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Remote Working and Open Offices: A Phenomenological Study of the Factors Impacting Employee Productivity

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Abstract

Office space transformations in the past have assessed physical environment aspects but may have ignored the dynamics of human productivity. The goal of the introduction of cubicles was to solve privacy and noise concerns, and the design was subsequently modified to address similar obstacles to increasing productivity. Knowledge workers need quiet, concentrative workspaces that also offer communal areas. Technological advances provide the freedom to move away from fixed workstations; however, are workers happy? This study investigated an open office work environment from the workers' perspective, to determine whether productivity is enhanced or hindered. The purpose was to identify variables that impact job satisfaction, which has a link to productivity. Real estate costs can be high, and poor design choices can cost corporations more lost productivity than the savings realized from office construction. Traditional management goals are to maximize worker productivity, whether in a manufacturing or service environment. The productivity of knowledge workers is difficult to measure in a conventional sense, and it is vital to provide a conducive working environment. Knowledge workers' perspective of the work environment is the focus of the study. The results may be applicable to other companies for office design enhancements and variables for new spaces. The goal of the design should be productivity enhancement. One consideration for corporations is the cost of employee retention, as also the balance between real estate cost and loss of productivity due to employee departures.

Keywords: Knowledge workers, open office, productivity, satisfaction

Dedication

Completing this dissertation has been a journey and reflecting on the path illustrates how different things have turned out compared to the start line. I would not have finished without the support of my wife, Sue, who has endured the years this has taken. Sue has supported me in the journey, encouraged, nudged, and provided great advice. My Chair, Dr. Paul Shelton, knew how to get the best from me: encouraging, candid feedback, and gave me the space to explore the subject. The Committee provided advice that really made me think of why this mattered, and how to better articulate my goals. My study participants were candid, and helped immensely in follow up questions, and just being forthright with their opinions. I'd be remiss if I didn't mention Cohort 9, and especially Dr. Marlon Ware, for being able to bounce ideas off of, providing advice, and just being there. The start of this journey was with a class by Dr. Dan Mertens – who set the tone for the program. I'm proud to have him as a friend, and now able to be a peer. My parents, Francis, and Anne, provided the drive to accomplish goals, of which this is just one – which I am forever grateful for. Finally, all thanks be to God, through Him all things are possible.

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Chapter 1: Introduction

Why measure satisfaction instead of productivity? To answer this question simply, satisfaction with the job environment influences employee productivity (Ajala, 2012). The physical environment of offices may not be a business emphasis item and thus becomes a missed opportunity. My personal example involved working first as a real estate supervisor and subsequently as a program analyst for the federal government. In both of these roles there was significant emphasis on reducing the space per employee, and new leases emphasized this behavior. The primary consideration was rent reduction and not employee productivity. One program analyst task which seemed to conflict with this space reduction was working with the federal employee viewpoint survey and tenant satisfaction surveys. A missing element in my position in both cases was a connection to providing productive spaces for employees to increase overall satisfaction with the office environment.

Management constantly looks at improving production through various methods. Robert Owen evaluated human elements in factories and created symbols to track, and emphasize, deficiencies used to discipline workers. Charles Babbage researched factory arrangements to reduce production costs and realized that innovations and improvements were essential to increase human performance (Wren & Bedeian, 2008). Frederick Taylor observed performance, with one emphasized element being incentives tied to productive behavior. His task management system focused on production and quality to emphasize

output. In this system, the standard management theme was to emphasize quality and production and create conditions that improve results.

Herman Miller Inc. introduced cubicles as a new furniture layout style in 1964 to improve the perceived privacy and reduce noise problems with open offices (Saval, 2014). We may think of the open-plan office as a new concept, but Frank Lloyd Wright developed the earliest open offices in 1939 (K2 Space, 2017). In the 1980s, office spaces evolved into professional layouts that sought to standardize processes and allow defined spaces. The overall design and productivity goals led to adequate space not being assigned to individual workers and the introduction of more casual elements. The research on office space by and large focuses on the physical design and not human behavior impacts (Ashkanasy et al., 2014). The affective events theory suggests that employees react differently to variables such as privacy, noise, interactions, productivity influencers, and well-being. Spatial density is another variable that influences the physical environment, with the density being increased in office layouts for cost-effectiveness. Density mitigation can allow employees to personalize their workspace, which helps with social interactions by defining personal space.

A modern management study might focus on knowledge workers and how to improve overall productivity. The same techniques used by Robert Owen for understanding the human element are acceptable for modern factories consisting of knowledge workers. In this context, it is necessary to define the term knowledge worker, goals, and impacting variables.

Peter Drucker defined knowledge workers as those who "apply theoretical and analytical knowledge, gained through formal training, to develop products and services"

(Corporate Finance Institute, 2018). To ensure that knowledge workers are as productive as possible, Drucker (1999) developed some questions, including the following: "What is your task? What should it be? What hampers you in doing your task and should be eliminated?" (p. 85). Some variables that hamper productivity may also impact satisfaction. These are explored in Chapter 2 and include cost, privacy, and office design.

Drucker's (1999) article suggests that knowledge workers may be considered capital assets due to economics and the likely impact on productivity. Companies assess real estate costs to balance their budget; however, this view may be shortsighted.

Jones Lang LaSalle (JLL) developed a 3-30-300 rule for office category costs (utilities, rent, payroll). It stands for $3 for rent, $30 for utilities, and $300 in payroll. The intent is to show that cost reduction is better served by concentrating on improving productivity rather than saving rent money (Jones Lang LaSalle IP, Inc, 2018).

Satisfaction in the physical workplace and its relation to productivity was the subject of a study that observed nine office buildings in the United States and Canada (Veitch et al., 2007). The findings supported a relationship between work environment satisfaction and job satisfaction, suggesting that occupants who were happier with their physical office space were more satisfied with their job.

Employees in a booming economy may choose to trade employers if the work environment does not suit their needs and there is an opportunity for change. Management must recognize the long-term factors impacting employee satisfaction and incorporate the best measures in workspaces. Research on employee turnover intention has found that the physical work environment is directly related to job satisfaction and

may indicate organizational commitment and overall performance (Kamarulzaman et al., 2011).

The current study focuses on knowledge workers in open office spaces to determine variables that may impact job satisfaction and productivity. Office environments exist in various areas, and what works for one company may not be suitable for another. There are common themes in the literature, and design elements that may make the space more suitable. The productivity levels of knowledge workers can be challenging to measure. One study confirmed that office visibility is related to improved employee performance perceptions compared to those who were teleworking (Elsbach & Bechky, 2007). Although not directly related to noise in the office space, it indicates the complexity of measuring productivity.

Statement of the Research Problem

The workspace design and physical environment in offices can impact job satisfaction, and in turn overall productivity. The literature shows a strong relationship between job satisfaction and employee productivity, and this study builds upon that framework. The literature reveals a correlation between office layouts and employee issues, including noise, audio, and visual privacy. The General Services Administration's (GSA) study on noise (Public Buildings Service, 2012) also considered illumination levels at workstations, visual comfort, and workplace satisfaction. Higher cubicle partitions could encourage people to talk louder since more privacy is perceived, and this contributes to neighbors' dissatisfaction.

Excessive background noise may be detrimental to open office spaces. Modern workspaces have evolved since the first cubicles, and the open office design was changed to meet perceived visual and privacy needs. Current research indicates that excessive ambient noise and a lack of visual and audio privacy in the workplace may impact the job satisfaction of employees, and by default their overall productivity (GSA Public Buildings Service, 2011).

Research Questions

RQ 1. How does the physical open office environment impact a knowledge worker's job satisfaction?

RQ 2. How does the physical open office environment impact a knowledge worker's productivity?

Hypotheses

H 1. The physical working environment has an impact on the knowledge worker's job satisfaction.

H 2. Knowledge workers with higher job satisfaction have higher productivity.

H 3. The open office environment has an impact on the knowledge worker's job satisfaction.

H 4. Knowledge workers who have adequate office space and access to alternative work environments are more satisfied with their work.

H 5. Alternative work environments impact perceptions of the open office environment.

Figure 1 shows the relationships between cost and other variables. The real estate bubble (value) must expand to capture more flexibility, collaboration, and finally privacy. The variables may turn out to be in a different order of importance; however, the point is that minimizing the cost incurred for real estate will result in the least amount of privacy. To increase privacy, one must spend more. Privacy variables contain audio and visual elements. The considerations given to audio privacy will increase the construction costs to provide sound mitigation, while visual privacy can impact privacy overall since employees tend to be less discreet if they feel they are in a private area.

Figure 1

Relationships Between Cost and Some of the Other Variables

Definitions of Terms

Open office: The Whole Building Design Guide (2018) has a description of this term that encompasses its spirit: “the office space type is durable and adaptable, and will typically include features such as a raised floor system for the distribution of critical services (power, voice, data, and HVAC) and mobile workstations to accommodate changes in employee, equipment, and storage needs over time. An open plan layout may take up a large proportion of the office, but quieter working pods and zones should also be provided for those who prefer to be away from distractions.”

Job satisfaction: It indicates the happiness with work and the direct impact on productivity, but many other factors are related as well, including the physical environment.

Productivity: It is challenging to measure for knowledge workers but tied with job satisfaction in referenced studies; managers need to remove barriers to work (McKinsey).

Alternative work environments: This could be a version of teleworking or working in another building that shares IT infrastructure.

Hoteling: The sharing of desks (space is not permanently assigned); some federal agencies use an electronic reservation system for workspaces.

Telework (telecommuting): It involves providing employees with tools to work outside the office, virtually; this can be from home or other locations.

Delimitations

The study participants included volunteers from various industries who were willing to share their perspectives on open office spaces. All participants had worked in

an open office space for at least one year. At the time of the study, some participants worked exclusively remotely from home, with the remainder being on a hybrid schedule. This study was limited to 16 participants, but was not limited to one industry. The study involved interviews of only knowledge workers. Non-volunteers were excluded, as also those who did not have at least one year of experience working in an open office. The results of this phenomenological study are based on the experiences of the 16 participants and their perspective of the impacts of an open office on productivity and job satisfaction.

Assumptions and Limitations

Real estate costs limit the amount of space an organization can provide employees. One assumption is that optimally designed office space considers job satisfaction, and by default employee productivity, when procuring space. The real estate markets in more expensive cities may drive companies to develop their area differently from other markets; however, there are lessons applicable for all needs. The salary costs will be higher than office costs in an organization, and employee productivity should reflect this relationship.

The GSA Office of Government-Wide Policy produced a study comparing federal office environments and commercial sector companies (U.S. General Services Administration, 2011). This study defines different settings and documents private companies' efforts in utilizing office space in the most efficient manner possible. The limitations of that survey include the difficulty in measuring the productivity of employees. The burden was met by linkages between job satisfaction and employee productivity, supported by previous studies. Studies have shown a link between physical

space, including environment variables, and ergonomic factors such as workstations and satisfaction.

Another study limitation is that the sample size may not account for all the variables across different companies or industries. Similar office designs may be used differently in different corporate cultures and produce different results. This study is a starting point in defining the impact of employee work environments on job satisfaction. The results may predict the employees' satisfaction with their work environment. The research may illustrate best practices to use in different scenarios and to save design time. White noise may mask ambient office noise but can be a target to reduce capital costs during renovations. Cost savings measures may include collaborative spaces, leaving less space for an employee for private conversations or team meetings. This study looks at how employees feel space is utilized, and assesses the physical areas where they work.

Different real estate markets may produce different solutions. The real estate market in San Francisco differs from lower-cost areas, but the considerations are the same. Other localities not under the same price pressure may develop different solutions. This concept applies across various industries and company cultures.

Significance of the Study

Real estate can be expensive to acquire, whether on lease or owned, considering the initial costs and longer-term maintenance costs. If the rented space exceeds the company's needs, there is a likelihood of inefficient resource usage. It may make sense to acquire extra space for short-term purposes in the immediate future; however, this may involve additional costs.

There should be an awareness of unintended budget consequences for other aspects of company operations when assessing the initial and recurring cost-cutting associated with property management and real estate acquisition. If reduced space per individual employee is inherent in an open office design, are there any mitigating factors to be considered that impact employee productivity? It would be wise to look at the scope of budget changes, impact on factors important to employee productivity, and mitigating factors to limit future issues. Mitigating factors may include teleworking, decreasing the number of seldom-used conference rooms, and increasing the number of team rooms. Team rooms allow employees to hold private conversations and may provide a space for concentrative work.

Companies acquiring or redesigning current space could benefit from information on what has worked well in the past and changes with the potential to enhance job satisfaction. It is important to consider the employees' perspectives on what they deem essential in their workspaces. Although recruitment costs are outside the scope of this research, those could be used to explore variables in determining real estate office configurations and the expenses used for justification.

Researcher's Perspective

Real estate costs as well as employee turnover costs can be rather high (Florentine, 2018); one monetary estimate is 1–2.5 times the salary amount for employee turnover costs, and other costs are equally substantial. The process of onboarding, training, and subsequently retaining employees represents a significant investment. There could be disruption in gaining productivity for new employees and loss of productivity

for current employees who assist in onboarding. Maintaining an employee's satisfaction and subsequent job productivity is vital to maximizing return on investment in employees. Trade-offs must recognize that saving money on office design may result in increased costs for recruitment and retention.

Productivity goals should focus on providing the best environment possible for the employees. The goal should be to attain maximum productivity and give them tools to achieve this, including a collaborative and effective physical working environment.

Chapter 2: Literature Review

Figure 2 presents the research goals and significant variables. Adequate space design can achieve the targets of efficiency, lighting, space per worker, and overall privacy. As the plan develops, cost factors create trade-offs in the construction of the office environment. These trade-offs may impact workspace satisfaction, and the final result will impact employee productivity, whether accidentally or intentionally. Other variables affect workers as well; for instance, frustration with noise, or other office elements, can shorten employees' tenure at the organization as they look for a better space.

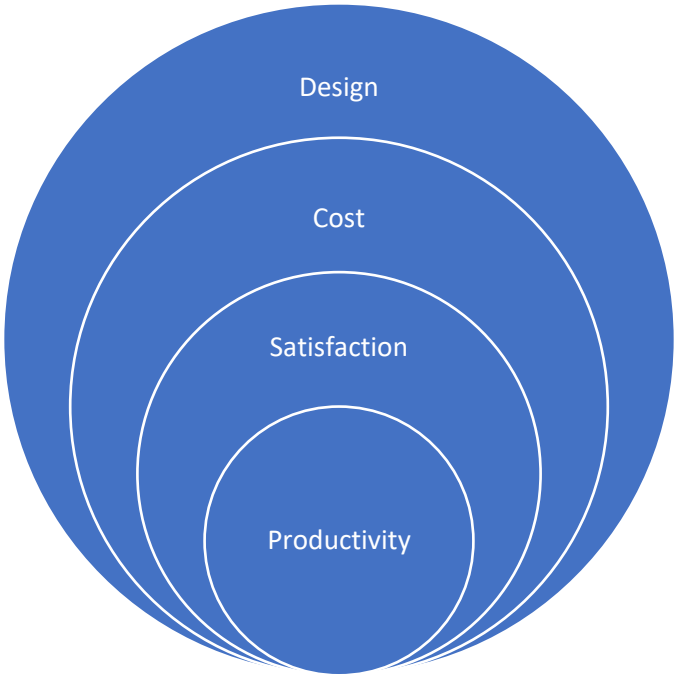

Figure 2

Relational impacts on productivity

In the new remote work environment (for some knowledge workers), a short-term view may be that considerations such as privacy, noise, and illumination will no longer be relevant. Every variable in an open office setting would apply in some fashion to a work-from-home scenario. For example, is there enough privacy to conduct business? How much/loud is the ambient noise? All these factors would be applicable. The next question is how a company expects to mitigate these issues. One example of a mitigation measure is a noise-canceling headset, and another would be an ergonomically sound desk.

