemic workplace?

Methodology Selected

A mixed methods approach was employed to integrate both qualitative research and quantitative data conceptually and analytically (*Why Mixed Methods? | Johns Hopkins Bloomberg School of Public Health*, n.d.). This mixed methods study used exploratory data analysis, or EDA, which is a methodology approach that investigates research questions that have not previously been studied in depth (George, 2023). Using exploratory research helped analyze and investigate the data sets, as well as summarized the main characteristics through data visualization methods (i.e., bar and pie charts) (*What Is Exploratory Data Analysis? | IBM*, n.d.). The qualitative data consisted of the answers to the survey's open-ended questions, while the quantitative data resulted from the rest of the survey's answers coming from the closed-ended questions.

Survey Methodology

The survey was conducted after an extensive literature review process. The study was made up of three main sections: (1) informed consent, (2) demographics, and (3) work-from-home (WFH) and return-to-workplace (RTW) analysis. The third section, WFH and RTW analysis had focused on various indoor environmental parameters, which included IEQ, privacy, functionality, workplace environmental freedom, furniture, and biophilic design elements. These

factors were identified through the initial literature review process, enabling the creation and implementation of each question found within the third section of the survey. Each of these questions were carefully designed to achieve the goals of the study by helping to answer the research questions (Robson, 2002). To save time, open-ended questions in the survey were kept down to a minimum due to limited time to complete the study, as well as the hope and potential for a large quantity of reliable responses. Both types of questions, both open and closed-ended, were all kept short with simple language to avoid confusion and to increase the reliability of responses.

Section 1: Informed Consent

The survey started with the informed consent section, which provided an overview to all potential participants. The overview included a brief summary of the study, who/how they can contact, the type of data being collected, and information regarding the IRB approval given to the questionnaire. At the end of this section, each participant was asked to answer 'yes' if they agreed to participate.

Section 2: Demographics

The second section of the survey asked participants for background information, without ever asking questions that could risk their anonymity. Overall, this information gave a healthy base on how the rest of the responses were looked at. Information collected here included the following:

- Age
- Race/ethnicity
- Gender

- Marital status
- Number of children
- Elderly relative residing in home

Section 3: Work-from-Home/Return-to-Workplace Analysis

In the third section, participants were asked to answer with their honest opinions to questions which related to experiences they have had in their home and workplace offices. This section gauged how satisfied participants were with their at-home office space(s), as well as returning to their workplace environment. These questions asked about satisfaction levels of IEQ factors, privacy levels, space functionality, biophilic design, and more. This section was organized based off of the three main topics defined through the reviewed literature: (1) Indoor environmental quality (IEQ); (2) Privacy, freedom, and functionality; and (3) Biophilic design elements. These three broader topics were broken down into more detailed questions pertaining to different aspects relating to the three main topics.

Some of the questions within this section allowed respondents to type out answers they may not have found listed below the specific questions asked. Some of the survey questions included the following:

1. Can implementing the positives of working from home into the workplace improve employee satisfaction and well-being?
2. Can implementing the positives of working from home into the workplace improve employee productivity with work-related tasks?
3. How can the workplace improve after returning to the office from the COVID-19 pandemic?

Study Participants

The intended study participants were only full-time working (40+ hour/week) professionals who worked from home during the COVID-19 pandemic lockdown and had since returned to their workplace, post-lockdown. Therefore, part-time employees did not contribute to the survey. In addition to these requirements, as shown in Appendix A, participants were required to be over the age of 18 years old as legal adults and were to determine whether they agreed to participate. Participation was entirely voluntary, and all types of gender, as well as work profession types were welcome to take part in the survey. A specific level of education was not relevant to the study, nor was asked for throughout any part of the survey.

Data Collection

This study used a self-completed survey questionnaire that was created using the Qualtrics Experience Management website, which is an online survey management tool used by students, faculty, and researchers at the University of Oklahoma. An online survey format made it easier to solicit participation and feedback from study participants due to the limited period of time to conduct the entire research study. The online survey fully kept the anonymity of each participant. The entire Qualtrics survey can be found in Appendix B.

Procedures Followed

Pre-testing of Survey Questionnaire

Before publicizing the survey, the study's committee members were sent a couple drafts and gave recommendations to the PI on what to change. This helped decrease the chances of confusion or misunderstanding of the material being asked for throughout the survey.

Institutional Review Board Protocols and Approval

Before publishing the questionnaire, approval from the Institutional Review Board, or IRB, was needed. The questionnaire was submitted, along with the research methods and procedures, to the IRB and was approved October 4, 2022, with the approval number of #15112.

Consent of Participants

The initial start of the survey asked participants whether they consented to the survey's guidelines, as well as if they were at least 18 years or older. If they answered 'no' to either or both of these questions, they were taken to the end of the survey. Participants who answered 'yes' were taken to the next page, which asked them whether they were currently working a full-time, 40 hour a week job. If participants answered 'yes', they were taken to the beginning of the survey's main content, where most participants completed all forty questions. If they answered 'no,' they were taken to the end of the survey.

Method of Contact

The primary method of contact was publishing the study's URL link, as well as a quick summary of the study's intent onto LinkedIn's website through the personal account of the PI. Using connections on LinkedIn, such as, professors, family members, and peers, to repost and reshare the PI's initial posting made it easier to spread awareness of the study's questionnaire to a much wider range of potential participants.

Data Analysis

When analyzing the study's data, the three research questions were viewed alongside the answers to the survey questions to discover any insight that would help formulate answers to the

research questions. The quantitative data received from the survey's questions provided statistical data relating to ways in which designers and architects can improve post-pandemic workplace satisfaction and productivity for employees. The quantitative data was analyzed using descriptive statistics to better understand the collected information from the survey helped to distinguish all relationships within the data itself.

Survey responses were collected through the online survey tool, Qualtrics, and data was extracted and analyzed using Excel. The anonymity of each participant was kept secure throughout the entire study and once the data was merged into Excel, only the PI and study contact had access to the file. First, the data was filtered by whether each participant completed the entire survey, and incomplete surveys were thrown out of the analysis. The survey data was analyzed by comparing means, where common themes were identified for the descriptive data. The survey data collected for the multiple-choice questions were organized contingent to the three main topics discussed in the study's literature review, which were the following: (1) Indoor Environmental Quality; (2) Privacy, Flexibility, and Functionality; (3) Biophilic Design Elements. The results helped provide answers to the research questions, as well as formulating additional ideas and questions for future related studies.

Thematic analysis was used to help quantify the qualitative data which came from the answers to the free response questions asked on the online survey. Each of these question's answers were read through numerous times to sort out any and all themes found within them that relate to the specific research questions being asked. These themes were then counted and tallied each time one was found in the qualitative data. This helped the PI understand the level of significance each theme carried over the research questions and study in general. The number of qualitative questions asked in the survey was kept to a limited amount to help keep the PI on

track to finish the research study, yet enough were asked to provide the PI with insightful, more in-depth answers from participants.

Conclusion

This chapter discussed step-by-step guidelines in detail on how the research study was conducted. The mixed methods approach taken for the study provided both qualitative and quantitative information, allowing for a better understanding of the research questions. The procedures followed for the survey questionnaire had started with the creation of the questions, which all came from the researched literature and gaps found throughout them. After the questions were created, the survey was sent a few times to the committee members for pre-testing. Upon confirmation to publish the survey, IRB consent and approval was needing completion. The survey was posted on the PI's LinkedIn website for participation of full-time working employees. Qualtrics had been used to create and collect the survey and its data, then transferred to Excel for further analysis. Thematic analysis was used to quantify the qualitative data to understand the different findings throughout the study's survey.

Chapter IV: Results

Introduction

The purpose of this study was to identify the ways in which workplaces can improve employee satisfaction and production after returning to the office from the COVID-19 pandemic. The study's methodology followed a mixed method approach, which used an online survey as the method. The online survey link was published publicly on the PI's personal LinkedIn and Instagram accounts. The population of this mixed method study were individuals who worked at home full-time during the pandemic. The sample ended with a total of 77 employees who have been connected with the author in the different media pages such as LinkedIn and Instagram.

Survey

Demographics of Samples

The total response count from the survey was 77; out of which, 48 responses were considered valid to use for this analysis. Table 3 below shows that 3 participants decided to answer 'no' in consenting to the questionnaire, while 26 chose not to finish the entire survey. The ages of participants ranged from 18 to 64. These ages varied closely, with the highest percentage at 37.5% for ages 24-34 years old. The other three ranges were the following: 18 to 24 totaled to 25%, 35 to 44 at 16.67%, and 45 to 64 at 20.83%. A total of 0.0% of survey participants were 65 years or older. The total percentage of male participants was 66.7% and female totaled 33.33%. The survey included two other gender options, which was 'a gender not listed here' and 'prefer not to state.' None of the participants chose either of these two options. Out of the 48 responses, 52.25% of full-time employees were single, 39.58% married, 4.17% were divorced, and none widowed. In addition, 77.08% of survey takers did not have children,

while 18.75% have 1 to 2 children, 4.17% have 3 to 5. The participants who have children were asked where their children go during the workday. A majority, 61.54% to be exact, answered that their children were at school. An equal amount, 7.69% for both, answered that their children were at home with a family member or at daycare. The remaining percentage, 23.08%, answered 'other' to the whereabouts of their children during their work hours. These people briefly described that their children were now grown adults. Lastly, the participants were asked whether they care for and/or house an elderly relative at their home. Out of the 48 total responses, only 2 people (4.17%) answered 'yes' to caring for an older relative. Two other participants answered that they 'occasionally' provide care for a relative, leaving 44 people (91.67%) answering 'no.'

Table 3

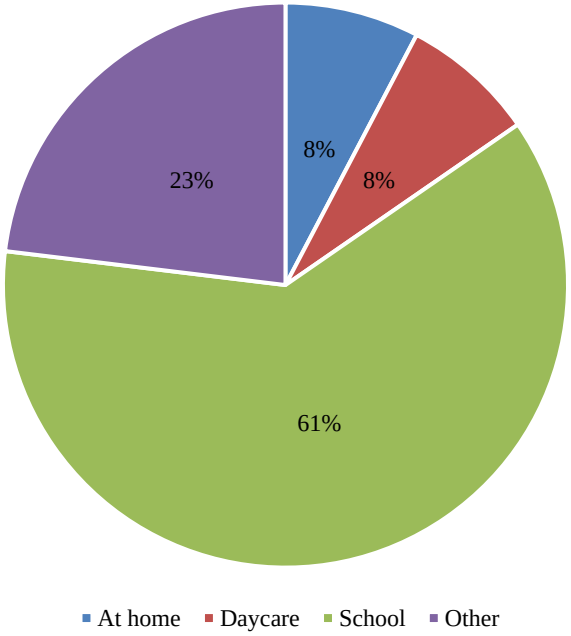
Demographics

Demographic Characteristics	Frequency	Percent
Age		
18-24	12	25.00
25-34	18	37.50
35-44	8	16.67
45-64	10	20.83
65+	0	0.0
Gender		
Male	32	66.7
Female	16	33.33
Marital Status		
Single	27	56.25
Married	19	39.58
Divorced	2	4.17
Widowed	0	0.0
Children		
1-2	9	18.75
3-5	2	4.17
6+	0	0.0

None	37	77.08
Caring for Elderly Relatives		
Yes	2	4.17
No	44	91.67
Occasionally	2	4.17

Figure 1

Location of Children While Working from Home



Essential Work-Related Questions

This next section of the survey followed after demographics. This section intended to ask participants about basic work-related questions like their weekly work schedule. When asked how long participants worked from home during the COVID-19 pandemic, Figure 2 shows that 36.36% of people had spent their workdays in their home office. The second most common period of time people spent working from home ranged between one to six months at a total of 29.55% of participants. Only 18.18% of the group had worked from home for a range of six months to one year. Lastly, 15.91% had worked from home for a few weeks to one month.

Figure 2

Period of Time Participants Worked from Home

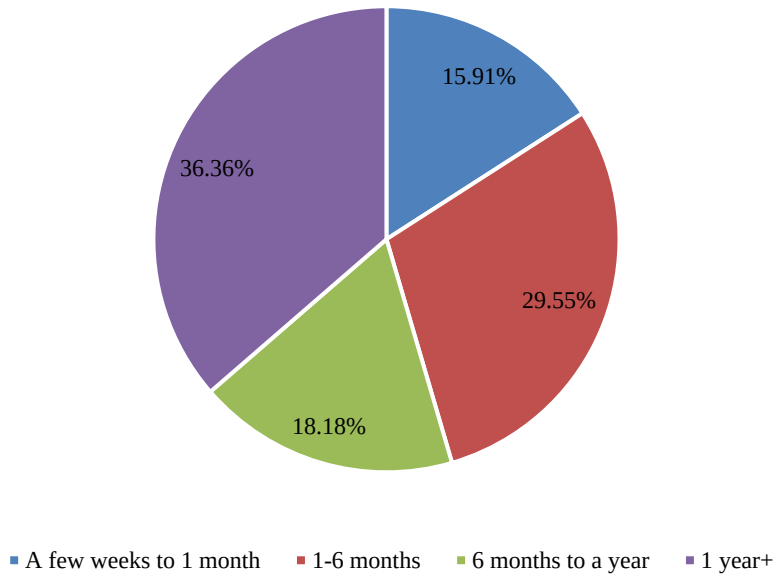


Figure 3 illustrates most of the participants, 67%, were working five days per week. 31% of people who answered said that they work more than five days a week. Only 2% work an average of one to two days and none work three to four days. In addition, Figure 4 shows that a majority, 52%, work nine hours or more a day. A total of 48% work around six to eight hours each day. No one from the group works less than five hours per day.

Figure 3

Number of Days Worked per Week

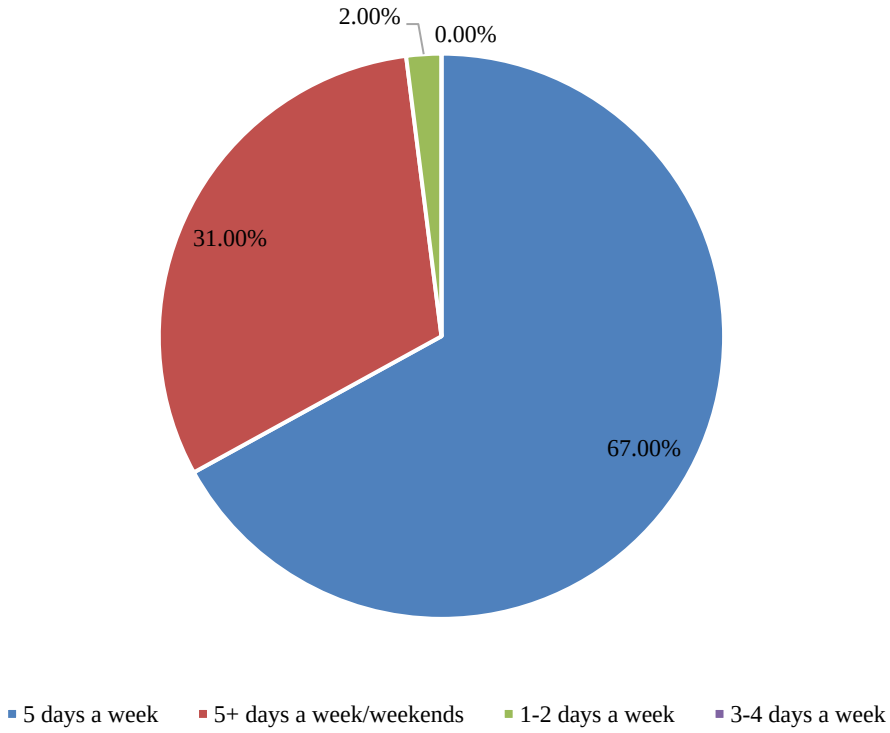


Figure 4

Hours Worked per Day

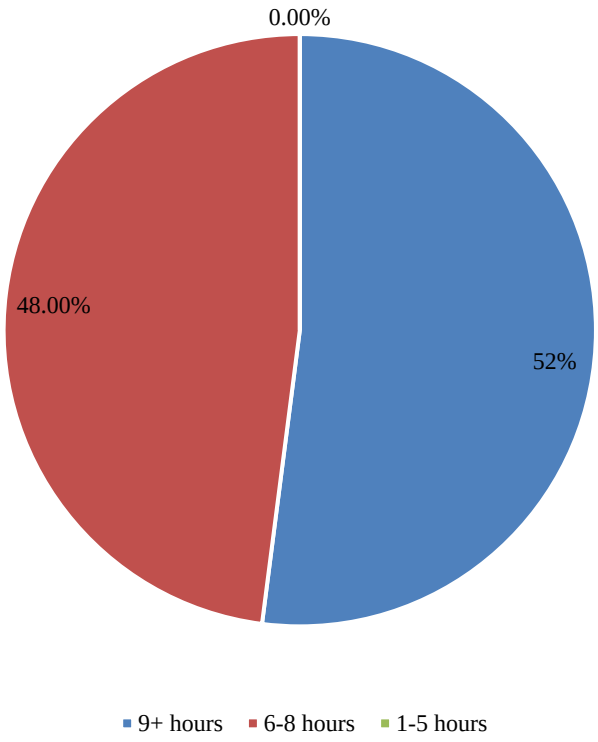


Figure 5 below shows the results of a question pertaining to work location preference. Only 8.33% specified working fully remote and 10.42% chose fully in-person. The bulk of the group, 60.42%, preferred a typical hybrid schedule, where the person would theoretically spend their time equally between the company's office and within their own home. The fourth preference totaled 20.83%, which was to work an occasional hybrid schedule ranging anywhere from just a few days at home every few weeks to a few scattered days at home throughout an entire month.

Table 4 displays the quantity of times a particular theme was discovered in the data collection and was organized into each of the four different work location preferences inquired in Figure 5. The themes related to these answers are the following: Better mental health/wellness, company culture/collaboration, convenience/efficiency, flexibility, more productivity/less distractions, save money/time, and socialization. The most favored theme observed in this collection of data relating to those who favored the option of 'fully in-person' was the conveniency and efficiency they felt at the workplace as opposed to when conducting work from their home. One of the explanations for this theme was that the participant preferred "…being at the office…" as they explained it was "…easier to handle files." The most common theme discovered for the option of 'fully remote' concluded the same favored theme as 'fully in-person' which was the conveniency and efficiency relating to remote working. One the descriptive responses favoring this theme for 'fully remote' stated that "it is very convenient to work from home. A lot of careers can be done at home." For the weekly hybrid preference, the most popular theme related to the savings of money and time of employees. In addition, a theme that was a close runner up for this work location preference is observed to be the levels of conveniency and efficiency felt. Lastly, the most common theme relating to the work location preference of

‘occasionally hybrid’ showed to be that participants felt they were more productive and less distracted with a schedule like so. Reference the table in Appendix C for all written responses to survey question #13.

Figure 5

Preferred Work Location (WFH, Fully Remote, or Hybrid)

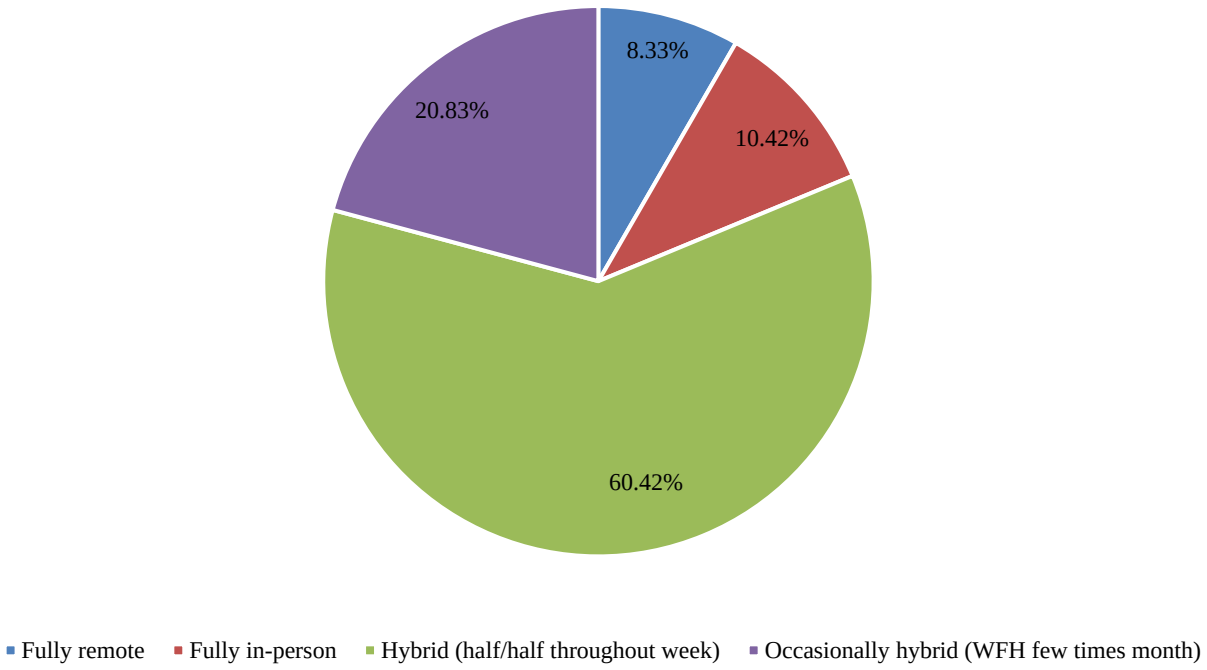


Table 4

Tallied Data Themes for Explanations on Preferred Work Location (Reference Appendix C)

Theme	Fully In-Person	Fully Remote	Hybrid (i.e., half/half throughout the week)	Occasionally hybrid (i.e., 1-2 times a week/month)
Better mental health/ wellness	0	1	1	2
Company culture/ collaboration	2	0	8	2
Convenient/efficient	3	3	11	2
Flexibility	0	1	9	3
More productive/ less distracted	2	1	9	4
Save money/time	0	0	12	1
Socialization	1	0	6	0

Figure 6 shows the number of times each theme was presented in participant responses. The data was sorted by the following themes: Better mental health and wellness, company collaboration and socialization, convenience and efficiency, flexibility, more productive and less distracted, and lastly, save money and time.

The results showed a majority of the participants favored the conveniency and efficiency levels experienced. A few examples found in the written responses related to the fact that participants saved gas, could sleep in longer, be around family and friends, and complete small tasks such as laundry or packaging deliveries. These were just a few of the examples found within the descriptive data provided by the survey participants. Reference the table in Appendix D for all written responses to survey question #15.

Figure 6

Tallied Data Themes for Positives of WFH (Reference Appendix D)

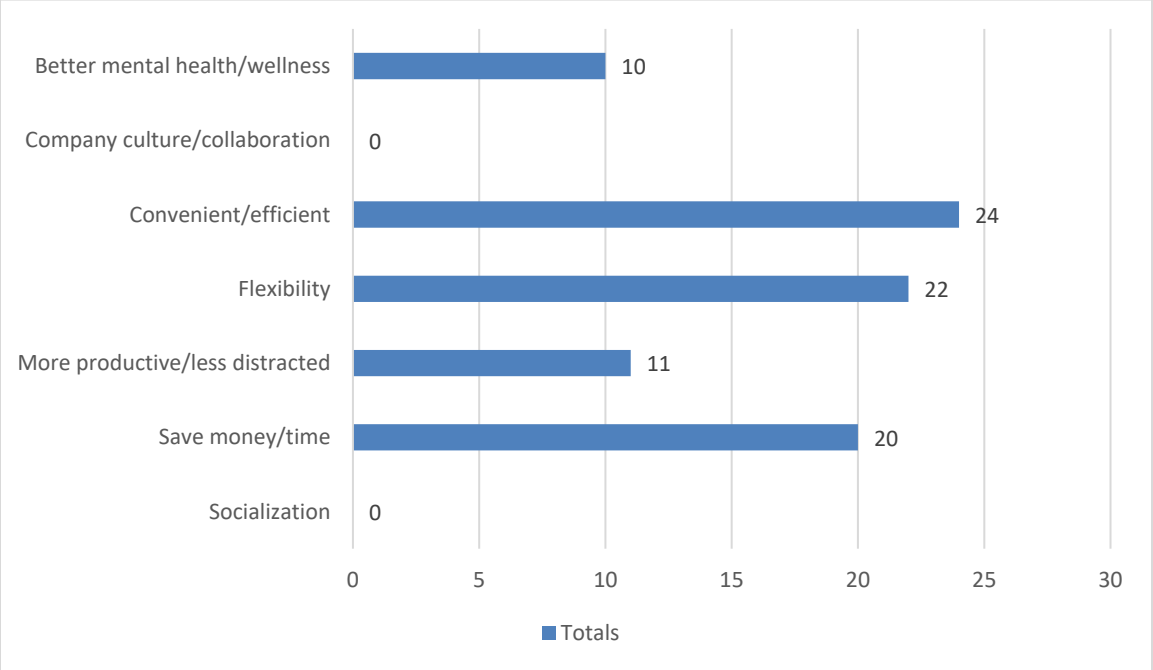
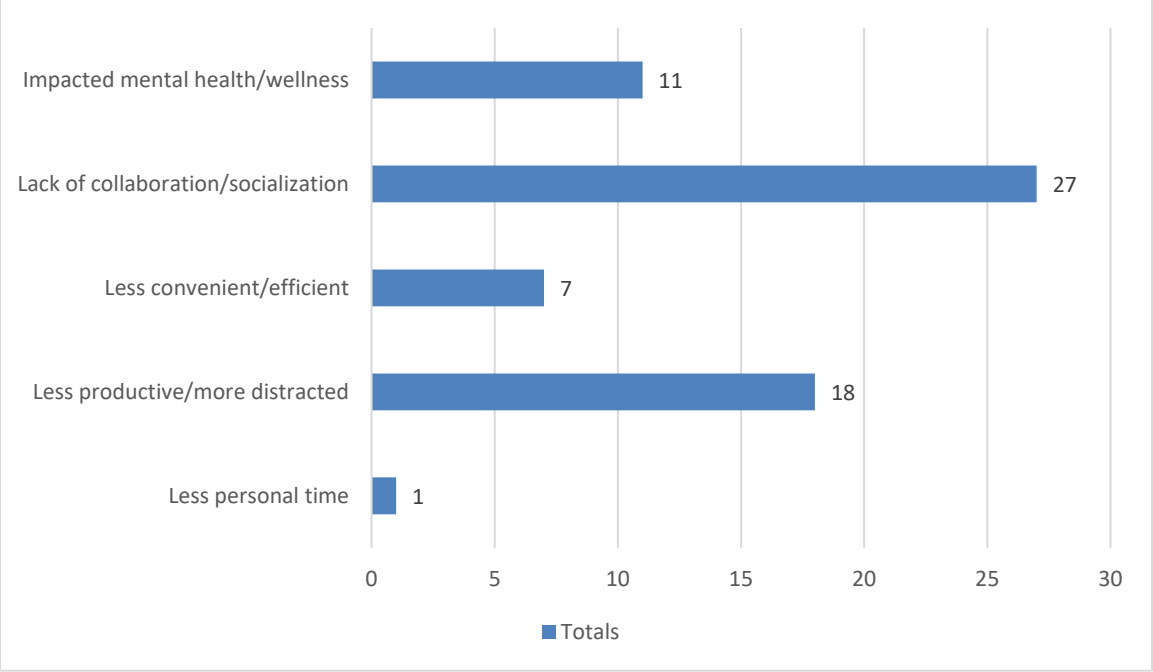


Figure 7 shows the number of times each theme was presented in participant responses. The themes discovered were the following: Impacted mental health and wellness, lack of collaboration and socialization, less convenient and efficient, less personal time, and lastly, less productive and more distracted.

The most common theme relating to the negative aspects of work-from-home resulted in a discovery that participants found remote working lacked collaboration and socialization amongst coworkers. A common response relating to this specific theme was that participants felt they were 'isolated' while working from home and that the lack of coworker interaction affected their mental health and well-being. Reference the table in Appendix E for all written responses to survey question #16.

Figure 7

Tallied Data Themes for Negatives of WFH (Reference Appendix E)



WFH vs. RTO: Freedom and Flexibility

Figure 8 shows the majority siding with the option of strongly agreeing to the statement. A much smaller percentage of the group, precisely 18.75%, felt they somewhat agreed with having a wider range of freedom where they reside. A total of 4.17% neither agreed, nor disagreed and only 2.08% had somewhat agreed. No one strongly disagreed with the statement.

Figure 8

Freedom while Working from Home (i.e., Workouts, music, lunch break)

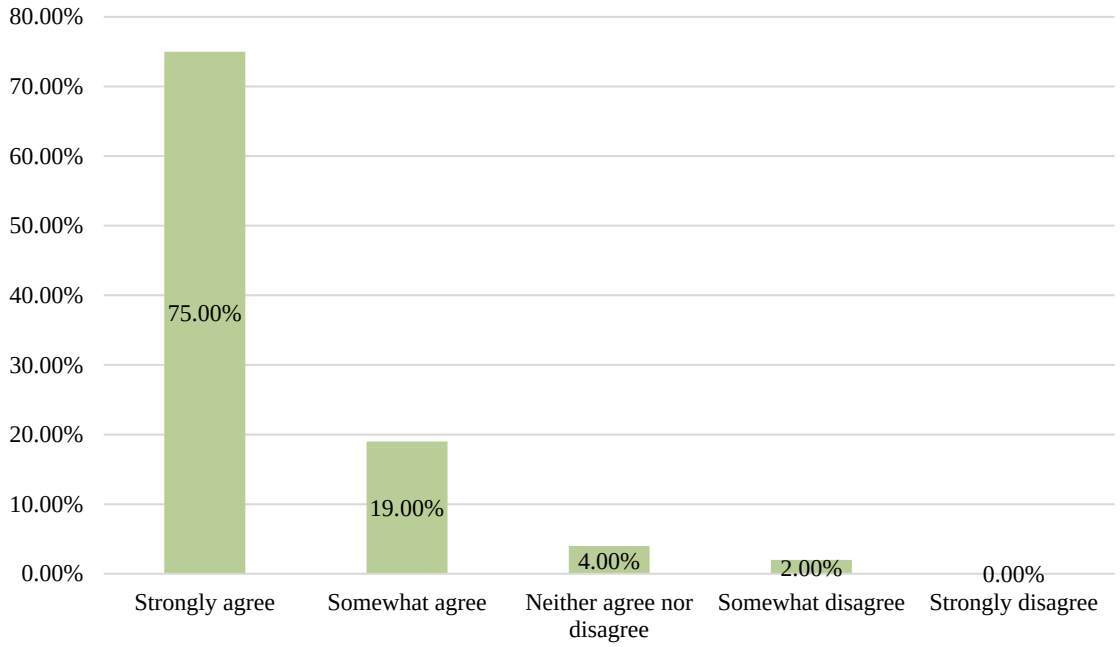
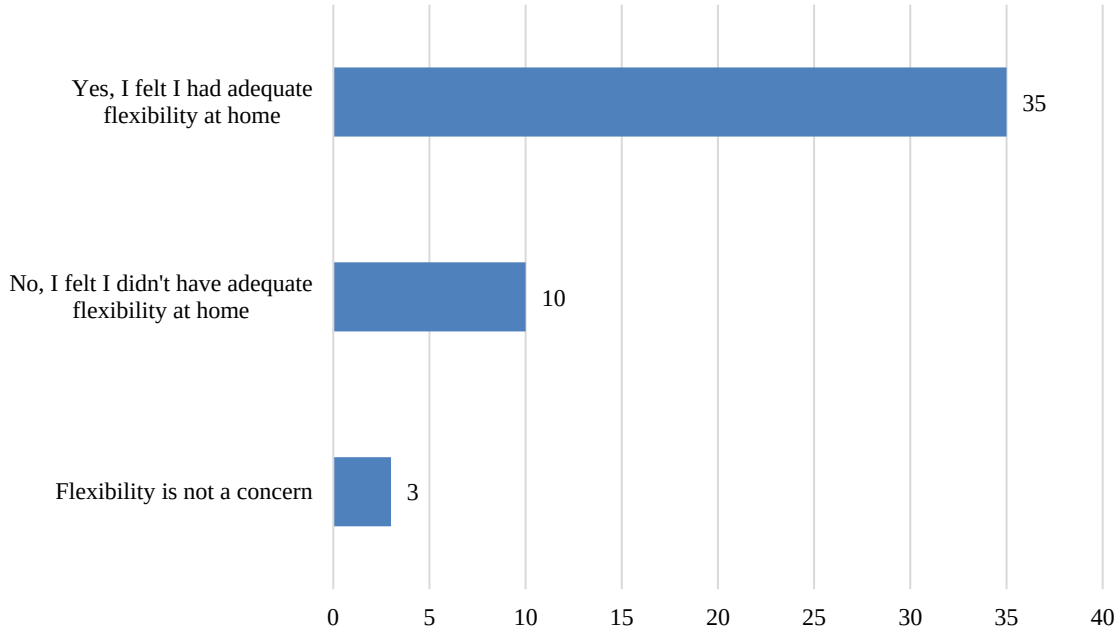


Figure 9 depicts that the majority of participants, which was a total of 35 out of 48, felt satisfied with the amount of flexibility while working from their residence. A total of 10 did not think they had enough flexibility. Only 3 people felt flexibility was not a concern to them.

Figure 9

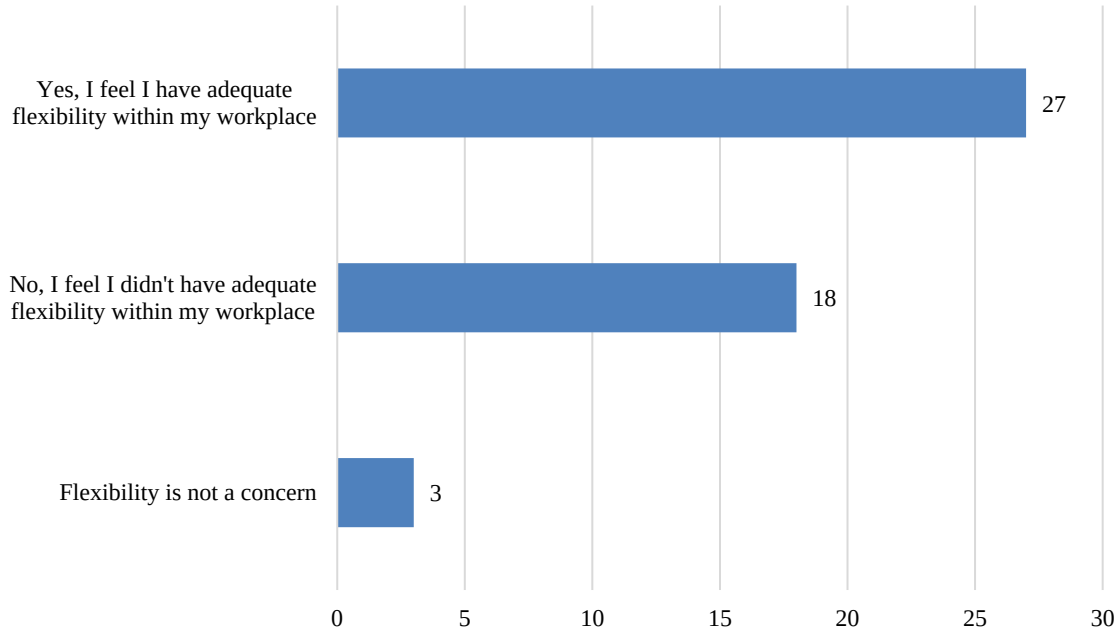
WFH Flexibility to Work in Different Locations



In Figure 10, there were 27 respondents who were satisfied with the flexibility they have to work in different locations within their office's workplace. A total of 18 who did not agree, while 3 felt flexibility was of no concern to them.

Figure 10

Flexibility to Work in Different Locations After Returning to Office (Post-Pandemic)

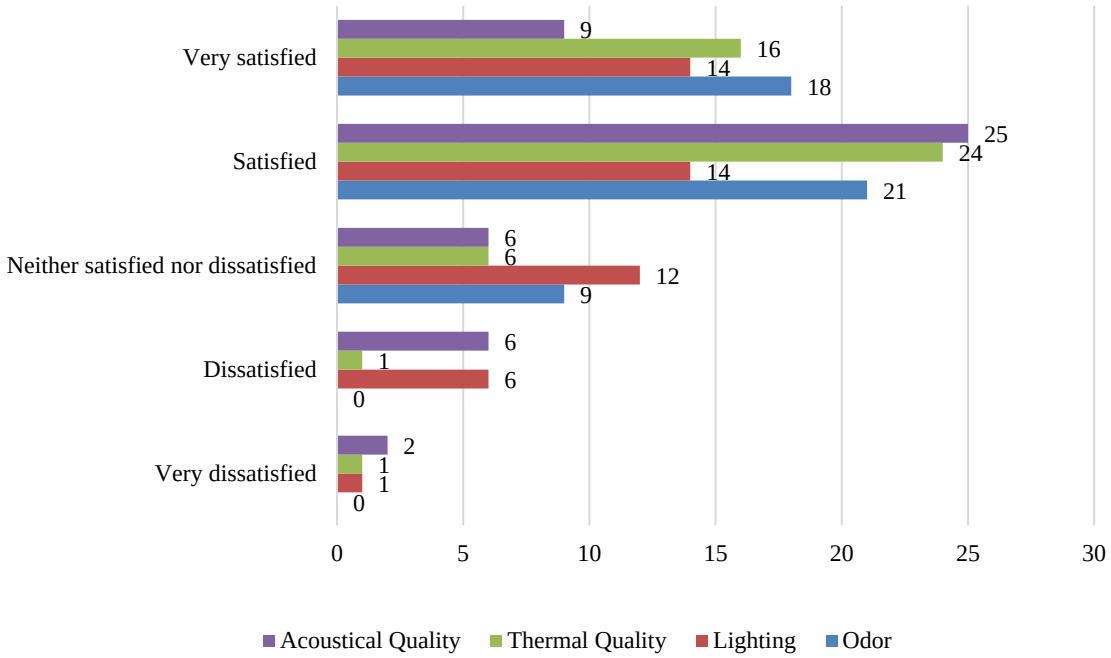


WFH vs. RTO: Indoor Environmental Quality

The next section questioned the participant's level of satisfaction regarding four specific indoor environmental qualities of their home office space. Figure 11 shows that odor was the first quality, with 18 people very satisfied, 21 satisfied, 9 indifferent, and zero for both dissatisfied and very dissatisfied. The next quality was lighting, where both satisfied and very satisfied tied with 14 people each. 12 participants felt indifferent, while 6 were dissatisfied and 1 person very dissatisfied. For thermal quality, the majority felt satisfied with their home office temperature, while 16 felt very satisfied. There were 12 participants who felt indifferent, 1 that felt dissatisfied, and 1 very dissatisfied. The last quality, regarding acoustics, had a total of 9 people very satisfied and 25 people satisfied. There were 6 people who felt indifferent, as well as 6 who were dissatisfied. Only 2 people felt very dissatisfied with their at-home office acoustics.