Cost

JLL focused on overall costs to determine whether real estate was the correct target for lowering overall costs (Jones Lang LaSalle IP, Inc, 2017). JLL developed a 3-30-300 rule using the building space in square feet. The rule provides a ratio that can utilize local prices, suggesting $3 in utility costs, $30 for rent, and $300 for payroll as a guideline. The ratio demonstrates an illustrative scale for decision making. For instance, it may make more sense to strive for a productivity gain of 10% and a budget impact of $30 than for a rent reduction of 10% with a budget impact of only $3.

A study on workplace trends in office space researched square feet per employee as a measure of the amount of real estate needed (N. G. Miller, 2014). However, one overlooked variable is the difficulty in predicting real estate expansion or contraction requirements. A counterintuitive fact is that some cities may be more expensive to lease

but have more space allocated per worker. The space reutilized for a new tenant may not be reconfigured efficiently, and space reduction trends are generally not seen until lease expiration. N. G. Miller (2014) concluded that larger firms, and GSA, the federal government's real estate arm, are looking for better utilization rates; however, the trend does not translate across all industries. One estimate showed the United States with 270 square feet per employee, Europe with 210, Japan with 140, and China with 50 (N. Miller & Brown, 2013). JLL has developed an office fit-out guide detailing rough costs per square foot for differing office types (Jones Lang LaSalle IP, Inc, 2018). The prices range from $120 per square foot for open office plans to $140 per square foot for traditional private office plans (30% private offices, 70% open).

Real estate costs can be a manageable budget target for cost reduction; however, organizational effectiveness can suffer if the strategies do not consider the impact on employees (Whole Building Design Guide, 2018). The Whole Building Design Guide looks at a building’s total life cycle costs. Magnitude is an essential factor. A private-sector example uses $200 per square foot for salaries, $20 for amortized brick and mortar, and $2 for energy. In this example, a 1% employee productivity increase ($2) can offset the energy costs. The overall design strategy should emphasize comfort, a sense of community, natural light, and other variables.

The US General Services Administration published a cost-per-person calculator that looks at the workspace, information technology, and telecommunications (US General Services Administration, 2019). This calculator looks at potential cost savings for alternative work environments but does not address worker productivity.

When office space cost is the main factor considered, employee turnover cost is a consideration. Work Institute (2018) published a report which listed the workplace environment at #10 of the top 10 reasons for an employee leaving (6%). Turnover cost was conservatively estimated to be 33% of the salary cost. The category also included factors such as culture fit issues, unsafe environment, and inadequate facilities.

Productivity

The Hawthorne Electric Company experiments are well known for starting organizational research and improving productivity; however, Elton Mayo had conducted other experiments prior to this (Mayo, 1975). A factory in the study had a high turnover rate, but during the 12-month investigation no one left after the management installed beds to enable workers to rest. The post-experiment turnover rate eventually settled at 5%. Several changes happened during this time at the factory, including social group development. The investigations ceased at that particular location; however, Hawthorne Electric Company was next. Lighting was the first variable studied, but variations in illumination were inconclusive as to their impact on the productivity rate/levels since the rate increased even as illumination decreased. The experiments continued with a small batch of workers whose productivity increased as they became a team. With inconclusive results from these experiments, interviews outside the researched department sought answers regarding the causes for increased production. Significant results included the realization of a social structure change, "the passage from an established to an adaptive social order" (Mayo, 1975, p. 66).

The Hawthorne studies have been extensively researched using various perspectives, and Hassard's article suggested that the social and political factors were insufficiently considered. Western Electric had a distinctive corporate culture that was staunchly anti-union and innovative (Hassard, 2012). There have been technical critiques of the study, but the analysis accounting for external forces is more interesting. The company saw the plant as a social organization and valued employee relationships. Western Electric had promoted human relationships previously, but predominately to avoid unionization. The Hassard study timeframe coincided with an economic downturn and a challenging working environment. In that context, the study accomplished phenomenal and groundbreaking work.

Western Electric was the most significant US electrical product manufacturer at the time and a provider of welfare capitalism. Welfare capitalism is defined as providing higher wages and benefits such as health care, social clubs, and training. The goal was to provide a strategic defense against organized labor; however, it is essential to realize that this effort started with initial operations in 1907 (Hassard, 2012). Studies also enhanced the reputation of the company by discovering the "social man" management model. The Harvard group used the lessons as the theme of three books and 33 articles. The critiques include an unpublished contextual analysis, which would have offered insight into the context of working women and other important topics in this regard.

Another view (Levitt & List, 2009) looked at data used to support the Hawthorne effect. Their conclusion was that reexamination showed a more subtle effect. Seasonal variations, for example, were not considered until the final analysis and may have led to less support for the conclusions. The data did not offer clear explanations for output

changes (for example, the increase in output) when compared among months, including after the end of the experiment. The results also showed some evidence that the output increased during changes in lighting rather than seasonal changes.

Another perspective (Sonnenfeld, 1985) found evidence that the Hawthorne results endorsed the original findings but for a different reason. Sonnenfeld's suggestion is for the experiment to be considered as a whole, as part of the social system, to include motivating influencers, effective leadership, employee involvement in decisions, and job satisfaction.

Satisfaction

The research link between satisfaction and performance was revealed in a study by Schwab & Cummings (1970). Frequently cited studies include the Hawthorne studies and the work by Herzberg (1965). The Hawthorne studies had a significant research impact, and Herzberg suggested a link between satisfaction and performance. Herzberg used motivation and hygiene variables to segment these two factors, with hygiene not seen as contributing to positive attitudes (Herzberg, 1965). The Porter-Lawler model suggested performance as the causal variable and satisfaction as the dependent variable. A notable aspect is that rewards must be perceived as equitable to be effective. Korman's (1970) additional moderating variable was self-esteem, which he found to be moderating the relationship between performance and satisfaction. The research suggested that these two variables are not dependent. The review by Schwab & Cummings concluded that it might be better to examine satisfaction solely as a theory or performance exclusively and not link the components, to avoid overlooking relationship variables.

Another review (Judge et al., 2001) looked at the literature through a series of seven models. These models considered job performance causing job satisfaction (and vice versa); a reciprocal relationship; a spurious relationship; moderation by other variables; no ties; and a reconceptualized understanding and satisfaction model. No model was a clear winner in all situations; however, the satisfaction–performance correlation was found to be higher for high complexity jobs. The study's future research recommendation was to look at integrative models, including factors such as moderators (performance rewards, job characteristics, work centrality) and mediators (behavioral intentions, festive mood) (Judge et al., 2001).

A longitudinal field study (Brennan et al., 2002) researched employee satisfaction with the physical environment and perceived productivity. The purpose was to determine the long-term impact of employee relocation from traditional to open office designs. Since open office can be a subjective term, the study used categories of individual open, shared open, or bullpen offices to define the environments. The survey referenced previous research where workstation lighting, office privacy, and noise accounted for incremental changes in productivity. This research did not explain why one design was successful in one company while unsuccessful at another location. The findings indicated that a lack of privacy and space for confidential conversations was a significant factor, and possible mitigation would include breakout rooms for private discussions. It was also revealed that open office protocols may assist the transition for workers into new areas.

How to align job satisfaction with practice was the focus of a study by Syptak et al. (1999). The authors found that the aspect of working conditions addressed the equipment and facilities' upkeep and the need to give employees personal space to avoid

tension. The work component emphasized contributions made to overall satisfaction and process improvements needed to sustain them. There is no single way to manage the aspect of working conditions and maintaining facilities, but the Herzberg framework may provide a starting point for creating environments to foster productivity.

Another practical application of satisfaction focused on open-plan offices (Veitch et al., 2007). They observed that the slow research progress was partially due to a lack of standard tools to measure work environments' efficiency. Their first hypothesis stated that satisfaction was related to environmental features limited to privacy, ventilation, and lighting variables. Happiness can be positively related to overall environmental satisfaction, which in turn can be connected to job satisfaction. The three-factor model appears to be generalizable across the public and private sectors; however, more analysis is required to make informed design decisions. The second hypothesis was also supported, and suggested that occupants who are more environmentally satisfied are more satisfied with their job. The conclusion was that satisfaction may impact organizational outcomes and would require to be researched further. Thus, the study found that job satisfaction did suggest a linkage between customer satisfaction, turnover, productivity, and profitability.

A study on job satisfaction among office types (Danielsson & Bodin, 2008) used multivariate regression models and adjusted for age, gender, job rank, and business line. It was found that the psychosocial environment influences employee health, and the study looked at office environment types and job satisfaction influences. The results indicated a flexible office design, along with shared and cell space, as being the best for satisfaction.

The conclusion was that individual perceptions play a part in job satisfaction; however, there was no indication regarding which office features drove the perception.

Kim and De Dear (2012) examined the privacy-communication trade-off in open-plan offices as well as indoor environmental quality issues that impact office productivity. Physical environmental factors, such as temperature and noise level, are critical factors that may affect productivity. Air quality and sound privacy are proportional factors that may drive satisfaction factors concerning building performance. Among the factors excluded from examination, the notable ones were daylighting and individual temperature control. Kim and De Dear (2013) noted that private offices scored the highest for satisfaction. Open offices received the lowest overall scores regarding visual privacy and noise levels. The implication was that occupants liked the increased interaction in open offices but disliked the overall workspace.

Kojima et al. (2017) analyzed office worker productivity and included common areas such as break rooms. Their analysis showed that four behavior types (focusing, relaxing, communicating, creativeness) influenced overall productivity. The conclusion was that office space impacts productivity. Areas such as break rooms, meeting rooms, and the general building were also found to impact workers' productivity and need to be considered when designing open-plan offices.

Another aspect of job satisfaction is turnover rates and longevity. Components that were impactful in the study of private club managers included quality of life and lack of recognition (Erdem & Cho, 2007). An important finding was that salary fairness had a more significant impact on job satisfaction than set salaries. The implication was that people want rewards to acknowledge what they do when compared to others.

One goal of researchers was to study the work environment for demanding positions without variables, including financial struggles. They were changing the physical work environment to improve outcomes focused on studying information technology workers at a Fortune 500 company (Moen et al., 2016). Work schedule control, including working from home, was one of the steps taken to assess changes. The results included reduced emotional exhaustion and increased job satisfaction compared to a control group. One noteworthy limitation was that the interventions needed to target all workers, not just those who were under pressure from lower wages. An earlier study that researched telecommuting noted lower productivity in dull tasks outside the office but higher productivity with creative tasks (Dutcher, 2012). These differences illustrate the difficulty of solving productivity for workers of differing wages, commutes, and job tasks, using one uniform solution.

Satisfaction Tied to Productivity

A study on workplace productivity and office type (Haynes et al., 2017) looked at open-plan office productivity variables. Their research found that organizations assumed collaborative environments to be more productive and that people spent more time in collaboration in open-plan offices. The overall findings were mixed and needed more investigation. Enclosed office occupants were more effective due to privacy and fewer distractions, with open-plan office occupants being more collaborative. Noise was a factor in open-plan offices. The best work environment had various spaces available, with occupants working on current tasks in a space they deemed most appropriate.

The productivity of individual employees can be subjective and hard to measure. Still, a modeling study (Kojima et al., 2017) used an approach to evaluate workplace productivity by asking employees to self-evaluate spaces and productivity. This data can be compared to the results of a database maintained by the Center for the Built Environment at the University of California, Berkeley (Occupant Survey Toolkit, 2019). The research findings suggested that factors influencing productivity included environmental office factors and other amenities in the building, such as meeting rooms and break areas.

Various studies have analyzed increases in productivity when workers are happy, with one article referencing Harvard Business Review (31% more productivity; 37% higher sales) and a study spanning 1996–2001 (6.6% increase in productivity) (Edward, 2015). Other studies have noted that a large number of variables impact happiness and that finding a solution can be difficult. Four trials (including tragic life events) showed that emotional well-being might be a causal force. There may be implications of everything from promotion policies to human resources for linking productivity and happiness (Oswald et al., 2015).

Fassoulis and Alexopolous (2017) conducted a study linking satisfaction and productivity. The findings suggested that the administrative staff were dissatisfied with their workplace, and productivity dropped. The variables that impacted productivity included lighting, noise levels from conversation, machinery, traffic, ergonomics and furniture, office aesthetics, and the employees' ability to change the environment. The type of work was examined, along with the levels of collaboration.

A longer-term study looked at Finnish plants from 1996–2001 to link productivity and satisfaction. Satisfaction increases produced a 6.6% increase in value for worked hours (Böckerman & Ilmakunnas, 2012). That study does not use knowledge workers, but potential linkages cannot be ignored in workspace analysis.

Research on aggregated life satisfaction and productivity links has suggested that well-being contributes to productivity (DiMaria et al., 2019). The data from 20 European countries' responses to the European Social survey revealed a positive correlation of employer-employee relationships with a higher productivity rate, as also with higher life satisfaction. The survey addressed six dimensions: an individual's estimation of happiness, emotional well-being; functioning; vitality; community; and support relationships (Economic & Social Research Council, 2015).

Knowledge Workers

The term knowledge worker was coined by Peter Drucker (Corporate Finance Institute, 2018) in 1959. These workers are people who think for a living; this description postdates the term white-collar worker. Worker characteristics include continual learning, prioritization, and leveraging of information. Further, they possess good communication skills and are motivated to refine their technological skills. A challenge in dealing with these workers is employee retention since they relish challenging roles and opportunities.

A survey of Central London offices looked at 213 knowledge worker respondents and the self-assessed office environment (Chadburn et al., 2017). One previous study (Myerson & Bichard, 2016) has suggested that office workers would only be productive

if the workspace design meets needs; other results are less conclusive. The Myerson & Bichard study analyzed both physical and social environments.

The questionnaire asked demographic questions (related to gender, age, profession) and when people were most likely to be productive, and it concluded with drivers that impact and enhance productivity. The main elements negatively impacting productivity were poor IT connectivity, distraction by colleagues, and office design. The more positive results were comfort and convenience, with adequate ventilation and temperature control leading the list. Some of the survey's findings did contradict the assumptions/hypotheses, with open office scoring well; however, privacy was needed by 30% for enhanced productivity.

Personal productivity is dependent on both personal and social-environmental aspects. Most people prefer an engaging environment and need a quiet, concentrative space (Chadburn et al., 2017). The article stated that further research was required to determine the reason for the contrast. The study found that one universally disliked item was the hot-desking scenario, where workers share space.

Drucker (1999) contrasted the potential for productivity increase in manual workers by studying tasks to increase the efficiency of knowledge workers. Six factors were found to be involved, ranging from autonomy to output quality and a desire to work in the position. A critical aspect of productivity is systematically defining the task and eliminating distractions. The article concluded that productivity research for knowledge workers is in the early stages, and there is more to discover.

An article by Matson and Prusak (2010) about boosting knowledge worker productivity concentrated on removing barriers. The focus is to eliminate anything that

impedes productivity, especially since traditional performance metrics are hard to manage for the knowledge worker style of work. The barriers defined include physical and technical barriers such as geographic limits, social and cultural barriers such as organizational hierarchies, contextual barriers, including different business lines, and time. The time component suggests that executives maximize interactions by introducing the required subject matter experts and sharing the knowledge electronically. There are several ways to look at productivity, and these articles suggest that no method on its own would improve retention and increase productivity among knowledge workers.

Engagement

Employee engagement and business performance linkages were the main variables in a study of 568 people (Harvard Business Review, 2013). This global survey covered a variety of industries and targeted senior executives. One finding was to look at engagement prioritization. Low prioritizers focused on cost-cutting, and high prioritizers focused on employee engagement. The results tied to productivity questions, with 81% of high prioritizers stating that efficient productivity was important, versus 38% for low prioritizers. Other items, including customer satisfaction, had similar results.

The Public Buildings Service (2009) looked at six different work environments. It categorized them into unassigned workspaces, changing organizational traits (including blurred boundaries and smaller work units), and new workplace trends. The goals included space efficiency, while recognizing an increased need for meeting spaces and private rooms for focused work and improved environmental quality variables such as air quality and daylight use. It was stated that occupants must be involved in design

decisions. Recommendations for federal spaces were to design for a mix of activities (collaboration and individual work), support technology (wireless and acoustic performance), and design to support employee engagement.

Steelcase (2016) found that employee satisfaction was directly related to higher engagement; however, globally only 13% of workers are highly engaged. Such engagement is directly related to satisfaction with the physical office environment, attitudes about their company, and control of their environment. Technology, remote work options, and specific location-dependent cultural norms also impact engagement and need to be considered to have the most significant engagement impact.

Office Design

K2 Space (2017) documented office design history, with ancient Rome being suggested as the place where offices first originated. The 1726 Old Admiralty Office was built in London as the first dedicated office building and was rapidly duplicated. The idea evolved to Taylor's scientific approach with workers in rows of desks and managers in oversight offices. It was efficient for production but lacked consideration of human factors. An open-plan office was designed in 1939 to increase productivity, which included bright lights and cork ceilings to absorb office acoustics. The 1960s German office design, known as Burolandschaft ("office landscape"), was developed to meet workplace needs and encourage collaboration. Modular furniture was prevalent in this open plan. Robert Propst invented the Action Office system to differentiate from Burolandschaft when he was head of the Herman Miller Research Corporation, intending to meet worker needs. The goals ranged from giving a greater level of privacy to a

modesty board covering female workers' legs. The evolution of the concept led to cubicle farms with tall dividing walls defining the office space.

The idea that office design can impact the employees' workplace perception and the concept of aesthetics versus function is an ongoing philosophical debate (Danielsson, 2015). It was discovered that window proximity which provided light was a positive functional component regarding employee satisfaction, while low partitions negatively impacted employees. The same study documented that individual employee accommodation for design features increased satisfaction. Office design can accommodate noise reduction; however, there is no clear solution. Offices where two to three people share space and traditional offices frequently cited noise as an issue, while open-plan offices varied as to noise complaints. A tech worker's priority is to focus on work in an uninterrupted manner, which they value over workplace perks; however, office style preference can change according to the nature of work (DeNisco, 2016). Collaboration is an important aspect and is perceived to be more common in open plans.

Office design research can leverage specific functions for space (Elsbach & Bechky, 2007). Instrumental roles may improve collaboration by allowing team rooms to use whiteboards to record work in progress. Symbolic functions may allow room personalization, and projectors could change the mood by displaying various backgrounds to allow for different aesthetics. These are examples of leveraging design features to enable individual identities to flourish in team spaces and emphasize designs' impact status and emotional workplace attachments. One design aspect to consider is adjusting for employee functionality and for managers to allow environment adaptation.

Design can impact employee engagement, with 88% of highly engaged employees feeling they have workplace control (Facility Executive, 2016). Managing the space itself can also maximize efficiency if workers have options on workspaces and how they collaborate. One example is to form neighborhoods of like specialties to avoid emails and having to walk across the building to have a quick meeting.

Can office type impact workplace productivity? A study designed to look at how occupants interact in various office layouts and occupant differences (gender, age) showed that those with enclosed private offices perceived the highest productivity, while those in open offices showed the most impact (Haynes et al., 2017). Young males were shown as being the most effective in open-office layouts, while older occupants viewed private spaces more positively. One way to design for a better outcome is to accommodate employee desires and plan for common areas and future space needs (Heathfield, 2019).

Knowledge workers specifically need interaction and concentration (Heerwagen et al., 2004). Knowledge work is both highly cognitive and highly social and needs space for both types of interaction. The estimated time for colleague interaction ranges up to one-third of work time, but identifying how time is utilized to ensure concentration can be difficult.

Gensler (2012) studied workplace design and effectiveness across modes of focus, collaboration, learning, and socializing. An unexpected finding focused on the workplace effectiveness factor, and one strategy to decrease distractions was providing private spaces. The US General Services Administration (U.S. General Services Administration, 2006) focused on workspace utilization. The GSA research found that different

organizations view space measurements differently, but most organizations used a per square foot per person methodology to reduce office size. This model subsequently impacts the budgets for maintenance and operations. Government agencies' strategies to minimize space include teleworking, hoteling, telework centers, and desk sharing. The findings emphasized that rooms may be more comfortable to set up with technology such as laptops, electronic conferencing, and wireless network usage, but change management must persuade employees of the value of these technologies.

The CBRE Institute (2018) looked at corporate intentions to utilize workspaces in the future. The theme was: "to achieve an agile workplace is to create a space strategy that is inherently flexible, supported by technology and designed with the employee in mind" (The CBRE Institute, 2018, p. 4). Reinventing workplace standards was what 43% of respondents looked for, whereas 41% were looking for new workplace standards. These items correlate to productivity, retention, and cost savings. Four design areas to consider include personal workspaces, ergonomics, design, and types of spaces (Chignell, 2015). Employees regard ergonomic furniture, lighting quality, daylight and views, thermal comfort, and air quality as necessary design elements (Cosgrove, 2017).

Telework

One aspect of office designs the federal government has embraced is cutting unused office space. An example is the GSA headquarters building at 1800 F Street in Washington, DC. They achieved a workspace ratio of 2:1, meaning 4,400 employees occupied 2,200 workstations (Work Design Magazine, 2016). Technology, such as employee badges, facilitates desk reservation since there are no assigned spaces. An

important note is that GSA stated that the space design may not be appropriate for everyone (Work Design Magazine, 2016); however, further research into space usage is warranted. Telework facilitates the concept of employee productivity improvement and allows for space reduction and desk sharing.

Does it matter whether you work in a traditional office, virtual office, or home office? (Hill et al., 2003). IBM worker perceptions of different environments and teleworkers were more positive in all environmental aspects except for career advancement potential. The data led to the conclusion that workers perceived increased productivity but reported no difference in documented performance appraisals. Multivariate analyses showed virtual work environments to be a predictor of poor performance, with one possible explanation: workers like flexibility, which thereby impacts their perception. The conclusion was that cost savings could be a compelling reason to adopt telework policies, but the benefits depend on the adopted policies.

Lynch (2017) looked at a Chinese travel agency with over 20,000 employees. The company wanted to grow but avoid Shanghai's real estate costs, if possible, with teleworking as an option. The finding was a 13% increase in employee performance, and the reasons given included the quiet home environment compared to the office. An additional benefit was a 50% drop in employee resignations, and the overall effort saw a profit increase of $2,000/person.

Various companies have used the teleworking framework to meet company goals or increase profit. One important aspect is to have public policies. Telework.gov is a website run by the US Office of Personnel Management for the US Government and guides federal employees (Telework.gov). The site debunks myths surrounding

teleworking and assesses job tasks while answering questions that managers might have on dealing with workers. The goal is to maximize employee productivity while teleworking.

Environment

The workplace environment has been researched in different countries and office settings. The assessment of the impacts of workplace features and communication on welfare, performance, and productivity was the focus of Ajala (2012). The 350 respondents stated that good lighting was a crucial component of organizational productivity, in addition to the lack of distraction when noise was absent. The open office plan was favored by employees due to collaboration, possibly with increased communication, while employers preferred the design due to reduced costs. This particular environment was found to have the potential to increase mentoring and problem solving, while allowing social aspects.

Lighting Research Center & Rensselaer Polytechnic Institute (2016) focused on a lighting study in a federal building in Portland, Oregon, to determine whether office occupants were receiving enough light to positively promote the circadian functions that affect sleep patterns, mood, and alertness. Open-plan designs should optimally plan for more daylighting, and the study looked at the impact of light on employees. Illumination appears to enhance well-being for employees, but the research was inconclusive. There were no significant findings differentiating between the winter and summer seasons. Other studies found that employees like daylight in their work environment. As a design

component, lighting changes have massive potential for improving employee productivity and energy savings using various lighting methods.

Alker (2014) stated that employee benefits and salaries account for 90% of an organization's operating costs, while rent is 9%. Given this cost disparity, reductions in facilities should account for potential employee productivity losses. Air quality can impact productivity by up to 10% for typing speed. Increased fresh air intake can reduce employee absence due to sickness. Office windows supplying light may appear to be a luxury, but studies suggest that workers with increased daylight exposure sleep 46 minutes more per night. Window daylight intake may reduce the need for artificial light. These variables indicate that the office environment has the potential to impact office productivity.

Ashkanasy et al. (2014) researched office spatial density and crowding, which refers to the space employees have and any perceived restrictions. Office space variables include personalization of space, workflow dependencies among office settings, and individual and team territorial behaviors. The article argued that the research on physical work environments has not used theoretical definitions for study and suggested that the affective events theory may provide a framework for organizational behavior. This particular theory addresses emotions, and the open office plan may offer unique perspectives to look at relationships involving work behaviors. The environment may cause frustration due to noise and restrict the employees' movements. The study concluded that the framework of affective events could help better understand behaviors in office environments.

Relocation to open-plan offices may impact health, work environment, and productivity (Bergström et al., 2015). A 12-month longitudinal study assessed these variables and saw a significant drop in all three categories, as reported by the participants. These results had long-term implications; one example was that sick leave usage would increase due to reported health issues. An additional concern was that 18% of employees intended to leave within two years (baseline 7%).

Sound

Sound insulation and masking were the focus of a study by Hongisto et al. (2016). The most disturbing sound identified was a colleague's irrelevant speech. One option would be to provide rooms for confidential conversations or phone calls. One notable study component was the use of physical insulation to protect conversations in private offices. The current standards in Finland do not provide optimal noise reduction, and a conclusion was to increase those standards for better employee work conditions.

The Public Buildings Service (2012) conducted a study on office acoustic comfort and defined acoustical comfort as being "achieved when the workplace provides appropriate acoustical comfort for interaction, confidentiality, and concentrative work"(p. 4). The level of comfort was quantified by a rating of how many random words can be understood in adjoining spaces, with most commercial buildings receiving a rating of less than 80. This number represents 20 words being understood, with 80 being the standard privacy threshold. One misconception identified was that phone conversations or conversations with colleagues constituted the primary noise distraction. Open office designs allow coworkers to see one another, with spontaneous interactions occurring as a

result. The report outlined steps for achieving acoustic comfort, including deliberate placement of support activities such as copier and break rooms, low-partition workstations, and organizational behavior protocols. The noise impacting privacy can be measured, but many of the steps calculated to increase design success involve deliberate planning and organizational behavior modifications.

More specific items to consider for acoustic comfort came through the post-occupancy evaluations of seven green buildings (Pardis, 2016). These include acoustic ceilings with a noise reduction coefficient of 0.75, systems furniture with a minimum height of 60", and avoidance of light fixtures over desks (they reflect sound). Conference rooms and private offices also had specific recommendations: ducted air return systems, not locating mechanical systems adjacent to each other, and walls extended to the structural deck.

Privacy

Two office relocations were studied (Haapakangas et al., 2018), emphasizing environmental issues such as noise and lack of privacy. The literature and previous research suggest that interpersonal relations are impacted, and environmental dissatisfaction increases with open-plan designs. It is unclear why this occurs. The most commonly cited stress factors include a lack of privacy, noise, and other distractions. The privacy component is an individually perceived variable driven by inadequate visual and auditory isolation, predominately the fact you can hear and see coworkers more than in previous environments. New environments can significantly impact overall employee satisfaction and productivity. Another challenge is that isolating complex variables can be difficult. The study showed that matching workers and different jobs with spaces was beneficial, including task concentration. One possible way to overcome this design limitation is to provide quiet workplaces for employees to accomplish these tasks.

In this context, the research on background noise has looked at working memory to determine the performance impact when dealing with background noise (Jahncke et al., 2011). The study determined that there is an impact but also that mitigation is possible with short periods of therapeutic conditions. It is essential to note that the environment is complex, and office environments can differ. A notable component was the discovery of a performance loss due to the impact of two hours of noise on self-reported fatigue and loss of motivation. The study concluded that further research was required to determine the optimal amount of noise to enable mitigation of speech and background components.

Employees in open-plan offices may lack 'sound privacy', with management using the design as a trade-off for enhanced communication. Some studies, dating back to at least 1982, found communication being hindered due to privacy concerns (Bradford, 2013). One study involving 42,000 office workers (303 buildings) found no evidence of increased communication (Kim & De Dear, 2012).

Acoustics is vital in office space, and self-adjustable masking noise was the subject of a literature review (Vassie & Richardson, 2017). The focus was on the impact of office noise on worker performance and satisfaction and whether masking would reduce effects. The indications were that worker concentration improved with masking; doing so reduced the speech intelligibility. Masking noise can be delivered by either loudspeakers or earphones, with earphones allowing workers to select masking when needed. The types of sounds for which decibel levels were identified in the study included single conversations, groups, loud nearby conversations, and neighbors' visits. The conclusion regarding using earphones was mixed. Although the method worked, employees rejected the technique for various reasons, including discomfort, loss of situational awareness of nearby conversations, and the consideration that overall task completion might suffer. Brown noise can alter the volume; however, future studies should consider the intelligibility of background conversation when using technology to improve office space performance.

How much of an issue is an auditory distraction? A simulation involving four talkers assessed the speech variable (Yadav et al., 2017). Noise can be subjective, and this study conducted assessments on the noise sensitivity of individual workers and environmental assessments related to concentration. The results showed that multi-talker

environments were more distracting than single talkers, even with masking noise. Additional considerations included speech intelligibility and privacy concerns, but both variables require further study. Cognitive performance (measured by distraction) decreased with an increase from one to four talkers, but not from one to two talkers or two to four talkers. The results validated the variable complexity and subsequent difficulty in subjective evaluations.