Figure 11

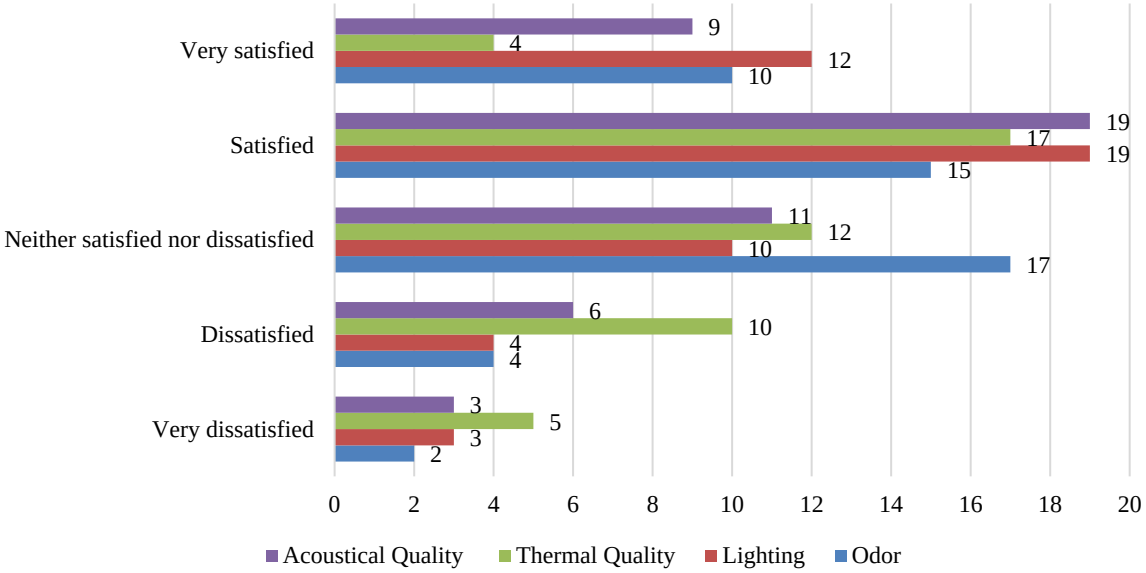
Satisfaction of WFH Office Environment



Similar to the questions raised in Figure 11, Figure 12 depicts the same questions over indoor environmental quality, but specifically after participants returned to work post-COVID-19 pandemic. For the quality of odor in workplaces, 10 people were very satisfied, 15 satisfied, and 17 neither satisfied nor dissatisfied. There were only 4 participants who felt dissatisfied and 2 who were very dissatisfied. Workplace lighting averaged similar numbers to odor, with 12 very satisfied, 19 satisfied, 10 indifferent, 4 dissatisfied and 3 very dissatisfied. There were only 4 people who felt very satisfied with their office's thermal quality upon returning post-pandemic, however, 17 felt satisfied. A total of 12 felt indifferent, with 10 dissatisfied and 5 very dissatisfied with the thermal air quality. Lastly, the acoustical qualities held, compared to odor and lighting quality results, a similar total of 9 participants feeling very satisfied. The majority of the group felt satisfied with the lighting in their workplace upon their pandemic return, with a total of 19. There were 11 participants who felt indifferent, 6 who felt dissatisfied and 3 very dissatisfied. In summary, majority of participants are satisfied with the lighting of their post-pandemic workplace environment. In addition, the majority of the participants are satisfied with the acoustic and light qualities of their post-pandemic workplace.

Figure 12

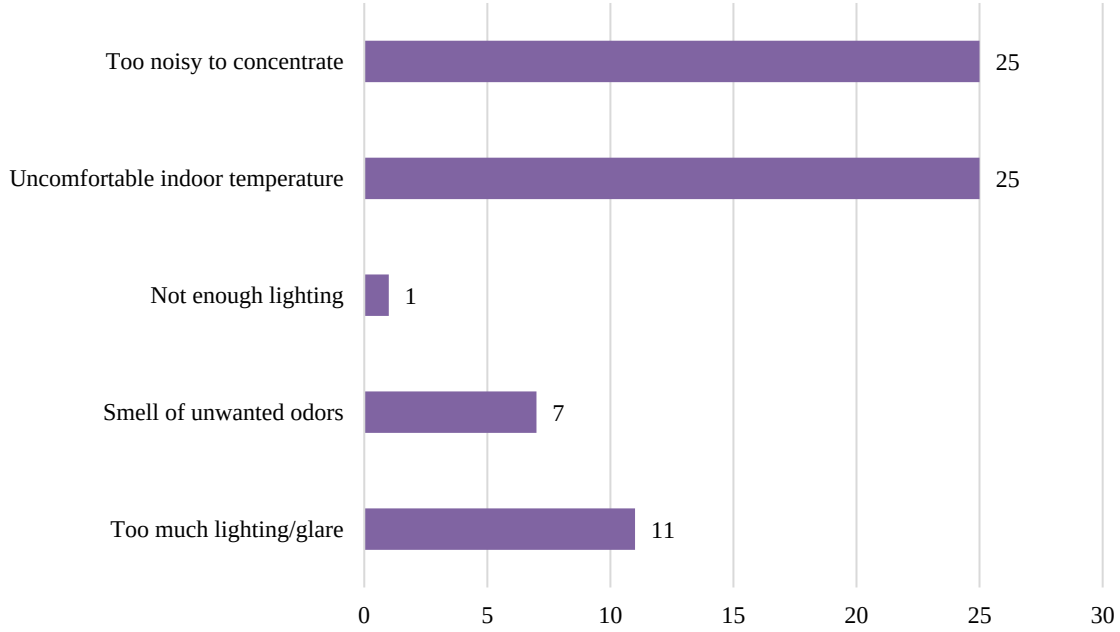
Satisfaction of Workplace Office Environment (Post-Pandemic)



Upon returning to the office, participants were asked what factors, if any, negatively contributed to their level of work productivity. They were able to choose any or all that they felt applied to them. Figure 13 shows the following findings. Firstly, a total of 25 people felt their workplace was too noisy upon their return from the pandemic. There were also 25 who felt uncomfortable due to the indoor air temperature. Only 1 respondent felt there was a lack of lighting and 7 who continuously smelt unwanted odors. Lastly, 11 participants felt there was often too much lighting, as well as glare throughout the office.

Figure 13

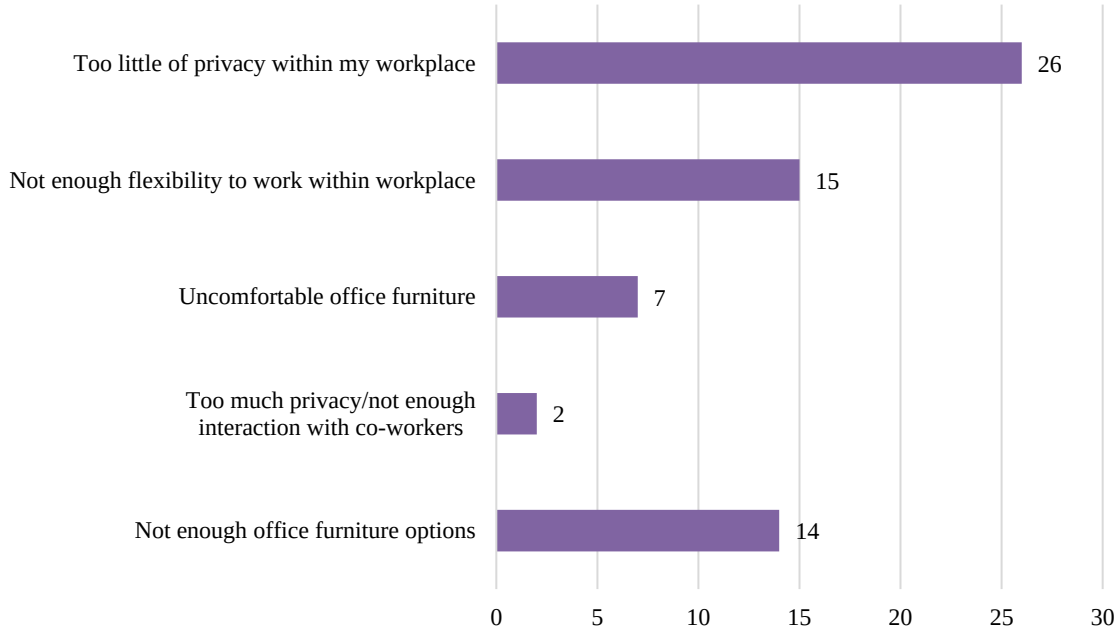
Negative Contributors to Productivity Once Returning to the Workplace (Post-Pandemic)



The same question was asked to the respondents, however, this time with a different list of potential negative productivity contributors to select from. Figure 14 shows that there was a total of 26 people who felt their workplace did not provide enough privacy for them. In addition, an inadequate amount of flexibility to work in different places throughout the workplace had 15 respondents unsatisfied. 7 people felt that a lack of office furniture comfortability led to less work productivity. A small number of the group, 2, felt there was too much privacy throughout the office building, often leading to a lack of interaction with co-workers. Lastly, 14 believed their company's office lacked furniture options.

Figure 14

Negative Contributors to Productivity Once Return-to-Office (Post-Pandemic)

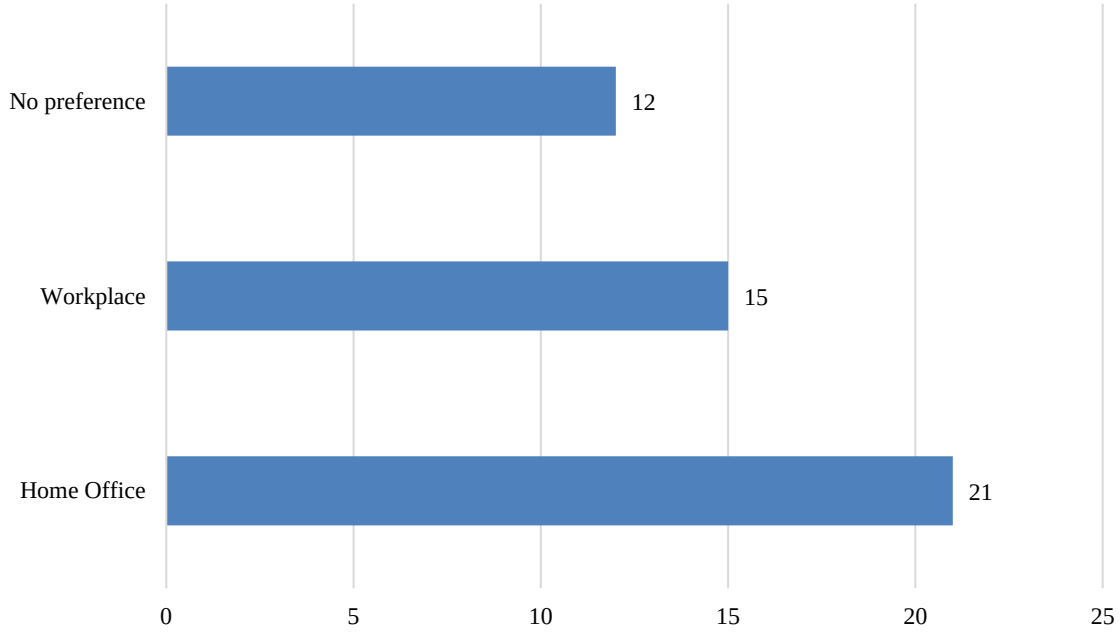


WFH vs. RTO: Lighting

The participants were asked about their lighting preference, whether they preferred the quality of light at home or at their workplace. The most popular preference was the lighting participants have at their at-home office, with a total of 21, as seen in Figure 15. Following closely, 15 people decided they would choose their workplace lighting over their home office. There were 12 people having no lighting preference between the two locations.

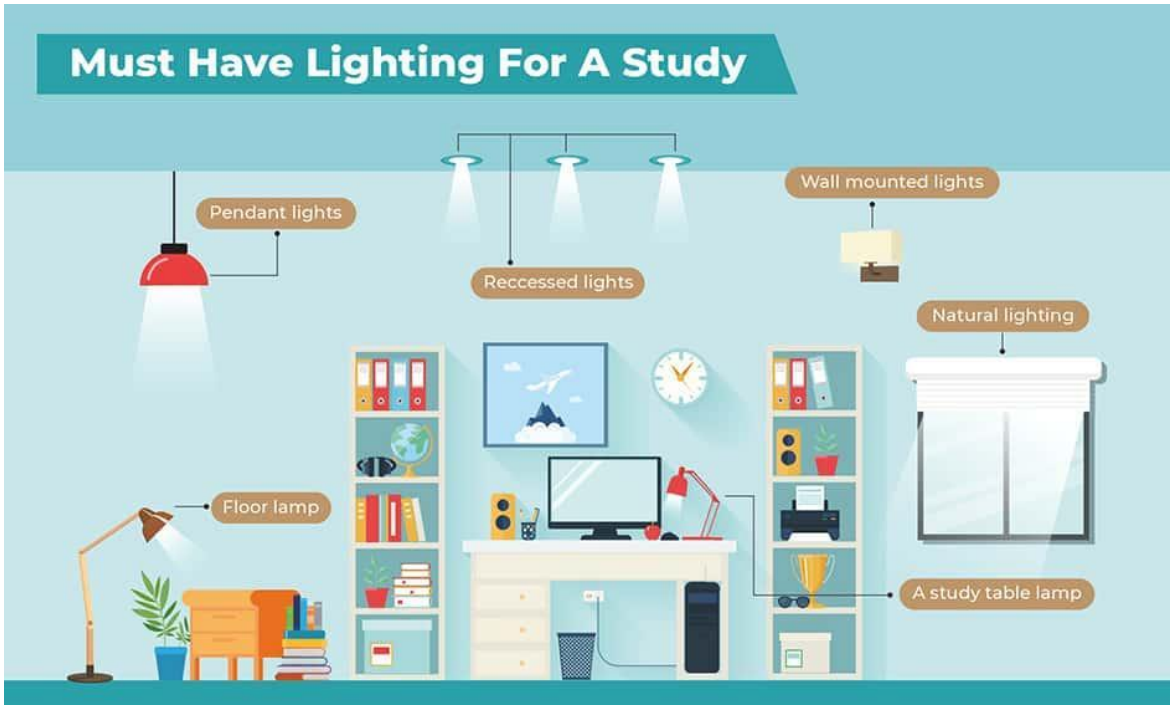
Figure 15

WFH vs. Workplace Lighting Preference



The next question on lighting preferences gave respondents an image depicting different light fixtures, each labeled with the fixture's name for reference. Refer to Figure 16. From the illustration, participants could clearly choose any or all preferred fixtures. A majority of participants, 52.08%, selected natural daylight and the second highest amount, 25%, selected recessed lighting. Pendants were chosen by 4.17% and 2.08% for wall mounted. A total of 0.0% felt they needed task lighting and 12.5% had no preference. See Figure 17 for this information.

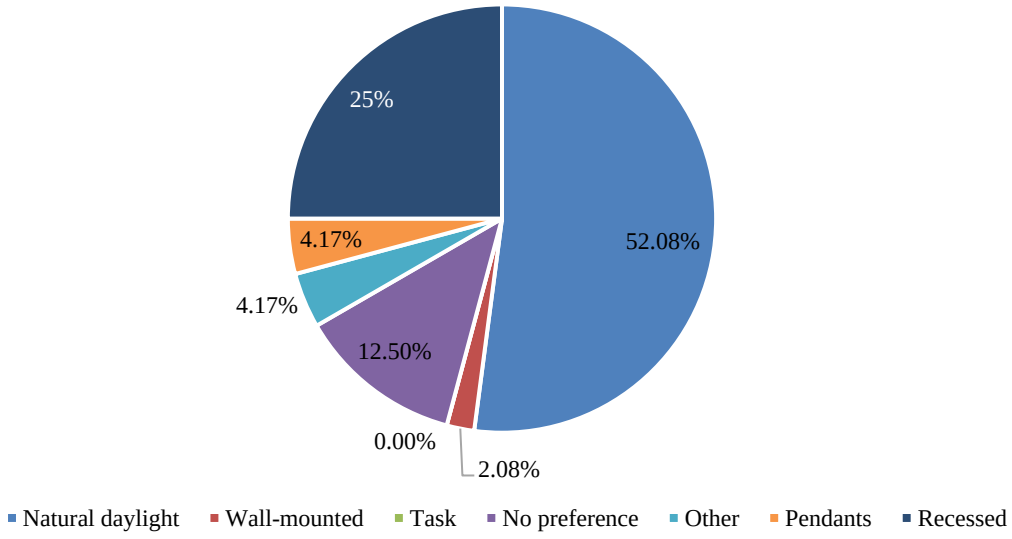
Figure 16



Source: A Guide to Study Room Lights | Design Cafe https://www.gsdjagkj.ml/ProductDetail.aspx?iid=190026678&pr=38.88

Figure 17

Lighting Fixture Preferences within Office Space

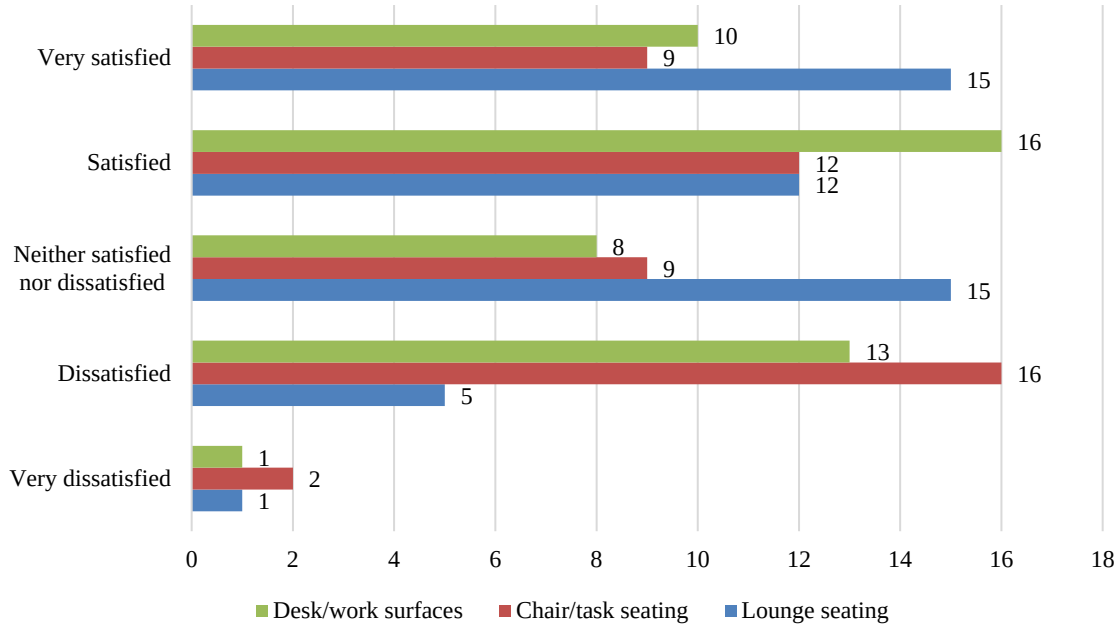


WFH vs. RTO: Furniture and Surface Space

When questioned about the level of satisfaction relating to office furniture while working from home, respondents were given three different furniture types to rate, which can be seen listed out in Figure 18. The first dealt with desks and overall work surfaces, which had a total of 10 respondents very satisfied, 16 satisfied, 8 indifferent, 13 dissatisfied, and 1 very dissatisfied. The second type of furniture focused on were chairs and task seating, where 9 were very satisfied, 12 satisfied, 9 indifferent, 16 dissatisfied, and 2 very dissatisfied. The final type was lounge seating, with a total of 15 very satisfied, 12 satisfied, 15 indifferent, 5 dissatisfied, and 1 very dissatisfied. Overall, majority of participants were dissatisfied with their chair at home, however, majority were satisfied with their desk and work surfaces.