With office noise distractions being subjective and a variable to consider in open office designs, what is the impact on worker satisfaction? Office noise and satisfaction as a component of employee well-being were the focus of a study by Sundstrom et al. (1994). Working conditions are consistently a job satisfaction element, and the study focused on office noise disturbances concerning the physical working environment. Noise was one component, and the results showed 54% of employees being bothered in some form. Noise, described as conversations, impacted environmental dissatisfaction, while the sounds of telephones ringing impacted environmental and job dissatisfaction. The study results' implication is that practical mitigation would involve installing acoustic treatments (carpet, draperies, acoustical ceilings, partitions, etc.) to reduce ambient noise and prevent privacy loss through overheard conversations.

A study on speech privacy in various office configurations showed that conversations disturbed nearby occupants and decreased task concentration (Salter et al., 2003). Comments included the following: "We currently don't have a conference room; therefore, meetings are held next to my cubicle. I can usually ignore that noise, but it is challenging and disconcerting to know that the people in these meetings hear my phone calls." Another interesting comment was related to job differences. "The other group next

to us is very chatty and loud. They are not programmers/developers, so they may not need the same amount of quiet I do to complete my job" (p. 8). The study provided practical solutions for reducing noise levels by implementing specific construction methods; however, it did show that noise reduction must be deliberate to be effective. Privacy is a concern with office occupants, and the benefits of office collaboration may be lost if it is not considered.

Ergonomics

Ergonomics training programs look at office environments to impact employee productivity with custom workstations (Hedge & Puleio, 2014). These authors' survey found that employees with custom workstations, adjustable keyboards, adjustable chairs, and adjustable monitors were more comfortable, productive, and better satisfied with their jobs. The new working space was more open than the previous locations, and noise complaints predominately alluded to the air conditioning. The survey defined additional variables that contributed to overall productivity. Office design must account for the entire worker environment to maximize productivity.

The US Department of Labor's Occupational Safety and Health Administration (OSHA) looked at ergonomics in a 2000 study (Occupational Safety and Health Administration, 2000). OSHA defined why ergonomics is essential, and specifically discussed workplace design. The factors that impact office workers include working in stationary positions and repeating the same motions. OSHA's reasons for using ergonomics in the workplace included worker safety, increased worker comfort, reduced fatigue, and improved morale. The previous study referenced by Hedge and Puleio (1982)

reinforced these findings 14 years later by allowing workers to adjust their workstation components.

These two are not the only studies to address ergonomics. A study by Occupational Safety and Health Administration (2015) analyzed how Dow Chemical Company used the Six Sigma methodologies to reduce worker injuries. Worker injury claims and productivity impacts exceeded $13 Million for US employers. When Dow Chemical Company analyzed the root causes, one significant finding was unsuitable ergonomics and the lack of adjustable furniture. One initiative was to upgrade workstations to improve worker's productivity—with the overall effort reducing risk factors by 64% and reportable injuries by 90%.

Organizational Ecology

Organizational ecology assesses the influence of social conditions, emphasizing organizational diversity variables (Singh & Lumsden, 1990). One organizational impact is resistance to change. Theorists have argued that inertial pressures inhibit change and adjust the adoption rate of company goals. Older organizations may resist change more and have more inertia regarding their current state. The research investigated institutional variables and population dynamics. The differences in resistance to change between older and younger organizations are related to external legitimacy and the institutional support for change. It is challenging to attribute variables to organizational ecology without considering structural criticism. Ecological ideas may not address organizational change, large corporations, or the density of organizations. One flaw may be an assumption that they are all equal.

Workplace strategy, given the idea that workers' routine tasks have declined and complex interactive cognitive tasks have increased in the years since 1959 is another focus area (Kampschroer et al., 2007). The US General Services Administration had workplace pilots standardize a new workplace style called WorkPlace 20+20. The intent was to study a workplace and design for the client considering organizational analysis, which looks at accomplishments according to work type. A project for the US Coast Guard in Oakland, California, was used to make behavioral changes and measure the outcomes to determine design effectiveness. Some changes included increased information flow and training new staff more rapidly. The design was predominately open, with a central filing system and increased daylight access for the employees.

Communication increased for some employees, but it was not consistent through the entire workspace. The learning aspect was rated by only a quarter of the people as being better in the new area, clearly not meeting one of the desired goals. A similar project took place in Philadelphia, with research being conducted for three years before and two years after the completion of the project. Although the interaction increased, it was mainly by workstations instead of the planned meeting areas. The desire for increased collaboration did not occur. The sites which needed to collaborate had already done so, and the new space helped facilitate a slight increase but not an overall increase in agency collaboration.

Becker (2007) explored organizational ecology and knowledge networks and continued studying the idea that the free flow of information among knowledge workers might help solve complex problems. The six variables considered were organizational ecology, eco-diversity, spatial transparency, unassigned workspace, human scale, and

neutral zones. The idea involved optimized workspace designs, usage, and management. Eco-diversity refers to having a range of workspace types. This idea was supported by a faculty study, with higher-performing members having more interactions throughout the day with people other than their regular co-workers. The spatial transparency variable refers to office members being around people they can learn from while at their workstations. Studies regarding lawyers and engineers have supported this concept. Functional inconvenience involves having employees walk to different areas, such as a break room, and have increased chance encounters, which are beneficial for team building. Intentionally designed spaces, with inefficiencies, allow these encounters to occur naturally. The human scale contrasted European companies, which generally have smaller floorplates, with American firms. The smaller spaces accommodate about 25 employees and reflect the European companies' desire to increase face-to-face interactions. The final variable was neutral zones, which looks at how the office occupants' status can inhibit information flow. One building studied was the US Treasury Department in Washington DC, and the office occupant's status indicator was colored mats outside office entrances. Executive floors seem to imply that you are not welcome unless invited and will still need an escort. The article concluded with an example of an organizational ecology checklist describing the variables, which is a valuable methodology for location investigation.

Affective Events

An article on the affective events theory examined experiences and effects on performance and job satisfaction (Weiss & Cropanzano, 1996). The cognitive judgment

and social influence approach considered environment and other variables, whereas the dispositional approach stated that a person's job satisfaction is related to a tendency about life's aspects. Research illustrates how physical and social environments can impact the overall work experience. Herzberg (1965) looked at motivations, but people react to various incidents in life differently. It becomes essential to consider more variables, make fewer assumptions on office design models, and maximize employee productivity.

A more in-depth look at emotional reactions considers how reactions might impact goals. The response to a neighbor chatting could be frustration (Ashkanasy et al., 2014). Affect-driven behavior can manifest as withdrawal and territorial actions such as building physical barriers. Judgment-driven behaviors refer to acts such as turnover and lowered performance. The implication is that affective reactions indicate whether employees see their organization as a good fit, and reflect their likelihood of leaving. Research has documented certain variables as factors that may sway employee performance and longevity in the organization. Control over workspace and distractions must include personal power and a desire to work alone to increase job satisfaction (Lee & Brand, 2005).

Bell et al. (2001) addressed the concept of community and interactions in the workplace. The corporate bond was not viewed as being as strong as the community bonds that developed, and executives can leverage this concept to increase retention, foster better communication, and improve overall engagement. The potentially negative aspect is the realization that the community can be stronger than leadership in their influence. This bond has implications for the location of teams and also the achievement

of organizational goals. Understanding these dynamics may allow better utilization of knowledge workers.

Social Identity

Henri Tajfel developed the social identity theory and proposed that we belong to groups which give us a sense of belonging (McLeod, 2019). We categorize objects (and people) to understand and use that assignment to know where we belong. After categorization, we compare the groups, and that becomes a source of self-esteem. Group competition for resources can also become the source of hostility.

Hoteling, or the shared workspaces that employees reserve, can have a negative impact on employee identification and perceived status if not implemented carefully (Elsbach, 2003). Examples of status changes include loss of window seating, depersonalization of desk space, and changes regarding membership in the status group (for example, acquisition by another company). Desk artifacts and uniforms can portray identity in a workspace, and employees support hierarchies if they perceive the system as positive. Employees tend to find a way to show their individuality and belonging to groups to affirm their status, and this is a variable that may impact office communities.

Chapter 3: Methodology

This chapter presents the procedures used to pursue this study. Phenomenology provides an opportunity to focus on the participants' lived experiences and account for the variables discovered during observation. These variables can be further studied to continue explaining the phenomenon. The method allows for the interpretation of the participants' lived experience in the open office environment. An additional variable encountered during this study was remote working, with some participants working with a hybrid schedule. Creswell's approach to conducting phenomenological research provided the framework for the study (Creswell, 2013).

Methodology

This phenomenological study utilized a qualitative research methodology to investigate the open office experience and its probable impact on job satisfaction and employee productivity. Satisfaction in the work environment is closely related to productivity (Kojima, et al, 2017). The qualitative method was selected to explore the perspectives and perceptions of knowledge workers on job satisfaction and gather suggestions for improving the work environment's quality. This method is suitable and consistent to garner insight into the variables that impact employee satisfaction and

productivity in the open office environment. It allows exploration of the participants' recommendations for improving the work environments based on their experience.

Phenomenology

Moran (2002) covered the background of phenomenological interviewing. The various philosophical contributions, primarily that of Heidegger and Husserl, were explored and contrasted. Creswell was also referenced for setting up the study. Understanding foundations is essential, but it is vital to look at new ways of describing and analyzing events in phenomenological studies. The following articles describe the research method evolution.

Aagard (2016) described phenomenological research methods, a style that evolved at Duquesne University in the 1970s. Various researchers have modified it since. An example is Edmund Husserl who focused on consciousness and intentionality. The goal is to focus on appearances and investigate derived descriptions without interpretation.

Bracketing was further defined (Hamill & Sinclair, 2010), as Husserlian phenomenology restricts a researcher's preconceptions to allow for pure data collection and analysis. The authors argued that a study should "include the degree to which bracketing affected the trustworthiness and rigor of the study in addition to data collection and analysis"(p. 17). Essential bracketing qualities include being aware of personal values and their influence on data collection and analysis, a willingness to be wrong, trustworthiness, and taking ownership of the analysis conclusion. Achieving this state involves understanding issues, current knowledge, keeping a reflective journal, and

developing an audit trail. No themes may emerge without supporting evidence. Participant perspectives form the basis of the conclusions. The research process is developmental and takes effort to master.

Bevan (2014) explored descriptive phenomenological interviews. Research indicates that we outline our experiences within the world compared to a contextual horizon. The end goal is a realistic description.

Interview approaches can vary depending on the question methodology. Bracketing requires personal knowledge, awareness, and belief while realizing that complete disconnection is impossible. Structures include narrative questions and structural questions. The approaches will bracket questions for the purpose of contextualization and clarification.

The clarification aspect used the data analysis of transcribed interviews. The research helps clarify an element. Different approaches may use the aspect earlier in the process if more information is available.

An advantage of clarification is the chance to validate claims from the interviewee's perspective. The activeness allows for more consistency by examining the phenomenon's structures and subsequently following up to clarify experiences from the interviewee's perspective (Bevan, 2014).

Data Collection

This phenomenological study utilized in-depth interviews of knowledge workers in open office environments to assess job satisfaction. Knowledge workers continually learn, prioritize and leverage information, possess good communication skills, and are

motivated to refine technological skills. The goal was to capture their experiences and determine whether additional variables would improve overall workspaces. The study design allowed the participants' voices to be captured (Creswell, 2013).

The 16 participant interviews helped gather a broad cross-section of experiences and work styles. Organizations are represented by both the public and private sectors. There are various industries represented, and all participants have worked for at least one year in an open-plan office, and volunteered for the study. The interviews were recorded; however, the participant responses were anonymized. The goal was to determine variables that enhanced their productivity as well as those which might hinder them. A natural setting was used (Creswell, 2013).

All interviews were digitally recorded and transcribed. The interviewees received the interview transcripts to verify their accuracy and provide additional information after reflection. The researcher made phone calls and emails as necessary to clarify points and seek further information.

Information security is guaranteed by a password-protected file stored on a secure computer. The participants did not see each other’s transcripts, and their responses were anonymized. Participants were not given a list of the other participants in the research.

Moustakas, as described in Creswell’s book (2013), developed the original broad questions used in this research. The questions are as follows: "What have you experienced in terms of the phenomenon? What contexts or situations have typically influenced or affected your experiences of the phenomenon?" (Creswell, 2013, p. 81). A qualitative method was used to facilitate an understanding of the problem and account for unknown variables. The research design is suitable for the exploration/analysis of

everyday experiences (Creswell, 2013), and determines employees' favorable reactions, adverse reactions, or ambivalence.

Validity

The researcher's lens frames the study's credibility (Creswell & Miller, 2000), but this is only one leg of the triad. Other aspects of credibility include the participants and whether they agree with their discovered perceptions, and external inputs to assess the validity. The three lenses assess the study's validity and the successful capture of participants' perceptions of the phenomena.

Creswell and Miller (2000) provided paradigm assumptions regarding procedure selection. There are postpositivist, constructivist, and critical perspectives. This study used an essential review to disclose social, political-economic, and other narrative antecedents.

Data Analysis

The analysis used a modification of the Stevick (1971), Colaizzi (1973), and Keen (1975) methods as cited in the publication by Moustakas titled Method of Analysis of Phenomenological Data (Moustakas, 1994). The method involves recording and then transcribing a full phenomenon description. Each statement analysis informs the significance, theme cluster, and meaning definitions (Creswell, 2013).

A reduction of the interview information then bracketed phenomenon knowledge and described the participants' experience in a manner that allowed for presentation. The

steps to enable this reduction include ensuring that the experience recorded is what the person perceived and not an inaccurate description influenced by the researcher's past knowledge (Giorgi, 1997). The next step is to read the data without the theme assignment. The information is broken into meaningful units and assessed to determine the significance of the phenomenon for the study. The interpretation defined interrelated structures to identify data variations in a cluster format. After describing the shared experience, the information continued to be classified into thematic categories to answer the research question. This process continued until saturation, with no remaining classes or satisfactory explanations.

The data assessment tool enabled qualitative data analysis through coding, sorting, and retrieval of data. Categories were expressed as nodes in hierarchical structures or free form, offering multiple ways to assess clusters. These clusters described attributes defining items and allowed for additional comparisons.

Model visualization of the data allowed for relationship exploration and theme identification. After completing the model assessments, these themes were reassessed for validity, relationship to the research question, and integrity of the data collected regarding the experienced phenomenon.

The 5-point ordinal scale used in the findings was developed through coding the data as very positive, positive, negative, neutral, or very neutral. Not all the items from the transcripts produced any directionally significant findings, and consequently these were not included in the findings. These codes were initially considered as part of the written transcript, and then the video was reviewed to ensure the context was maintained. If the coded information was still directionally significant, from the perspective and

spoken words of the participant, then the scale was used to assign a value. This value is only meant to show directional significance. The coded items and ordinal scale did help determine the theme significance developed in these data coding exercises.

Credibility

The research perspective is dependent upon the participants for the validity and review of the results. Each participant was given access to their respective transcript for verification of its accuracy and completeness. The results were developed through a process that involved reading the transcripts, forming clusters of meaning, and looking for themes. After the preliminary theme identification, the transcripts were reread to ensure minority views were not discounted and that the themes were representative of participant perspectives.

Limitations

The study is limited to the physical open office environment. One limitation is that it involved the individual participants' perspective and their willingness to disclose privacy, satisfaction, productivity, and other influencers' views. Although the results cannot be translated directly to another space, they inform the decisions that impact employees and their satisfaction in open office spaces. Despite the study limitation, the themes researched are universally applicable and translatable to other environments.

The researcher guarded against bias in the phenomenological study questions by using a script to ask previously provided questions, by not asking follow-up questions

until the participant had completed their answer, and taking care to not ask leading follow-up questions. It is noteworthy, however, that the researcher has a background in real estate and is very familiar with the open office concept (design and operations) and employee engagement. Any resulting bias was guarded against, to the extent practical, by only reviewing and considering answers to one question at a time. The intent was to simply analyze that answer without the context of other answers, which might influence the analysis. Answers could span multiple areas, so they were looked at in aggregate to gain a better appreciation of the participants' overall lived experience, without losing the individual perspective.

Questions

Detailed below are the clarificatory note and the questions addressed to the participants:

Note: This study is designed to examine the impact of office environments on job satisfaction. If you currently work from home but are generally in an office, please describe the different environments, and whether one is more suitable for your work.

Q 1. Please describe the type of work you do, the physical office environment where you work, and how long you have worked there.

Q 2. What do you like about your current office environment?

Q 3. How is your work impacted when there are sound concerns, and do you ever feel a loss of privacy?

Q 4. How would you design a perfect working office environment?

Q 5. How would you make your office space more productive?

Q 6. What would make you more satisfied in your work area?

Q 7. How do you feel about daylight from windows in your workspace?

Q 8. Can you describe what would make you feel more productive on a workday?

Q 9. Is there anything else you'd like to add about your office and how it makes you feel?

Chapter 4: Results

The primary focus of this phenomenological study was to determine the impact of open offices on a knowledge worker's satisfaction and the subsequent effects on worker productivity. The timeframe of the study, amidst the COVID-19 pandemic, had some participants working at least partially from home workspaces.

A qualitative research method was selected based on reasons provided by Strauss and Corbin as outlined by Roberts and Priest (2010). These include the nature of the problem and the need to gain information on the phenomenon (Roberts & Priest, 2010). The data collection required the researcher to remain aware of personal bias, ask clarifying questions, and maintain an audit trail of interviews and transcripts (Hamill & Sinclair, 2010). Themes require evidence, and participant perspectives form the basis of the conclusions. The study goal was to answer two research questions: How does the physical open office environment impact a knowledge worker's job satisfaction? How does the physical open office environment impact a knowledge worker's job productivity?

Previous research has shown a link between satisfaction and productivity (Schwab & Cummings, 1970) and complex positions such as knowledge workers having a higher correlation between the variables (Judge et al., 2001). Dissatisfaction with the workplace can lead to decreased productivity (Fassoulis & Alexopolous, 2017).

With workers working at least partially from home, the study also examined how home working environments impacted job satisfaction from the participants' perspective. Several issues, including ergonomics, privacy, sound, and collaboration, exist in a different physical environment such as the home workspace. If the domain was meant to replace the office environment, the issues were considered pertinent to job satisfaction.

The questions and participants' answers are described in the same order that questions were asked during the interviews. Many participants voiced similar sentiments; therefore, the responses quoted are representative of the overall lived experiences.

Demographics

The phenomenological study results are from individual interviews conducted via Zoom, with 16 separate participants. The participants belonged to the following demographic categories: eight males, eight females; 11 participants with at least 10 years' work experience; two participants with six to 10 years' work experience, and three participants with under five years' work experience. The participants' geographic locations included several cities across various states such as California, Texas, Nevada, and Michigan. Table 1 below contains the demographic information of the interview participants.

Table 1

Participant Demographics

	Total	Private	Public	Education	Finance	IT	Real Estate	CA	NV	TX	MI	Remote Full Time
Male	8	4	4	0	1	3	4	4	1	2	1	7
Female	8	4	4	4	0	0	4	8	0	0	0	4

Work Area Description

The focus was on open office spaces; however, all participants worked from home for at least part of their working days during the time of the study. Some participants (11) worked remotely due to COVID-19 restrictions, while others worked with hybrid schedules. Hybrid schedules in this context signify that at least some days were in an office, while other working days were in a remote location. The range of mixed schedules was 1–4 days in an office, with some participants adapting to the workload and office needs weekly. All participants had at least one year of work experience in an open office environment.

The demographics of those working partially remotely were as follows: four females and one male, all in the private sector. With the phenomenology focus being a narrative of lived experiences from the participants' perspective, the answers were framed around the working environment they were comfortable discussing in the interview. Some participants described their office layout in the organizational setting, while others discussed their home office scenario. Table 2 identifies the participants by alias, industry, and number of working years.

Overview of Participants

Table 2

Participant Alias, Industry, and Working Years

Participant	Industry	Years
Alexander	Information Technology	10+
Bethany	Real Estate	6–10
Charlotte	Real Estate	10
Daniel	Real Estate	10
Emily	Real Estate	10
Hannah	Real Estate	10
James	Real Estate	10
Joseph	Education	5
Lauren	Finance	10
Luke	Education	6–10
Matthew	Real Estate	10
Olivia	Education	5
Rebecca	Information Technology	10
Samuel	Education	5
Sophie	Information Technology	10
Thomas	Real Estate	10

The industry categories are broad and cover various types of employment. The information technology category includes sales and traditional functions; education includes administration, project management, and others; and real estate covers architect, space design, project management, and contracting officers. Participants expressed opinions on work environments, elements that worked from their perspective, and improvement opportunities. The interviews were conducted using the questions listed in Chapter 3. The technique used involved asking the question as written, and the participants answered with no interruption from the researcher. After their response, clarifying questions were asked as appropriate to ensure accuracy, look for themes, and allow comments so as to have accurate commentary (Creswell & Miller, 2000).

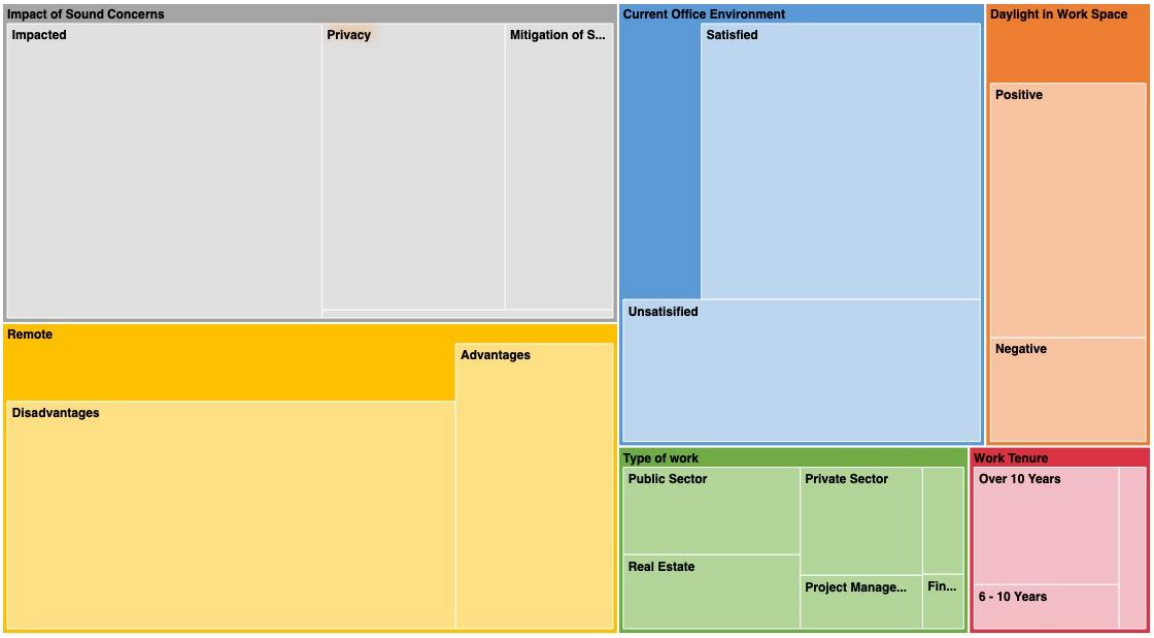

Figure 3

Relative Ratio Representations

Figure 3 is a visual representation of ratios representing participants' feelings about working in various areas, relationships between public and private sectors, and work tenure. Sound concerns spanned both public and private sectors. The disadvantages of remote working were predominately voiced by public sector participants, although the private sector was represented as well. Satisfaction in the current office environment was split, with positive comments expressed in all industries.

The interviews developed four separate themes for this phenomenological study. All the participants articulated these themes in some fashion; the following section highlights some of the participants, detailing their biography and their comments on that theme from their perspective.

Theme 1 – The challenges of remote working and organizational support

Hannah and Thomas described the challenges of working remotely and the support they received from their organizations. These issues impacted both productivity and job satisfaction from their perspective. Hannah and Thomas are both public sector employees and have worked in real estate for over 10 years. Hannah's concern on working remotely was finding a balance. "I don't have to commute. I'm working that extra hour in the morning, the extra hour at night. So I need to figure that out at a certain time, I need to shut down" (Hannah). Other employees too commented on remote working as well. "I think I could work from home forever…if I were to return to an office…I would still prefer the desks next to each other" (Matthew).

Hannah

Hannah works in real estate and has not gone to an office environment in over a year. She predominately works on the computer, but in pre-COVID-19 times she used to

conduct inspections on site. When describing the open office environment, Hannah appreciated the ability to control the temperature in her space and the number of windows. The negative aspect was the lack of privacy and the inability to concentrate due to background noise. Private phone calls, both business and personal, required Hannah to find a space where she could not be overheard. Hannah's idea of a perfect working environment would include desk spaces by windows, with the interior spaces reserved for conference and team rooms. Privacy while working from home was cited by 50% of participants from both public and private sectors as a positive factor.

There are several obstacles to accomplishing her work and connecting with other employees in Hannah's current remote working environment. Hannah's company only provides a laptop for equipment, along with a cell phone. When she works on items where multiple computer monitors could facilitate the process, Hannah can only switch between tabs on her laptop computer. Hannah's laptop has had some malfunctions, and troubleshooting is only possible via phone since accessibility to the office is impossible with the current restrictions. Although a loaner laptop was mailed to Hannah, the problem has not been resolved, and the temporary equipment does not have all the capabilities of the primary laptop. Another essential piece of equipment missing is a computer printer, but this was also not provided. Only 1 public sector employee had better equipment at their remote location, and that equipment was personally acquired. A lack of employer furnished office supplies impacted productivity (for example, printing) and satisfaction, as cited by 6 of the 16 interview participants.

During the interview, Hannah appreciated the time saved by not commuting to the office, but it caused other issues. The laptop malfunction is one, and the inability to

connect with coworkers is another concern. The only contact she has with coworkers is through phone or virtual meetings. Her management does not attempt to communicate with their workers, which has created a disconnect in the unit. Hannah lives in a community that is still locked down, with everyone wearing masks during the rare occasions when they venture outside. This disconnection from any social contact can lead to feelings of isolation. One effect of this isolation is a tendency to work longer. Management communication as a negative remote working factor was cited by 50% of the public sector participants, but was not a factor discussed by the participants employed in the private sector.

Hannah stated that she often works longer than regular office hours because the computer is always set up on her kitchen table. With this accessibility, it is easy to check for new emails or work projects quickly. The downside is that there is less of a dividing line between work and family life, and she works substantially more hours with no increased pay. Hannah also indicated there is increased difficulty in working through problems since it is challenging to effectively gather teams together for training or brainstorming. While there are virtual tools, not everyone is as familiar with them, and erratic internet connections can disrupt goals. The team's newest members are isolated from substantial work relationships and unable to ask questions as they arise due to a perception of employee unavailability. Hannah's ideal working situation would allow for remote working as well as the required time in the office to connect with others and have the synergy to solve problems or talk through problematic projects with peers. Commuting to work can take a substantial amount of time, and was cited as a positive remote working factor by 5 of 16 participants. Working hours, and a lack of separation

from the office, were cited by 6 of 16 participants (split evenly between public and private sectors). Of the participants who did not cite working hours as a negative factor, none had at least 10 years' experience.

Thomas

Thomas works in real estate and is also currently working remotely. The pre-COVID-19 office routine interactions were essential for him, and the current virtual interactions pale in comparison. Thomas's work interactions are limited to virtual meetings, phone calls, and chats. The comparison he made was regarding the loss of quick interactions, such as exchanging a greeting or checking on others. Email usage versus in-person conversations were cited by 12 of 16 participants as a negative remote working factor. Education counted for 3 of the participants who did not have an issue with email as a primary communication medium versus in-person conversations. However, two of those participants also worked in the office at least some of the time.

Email exchanges can result in message translation issues that would be rapidly cleared up in person but can linger in the current environment. Privacy issues are also a concern, but another aspect is the equipment differences. Previous phone conversations in the office were predominately held using either a headset or going to a conference room. Current discussions are made using a purchased headset; however, interruptions are more prevalent, with Thomas's family being at home. His additional supplies for the home office environment include notebooks, writing instruments, and other office supplies, with none of these being reimbursable by his employer.

Thomas indicated workforce management as an area where improvements could be made for remote working situations. His current manager does not hold routine

meetings to allow people to ask questions in a group setting or check in to see how employees are working. The result is a feeling of isolation and a reduction in shared knowledge among employees. Communication issues overall, not limited to management, were cited by 9 of 16 participants, with the sectors divided as 4 in the public sector and 5 being private sector.

Thomas's ideal work situation would be meeting in an office environment for some workdays and having the option to work remotely on a routine basis. His ideal situation would be going into the office at least once a week to allow time to get away from the house and meet coworkers. Thomas addressed the needs of new coworkers, including the relationship built during physical interactions so that virtual meetings would facilitate reconnecting and continuing the relationship. If there is no icebreaker or a similar event to let people know each other on some level, it would become more challenging to connect. The other positive factor for the physical office and shared spaces with coworkers was the opportunity to get coffee or have lunch and interact with fellow workers. The option to work remotely at least some days was cited as a positive factor by 14 of 16 participants, with 4 participants wanting 100% remote as their preferred working environment.

Theme 2 – Management’s organizational impact on dynamics and productivity

Charlotte and Matthew were candid about the management's impact on an organization towards organizational dynamics and productivity. If leaders do not support their employees, there may be an impact on productivity where employees do not feel free to speak out on issues, leading to unfavorable results. Charlotte and Matthew are both public sector employees with more than ten years’ experience. Regarding managers,

Charlotte stated “And I’ve seen that they don’t usually come out of their office anyway. They don’t come out to say hi to folks. That’s the cultural thing, but it affects your work.” Matthew described a lack of trust and support. “I think more support from senior leadership would allow me to feel more productive and allow me to feel better about what I’m doing on my day-to-day basis.”

Charlotte

Charlotte has worked in her field for over 30 years and is highly experienced in her craft. Her need for concentration drives a requirement for private space to take phone calls and hold client meetings. Conference rooms are a common working area for Charlotte and usually are used for about 25% of her working day. With Charlotte’s longevity and experience, her advice on employment, progression, and job details is sought by younger knowledge workers. Charlotte loves being a coach; however, a key component for her is a private space for discussions.

Charlotte’s desired workspace is one where she could have a private office and have the door open or closed to regulate privacy concerns. She would often go to a different section of the building to meet people for private conversations. This practice was excellent but ineffective in maintaining ergonomic practices for her desk and computer. The lack of ongoing mentorship was cited by 12 of 16 participants as a negative remote working factor. Three participants who did not cite this as a factor work in the office at least part of the time, and are in the private sector.