Figure 18

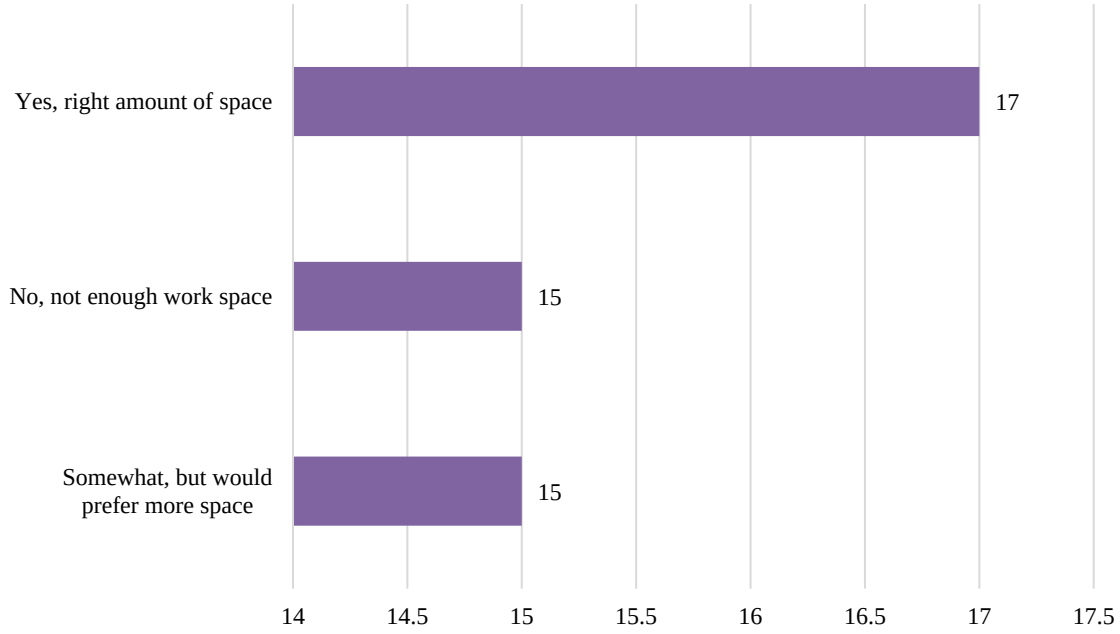
Satisfaction of WFH Office Furniture



The survey specifically asked participants to describe how they felt about the amount of workspace they had while working from home. Although all close in quantity, the option with the highest number at 17 was that yes, respondents did have enough work surface. There were 15 people, both disagreeing with the statement about having enough workspace, as well as somewhat agreeing, yet preferring they had more. See Figure 19 for these results.

Figure 19

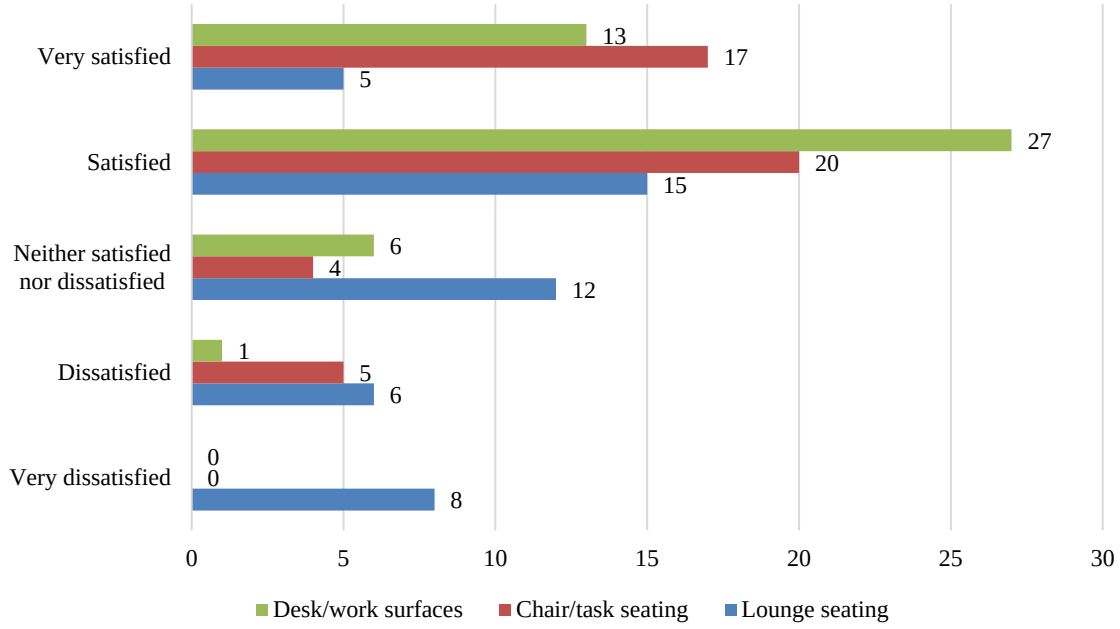
Satisfaction of WFH Work Surface Space



As seen in Figure 20, respondents were also asked to select their level of satisfaction with the three furniture types after returning to their company's offices. Desk and work surfaces had totals of 13 respondents very satisfied, 27 satisfied, 6 indifferent, 1 dissatisfied, and no one dissatisfied. As for chair and task seating, a total count of 17 respondents were very satisfied, 20 satisfied, 4 indifferent, 5 dissatisfied, and zero dissatisfied. Lastly, lounge seating had 5 respondents very satisfied, 15 satisfied, 12 indifferent, 6 dissatisfied, and 8 very dissatisfied. Similar to the WFH results previously discussed in Figure 19, Figure 20 below shows that a majority of participants felt satisfied with their desk and work surface space after returning to the post-pandemic workplace.

Figure 20

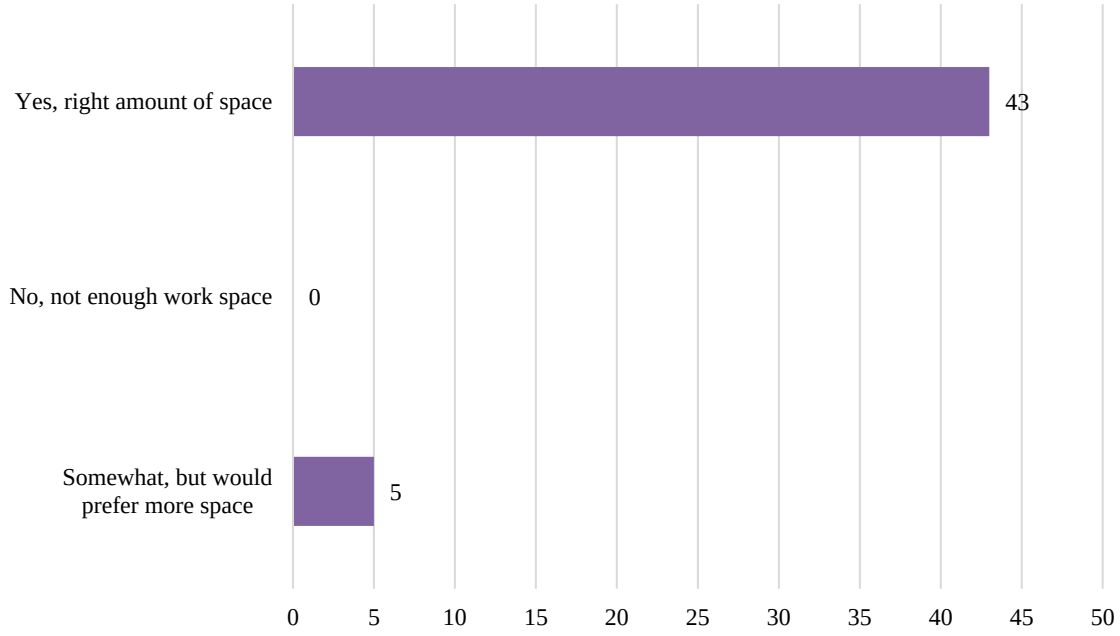
Satisfaction of Office Furniture After Returning to the Office (Post-Pandemic)



Upon returning to the office, an overwhelming number of respondents were satisfied with the amount of surface space their workplace is able to give to them, totaling 43 out of 48 total participants. In addition, zero disagreed with having enough workspace and only 5 ‘somewhat’ agreed. This information can be seen graphically in Figure 21.

Figure 21

Satisfaction of Work Surface Space After Returning to Office (Post-Pandemic)



WFH vs. RTO: Privacy

With the aid of Gensler's Winter 2021 U.S. Workplace Survey, respondents selected which choice described their current overall work environment in terms of privacy. Figure 22 shows that there were 10 people who selected their current work environment was totally open and 13 working within a mostly open space. Additionally, 7 work in a space which is somewhat open, 8 mostly private, and 3 totally private.

Figure 22

Current Overall Work Environment in Terms of Privacy (Source: Gensler U.S. Workplace Survey Winter 2021)

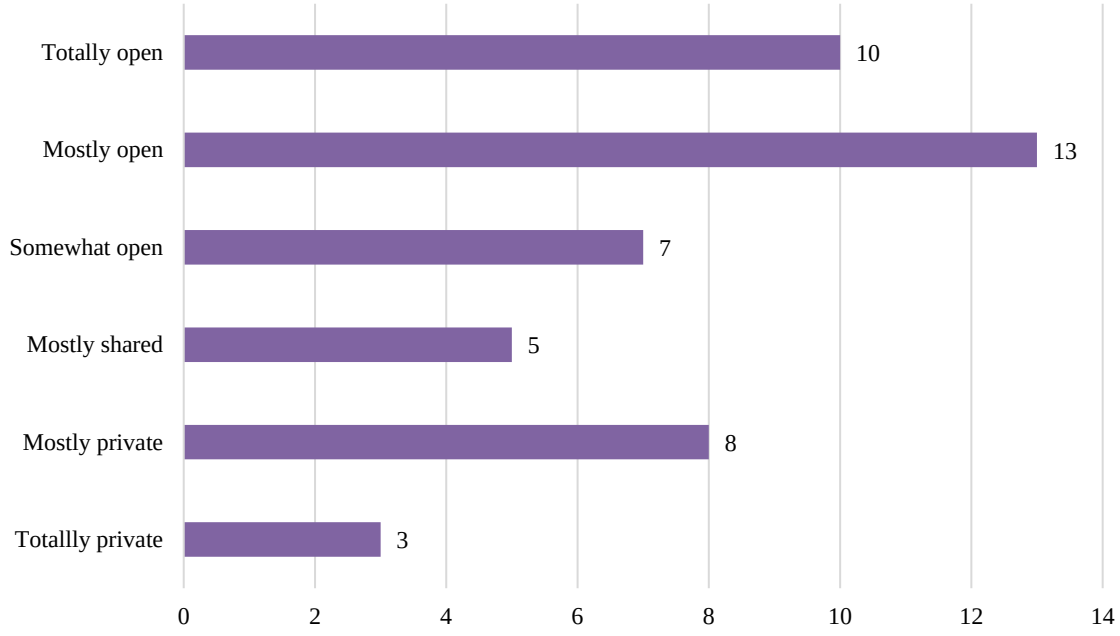
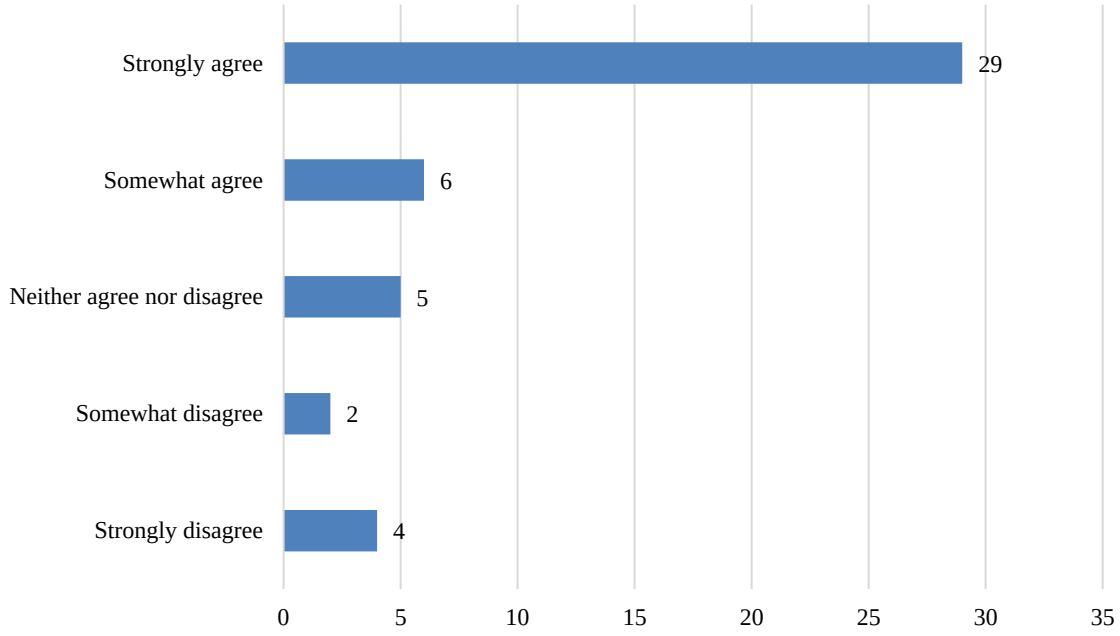


Figure 23 depicts a majority of respondents, precisely 29, strongly agreed that their home office included more privacy than their company's office. Furthermore, 6 participants somewhat agreed, 5 indifferent, 2 somewhat disagreed and 4 strongly disagreed.

Figure 23

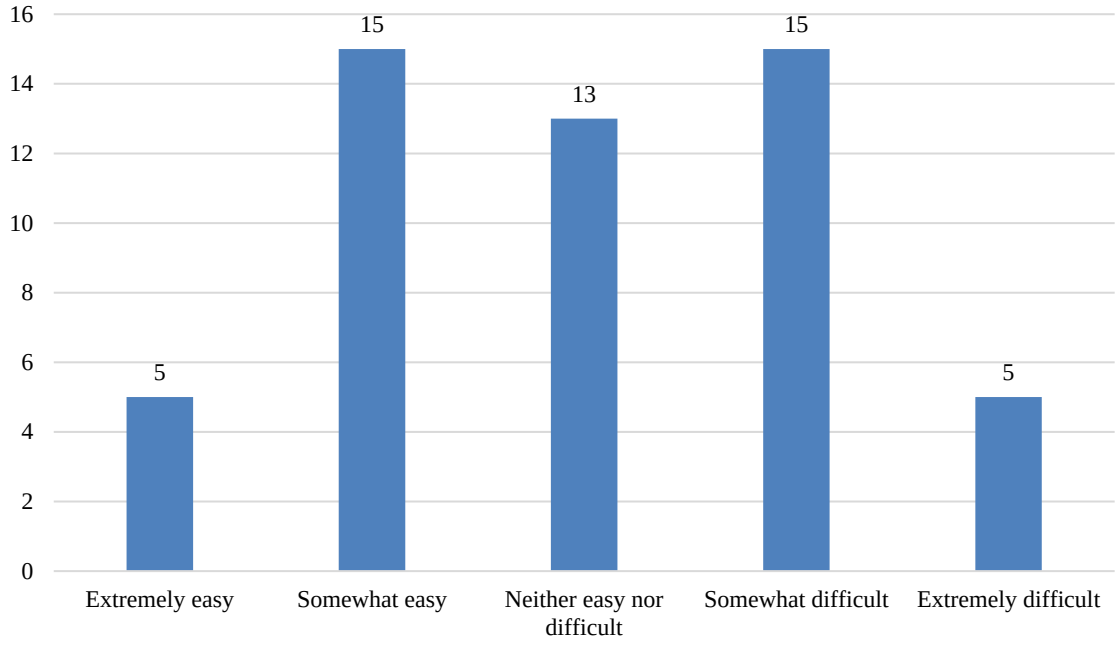
More Privacy in WFH Office than Workplace Office



In regard to the level of difficulty finding privacy upon workplace returns, there was a tie of 15 responses for both the somewhat easy and somewhat difficult options. The runner up had 13 people who felt they were indifferent. Another tie was seen between extremely easy and extremely difficult with 5 responses each. This information is graphically organized in Figure 24.

Figure 24

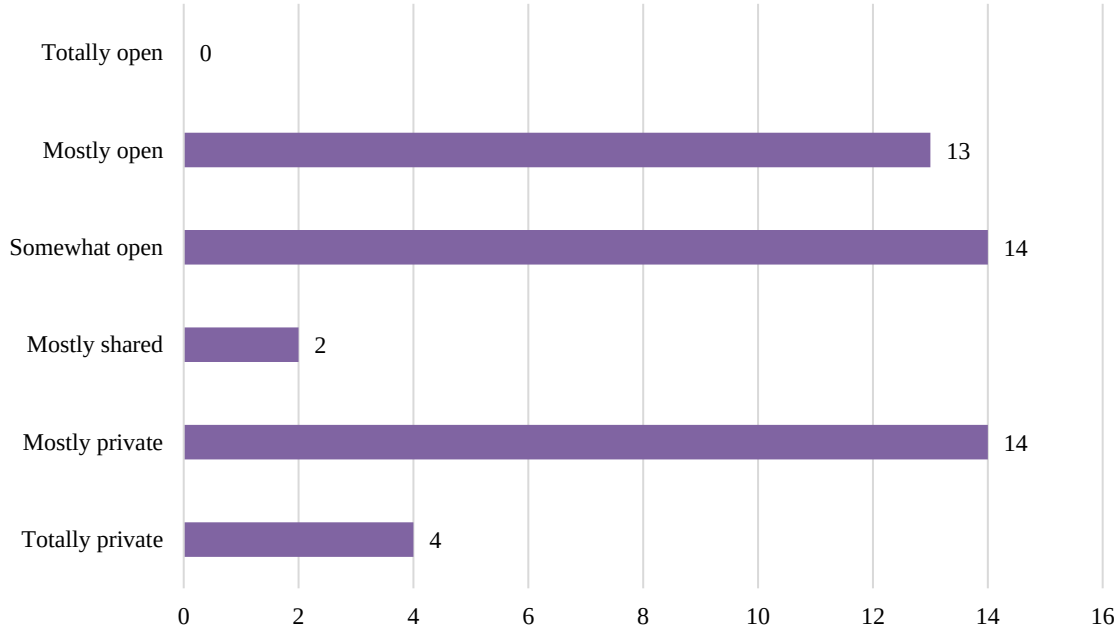
Level of Difficulty Finding Privacy After Returning to the Office



Using the Winter 2021 U.S. Workplace Survey created by Gensler, Figure 25 shows that zero respondents preferred a totally open office for their ideal environment, however, there were 13 who wished for a mostly open office plan. There was a total of 14 respondents for both options of somewhat open and mostly private offices. Only 4 liked the idea of totally private space and 2 decided on a space in which would be mostly shared.

Figure 25

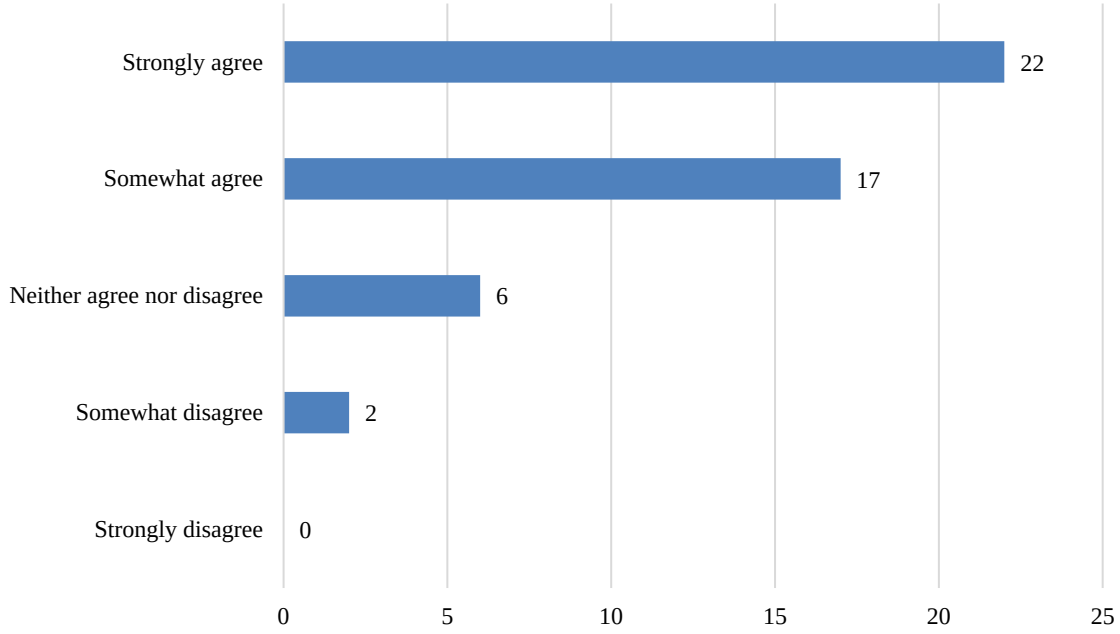
Ideal Overall Work Environment (Source: Gensler U.S. Workplace Survey Winter 2021)



With the idea that workplaces could consider supplementary informal meeting spaces throughout the office for things like personal phone calls and telehealth appointments, Figure 26 depicts a total of 22 respondents strongly agreed to the idea and 17 somewhat agreed. There were only 6 who felt indifferent and 2 who somewhat disagreed. This left a total of zero who strongly disagreed.

Figure 26

Employee Satisfaction and Production Benefitting from Additional Informal Meeting Spaces within the Workplace (i.e., personal phone calls, informal work meetings, appointments, etc.)



WFH vs. RTO: Biophilic Design Elements

The main biophilic elements, consisting of greenery, animals, water, natural scents, natural lighting, and outdoor air, were listed for respondents to rank each in terms of their satisfaction within their home office.

Figure 27 depicts occupant satisfaction relating to the presence of greenery within respondents' home office. A total of 31.25% felt they were satisfied and 20.83% very satisfied. Additionally, 25% felt indifferent, 18.75% dissatisfied, and 4.17% very dissatisfied.

Figure 27

WFH: Occupant Satisfaction of Biophilic Design Elements

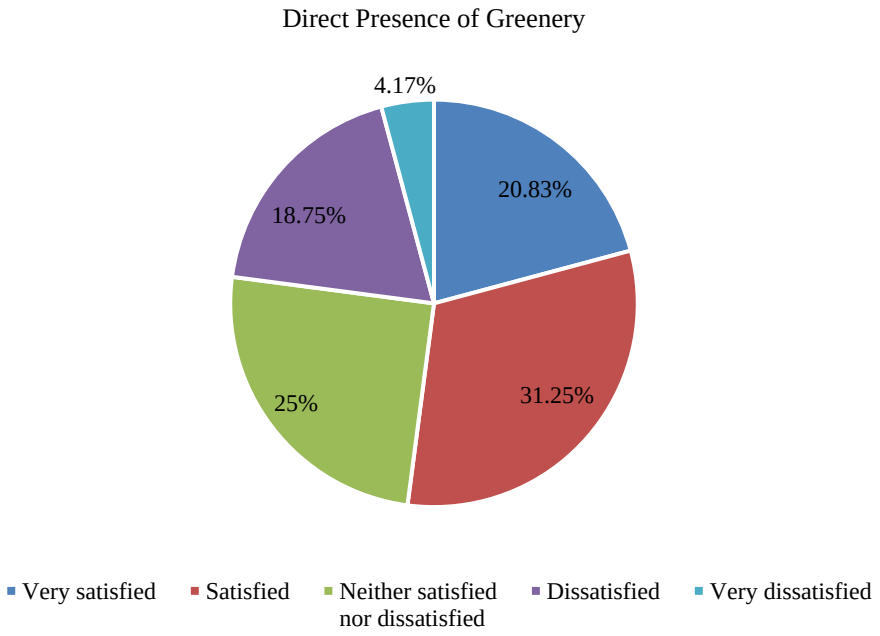
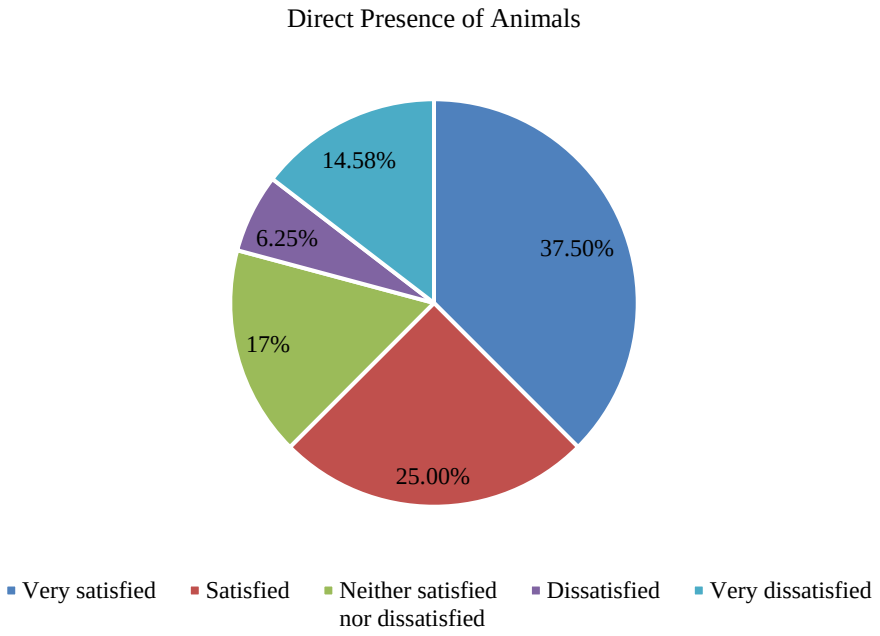


Figure 28 shows that the second element dealt with occupant satisfaction regarding the direct presence of animals. There were 37.5% very satisfied, as well as an additional 25% satisfied with the presence of animals they experienced while working. Furthermore, 17% felt indifferent, 14.58% dissatisfied, and 6.25% very dissatisfied.

Figure 28

WFH: Occupant Satisfaction of Biophilic Design Elements



Shown in Figure 29, only 10.42% of participants were very satisfied with the amount of water features visibly present while working from home during the pandemic, however, a larger number, 22.92%, were satisfied. The greatest amount averaged to 40% of respondents feeling indifferent about the specified element. The percentage of people who were dissatisfied with the direct presence of water was 16.67% and 10.42% very dissatisfied.

Figure 29

WFH: Occupant Satisfaction of Biophilic Design Elements

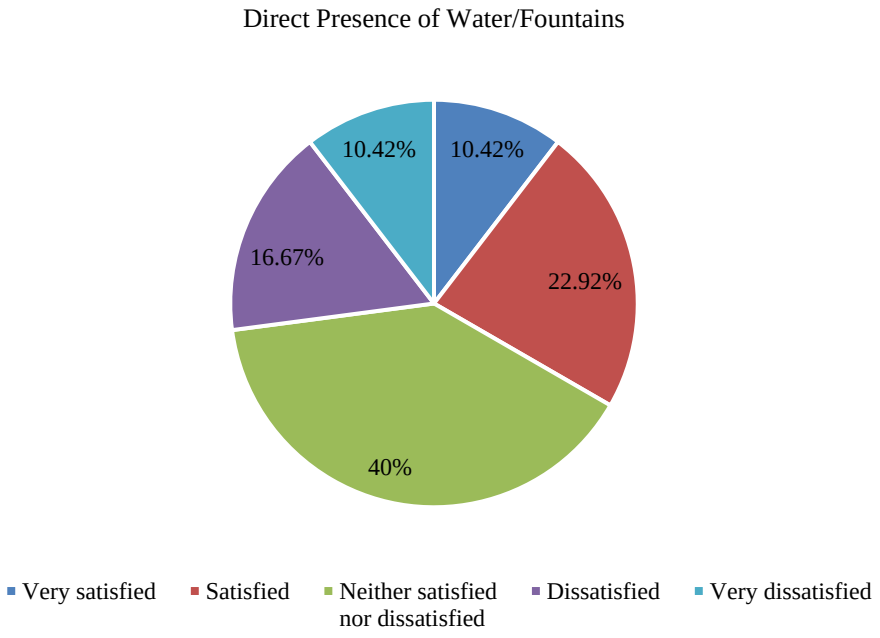


Figure 30 shows that when observing the range of satisfaction levels with relation to the direct presence of natural scents, there were 14.58% very satisfied, 37.5% satisfied, 27.08% indifferent, 12.5% dissatisfied and 8.33% very dissatisfied.

Figure 30

WFH: Occupant Satisfaction of Biophilic Design Elements

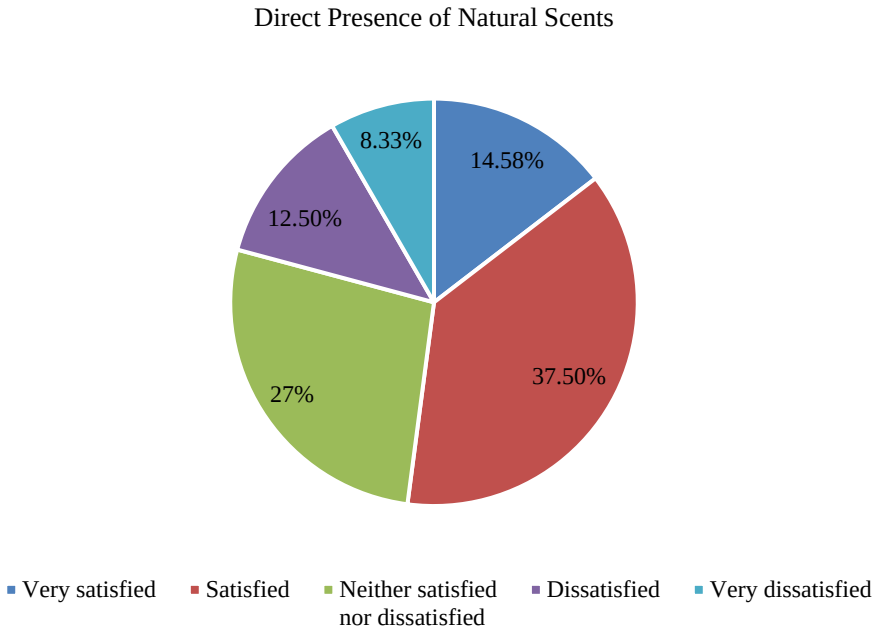


Figure 31 represents occupant satisfaction levels of natural lighting within home offices. 29.17% felt very satisfied, 47.92% satisfied, 16.67% indifferent, 2.08% dissatisfied and 4.17% very dissatisfied.

Figure 31

WFH: Occupant Satisfaction of Biophilic Design Elements

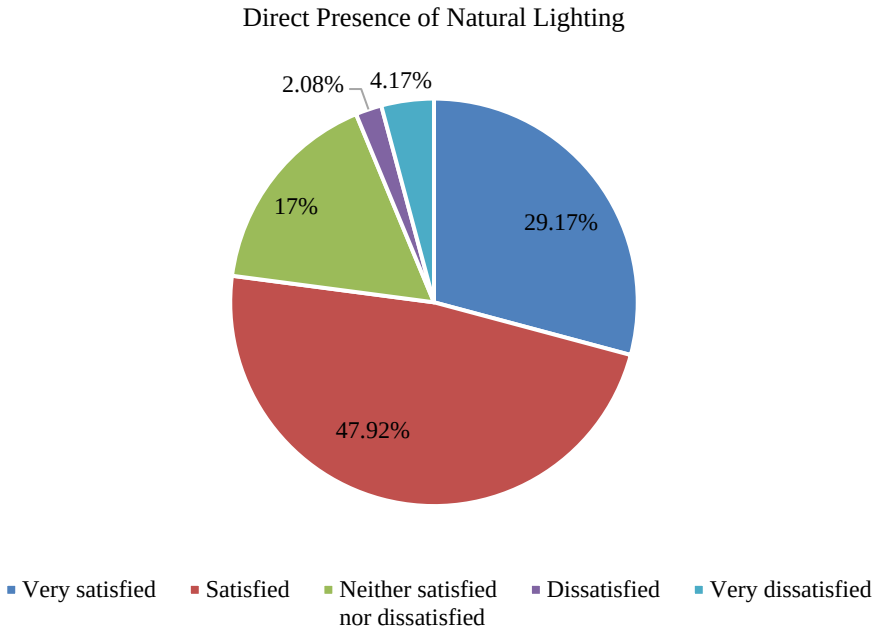
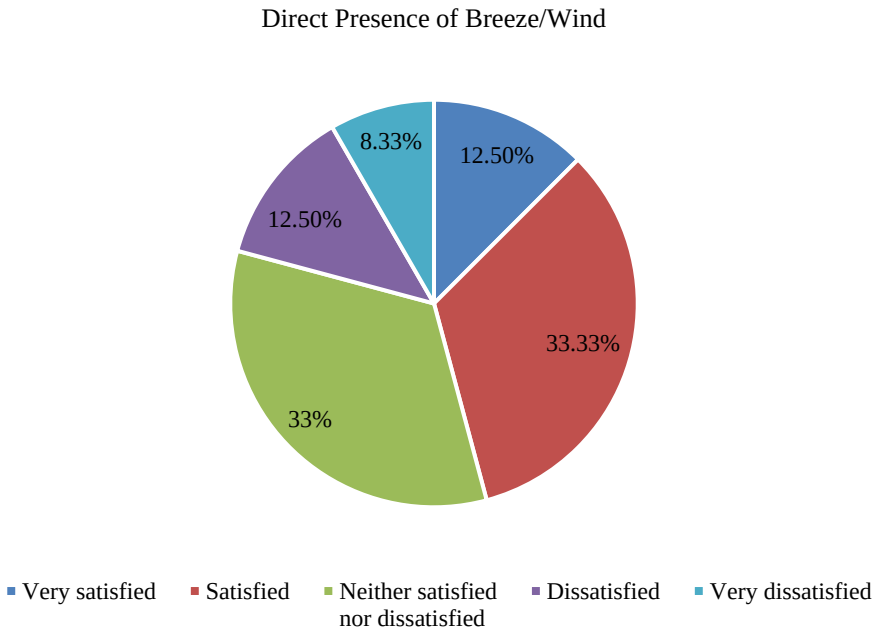


Figure 32 shows the level of satisfaction of respondents for the sixth biophilic element, which was natural breeze and wind. A total of 12.5% were very satisfied, while a much larger proportion of 33.33% decided they were satisfied with the direct presence they had to the element. The same number of satisfied participants, 33%, felt they were indifferent towards the topic. Lastly, 12.5% were dissatisfied along with 8.33% very dissatisfied.

Figure 32

WFH: Occupant Satisfaction of Biophilic Design Elements



Participants were then asked about their overall appreciation of any biophilic design elements present while working from home. Figure 33 represents the following information. The majority of respondents, 78.72%, appreciated the elements present while working from home, while 4.26% did not feel a sense of appreciation. There were 17.02% who were unable to access any biophilia at home.

Figure 33

Biophilic Appreciation While WFH

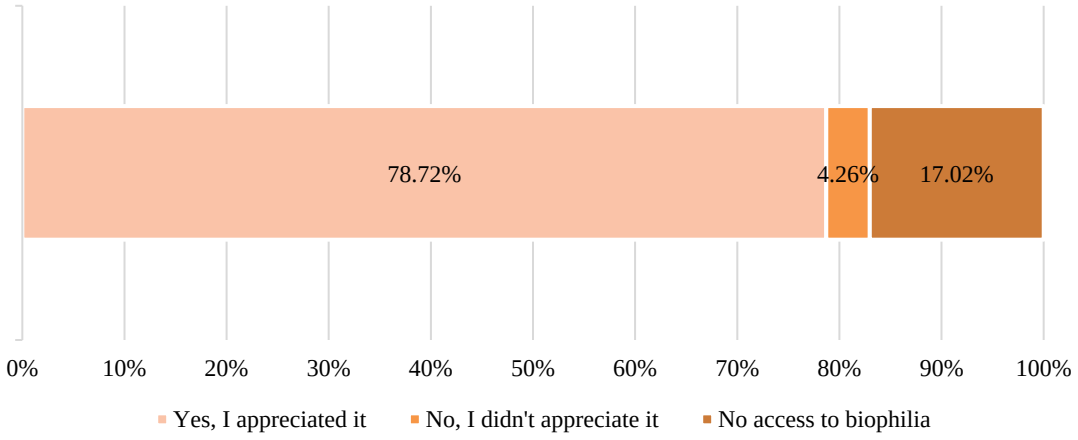


Figure 34 depicts the respondent results when asked to describe their level of satisfaction relating to any or all direct presence of the six main biophilic design elements. Starting with the satisfaction of greenery and foliage present within the workplace, only 2 respondents felt very satisfied. In addition, 12 were satisfied, 11 indifferent, 14 dissatisfied and 8 very dissatisfied. Satisfaction with the presence of animals was zero very satisfied, 2 satisfied, 13 indifferent, 18 dissatisfied and 14 very dissatisfied. The next element was water, which had 4 very satisfied, 7 satisfied, 15 indifferent, 10 dissatisfied and 11 very dissatisfied. Natural scent ended with totals of only 3 very satisfied, 8 satisfied, 16 indifferent, 12 dissatisfied and 8 very dissatisfied. Lastly, the element of outdoor breeze and wind rang in totals of zero very satisfied, 4 satisfied, 17 indifferent, 12 dissatisfied and 13 very dissatisfied. The most prominent biophilic design element participants were dissatisfied with was the lack of animal presence after returning to the post-pandemic workplace.