A concern Charlotte expressed was regarding the lack of a social area to train and coach other employees. Management resisted setting aside space and would actively ensure that the space could not be reserved. Even frequently used conference rooms

lacked acoustic treatments, and the conversations could be heard outside their doors. This lack of audio privacy protection would become apparent when people mentioned that they could listen to her conversations, and Charlotte expressed frustration with the office design.

An additional component of the physical environment was the office culture and how it was managed by leadership. Small meetings would be interrupted and questions asked concerning the subject. Color can be an essential component of design, and attempts to brighten the areas were denied, with only traditional colors being used. The result was a feeling of not being listened to and having their objections regarding how space was used being ignored. Charlotte felt that she had more years to contribute and train the next generation but did not know if she was appreciated or wanted to continue with the current management and the culture of suppression.

Matthew

Matthew is thriving in the remote environment and uses various communication tools to stay in contact with coworkers. He has been in his current career for over 10 years, after working in different industries. Matthew's collaboration style allows him to chat with one coworker while on the phone with another. His perspective on privacy is that it simply does not exist in the office and that everyone overhears conversations, whether intentionally or not. His solution is to trust coworkers with those overheard conversations and not feel the need to retreat to private business calls. Matthew is one of four participants who wants to work exclusively remotely fulltime.

A typical gathering area is one of Matthew's desires, and a space where one could collaborate better would be ideal for him. Office storage space and assigned desks are not a concern, and he is happy to have just a small space to work.

Matthew's goal would be for leadership to back up the decisions of workers. For example, according to him, when asked for answers to difficult questions some managers would alienate employees and provoke the apprehension that they were not going to answer the questions or support the employees' decision once made. When promotions were made, one demoralizing aspect as expressed by the participants was that the person promoted did not seem to be either a sound technician or leader. This led to Matthew concluding that there probably was favoritism in promotions. Some temporary assignments were completed to have people gain experience, but this seemed to be discounted once the promotion ranking began.

Matthew's desire for a more productive workspace was overall based more on the culture of management and support for employees than any aspect of the physical office. He has solutions for insufficient equipment supplies and computer functionality and is more focused on being supported by management in performing the job requirements. Overall, Matthew discounted the need for physical office space improvements and would prefer to work within the current framework and improve other working conditions first.

Theme 3 - Office design and productivity impacts

James and Daniel have years of experience with office design and worked in companies where they designed and implemented changes meant to improve productivity. One aspect is that the budgetary constraints often changed the designs to meet that limitation but unintentionally impacted employee satisfaction in their spaces.

James and Daniel are both public sector employees, but have significant private sector experience as well. James stated that office design in his office area failed because the "acoustics are really bad…and we can be extremely noisy. So we have these break rooms where we have to go to make a conference call or just to work on something when you want a quiet place." Daniel mentioned that preference sometimes overcame good interior design with one organization having cubicles "completely surrounded by files" and ignoring the workplace analysis where the records would either be scanned or located elsewhere.

James

James has worked in various aspects of real estate for well over 10 years, with experience in design and construction. He has embraced remote working as well, although he expressed concerns about not having clearly defined working hours as also the increased costs of working from home. However, James is more productive at home with his personal office equipment.

James's workload has increased, and he is trying to mentor others regarding how to better accomplish their work. The goal is for them to have better work products to alleviate rework and produce a better product in the end. Interaction in the office is a better way to accomplish this goal, but his preference is to work from home and avoid commuting. Part of the workload increase is attributed to reduced collaboration opportunities while working remotely; besides, working with older equipment can hinder productivity.

With James's experience in real estate, he emphasized some design issues with open offices as they were executed in his current environment. Examples included

inefficient lighting, poor acoustics, and conversations that should remain private being overheard. The advantage of being in the office would be the ability to go into conference rooms and hold calls with everyone physically present to be able to support one another and ask questions. The disadvantage lies in the inability to do concentrative work with other people present and either having conversations in person or on the phone. Temperature control of the environment is another aspect, with poorly installed systems leading to fluctuating temperatures. The layouts of the desks and the implementation also did not account for grouping of particular types of workers, which would better allow collaboration when required. A different type of knowledge worker might not realize the impact the conversations with someone doing their type of concentrative work would have. Participants expressed a willingness to accept different working conditions to stay at home, but also acknowledged the challenge of working from home. This was cited by 6 of 16 participants, stating that the home environment had negative aspects, ranging from the lack of ergonomic equipment to a lack of separation between home and work. An additional factor for those participants with school age children was cited by 5 of 16 participants as a negative remote working factor, with lack of privacy and noise from other activities being the most common.

Daniel

Daniel works on design projects and spoke of the need to account for working types that apply to employees. The room types that would be available for private conversations, the smaller collaborative spaces, and designing neighborhoods so people would not feel cramped are considerations that can be expensive to implement and consequently a target for cost cutting exercises. Daniel stated there was a disruption with

concerns about COVID-19 in the office environment, and that the application of better technology including the correct tools, training, and equipment may allow for workers to be dispersed geographically. The downside includes the difficulty in training new employees remotely, which will need a different approach to be effective, and concerns of how to provide effective mentorship in a virtual environment.

From Daniel's perspective, interpersonal connections are an important part of a successful culture where employees want to remain in the organization. Employees not having a functioning space they can use efficiently makes it more likely that they will search for the next company that will either give them space or a higher salary to work in the same type of space. The difficulty in connecting with coworkers and solving problems synergistically was cited as a negative remote working factor by 11 of 16 participants.

Daniel's experience with the remote working environment has been mixed. Many people he was close with inside the physical environment are not good at communicating electronically, and they have lost most contact. In his office, the design aspect of the physical work environment was carefully chosen; however, some items were cut to save funds. These items included acoustic treatments and the style of desks used. The partitions were lower, with the thought of increasing collaboration, but without other design elements, which led to decreased privacy. The other design aspect discussed was the need for different spaces for different types of work. An administrative professional was more likely to be placed close to circulation corridors with decreased privacy as part of their work specialty. Someone with a different type of work would not thrive in the

same environment where people could readily access them while transiting to another space.

Daniel's comments regarding design also examined what could be retrofitted to improve the space. Initial comments documented the need to determine employee space needs and offer options, which did not occur in the current space. Daniel is an advocate for open offices with private areas, effectively designed collaborative space, and employee technology support.

Theme 4 – Employee interaction challenges and productivity impacts

Bethany and Lauren represent two distinct industries and geographic locations, but both described challenges with employee interaction. These challenges range from less than optimal space design to cultural differences. The result, however, is similar; both companies showed an impact on productivity. Lauren is a private sector finance employee, while Bethany works in the public sector, with significant private sector experience. Bethany described her office environment as one where people were too close to effectively collaborate without disturbing others. "Even when we keep our voices down, there would be conflicting voices, and you can see people looking at you like you're making too much noise…let's go find someplace we can sit together and go over this."

Lauren described challenges with meetings that were called with minimal notice in her organization while the majority of people were working remotely. A senior manager would "have surprise meetings at 8.30 in the morning…and ask why don't you turn on your camera?" From Lauren's perspective "it's hard for him to trust people that they'll be working."

Bethany

Bethany is a real estate professional with nine years of experience, along with work experience in several other industries. Her work involves speaking with clients and negotiating deals, which involves interaction on a routine basis in meetings or on the telephone. Bethany's comments on office interactions included both the collaborative aspect which helped everyone as well as the interruptions during concentrative work. Her office environment was redesigned from one style of open office design to another which reduced privacy.

The new design allowed for more desks to be in the same area, but the distractions increased. Lower desk partitions and less space between desks meant that phone calls were more easily overheard. The collaborative aspect of going to a coworker's desk for a quick conversation usually ended with other coworkers glancing in your direction, since you disturbed their work pattern. This environment meant conversations were taken to other spaces to preclude disturbing others; however, this reduced productivity since you were removed from your computer and desk phone. Workarounds were common to help in this aspect, but the overall environment was not one where Bethany thrived.

Bethany's comments emphasized that coworker interactions centered on the need to have different workspaces for different kinds of work. If you have a high customer interaction count for your work, you need more separation to avoid disturbing other employees. If your work requires more collaboration, you may need closer desks but also a space to retreat to for work that requires concentration. Bethany attempted to influence management during the design process, but no differences in the space design were

accepted. The end result, for her, was a space that impacted her productivity and ultimately her job satisfaction.

Lauren

Lauren works in finance, has more than ten years of experience, and is used to various styles of office design. She works for a multinational corporation, and cultural influences are part of the company dynamics. When the pandemic started, and people began working from home offices, the potential impact to organizational culture was a requirement for cameras to be turned on to ensure people were truly present and working. This requirement was seen as a lack of trust by some employees.

Lauren stated there is a strong need for interaction among employees for both mentoring and developing new employees. The difficult part was having many more employees in spaces designed for lower occupancy. These tight workspaces impeded confidential conversation, and some people would be asked to leave when matters were discussed which they were not supposed to overhear. The leadership determined that this was a small but essential distraction, without considering the lack of trust it implied. The other issues with interaction included the distinction regarding how different corporate locations had their spaces configured. Many spaces were simply located in certain geographic areas, with minimal attention to actual space needs. These trends impacted productivity and ultimately job satisfaction as well. The end result was a higher employee turnover rate than what they were comfortable with accepting, and some physical space changes are currently being implemented.

The following section details the results regarding specific aspects of the interviews.

Current Office Environment

Collaboration in the office was a key factor, and Joseph remarked that having an open office environment was beneficial. “The benefit was huge because we got to brainstorm,” and “it was very easy to just turn to someone or talk across the room and ask if they knew an answer.” The joint meeting was an excellent method to learn from current issues others experience, which is challenging to duplicate virtually. Charlotte observed that traditional office environments provided “more room to walk around,” which is not always the case in a home office environment. Thomas described the positive social aspect of office spaces as significant since you “go into the office to interact with people…going into meetings where you actually sit at the same table, and you interact.” Hannah valued the ability “to control our own temperature” and “open the windows.” James described remote working as his preferred environment “because I have a room that is dedicated to my work.” Another statement reflected the freedom to talk to spouses compared to being in an office where you were separated. “I really enjoyed being able to talk to my husband when he’s on his break…and being able to take that flexibility.”

Eight participants had significant statements about what they did not like in the remote working environment. Five participants were in the public sector, and three from the private sector. One participant liked the collaboration potential but judged the overall environment with this remark: “I can hear any talking. I need a separate space.” Several participants offered opinions to the effect that days of the week in the office matter. They would prefer to work in the office on Fridays because fewer people came in than on other days of the week. Some commentary related to performing routine/regular work in the office and concentrative work at home, due to the noise levels. The advantage of Friday

with fewer people was that concentrative work could be accomplished at the office. An observation on phone calls described a need for common areas to avoid disrupting the work and concentration of others.

Office design changes can have unanticipated consequences if the variables of light and noise are not anticipated. New workspaces created work areas with no barrier to walkways where employees transited or those which did not restrict the glare from windows. The employees' working solution was to raise the desk to block the sunlight glare and work on the workspace's desk return side with a laptop, effectively defeating the purpose of having dual monitors. Lauren stated that she did not need an ergonomic desk for the workspace, but an ergonomic chair was required. She also noted the financial challenge involved in supplying ergonomic equipment to all employees and that a company policy was needed to set guidelines. Lauren further observed that in the office environment, “You need sufficient private space when working on stuff other people shouldn’t be hearing.” Several participants emphasized a need for team rooms. Matthew discussed the lack of privacy. “There's a loss of privacy—we have the team rooms, and we'd often see people in them because they want to have a conversation with whomever that the whole office didn't need to hear.” Privacy in the office environment was a common concern. “Open office space inhibits me from being able to do what I need to do, and I have a desire of some privacy whether it’s a higher cubicle or an enclosed office” (Matthew). Rebecca had strong opinions on how collaboration requires flexibility. “It was great when we needed to collaborate, but it was distracting when two or three people in the room needed to collaborate and the rest of us were individually working.” A proposed solution from Olivia was to have “some kind of signage to indicate ‘leave me

alone; I am trying to do some heads-down work'." An alternative collaboration aspect that was questioned was regarding how much is too much. Luke said, "I generally really like shared workspaces because it feels communal…you get to easily communicate with other people if everyone has a degree of respect." Luke provided another perspective as well: "I found myself reaching out to my boss who sat next to me…to solve things I could solve on my own." Table 3 illustrates positive and negative aspects of the work environment.

Table 3

Work Environment Aspects

Positive aspects	Negative aspects
Collaboration	Overhear conversations
Space	Noise
Social aspects	Phone calls
Control environment	Lack of privacy
Remote - Concentrate	Ergonomics

Sound

The question of privacy brought many perspectives from the participants. The answers on this subject tended to be longer, and most participants had at least one negative comment on the issue. Some of these came up in another question. Figure 4 below shows the relative levels of the significant thoughts coded.

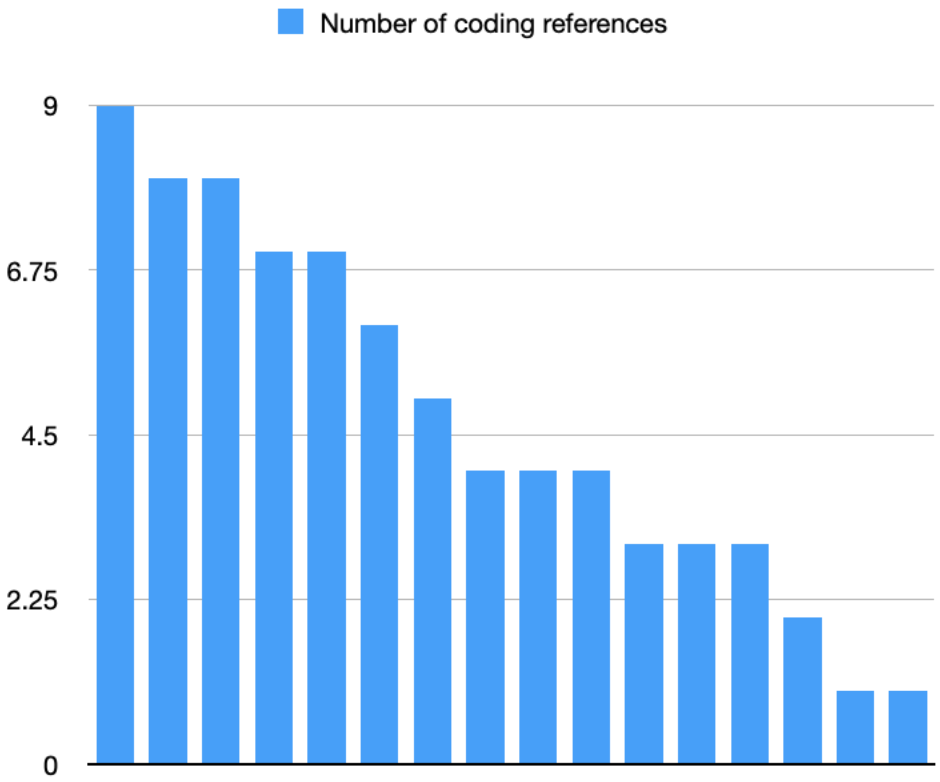

Figure 4 Relative levels of significant thoughts coded

Each bar on the x axis represents a participant, and the y axis represents the significance of the comments on privacy.