Figure 34

Satisfaction of Direct Presence of Biophilia After Return-to-Office

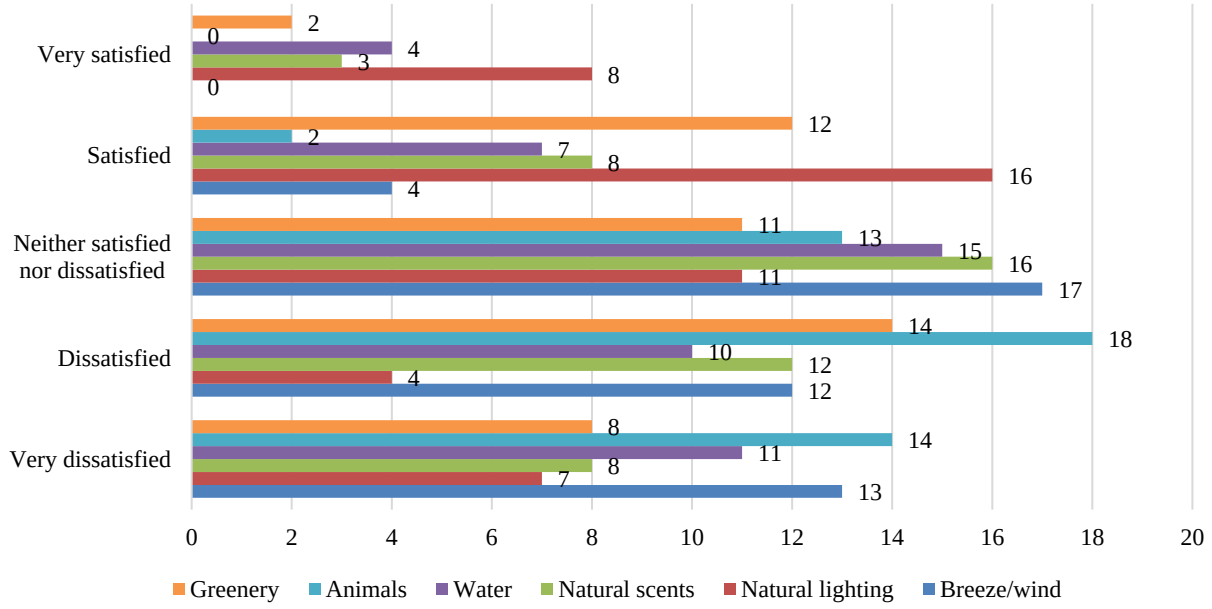
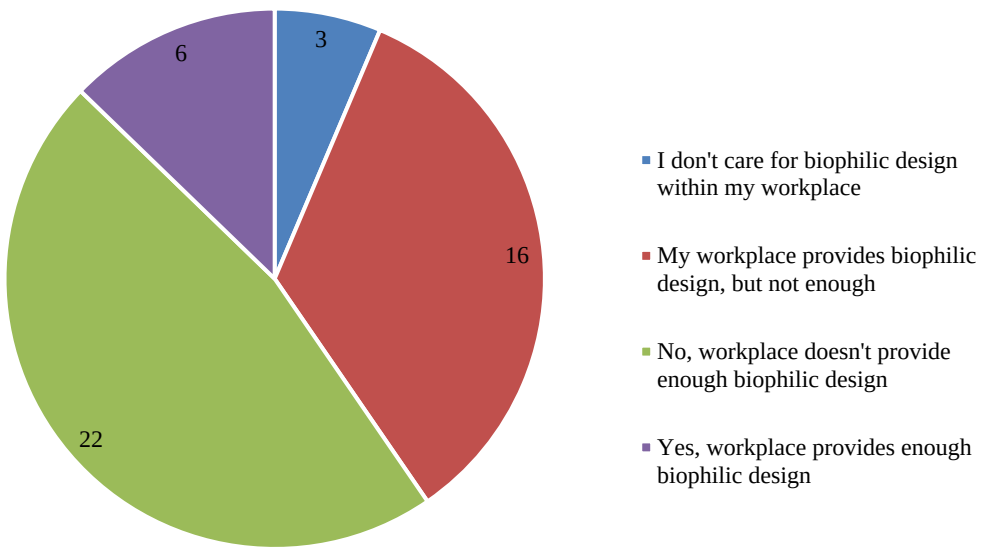


Figure 35 shows a question relating to the topic of biophilic incorporation upon returning to the office averaged its highest number of respondents, at 22, answering that they did not have enough biophilic incorporation. There was then a total of 16 people who felt their workplace included some, but not enough biophilia within the office. Only 6 felt their workplace provided a satisfying amount of biophilia and 3 who felt indifferent with the overall topic.

Figure 35

Biophilic Incorporation Upon Return-to-Office



Respondents answered with their opinions regarding the incorporation of accessible biophilic design within the workplace. Figure 36 depicts a total of 28 participants who liked the thought of their office having copious amounts of sunlight beaming in. For the implementation of natural color schemes throughout the interior office materials, such as bamboo, wood, and neutral tones, 20 people were fond of the idea. There were 30 people who felt they would enjoy having greenery and foliage easily visible. Adding accessible means to outside air and breeze had 27 in favor and, following this idea, 33 desire an outdoor courtyard and/or garden area attached to the office building. A much lower, yet still significant number of respondents, 16 specifically, considered a sensory refuge area such as a quiet or dark room could be of benefit. Lastly, 21 deemed accessible water sounds or features could also add value to the workplace.

Figure 36

Accessible Biophilic Design Elements to Incorporate into Workplace

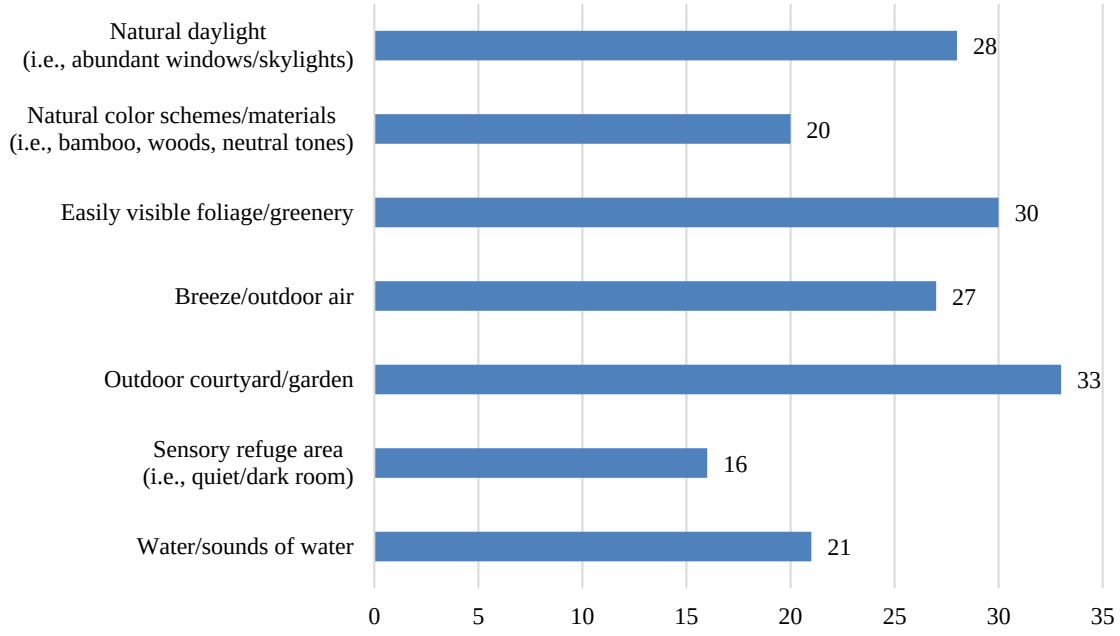
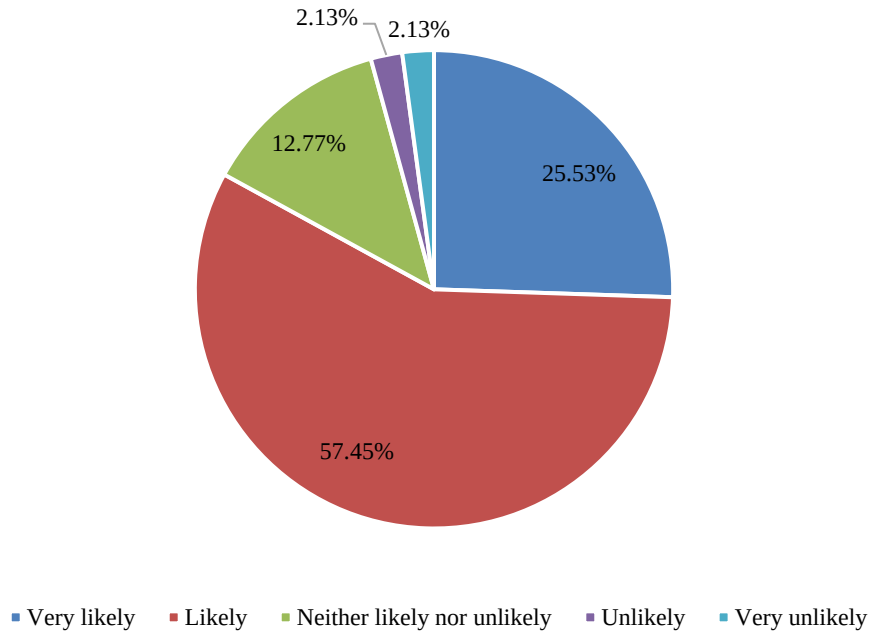


Figure 37 shows the majority of respondents, totaling 57.45%, decided that the incorporation of biophilia into the workplace would likely enhance their mood and productivity towards work-related tasks. There were then 25.53% who felt that biophilia would very likely benefit them while at work. Additionally, 12.77% were indifferent and 2.13% felt unlikely, as well as very unlikely to benefit from biophilic design elements in their company's office.

Figure 37

Likelihood of Biophilia in the Workplace Enhancing Mood & Productivity



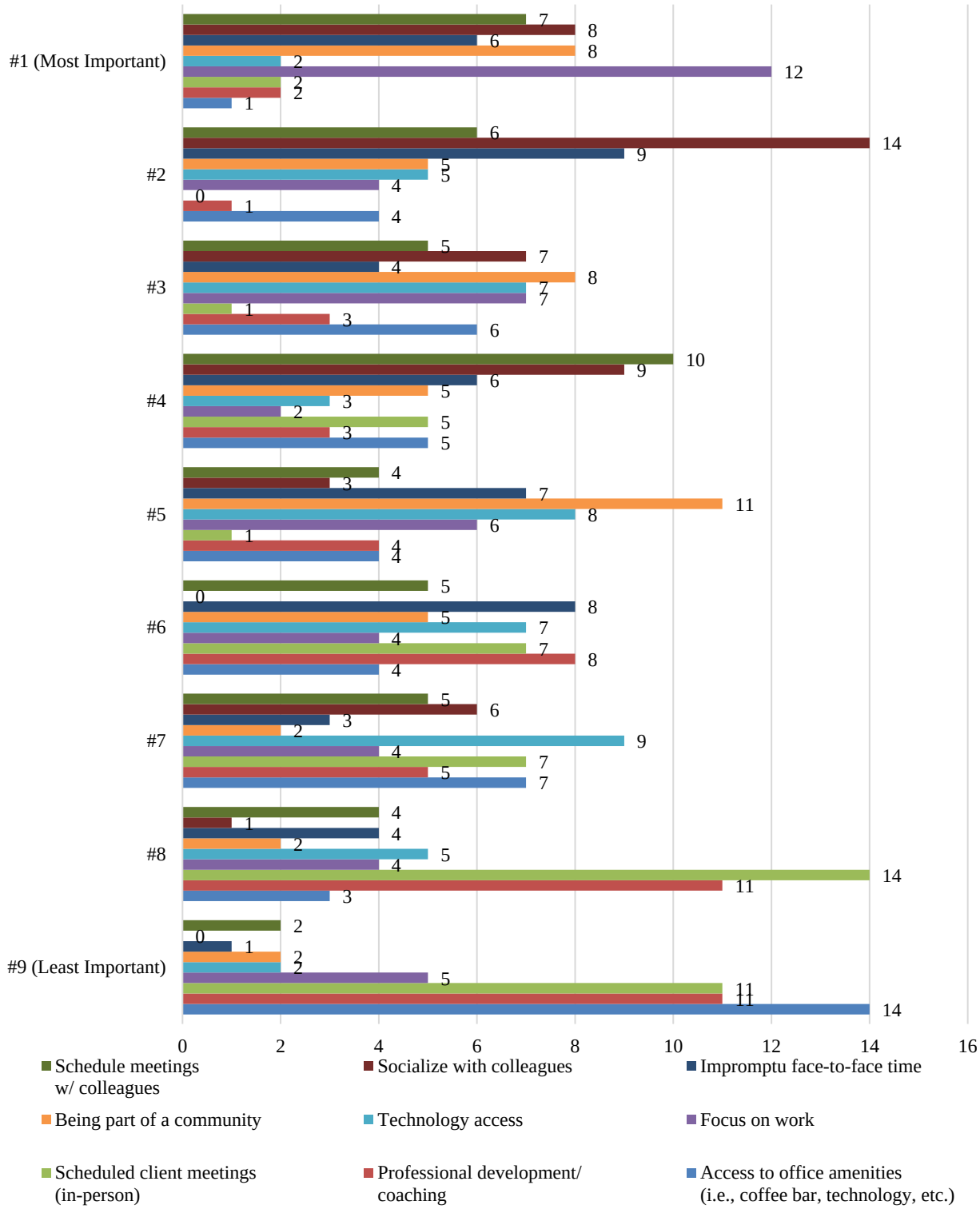
The final question of the survey came directly from Gensler's U.S. *Work from Home Survey* in 2020, which asked respondents to rank a total of nine factors relating to workplace return. The factors shown in Figure 38 were ranked from most (1) to least (9) important.

The highest ranked factor with a total of 12 votes was the ability to focus on work-related tasks while in the workplace. The runner up, with a total count of 14, was the capability to socialize with colleagues in the office, while the third highest ranked factor was the sense of being a part of a community. The ability to schedule meetings with colleagues was the fourth highest ranked factor and the fifth, access to technology. There was a tie between professional development, as well as impromptu face-to-face time for the sixth highest ranked factor. The seventh was the ability to schedule client meetings. Lastly, access to office amenities was the least ranked option.

Figure 38

Ranking Return-to-Work Factors from Most (1) to Least (9) Important

(Source: Gensler U.S. Work from Home Survey 2020)



Conclusion

This chapter summarized the survey's results which expressed the findings through written text, tables, and graphical figures. Using these different forms to organize the data collected allowed the PI to thoroughly understand the information received from participants and detect how the results pertained to the study's main intentions of improving employee satisfaction and productivity. The section gave an overview of employee preferences and concerns that have since surfaced after the heigh of the COVID-19 virus and the post-pandemic workplace return. The survey results helped organize common analytical themes. The themes are discussed in the next section, which is Chapter 5. These results were proposed to be implemented by designers and architects planning for the future workplace.

Chapter V: Discussion and Conclusion

This study intended to answer the research questions raised at the start of the research process pertaining to the study's intent which is to help improve employee satisfaction and productivity in the post-pandemic workplace. The results of this mixed methods study have indicated that there are, in fact, specific design implementations designers and architects can incorporate into future workplace projects to strengthen employee engagement and the sense of belonging, ultimately increasing levels of satisfaction and productivity.

Although over half of survey respondents prefer an equally split weekly-hybrid work schedule, many companies may not have the ability to offer their employees this type of schedule. The major findings from this study will help provide designers with new solutions relating to the future of workplace design. These solutions center behind the devotion to improve employee satisfaction and productivity related to the workplace environment.

Discussion Overview

Out of the participants who completed the survey, only 28% stated they have children. When asked the location of their children during the period in which they worked from home during the pandemic, the majority answered that their children were at school during work hours. In addition, the supermajority of participants also said they do not care for or live with an elderly relative. Overall, the questions of distraction streaming from children or caring for elderly relatives while WFH did not seem too big of a concern for the participants of this study. The highest number of survey participants had worked from home during the pandemic for at least a year or more. The second highest was found to be an average of one to six months of WFH. The

majority of participants stated they work five days a week, as well as an average of about nine hours or more per workday.

The majority chose a hybrid work schedule (i.e., half/half split per-week) when asked about work location preference. In regard to in-person and fully remote preferences of participants, the most common theme or explanation discovered was the conveniency and efficiency of these two work locations. Preferences for hybrid work showed a majority of the participants found the aspect of money and time savings to be beneficial. In addition, the conveniency and efficiency of hybrid work was determined highly favorable. Lastly, the most commonly beneficial theme related to working occasionally hybrid related to an increase in work productivity and a decrease in distraction.

In terms of work-from-home positives, the most common theme discovered related to the conveniency and efficiency of this work location. Two other less commonly observed themes related to the satisfaction of flexibility, as well as the ability to save money and time. The most common theme discovered to negative WFH aspects was a lack of collaboration and socialization between colleagues. Decreases in production with increases in distraction followed closely behind, as well did the impacts on the mental health and wellbeing of employees. A few of the common reasons included in survey responses dealt with higher feelings of isolation due to the total lack of collaboration and socialization while working at home. Another negative factor commonly mentioned by participants when working from home was the fact that the work and personal life balances for many felt very one-sided due to the difficulty of not knowing when to stop working.

Major Indoor Environmental Quality (IEQ) Findings

Most participants felt ‘satisfied,’ if not ‘very satisfied’ with their WFH lighting quality. In regard to the qualities of acoustics, odor, and thermal, most participants were ‘satisfied’ with all three while working from home. The most common satisfaction level regarding the qualities of acoustical, thermal, and lighting were that participants were ‘satisfied.’ With this said, it was discovered that odor quality dropped from mainly ‘satisfied’ results while WFH, to participants feeling neutral after workplace return. The two most common factors which have negatively affected participants returning to the post-pandemic workplace was discovered to be that the indoor environment is far too noisy to concentrate, as well as uncomfortableness relating to the indoor air temperature. There was only one single participant who felt that workplace lighting negatively affected their satisfaction and productivity.

Major Privacy, Freedom, and Flexibility Findings

Privacy

After returning to the workplace, participants felt there was a lack of privacy found throughout the interior environment. The majority described their workplace office as ‘mostly open’ and ‘totally open’ after post-pandemic return and that it was ‘somewhat easy’ and ‘somewhat difficult’ to find privacy anywhere in the interior environment. In addition, the majority ‘strongly agreed’ to additional privacy throughout their post-pandemic workplace interior. There was no distinct answer when asked their preferred or ideal overall work environment in terms of the openness.

Freedom and Flexibility

A supermajority of the survey respondents felt they had the freedom to conduct various non-work-related activities while working from home. A few of the commonly mentioned non-work-related activities included, but was not limited to, an ability to conduct household chores such as laundry, washing dishes, or tending to pets. In addition, some participants mentioned the freedom to cook meals within their homes instead of eating out for lunch or fitting in an at-home workout.

In terms of overall flexibility, most participants felt they had an adequate amount of WFH flexibility. In addition, the majority felt the same way towards their post-pandemic workplace after returning. A majority of participants 'strongly agreed' to the idea of additional impromptu meeting rooms improving their satisfaction and productivity levels.

Satisfaction levels relating to the flexibility and overall functionality of WFH office furniture were discovered that the majority was 'satisfied' with their desk and work surfaces, however 'dissatisfied' in terms of satisfaction of chair and task seating. In regard to lounge seating options, the majority felt indifferent towards the specific type of furniture. An improvement to furniture satisfaction was discovered for participants returning to the workplace, showing 'satisfied' for all three of the furniture types.

Major Biophilic Design Findings

Work-from-Home Elements Satisfaction

Overall, a supermajority felt they agreed with appreciating the aspect of biophilic design within their home office. In regard to greenery, a very small percentage of participants had answered that they were 'very satisfied' with this element within their home office, however, the majority was 'satisfied' with the amount of direct presence. The majority felt 'very satisfied,'

and if not, then most others felt ‘satisfied’ in regard to animal presence at home. Most participants felt neutral towards the presence of water and water features in their home office. For natural scents, the majority felt ‘satisfied.’ For natural lighting, almost half of the participants felt ‘satisfied.’ Lastly, a tie was discovered in regard to the direct presence of breeze and wind within home offices.

Post-Pandemic Workplace Satisfaction

After returning to the workplace after the pandemic, most had felt ‘dissatisfied’ with the presence of greenery. The majority of participants felt neutral in regard to the direct presence of water and water features, natural scents, and breeze and wind. For natural lighting presence, most of the participants felt ‘satisfied’ in their post-pandemic workplace. Lastly, the majority of participants felt ‘dissatisfied’ in terms of their satisfaction relating to the presence of animals in the post-pandemic workplace environment.

Recommendations for Future Studies

Flexibility and Freedom

A question to recommend for future related studies would be to inquire about the likelihood of employees using the ‘flex’ rooms recommended within the literature review, and lightly touched on in the survey. This question comes to mind based off the idea and concern that many employees could assume that even though their company provided these types of flexible rooms, the workplace is just for working, not taking a yoga stretch class after your lunch break, or taking time out of the workday to sit in a ‘quiet’ room to de-stress. All of these new ideas are exactly what so many workplaces need to offer their employees, but would the majority of

employees feel too much guilt from stepping away from their office in the middle of the morning or afternoon?

In-Person Controls

Further research related to the way in which workplaces could potentially provide the in-person controls that were previously discussed in the literature review for indoor environmental quality concerns of employees relating to the thermal temperature and acoustics.

Spatial Layout

Looking into the idea proposed in the article, *Designing Post COVID-19 Buildings: Approaches for Achieving Healthy Buildings*, regarding the spatial layout during building design in relation to improving indoor air quality could be something specifically researched upon in another relative and future study.

Detailed Survey Questions

A recommendation could be to ask the same survey questions, but in more detail. For instance, asking employees their favorite type of indoor plant(s) to have on or around their workspace within the workplace. Receiving survey responses with even more detail could significantly improve the findings and the strength of validity regarding this research study.

Comparing Work Schedules

Adding onto recommendations for future studies would be specifically looking into and comparing the opinions of employees who started working flexible schedules before the work-from-home shift occurred during the pandemic. The importance of looking into these answers would be that they may differ entirely in the sense that these employees may have more

experience working from home and could perhaps add different suggestions than what has been discovered by the employees who WFH due to the pandemic.

Biophilic Design Element

An additional suggestion for future studies could look into how the biophilic design element of direct presence of animals within the workspace affects employees with allergies and how to combat the potential issue.

Conducting Survey During Different Seasons (i.e., Winter, Spring, Summer, Fall)

An idea for future related studies would be to conduct the same and/or closely similar survey throughout the different seasons of the year. For example, the online survey that was created and published for this study had been made in the beginning of September, where Fall was just starting. It would be interesting to conduct the survey at different seasons to compare answers, common and/or rare themes, and other potential findings.

Conclusions

Overview

Ultimately, the workforce has gradually begun to recognize that, in order to find future success within the workplace, the interior environment can no longer be static (Crawley et al. 2021). The term *static* is defined as "showing little change," ("Definition of Static," 2023). Crawley denoted that the future of workplace design now relies on and relates to change. Designers and architects must transition from former workplace design strategies primarily focused on the indoor environmental aesthetic and begin emphasizing the importance of designing for evolving tenant needs. These workplace design changes should always promote

employee well-being through the support of food, exercise, beauty, and spiritually ("Design Forecast 2021: Designing Places and Spaces in a Post-COVID World," 2020).

Indoor Environmental Quality Conclusions

Lighting

The main concern of survey participants regarding the lighting quality of their workplace was a lack of natural daylight. One design consideration would be the addition of more windows that would allow for ample levels of daylight. A less costly design consideration would be the implementation of light fixture colors that closely mimic daylight colors. These additions would not only improve employee production, but would improve mental health and well-being through the benefits provided from the mimicked daylight color.

Air and Thermal Quality

A design factor to consider rendering the problem related to uncomfortable indoor air was the discussion of personal temperature control integration. In addition, implementing the design considerations discovered throughout the literature review section on air and thermal quality, such as installing the newer and more advanced technology would decrease negative effects on the levels of satisfaction and productivity for employees.

Acoustics

A factor for designers to consider in regard to advancing acoustical qualities in the post-pandemic workplace to better benefit the well-being and productivity of employees would be implementing higher-graded acoustical materials. These materials could be added throughout office furniture, as well as integrated in floor, ceiling, and wall interior and exterior materials. In

addition, configuring an appropriate spatial layout that considers which areas will require more or less talking. This would help to separate the louder, more distracting areas of a workplace's interior environment with the quieter spaces.

Privacy, Freedom, and Flexibility Conclusions

Designing for employee freedom within the workplace relates to many aspects relating to interior parameters. The second research question addressed the most common interior environmental complaints raised by employees in terms of their satisfaction and productivity. These included an overall lack of workplace flexibility and privacy, as well as the quality of thermal air temperature. With this said, the lack of flexibility and privacy could be addressed using the idea previously stated, known as 'flex' spaces and/or rooms that are intended to be used for any and all workplace-related functions or needs. One way for future designers to design workplace freedom for employees is by providing more accessible collaboration spaces for work-related events like birthday celebrations or even enclosed spaces to conduct urgent and unplanned work-related discussions. Furthermore, addition easily accessible private focus rooms for things such as taking telehealth appointments like virtually speaking to personal therapists would allow employees to move more freely throughout their workplace and could likely increase their mental health and wellbeing. In addition, workplaces providing full kitchens would allow employees the option of preparing quick and affordable meals. This design idea could help more employees save money and time, which was a common beneficial factor discovered by participants working from home.

Biophilic Design Conclusions

In terms of the data collected regarding biophilic design in the post-pandemic workplace, the survey results helped determine the major lack of the following: presence of water features, breeze, and animals. With this said, implementing small water features, as well as images of water such as a calm, still lake or ocean waves could likely improve employee satisfaction in terms of this biophilic design element. Opening doors and windows, when weather permits, is an easy way for employee satisfaction of natural breeze and wind levels to increase significantly. Lastly, employees could schedule set days for employees to bring their pets into the workplace, or allowing foundations that work with emotional support animals to visit the workplace from time-to-time to provide this type of element. In addition, including images in areas throughout the office, such as ‘refuge’ or ‘de-stress’ rooms of animals could benefit this biophilic design aspect for employees, as well.

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Appendix A: IRB Consent Form

Informed Consent

Consent to Participate in Research

University of Oklahoma

You are invited to participate in research about implementing the positives of working from home back into the workplace after returning to the workplace during the COVID-19 pandemic.

If you agree to participate, you will complete a 10-minute online survey.

There are no risks or benefits to participating in this research.

Data collected online or by a device and transmitted electronically: You will be asked to complete an online survey as part of this research. The organization hosting the data collection platform has its own privacy and security policies for keeping your information confidential. There is a risk that the external organization, which is not part of the research team, may gain access to or retain your data or your IP address which could be used to re-identify you. No assurance can be made as to their use of the data you provide for purposes other than this research.

Collection of demographic or geographic location data that could lead to deductive reidentification: You will be asked to provide demographic information that describes you. We may also gather information about your geographic location in this research. Different combinations of personal and geographic information may make it possible for your identity to be guessed by someone who was given, or gained access, to our research records. To minimize the risk of deductive re-identification, we will not combine identifying variables nor analyze and report results for small groups of people with specific demographic characteristics.

You may experience these benefits: There are no benefits for participating in this research.

Your participation is voluntary, and your responses will be anonymous.

We will not share your data or use it in future research.

If you have questions about this research, please contact: Antia Thorson at antia.thorson@ou.edu and/or Negar Heidari Matin at negar.matin@ou.edu.

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board at 405-325-8110 or irb@ou.edu with questions, concerns or complaints about your child's rights as a research participant, or if you don't want to talk to the researcher.

Please print this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.

Are you 18 years of age or older? ___ Yes ___ No (If no- cannot participate)

IRB #15112. IRB Approval Date: October 4, 2022.

Appendix B: Survey Questions

Implementing Work from Home Practices in the New Workplace: Mid/Post-Pandemic

Start of Block: Default Question Block

1. Consent to Participate in Research University of Oklahoma

You are invited to participate in research about implementing the positives of working from home back into the workplace after returning to the workplace during the COVID-19 pandemic.

If you agree to participate, you will complete a 10-minute online survey.

There are no risks or benefits to participating in this research.

Data collected online or by a device and transmitted electronically: You will be asked to complete an online survey as part of this research. The organization hosting the data collection platform has its own privacy and security policies for keeping your information confidential. There is a risk that the external organization, which is not part of the research team, may gain access to or retain your data or your IP address which could be used to re-identify you. No assurance can be made as to their use of the data you provide for purposes other than this research.

Collection of demographic or geographic location data that could lead to deductive reidentification: You will be asked to provide demographic information that describes you. We may also gather information about your geographic location in this research. Different combinations of personal and geographic information may make it possible for your identity to be guessed by someone who was given, or gained access, to our research records. To minimize the risk of deductive re-identification, we will not combine identifying variables nor analyze and report results for small groups of people with specific demographic characteristics.

You may experience these benefits: There are no benefits for participating in this research.

Your participation is voluntary, and your responses will be anonymous. We will not share your data or use it in future research.

If you have questions about this research, please contact: Antia Thorson at antia.thorson@ou.edu and/or Negar Heidari Matin at negar.matin@ou.edu.

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board at 405-325-8110 or irb@ou.edu with questions, concerns or complaints about your child's rights as a research

participant, or if you don’t want to talk to the researcher.

Please print this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.

Are you 18 years of age or older? ___ Yes ___ No (If no- cannot participate)

RB #15112 IRB Approval Date: October 4, 2022

- ○ Yes (1)
- ○ No (If no- cannot participate) (2)

Skip To: End of Survey If Consent to Participate in Research University of Oklahoma You are invited to participate in resea... = No (If no- cannot participate)

Page Break

2 Do you currently work a full-time job (i.e. 40+ hours/weekly)?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Do you currently work a full-time job (i.e. 40+ hours/weekly)? = No

Page Break

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3 Please select your age

- 18-24 years (2)
- 25-34 years (3)
- 35-44 years (4)
- 45-64 years (5)
- 65 years or older (6)

4 What is your gender?

- Female (1)
- Male (2)
- A gender identity not listed here (3) _____
- Prefer not to state (4)

5 Please select your marital status

- ○ Single (1)
- ○ Married (2)
- ○ Divorced (3)
- ○ Widowed (4)

---

6 Do you have children? If so, how many?

- ○ Yes; 1-2 children (1)
- ○ Yes; 3-5 children (2)
- ○ Yes; 6+ children (3)
- ○ No; I do not have any children (4)
- ○ Definitely yes (5)

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7 If you answered 'Yes' to Q3 regarding children, please explain where your children are while you are at work during the day.

- ○ At home with me or another family member (4)
- ○ Daycare (5)
- ○ School (6)
- ○ Other (7) _____

---

8 Do you take care and/or live with an elderly relative at your home?

- ○ Yes (1)
- ○ No (2)
- ○ Occasionally (3)

Page Break

9 If you worked from home during COVID-19, approximately how long did you do so?

- ○ A few weeks to 1 month (1)
- ○ 1 month to 6 months (2)
- ○ 6 months to a year (3)
- ○ 1 year+ (4)

10 How many days a week do you work?

- ○ 1-2 days a week (1)
- ○ 3-4 days a week (2)
- ○ 5 days a week (3)
- ○ 5+ days a week/weekends (4)

11 About how many hours per day do you work?

- ○ 1-5 hours (1)
- ○ 6-8 hours (3)
- ○ 9+ hours (4)

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12 If you were to choose, would you rather work fully remote, fully in-person, or hybrid (a mix of both)

- ○ Fully remote (1)
- ○ Fully in-person (2)
- ○ Hybrid (i.e. half/half throughout the week) (3)
- ○ Occasionally hybrid (i.e. working from home no more than 1-2 times a week, every few weeks, and/or a month) (4)

---

13 Please briefly explain why you prefer working fully remote, fully in-person, or hybrid (bullet points/short sentences)

_____

14 When working from home, did you feel you had more freedom to do certain things, such as, fitting in a workout when you wanted to, deciding when you took your lunch break, listening to music, etc.?

- ○ Strongly agree (1)
- ○ Somewhat agree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat disagree (4)
- ○ Strongly disagree (5)

15 In a few short sentences and/or bullet points, please describe any POSITIVE aspects you found about working from home.

_____

16 In a few short sentences and/or bullet points, please describe any NEGATIVE aspects you found about working from home.

_____

Page Break

17 Evaluate the interior of your work-from-home office environment in terms of occupant satisfaction during the COVID-19 pandemic.

	Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Acoustical Quality (1)	○	○	○	○	○
Thermal Quality (2)	○	○	○	○	○
Lighting Quality (3)	○	○	○	○	○
Odor (9)	○	○	○	○	○

18 While working from home during any part of the COVID-19 pandemic, do you prefer the lighting you have in your home office as opposed to the lighting you have at your workplace? Please explain why.

○ I prefer the lighting in my home office. (1)
_____

○ I prefer the lighting in my workplace. (2)
_____

○ I don't have a preference. (4)

19 Evaluate the interior of your office environment in terms of occupant satisfaction AFTER returning to your workplace mid/post-COVID-19 pandemic.

	Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Acoustical Quality (1)	○	○	○	○	○
Thermal Quality (2)	○	○	○	○	○
Lighting (3)	○	○	○	○	○
Odor (9)	○	○	○	○	○

20 After returning to the office, which factors, if any, have you felt NEGATIVELY contributed to your level of work productivity?

- ☐ The office is too noisy to concentrate at times (1)
- ☐ The indoor temperature often makes me feel uncomfortable (i.e. hot and/or cold) (2)
- ☐ Not enough lighting (3)
- ☐ Too much lighting/glare (5)
- ☐ Often smell unwanted odors (4)

Page Break

21 Evaluate the interior FURNITURE of your work-from-home (WFH) office environment in terms of occupant satisfaction and comfortability during the COVID-19 pandemic.

	Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Desk/work surfaces (6)	○	○	○	○	○
Chair/task seating (10)	○	○	○	○	○
Lounge seating (12)	○	○	○	○	○

22 Did you feel your work surface(s) when working from home (WFH) had an adequate amount of space to work on?

- ○ Yes, my work surface(s) had the right amount of space (1)
- ○ No, my work surface did not have enough space (2)
- ○ Somewhat, but I would have preferred more space (3)

23 Evaluate the level of flexibility you felt you had to move around and work in different spots while working from home (WFH) during the COVID-19 pandemic.

- ○ Yes, I felt I had adequate flexibility within my home (6)
- ○ No, I felt I didn't have adequate flexibility within my home (10)
- ○ Flexibility is not a concern to me (12)

24 Which of the following best describes your CURRENT overall work environment in terms of privacy? (Source: Gensler U.S. Workplace Survey Winter 2021)

- ○ Totally open (1)
- ○ Mostly open (2)
- ○ Somewhat open (3)
- ○ Mostly shared (4)
- ○ Mostly private (5)
- ○ Totally private (6)

25 If you worked from home during the pandemic, do you feel you had MORE privacy within your home office than you typically have at your workplace?

- ○ Strongly agree (1)
- ○ Somewhat agree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat disagree (4)
- ○ Strongly disagree (5)

26 In terms of privacy, how easy is it to find after returning to your workplace?

- ○ Extremely difficult (1)
- ○ Somewhat difficult (2)
- ○ Neither easy nor difficult (3)
- ○ Somewhat easy (4)
- ○ Extremely easy (5)

27 Evaluate your office's interior FURNITURE in terms of occupant satisfaction and comfortability after returning to the workplace during the COVID-19 pandemic.

	Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Desk/work surfaces (6)	○	○	○	○	○
Chair/task seating (10)	○	○	○	○	○
Lounge seating (12)	○	○	○	○	○

28 After returning to your workplace, do you feel your work surface(s) have an adequate amount of space to work on?

- ○ Yes, my work surface(s) had the right amount of space (1)
- ○ No, my work surface did not have enough space (2)
- ○ Somewhat, but I would have preferred more space (3)

---

29 Evaluate the level of flexibility you feel you have to move around and work in different spots after returning to the workplace during the COVID-19 pandemic.

- ○ I feel I have adequate flexibility within my workplace (6)
- ○ I feel I do not have adequate flexibility within my workplace (10)
- ○ Flexibility is not a concern to me (12)

---

30 After returning to the office, which factors, if any, have you felt negatively contribute to your level of work productivity? (Choose all that apply)

- ☐ Too little of privacy within my workplace (1)
- ☐ Too much privacy/not enough interaction with co-workers (5)
- ☐ Not enough flexibility to work within my workplace (2)
- ☐ Uncomfortable office furniture (3)
- ☐ Not enough office furniture options (6)

---

31 Which of the following best describes your IDEAL overall work environment? (Source: Gensler U.S. Workplace Survey Winter 2021)

- ○ Totally open (1)
- ○ Mostly open (2)
- ○ Somewhat open (3)
- ○ Mostly shared (4)
- ○ Mostly private (5)
- ○ Totally private (6)

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32 According to the Natural Resource Defense Council (NRDC), "Biophilia is defined as the innate human instinct to connect with nature and other living beings" (McCain, Maria. "Bringing the Outdoors In: The Benefits of Biophilia." June 2020.).

Evaluate the interior of your work-from-home (WFH) office environment in terms of occupant satisfaction regarding biophilic design elements during the COVID-19 pandemic.

	Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Direct presence of greenery (5)	○	○	○	○	○
Direct presence of animals (9)	○	○	○	○	○
Direct presence of water/fountains (10)	○	○	○	○	○
Direct presence of natural scents (11)	○	○	○	○	○
Direct presence of natural lighting (12)	○	○	○	○	○
Direct presence of breeze/wind (13)	○	○	○	○	○

33 If you worked from home (WFH) during the COVID-19 pandemic, did you find that you appreciated having biophilic design elements (i.e. natural lighting, greenery, fresh air, sounds of water, etc.) surrounding your workspace?

- ○ Yes (1)
- ○ No (2)
- ○ I did not have access to biophilia (4)

34 After returning to the office, evaluate the interior of your workspace in terms of occupant satisfaction regarding biophilic design elements.

	Very dissatisfied (1)	Dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Satisfied (4)	Very satisfied (5)
Direct presence of greenery (5)	○	○	○	○	○
Direct presence of animals (9)	○	○	○	○	○
Direct presence of water/fountains (10)	○	○	○	○	○
Direct presence of natural scents (11)	○	○	○	○	○
Direct presence of natural lighting (12)	○	○	○	○	○
Direct presence of breeze/wind (13)	○	○	○	○	○

35 After returning to work during the pandemic, do you feel your work place incorporates an adequate amount of biophilic design elements?

- ○ Yes, my workplace provides enough biophilic design elements (1)
- ○ No, my workplace doesn't provide any biophilic design elements (2)
- ○ My workplace provides biophilic design elements, but not enough (3)
- ○ I don't care for biophilic design within my workplace (4)

36 According to the Natural Resource Defense Council (NRDC), "Biophilia is more than just a philosophy—biophilic design has been found to support cognitive function, physical health, and psychological well-being" (McCain, M. "Bringing the Outdoors In: The Benefits of Biophilia." June 2020.).

With this said, which elements of biophilia would you appreciate having access to within your workplace? (Select all that apply)

- [ ] Access to natural daylight within your office (i.e. abundant windows/skylights) (1)
- [ ] Natural color schemes/materials throughout my office (i.e. bamboo, wood, etc.) (2)
- [ ] Easily visible foliage/greenery (3)
- [ ] Access to breeze/outdoor air (4)
- [ ] Access to an outdoor courtyard and/or garden (5)
- [ ] Access to places of sensory refuge (i.e. quiet/dark room) (6)
- [ ] Access to water/sounds of water (7)

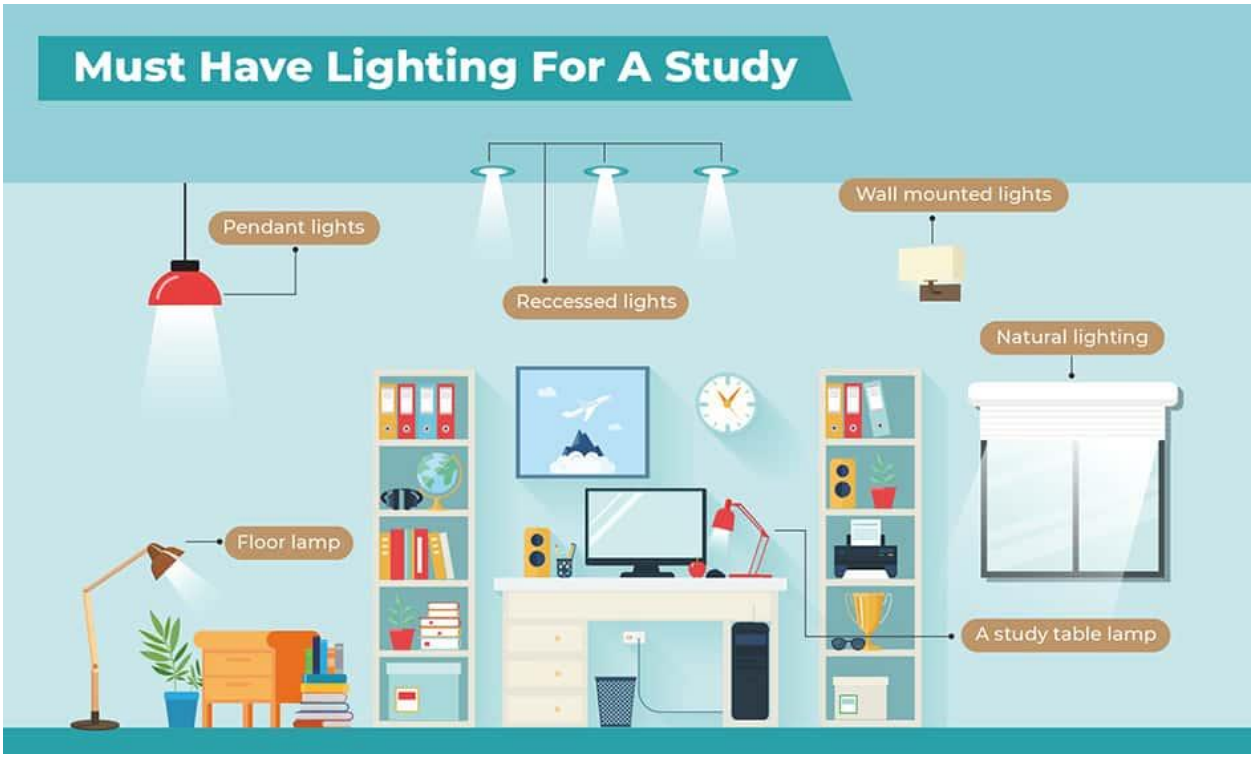
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37 How likely are having biophilic elements in your workplace help to enhance your mood and productivity while at work?