Some locations had conference rooms; however, this did not mitigate privacy concerns.

> Even in the conference rooms that we have, you could hear on the outside...that private conversation whether you're talking to your doctor, lawyer, your wife, or a friend. You need to have that privacy without having to worry about people listening to you (Charlotte).

The ability to have conversations at desks was a positive collaboration aspect. However, it depends on the perspective. Bethany observed that this environment had challenges for collaborating with coworkers in open spaces. “Even when we keep our voices down, you know, there would be conflicting voices. You can see people looking at you like you're making too much noise.” Conference rooms were a solution for some, but not for James, whose solution was to leave the open office environment. “I will have to go outside of the building; unfortunately enough, there was less noise than inside the building because of the acoustics.” Different desk designs can highlight the loss of privacy in other ways. “We've got very low partitions, and that does not help for privacy at all. I mean, you, you can hear everybody talking on the phone, and where I sit, I can actually hear people around the corner” (Hannah). Some organizations have workers and management housed in the same physical office space. The space design can highlight additional concerns when a manager does not realize that privacy was not available. “You can still hear everything that they were doing…they probably thought they had more

privacy, but the reality was they had the same amount as everybody else. They just didn't realize it" (Luke).

Perfect Working Office Environment

Daniel said that it was necessary, in open office environments, to have "conversation type workspaces…with the ability to have informal connections…with just a little more flexibility." Emily observed there is no perfect design, but some aspects are more important to solve. "I don't think you'll ever have the perfect office, but eliminating interruptions or the sound concerns…or having a little designated area where you can do calls." She also acknowledged there are some issues where people are unaware of their impact. "I don't think most people are considerate of other people when it comes to eating…it smells whether or not they clean their office space" (Emily). "The perfect working office environment would be a place where you have some quiet space to work, but then you would have conference rooms or collaborative spaces where you could get together as a team" (Rebecca). Her follow-up comment regarding interruptions provided a potential solution:

> It would be great if there were ground rules where you say don't do a drive-by, you contact that person, and say I need to talk to you about something and then arrange a time to meet in your cubicle or the conference area.

Luke commented: "The only thing I don't like about open workspaces is that people have to sit facing the door or facing walkways." Matthew had a similar observation: "We need some way to not be disturbed by every little thing that comes by because out of the corner of your eye you see someone walking by, you know, human

nature dictates you look up." Remote working was an aspect some workers envisioned as being a part of the perfect office. "I think I could work from home forever…if I were to return to an office…I would still prefer the desks next to each other" (Matthew).

Productivity

Equipment in both the open office and remote working environment was discussed extensively, with the necessity of multiple computer screens being a common theme. However, "more organized space" (Alexander) and "resources and equipment" (Thomas) were also commonly acknowledged variables that need to be met to have a more effective working environment, whether it is remote or in an open office. Meetings can be seen as ways to be more productive, but "with Skype or Zoom, you're missing the little bit of the human element…social interaction energizes me" (Rebecca). "I feel we are very productive when we're there and working. I would say that maybe chatting too much… so finding that balance" (Luke). Management can have an impact on productivity. "I think it would allow me to feel more productive…to have senior leadership back you up…you feel the pressure to what senior leadership wants you to do versus what you think may be appropriate" (Matthew). Remote working has an impact on productivity as well. "I'm actually over-productive here at home because the laptop is sitting right on my kitchen table. And I feel like I'm putting in 10, 12-hour workdays…I should learn to shut down. I don't have to commute. I'm working that extra hour in the morning, the extra hour at night. So I need to figure that out at a certain time, I need to shut down" (Hannah). "If we could avoid the water cooler talk, you would listen to the conversation, and then you get up and start talking about it….a conversation for an

hour…then your day ends, and you really did not accomplish what you were supposed to do" (James). The following diagram (Figure 5) indicates variables that impact productivity.

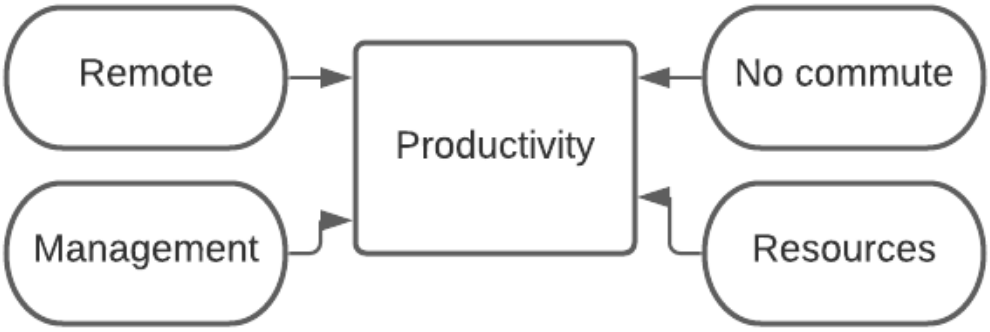

Figure 5 Variables that impact productivity

Satisfaction

A standing desk with enough space, a design to meet work needs, and a more thoughtful design were the necessary items Alexander listed that impact satisfaction. Offices that were empty on Fridays, a place to eat lunch, and small break rooms with common everyday items furnished were common answers from several participants. Personalization of an assigned desk and working from different locations, including remote offices, were identified as additional keys to satisfaction. Another essential item was to have the correct type of equipment and resources supplied by the employer, regardless of whether the participants were in the office or working from home. The

items specified include computer monitors, basic office supplies, a facility to print, and coffee. Coffee is not a commonly considered element, but the participants had a great explanation of its value and how it could be implemented. Most offices supply coffee in the office; however, it becomes an additional expense for the employee when working from home. Emily suggested providing care packages for teams to replenish items they do not keep in the house. Coffee has become an additional expense with remote working. One care package component suggestion was coffee supply for the month or a stipend to show encouragement from the employer. As remote working continued, some team events such as lunches disappeared, and this care package would be a mechanism to regain some of the camaraderie. Remote working conversations included the value of ergonomics while working away from the office. Some employees may have an inadequate functional area at home with "kitchen stools or kitchen chair, something kind of cobbled together or sitting on the couch," taking the place of an office desk and chair (Luke). "Management is really the key. Honestly, I think it's the key to making happy as far as recognizing the work, recognizing the employees in the work that they do—promoting the workplace, engaging everyone, having one-on-ones but even better team meetings. It just makes an amazing experience. You literally go to work super happy. You just want to be there; you don't care what time it is" (Thomas). The following diagram (Figure 6) indicates variables impacting satisfaction.

Figure 6 Variables that impact satisfaction

Daylight

Daylight coming through windows in open offices was a positive aspect. “There’s something happier about it…birds fly by, you see how windy it is, it helps not be quite an abrupt shift when I leave work and go outside…I can kind of watch the day go by outside” (Olivia). “What I missed in the office environment was daylight, not daylight in behind my screen or behind me where it would reflect off the screen, but at least some daylight to give a sense of what time of day it is,” stated a current remote worker (Rebecca). “Light shining in the windows isn’t necessarily great, but having bright natural light is key” (Alexander). “I can stand and look out the window, which gives me inspiration” (Luke). “I personally have always had trouble being in a place where all I have is artificial light” (Bethany). A poor design can cause more issues with “people having to wear sunglasses…or hats with visors” because of the glare when directly facing windows (Bethany). James observed that more attention should be paid to how office spaces are illuminated. “Lighting engineers should do a study and see how we adjust the

lighting…relocate lighting fixtures to work for the cubicles." The overall trend was that natural light is good, but there can be issues if the design does not account for glare on computer screens, or when employees face windows.

Workday Productivity

Remote working can be a challenge if you are new to the organization, since "you have no familiarity with the person and you have no ability to go directly to them and ask them" (Alexander). Alexander observed that the lack of access to ask nuanced questions that are hard to communicate through email and the inability to ask quick and spontaneous questions could be two challenges faced while working remotely and trying to solve issues. Solving problems collaboratively was an issue many participants experienced while working remotely, which they shared (11 of 16 participants). Emily said it was the ability to be more comfortable with "things that move or motivate," such as control of lighting or "cool, dark colors" in a working space. When describing a redesigned office environment, Bethany said, "It's demoralizing when you're put into a space like sardines, in an environment where you're all crammed together. No one has enough space." The "value aspect wasn't really there in the sense of take care of the people…it was more take care of the space, and the people thing will work itself out" (Bethany). Daniel said, "If I didn't have to sit at my desk every minute and could be up and moving around…to leave my desk and go out for lunch." Hannah spoke of the remote environment where "we can't have impromptu meetings where it's really important to get information from each other…but if we were in the office and we're walking the hallways, we can have these meetings in the hallways and get things done."

"Structured private time and structured meeting times is really beneficial" for productivity (Samuel). Access was viewed differently by different participants, with some preferring a schedule to work from and others open to impromptu conversations. Part of productivity can also relate to the time of day and empowerment, according to Samuel. An important aspect is "the trust that comes with feeling like you are empowered to do your job," and being "very aware of the fact that I'm not a morning person…I function better later in the day." Thomas said, "to have the resources and equipment… and if you like the job, I mean you're just passionate about it." The following figure (Figure 7) illustrates variables impacting workplace productivity.

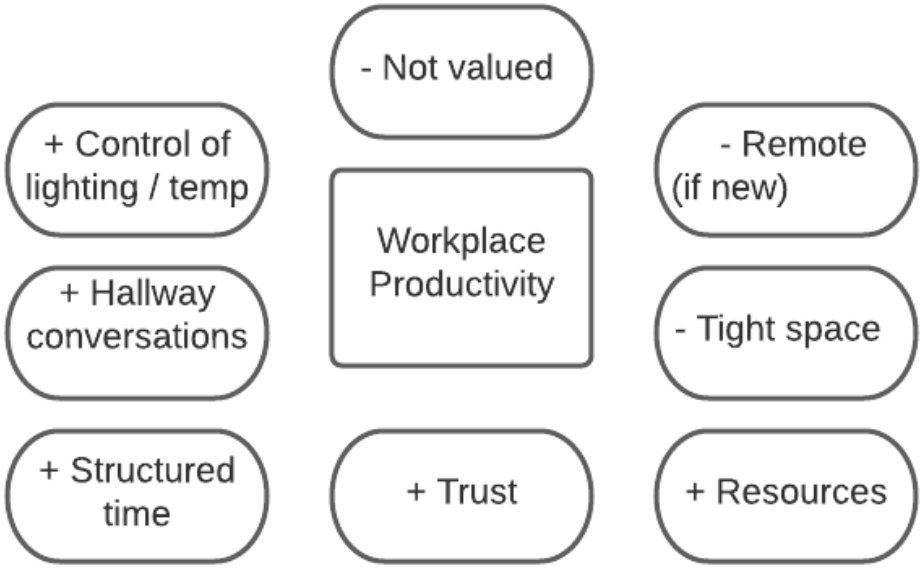

Figure 7 Variables that impact workplace productivity

Additional Thoughts

Daniel debated the sustainability of remote work and the mixed messages that are sent to employees. “My person is putting all the time in…we are telling everybody not to go anywhere, not to do anything social or anything else, but then we’re saying we love you doing the work….” Hannah observed that remote working could bring up messages such as “do you have a minute to chat?” and drive schedule issues while you responded to the message and were distracted from your work. Some of these items may be worked differently in the office, but the approach has changed. Bethany wants a workspace where it is “like somebody actually cared about being able to do your job effectively.” Remote working can become an issue where perspectives can differ depending on one's office set-up. Some participants did not have space for a monitor or furniture dedicated to working. “I don’t mind going into the office at least once a week, just to kind of get out of the house” (Thomas), was a commonly recognized theme as people feel isolated by working remotely and remaining in their residence during times when they would normally be at the office and around people. Sound is also a common concern in the office, as noted by Charlotte in references to conversations around the desk environment and poor acoustics in conference rooms: “The sound thing is the piece that is more disconcerting than anything else.” The remote climate has brought different ways of looking at the domain, with commentary such as the following: “I have really enjoyed just the freedom that comes from being able to work in your own space rather than a space that’s given to you” (Joseph). “I can go on a walk during a call…and if I were to go back in the office, maybe I will take that call on a walk.” Isolation is something that needs to be addressed with remote workers to have a long-term sustainable solution for the remote workforce. “I sit

in my home office and only interact with my wife for an entire month" (Joseph). "The social piece is missing. It ends up being phone calls rather than being able to go talk to somebody" (Alexander). "I get a lot more work done than in an office…but I have to admit that it is nice to see people once in a while, even if it is only to say hello," was another illustrative comment regarding isolation (James). James also stated there is less of work and home separation than was apparent when he went into the office. "You're really working 15 hours a day because there's not a starting time, and you don't stop on time." Management can be suspicious in some work areas, wanting to ensure that employees are fully engaged. Comments such as "why don't you turn on your camera" have been common during virtual meetings to ensure their employees are in a suitable environment (Lauren). Other participants have adapted to different communications: "It is very easy to get in touch with my colleagues, either by chat, or email or phone" (Matthew). Depending on the organization, equipment and resources can be supplied or may constitute new expenses for an employee, incurred from working at home. Increased utility expenses from working at home, and other costs, are reflected in comments such as "I have to spend money to upgrade my Internet" (Hannah). Olivia said, "I do miss all the things going on in the background…and I wouldn't want to be completely secluded." Some remote meetings may not be as effective in communicating goals of the organization, and "email messages may get lost in translation, then you have to get clarification," and you know "someone is going to walk in unexpectedly" during a meeting (Thomas). Thomas also said the "interaction is not the same," and you have to "recreate an office set up at home."

Findings

RQ 1. How does the physical open office environment impact a knowledge worker's job satisfaction?

RQ 2. How does the physical open office environment impact a knowledge worker's job productivity?

H 1. The physical working environment has an impact on the knowledge worker's satisfaction. The office design, personalizing workspaces, ergonomic equipment availability, and recognition were all recognized as significant job satisfaction factors. The physical environment has a significant impact on happiness. This hypothesis was found to be true in this phenomenological study.

H 2. Knowledge workers with higher job satisfaction have higher productivity. This hypothesis was found true in this phenomenological study. The comments by various participants supported the view, with management being a significant factor. If support and recognition were provided, the participants felt that they belonged to the organization and were willing to work past any obstacles. Conversely, a lack of belonging diminished their satisfaction.

H 3. The open office environment has an impact on the knowledge worker's job satisfaction. Resource availability, management interaction, remote working, and no commute were all acknowledged as factors impacting productivity. The hypothesis was found to be true in this phenomenological study.

H 4. Knowledge workers who have office space and access to alternative work environments are more satisfied with their work. This hypothesis was found to be true in this study. Many participants acknowledged the social aspect of their office environment,

which is something most participants expressed a positive factor for, and also the need for concentrative space. With options to work from both an open office area and the ability to work remotely, both requirements were more easily met.

H 5. Alternative work environments impact perceptions of the open office environment. The hypothesis was found to be true in this study. The office environment was a source of comparison. These comparisons ranged from equipment availability to ergonomic designs of spaces and furniture. The natural comparisons showed the value in each location and emphasized the desire to fix what was missing. For example, remote working had less social interaction, but some workers had better workspace in their remote location to do concentrative work. Office environments had more social interactions but more noise and a loss of privacy.