- ○ Very unlikely (2)
- ○ Unlikely (3)
- ○ Neither likely nor unlikely (4)
- ○ Likely (5)
- ○ Very likely (6)

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38 What type of lighting fixtures do you prefer to have in your office space? Use the figure below for reference.



Source: A Guide To Study Room Lights | Design Cafe https://www.gsdjagkj.ml/ProductDetail.aspx?iid=190026678&pr=38.88

- ○ Natural daylight (8)
- ○ Recessed (1)
- ○ Pendants (2)
- ○ Task (6)
- ○ Wall-mounted (7)
- ○ Other (4) _____
- ○ I have no preference. (5)

39 Please rate how much you agree to the following statement:

Your satisfaction and production levels as an employee would likely benefit from the addition of informal meetings spaces within your workplace (i.e. places to make personal phone calls, hold informal work meetings, etc.)

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Neither agree or disagree (3)
- ○ Disagree (4)
- ○ Strongly disagree (5)

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40 In regard to returning to in-person work, rank the following factors in order from most important to least important to you (Source: Gensler U.S. Work from Home Survey 2020):

_____ Ability to schedule meetings with colleagues (1)
_____ Ability to socialize with colleagues (2)
_____ Impromptu face-to-face time (3)
_____ Being a part of a community (4)
_____ Access to technology (5)
_____ To focus on my work (6)
_____ Scheduled meetings with clients (in-person) (7)
_____ Professional development/coaching (8)
_____ Access to office amenities (i.e. coffee bar, technology, etc.) (9)

End of Block: Default Question Block

Appendix C: Written Responses to Survey Question #13

Answer Choice	Written Description	Theme
Fully remote	"Taking care of my parents"	Convenient/efficient
Fully in-person	"As a designer, it is hard to work from home collaborating. Many times you can't fully communicate problems / answers easily on a computer. It can also be hard using only a laptop running programs such as revit and bluebeam."	Company culture/collaboration; Convenient/efficient
Fully in-person	"Social aspect, collaboration, young kids are home and its distracting, Zoom meetings are awkward and people don't have normal interaction/conversation as in person."	Company culture/collaboration; Convenient/efficient; Socialization
Hybrid (i.e., half/half throughout the week)	"Working from home sometimes is just easier"	Convenience/efficiency
Hybrid (i.e., half/half throughout the week)	"Sleep in some days, no commute occasionally, also have a social interaction, meetings and questions are more easily answered in person"	Convenient/efficient; Save money/time; Socialization
Occasionally hybrid (i.e., 1-2 times a week/month)	"still get company culture while also getting more of a mental break, can focus more from home"	Better mental health/wellness; Company culture/collaboration; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"I have a far commute to work, over 40 miles and working remote helps me save my car and body on the long commute."	Save money/time
Occasionally hybrid (i.e., 1-2 times a week/month)	"Hybrid allows for opportunity to choose. Sometimes the office is not the most productive place. Sometimes home is not very productive. Seems like a happy compromise that benefits as many people as possible."	Convenient/efficient; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"I like to choose when I work from home, but it's nice to have the option to go in-person and make human connection with my co-workers"	Flexibility; Socialization
Occasionally hybrid (i.e., 1-2 times a week/month)	"I like the structure I get in the office and my office set up, so doing a hybrid schedule where i work from home occasionally works best for me at my current position"	Convenient/efficient
Hybrid (i.e., half/half throughout the week)	"Less office distractions/no small distracting conversations / meetings are more to the point"	More productive/less distracted
Fully remote	"It is very convenient to work from home. A lot of careers can be done at home."	Convenient/efficient

Hybrid (i.e., half/half throughout the week)	"Get more done. Not as many distractions. No commuting time wasted."	More productive/less distracted; Save money/time
Hybrid (i.e., half/half throughout the week)	"Connection with team, easier to collaborate and brainstorm"	Company culture/collaboration
Hybrid (i.e., half/half throughout the week)	"- can get small home tasks done (laundry, make lunch, dishes)- no commute time, more sleep and free time - have to get gas less often - still get to be in the office some for the social aspect"	Flexibility; Save money/time; Socialization
Occasionally hybrid (i.e., 1-2 times a week/month)	"More productive at the office than at home, but would like the opportunity to occasionally wfh for mental health reasons"	Better mental health/wellness; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"Flexibility with having kids. Hybrid allows me access to things and people I need at the office but if my kids are sick or I need to parent first, I can make up the time lost during other hours. I am more productive as an employee this way"	Convenient/efficient; Flexibility; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"Hybrid gives mix of collaboration and head down time"	Company culture/collaboration; Save money/time
Hybrid (i.e., half/half throughout the week)	"Hybrid offers the comfort of home, but the culture of an office. No commute when working from home. More engaging relationships in person."	Company culture/collaboration; Convenient/efficient; Save money/time
Hybrid (i.e., half/half throughout the week)	"I am much more productive at home than in the office. However, is it nice to have in person meetings, see your co-workers, and meet new people that you don't normally work with."	Company culture/collaboration; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"-Hybrid allows for autonomy over your time in a balanced way in whatever way best suits your work needs for the day/week. If I need to do heads down focus work, I prefer to do that at home where I have no distractions. When I need to collaborate with other team members or just need some socialization, in office is great."	Company culture/collaboration; Convenient/efficient; Flexibility; Socialization
Fully remote	"Able to choose a city closer to family."	Flexibility
Fully in-person	"More productive in the office. easier to get distracted at home"	More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"My job requires me to be in-person at times to access certain resource material."	Convenient/efficient
Hybrid (i.e., half/half	"hybrid to still see people"	Socialization

throughout the week)		
Occasionally hybrid (i.e., 1-2 times a week/month)	“flexibility for at home needs during the work day, but need office for hands on/face to face activities”	Company culture/collaboration; Flexibility
Hybrid (i.e., half/half throughout the week)	“I enjoy hybrid because I am more productive at home for production tasks, but meetings in office are more effective than they are in a virtual setting.”	Company culture/collaboration; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	“*Flexibility *Less commute time *Less gas consumption *Increase sleep time”	Flexibility; Save money/time
Hybrid (i.e., half/half throughout the week)	“flexibility”	Flexibility
Hybrid (i.e., half/half throughout the week)	“Working in hybrid gives me flexiblity of WFH but also the collaboration with others while in the office. Burnout is much lower for me.”	Company culture/collaboration; Flexibility; More productive/less distracted
Fully remote	“Fully remote is the most efficient in my role. I also dislike commenting and working in an open office with a lot of distractions. Office culture is a myth. Technology works so we should use it to create better work / life balance.”	Better mental health/wellness; Convenient/efficient; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	“I'm a contractor so a hybrid system works perfect”	Convenient/efficient
Hybrid (i.e., half/half throughout the week)	“Better concentration, saving in time”	More productive/less distracted; Save money/time
Hybrid (i.e., half/half throughout the week)	“Better work-life balance”	Better mental health/wellness
Hybrid (i.e., half/half throughout the week)	“I believe a good mix will assist with flexibility for working hours and will improve efficiency”	Convenient/efficient; Flexibility
Hybrid (i.e., half/half throughout the week)	“Save gas/travel time. Like going to the office once in a while for face time.”	Save money/time; Socialization
Hybrid (i.e., half/half	“It’s more comfortable to work from home and it would eliminate vomiting to work and will save a lot of time. Also I like to go to	Company culture/collaboration;

throughout the week)	the office once a week or once in 2 weeks to handle some tasks that I can facilitate better in person."	Convenient/efficient; Save money/time
Occasionally hybrid (i.e., 1-2 times a week/month)	"Hybrid is also helpful for longer commutes - thus, affecting time, car maintenance, gas, etc."	Save money/time
Fully in-person	"prefer being at the office, easier to handle files"	Convenient/efficient
Occasionally hybrid (i.e., 1-2 times a week/month)	"I prefer to have a change of environment and am more productive with a change periodically"	Flexibility; More productive/less distracted
Hybrid (i.e., half/half throughout the week)	"- avoid traffic, some days are slower than others, prefer not to come in to the office during slow days, sometimes office has too many distractions, easier to talk on the phone at home, lunch is easier at home"	Convenient/efficient; More productive/less distracted; Save money/time
Hybrid (i.e., half/half throughout the week)	"Hybrid version could save some time while keep the productivity at a high level"	More productive/less distracted; Save money/time
Fully in-person	"The Workplace Environment promotes productivity and eliminates distractions like TV, pets, etc."	More productive/less distracted
Occasionally hybrid (i.e., 1-2 times a week/month)	"Nice to mix it up a bit . . . do something different every once in a while."	Flexibility
Hybrid (i.e., half/half throughout the week)	"I prefer hybrid system since I can observe my kids and my parents while working from home in some days of week."	Convenient/efficient; Flexibility

Appendix D: Written Responses to Survey Question #15

Response	Themes
"sleeping in, lunch when I want, working with my partner, working wherever, saving money on not buying work clothes"	Convenient/efficient; Flexibility; Save money/time
"saved gas"	Save money/time
"no traffic"	Convenient/efficient; Save money/time
"get more done, less frustrated, break from others, more reset, be around my dogs more higher focus"	Better mental health/wellness; Convenient/efficient; Flexibility; More productive/less distracted
"flexibility in doing different tasks and flexibility in using different spaces"	Flexibility
"flexibility for at home needs during the work day like subcontractor visits, package deliveries, cooking lunch"	Convenient/efficient; Flexibility
"You can work more and deliver more also less commutes"	More productive/less distracted; Save money/time
"Whole family was home due to pandemic . . . nice to be around them. Also, dogs liked it."	Convenient/efficient
"Small tasks when waiting for something to load"	Convenient/efficient
"Sleep enough, not wasting time travelling to the office, using my break to eat out or going to the gym or even have a nap that would refresh me for the afternoon, cooking at home and save money"	Better mental health/wellness; Convenient/efficient; Save money/time
"See question 14 above."	N/A
"Saved time. Was more comfortable."	Convenient/efficient; Save money/time
"Saved money on commute, little prep time for work"	Save money/time
"Save gas, can do laundry and other chores while working. Can go on a walk in middle of day."	Convenient/efficient; Flexibility; Save money/time
"Room condition, more concentration, no worry about home duties"	More productive/less distracted
"N/A"	N/A
"More flexibility when eliminating commute and if other issues arise not related to work/office."	Flexibility; Save money/time
"More comfortable environment. easier to get chores around the apartment done. No commute to work"	Convenient/efficient; Save money/time
"Mini breaks to do chores, practice mindfulness, go on walks, etc. Able to work while visiting family out of state without taking PTO. Reclamation of time spent commuting. More focused on tasks without distractions."	Better mental health/wellness; Convenient/efficient; Flexibility; More productive/less distracted

“Mid-Day workouts, saved money by making lunch at home and not ordering food”	Convenient/efficient; Flexibility; Save money/time
“Less pressure. Comfortable clothes. Flexibility - working out, eating, moving around. Time with pets.”	Better mental health/wellness; Flexibility
“I was able to get more done around my house and I felt that I had more time with my family. It allowed me more freedom to choose when I wanted to work, as long as I was hitting my billable hours for the week.”	Flexibility; More productive/less distracted
“I saved some much time by not having to drive to work. I was less stressed and could focus more on the tasks at hand.”	Better mental health/wellness; More productive/less distracted; Save money/time
“I found it more comfortable and less stressful”	Better mental health/wellness; Convenient/efficient
“I feel like I was able to get my work done more efficiently without the distractions of coworkers and it give me so much more time to do thing before or after work.”	Convenient/efficient; More productive/less distracted; Save money/time
“I am able to take my dog out, do not have to send him to day care. I am able to do little chores around the house during breaks rather than squeezing them all in once I get home.”	Convenient/efficient; Flexibility
“Freedom to set schedule”	Flexibility
“Freedom in activities”	Flexibility
“Flexibility, eating at home more often/ not having to meal prep”	Flexibility; Save money/time
“Flexibility, balance of work/life was more fluid and relative to my needs”	Better mental health/wellness; Flexibility
“Flexibility to do other things, work my own hours”	Flexibility
“Flexibility”	Flexibility
“Feeling more comfortable, less stressed, and more productive in most cases”	Better mental health/wellness; Convenient/efficient; More productive/less distracted
“Eating healthier, got to workout more, saved on gas, did not have to spend an hour doing my hair and makeup each morning.”	Convenient/efficient; Flexibility; Save money/time
“Easy access to food/drinks for lunch rather than needing to leave the office”	Convenient/efficient
“Dedicate some time to administrative work in gaps of my job. Save commute time”	Convenient/efficient; Save money/time
“Could manage home life better”	Convenient/efficient
“Can listen to my music, cook a healthy lunch, hang with my dog more, dress comfortably”	Convenient/efficient; Flexibility

“Better time management, less commuting expenses, more family time”	More productive/less distracted; Save money/time
“Better mental health, got things done around the house while unplugging for 10-15 minutes every so often, more time for workouts in the mornings”	Better mental health/wellness; Save money/time
“Being able to get chores done when taking a break. Freedom of choice as to what I did and when I did it was nice too.”	Convenient/efficient; Flexibility
“Being able to easily schedule appointments, virtual doctors visits, zero travel time, saved money on eating what was at home”	Convenient/efficient; Flexibility; Save money/time
“Ability to focus. Ability to not have workplace interactions. Saving time from not commuting so I can enrich my own life with exercise or a hobby.”	Better mental health/wellness; More productive/less distracted; Save money/time
“Ability to do a few household chores during the day”	Convenient/efficient
“- no traffic! - less distractions - during my lunch hour I could run errands”	Convenient/efficient; More productive/less distracted; Save money/time
“*have pet with me *can snack anytime *can be comfortable *step outside to stretch *workout during lunch”	Convenient/efficient; Flexibility

Appendix E: Written Responses to Survey Question #16

Response	Themes
"limited social interactions"	Lack of collaboration/socialization
"I felt that I was getting distracted easily. Things could come up around the house with one of my family members and it caused me to lose focus on what task I was currently working on for my job."	Less productive/more distracted
"Felt like I was distracted and not able to complete work as easily. Lacked social encounters and chances for collaborating"	Lack of collaboration/socialization; Less productive/more distracted
"Isolation"	Lack of collaboration/socialization
"harder to get a question answered from management"	Less convenient/efficient
"It's hard to separate work and my home life because I feel like I need to always work."	Impacted mental health/wellness
"Living where you work can lead to stress. Lack of connection with the place you work. Loneliness. May find distractions that are not present at an office. You could end up doing all of you work at weird hours to get it finished (could be a positive for some)."	Impacted mental health/wellness
"- lacking in-person connection"	Lack of collaboration/socialization
"Focusing is more difficult for me at home"	Less productive/more distracted
"It was more difficult for me to stop working"	Impacted mental health/wellness
"It can get lonely sometimes not being able to socialize as much with coworkers."	Lack of collaboration/socialization
"Less human interaction."	Lack of collaboration/socialization
"Lack of social interaction"	Lack of collaboration/socialization
"Bad work/life balance if you weren't good about keeping it separate and stopping at the end of the day, less social and bonding with coworkers"	Impacted mental health/wellness
"Too many distractions, not enough interactions"	Lack of collaboration/socialization; Less productive/more distracted
"Sometimes hard to disconnect"	Impacted mental health/wellness
"Harder to get help from others and get to know them, started the job during fully remote"	Lack of collaboration/socialization
"I occasionally got easily distracted, or it blurred the lines on work life balance."	Lack of collaboration/socialization; Less productive/more distracted

“Not interacting face to face with my co workers.”	Lack of collaboration/socialization
“Can get lonely after a while. Work and life can become one if not careful.”	Lack of collaboration/socialization; Impacted mental health/wellness
“Not being able to close the laptop after work hours, can get easily distracted”	Less productive/more distracted; Impacted mental health/wellness
“Zoom”	Less productive/more distracted
“Easily distracted. Loss of productivity. Isolation. Not being able to connect with coworkers”	Lack of collaboration/socialization; Less productive/more distracted
“I tended to work more hours than I should have without intending to. Being alone was isolating at times.”	Lack of collaboration/socialization; Impacted mental health/wellness
“If you need help, and not seeing people”	Lack of collaboration/socialization
“less interaction, more isolation”	Lack of collaboration/socialization
“It made it much hard to get back to an in-person work setting. It has been much hard to get back to my regular schedule, I find myself skipping workouts or selfcare routines to attend more in-person events.”	Impacted mental health/wellness
“*Harder to get ahold of someone virtually *more delay in communication at times *issues with technology at times”	Lack of collaboration/socialization; Less convenient/efficient; Less productive/more distracted
“collaboration is challenging”	Lack of collaboration/socialization
“being alone!!”	Lack of collaboration/socialization
“None”	N/A
“N/A”	N/A
“More working time”	Less personal time
“Problem in understanding my colleagues and job and loss of concentration in meetings and during day which leads to lower efficiency, reduction of self-confidence, and depression. Feeling alone and bored.”	Impacted mental health/wellness; Lack of collaboration/socialization; Less convenient/efficient; Less productive/more distracted
“Distractions, dog, kids, etc.”	Less productive/more distracted
“Workers can sometimes allow working from home to miss or skip hours that may be needed to complete their work or assignment.”	Less productive/more distracted

“Distractions”	Less productive/more distracted
“Missing colleagues and office services”	Lack of collaboration/socialization; Less convenient/efficient
“Losing face to face teamwork. Communication often becomes less consistent amongst co-workers.”	Lack of collaboration/socialization
“Hard to work on client files, difficulty coordinating with co-workers”	Lack of collaboration/socialization; Less convenient/efficient
“More unproductive time and interruptions”	Less productive/more distracted
“- my dogs and parents did not understand that even though I was home, I was on the clock and working - some attorneys did not respect my lunch hour or understood that I was still entitled to it”	Less productive/more distracted
“No interaction with co-workers, isolating, less technology available than in office”	Lack of collaboration/socialization; Less convenient/efficient
“Social life”	Lack of collaboration/socialization
“Easily distracted, no extrinsic motivation to get work done, lack of socializing”	Lack of collaboration/socialization; Less productive/more distracted
“Not as efficient. Too many potential distractions.”	Less convenient/efficient; Less productive/more distracted
“Nothing!”	N/A