Summary of Findings

The thematic findings identified in this study were derived using Creswell's (2013) standards. These standards include the conveyance of the overall participants and also employ Moustakas's data analysis (1994). In addition to Creswell's methods, an article describing phenomenological reference design was frequently referenced (Groenewald, 2004). These references formed the structure to cluster meanings to form themes and subsequently extract the unique themes to create a composite summary of all participants. These themes must account for counterpoints from participants to be considered when under development, but the authentic narrative from the participants must be maintained.

The questions were designed to allow participants to describe their work environment and address potential open office limitations identified from the literature. The researcher initially identified potential limitations while working on real estate tenant improvement projects, and this bias potential was identified. The literature review supports the issues identified; therefore, the attempt was only to give a starting point for research and not direct the study itself.

The social identity theory proposes that we belong to groups that give us a sense of belonging (McLeod, 2019), and the research on affective events theory and job satisfaction (Weiss & Cropanzano, 1996) illustrates how physical and social environments can impact the overall work experience. The study participants worked remotely at least partially, and there were differing levels of acceptance regarding the new work environment. While the remote experience may not be a typical open office, the remote theme emerged as participants articulated its challenges and opportunities. Comments ranged from a lack of social interaction and a sense of being lost to not having an effective functional workspace in their current living area. Additional significant comments included the freedom of schedule, no commute, and ability to work from many and different types of locations. Remote workspaces ranged from kitchen tables to bedrooms and couches, with only a few dedicated spaces used by participants.

Management was a second emerging theme, with another connection to remote working. With less physical interaction, it becomes easier not to connect. Meetings that were canceled, an expectation of always being available, and ignoring equipment constraints such as slow internet access and inadequate monitor displays, along with a printing limitation, reveal the range of problems that are allowed to continue. The lack of

solutions can lead to lower productivity, less job satisfaction, and a feeling of not belonging to an organization. This isolation has the potential to alienate employees further.

The office design was an apparent theme that emerged; however, there is no one solution to solve all workspace issues. Individuals in different career phases possess different needs and work styles, but it is not consistent enough to translate in a general manner. The predominant theme is that most people require private space at some point. Participants are willing to work in open offices, but concentrative work requires a quiet area for most. If given a choice, people opt for private spaces, such as offices, with an option to open the door to allow collaboration.

Interaction was the last emerging theme, with participants liking the social interaction aspect of offices. It is clear for those who work in a strictly remote environment that it has taken a toll on their working style; however, there is no quick solution. Video conferences help with interaction but leave little space for personal time previously spent before and after meetings to build relationships. A potential negative aspect of collaboration is the conversations held in open areas, where one cannot ignore distractions. While many want the interaction, they also want time to concentrate on their work.

The identified themes interrelate and are representative of the lived experiences of the participants.

Chapter 5: Discussion, Recommendations, and Conclusion

This chapter discusses the themes presented in Chapter 4 and their interdependencies. The goal was to identify lived experiences of participants and what they perceive as solutions. Each question's findings are reviewed to see if they conform to expectations derived from the literature review. The research significance and the implications for business, academia, and further research are discussed in the remaining section.

Findings—Do They Conform to the Literature Expectations?

The participants' comments about their current working environment discussed the collaboration aspect, which is in line with the social identity (McLeod, 2019) and affective events theories (Weiss & Cropanzano, 1996) and indicates that belonging to a group and having a positive workspace helps overall well-being. The lack of collaboration was defined as a very negative factor (ordinal scale) and emails in place of in-person conversations (very negative) reinforced this finding. There is potential to address collaboration through the use of better virtual tools, and a more balanced communication approach that doesn’t predominately depend on email. The privacy aspect for remote working was an important component (positive); however, an aspect of organizational ecology was raised. One participant observed that the work environment

would benefit from a displayed sign when you need to be left alone, while another acknowledged the benefit of having scheduled meetings in designated locations instead of impromptu meetings at individual desks. Both are indicators of working solutions that are not embedded deeply in cultures but show the employees' efforts to manage their environment in a way that complements the space while allowing for productive working time. Substantial efforts would be required from companies on an enterprise-scale to implement practical rules such as these and set in motion behaviors to make workspaces more productive and conducive to employee needs. The study shows there is an opportunity for better communication (negative), management specific communication issues (negative), but allowing for better ways of solving problems using teams (very negative) in remote environments. Management communication factors include the cancelation of meetings previously held in person. Participants expressed concern that this reduced the scope for communication, whereas problems could be raised in the team environment and resolved through brainstorming. Addressing the problem of teams meeting virtually on a routine frequency also has the potential to help solve the problem-solving collaboration issue.

Sound was referenced in the answers regarding the current environment and based on question 3, which addressed the impact of sound. Tech workers have said they value the possibility of having a quiet space over workplace perks, which was upheld in the answers (DeNisco, 2016). The participants observed that they need private conditions for phone calls and conversations (negative factor, but positive in a remote environment). The lack of personal space was cited as a catalyst, since it necessitated attempts to keep one’s voice down, not bother others, make room for discussions that are not to be

overheard, and allow for private phone calls. Public Buildings Service research (2012) supported these findings. Some other recommended items (negative, although one third of participants had better office equipment at home), which participants stated were not always followed, including system furniture heights of at least 60 inches and avoidance of light fixtures over desks (Pardis, 2016). The ratings suggest companies need to look closer at what equipment is being provided, and what would make employees more productive. Many participants simply needed a keyboard and computer mouse for their company provided laptop, while others needed more specialized equipment. An example is oversize printing, which could also be solved through the use of a printing allowance at a local office supply store. Not all employees want, or have the space for, more computer monitors, and it would be beneficial for managers to determine individual team needs. Another aspect of the work environment that was a negative factor was that conversations could be easily overheard, and employees would start to listen and might even participate, interrupting the overall workflow of the office. The research showed that half of the employees were bothered in some fashion by conversations taking place around them, which is also in line with the literature review (Sundstrom et al., 1994). A more recent study discussed collaboration and noise from conversations in relation to decreased task concentration (Salter et al., 2003). These results also fit with the study participants, with several mentioning conference rooms with poor acoustics where you could be overheard outside the room. Practical mitigation measures include acoustic treatments to prevent conversations from being overheard.

The perfect working office environment is significantly depends on the employee's perspective, but there are indicators regarding certain items that should be

prioritized. Smells from lunches or snacks eaten at desks were negative factors, and the design function should incorporate some type of functional break room to avoid employees eating at their individual workstations. Kojima et al. (2017) concluded that areas including break rooms also impact productivity positively. Another good design aspect would be to consider lighting, whether task or overhead, to determine effectiveness. Daylight is usually a great amenity and prized in office environments; however, if the glare is on one's computer screen or in their eyes, employees may be less enthusiastic. Both daylight, including positive and negative factors in illuminating the workspace, and task lighting, were documented in participant responses. Designs can be subjective, but one illumination aspect outlined impacts employee perception and functionality (Daniellson, 2015). Illumination and the design application that applies to open office workspaces where it may have been overlooked is the space allocated for walkways between desks. Light was the study focus in a federal building (Lighting Research Center & Rensselaer Polytechnic Institute, 2014). The study analyzed the impact of light on employees, but the assumption was that the lighting was balanced. Some participants stated how daylight was good in the overall workspace, but that task and overhead lighting were inadequate for illuminating their personal working spaces. Some lights were energy-efficient, and they may have served that purpose well despite being ineffective at improving the work environment illumination. Other items appliable to the perfect office environment were ergonomics in different settings, such as remote locations and traditional open office spaces. Custom workstations can make employees more productive and satisfied (Hedge & Puleio, 2014); however, this aspect has been neglected in remote working environments. Some participants noted that they were

working from their kitchen stool, a couch, or their bedroom. The home environment has become their primary functional area, but the equipment is neither ergonomic nor efficient for their working needs. Office design must account for the overall environment, and if remote working is the environment, care should be taken that the space is appropriately equipped. Participant needs varied extensively for ergonomics as well. Some simply desired a better chair, while others needed an ergonomic keyboard or desk. Interestingly, many organizations had already supplied this equipment at the traditional office, but would not consider supplying it for the remote environment. An additional component of remote office productivity is the productivity impact and likelihood of worker injury claims (OSHA, 2015). Upgrading workstations has been shown to improve productivity and reduce risk factors by 64% and reportable injuries by 90%. Remote environments have the same issues and potential for improvement as open office spaces, and participants' comments suggested one third of them having negative ratings for employer provided office supplies, suggesting that companies are not supplying even the basic requirements to ensure employees remain productive. Office supplies is a broad category, but participants pointed out how they were not furnished basic office items such as notebooks, pens, and highlighters, which had all been freely available in the workspace.

A significant negative factor when working remotely, as reflected in the participant answers, was the inability to separate work and home. Extra working time was expended, as some felt they saved time overall with no commute to an office location. Participants also stated having little social interaction time outside the home, so this was one way to stay occupied. The negative factor is that this tended to align with an

employer expectation. A contributing factor to this environment of no separation was the easy access to the work computer since it was left connected. Checking email, or working for just a few more minutes becomes normalized, and the challenge is determining when to stop one's working day. The Hawthorne Studies are well known, but a different perspective is an analysis looking for external forces that could impact productivity (Hassard, 2012); a similar study in particular would be helpful in the area of remote working. The link between satisfaction and performance has been established (Schwab & Cummings, 1970). Additional analyses (Judge et al., 2001) proved a higher correlation for high-complexity positions. Open office plans were specifically analyzed in a study that noted slow research progress due to a lack of standard work environment ratings (Veitch et al., 2007).

All these factors add to the difficulty of making spaces more productive, with the latter's value being emphasized differently in the approach to tackling each factor. Some participants would prefer to never work in an office, despite any deficiencies in remote working conditions, which should be a warning sign for companies who want to maximize performance. Remote working was rated negatively due to one's being in the house continually, and having children and other relatives at home at the same time. One negative aspect was that children were doing virtual school, and spouses were also working remotely. With minimal time to prepare separate spaces, or no room in the residence to accomplish this, it became difficult to separate various efforts and maintain an effective environment for everyone. Other participants see impediments to productivity in how management acts in situations (i.e., no support), or the lack of clear, consistent communication to those in the remote environment. Participants emphasized

the value of ergonomic furniture to ensure a productive working environment. All the perspectives are valid, but show how the trade-offs in location may impact the number of challenges people will accept in work environments. The questions on productivity and satisfaction did not show a pattern or vary across geographic areas, industries, or age demographics; these aspects were unanimously valued the most. The subject of importance for companies is the role job satisfaction plays in turnover rates. Edward (2015) noted that more variables impact happiness, and solutions can be complicated. A direct link to satisfaction and productivity showed that workplace dissatisfaction leads to decreased productivity (Fassoulis & Alexopolous, 2017), and this reinforces the argument as to why companies should pay attention to office designs and how they can impact an employee's well-being. Some participants seemed dissatisfied with their current environment but were willing to stay employed with the organization due to the current economy. The feelings of isolation from coworkers (very negative) were amplified by working from home, but they found comfort in having employment, and familiar work. An interesting aspect is that only 4 participants felt they accomplished more work by being a remote worker.

Asking the question on how to be more productive in a workday brought a range of proposed solutions. Being a new worker who has never physically met their coworkers is another variable, where an employee in an organization may feel isolated and lack belonging to a team. This feeling may eventually lead to job dissatisfaction and ultimately the search for a new position. The lack of mentorship in a remote environment was rated as a very negative factor by participants. Participants noted both the difficulty in staying connected and also the loss of short, unscheduled conversations that were the

norm in the workplace. The remote environment doesn't provide the same flexibility without coordination. Companies would benefit from paying significant attention to employees adjusting further to the remote or hybrid environments, and also to the basics of the social identity and affective events theories. Another aspect that stood out was how employees felt valued in spaces that were less optimally designed. These work areas are seen as illustrations of how companies treat employees as a function of organizational ecology. The participant answers fit the literature review in several ways. Some felt productive in their respective spaces, while others felt that improvements were needed. These improvements ranged from having better office equipment to managers developing more frequent and effective processes of checking in with their teams.

Remote working may not be attractive for employees if they do not perceive themselves benefiting from the arrangement as much as the employer. Company policies that pay expenses incurred from home are not standard, with only 10% of companies offering cost subsidies (S. Miller, 2020). Most people were not allowed to take company equipment home, and one in three employees had to purchase remote equipment (S. Miller, 2020). Better equipment at their home office versus company supplied equipment was acknowledged by one third of participants. With more of the burden for efficient equipment being shifted to employees, a cost savings may be realized for companies, but the expense has been noticed by employees and impacts how they feel about the organization. Office supplies were inadequate for one third of participants. The equipment policy in participants' organizations was varied, with some allowing just a laptop to be taken home and excluding other items such as a mouse and keyboard. Others

allowed monitors, but it was not consistently applied and seemed to be a function of management decisions.

The significance of the research and its implications are discussed in the following section.

Significance of the Research: Practical Implications

Business

Opinions vary on whether companies should return to the office and by when. A MarTec Group survey found a "mere 16% of workers were thriving-defined as benefiting from working at home" (Bean & Cochran, 2020, p. 26). Job satisfaction dropped by 35%, and productivity declined. In December 2020, Apple stated they would return to the office in June 2021 (Gurman, 2020), while Google currently plans to delay their return until September and is also testing "flexible workweeks" (Wakabayashi, 2021).

How can the conversation regarding returning to the office be initiated? According to Ciampa, (2021), the steps outlined in this context include the following: resist decisions until necessary; keep personal opinions private; survey managers separately; and avoid being influenced by high profile companies. These steps are a good starting point; however, the implication is that the return to the office consists of a checklist to mark off completed items. The present study has shown differences between workers, but the themes are consistent. Workers want to be part of an organization that values them as employees and provides them with the resources to do their job effectively. For some it is equipment, and for others it is access to coworkers. Organizations need to have a clear direction on the goal and work towards that with the

help of employees. Anything lesser risks changes in the work culture, changes that may not be positive.

None of the articles cited addressed the items raised in this phenomenological study. The additional expenses borne by employees, guidelines for home office locations, required internet connections, and how to ensure productivity and satisfaction are just a few of these items. A gap in the survey methodology adopted by businesses may involve the types of questions being asked. If they are simply based on a Likert scale or a binary answer, the underlying issues that concern employees may never be realized.

If these problems are not addressed, a business may face retention issues without realizing why employees are leaving. What are the next steps business can take to address these issues? For remote workers, the challenges of computer equipment and connecting with other employees is a starting point. Hannah mentioned the difficulty in troubleshooting her laptop when it malfunctioned, and that a loaner was mailed to her. This solved having access to the company network, but the equipment did not have all of the required access. Providing equipment that was complete with all the necessary applications would have alleviated Hannah's concerns. The connection with other employees while remote working is more challenging. Thomas mentioned the loss of quick interactions to check in on others. Thomas suggested that his manager could hold group meetings providing the opportunity to ask questions, and check in on others, as a potential solution. This opportunity could also address concerns regarding support from managers that were raised in the interviews. Charlotte mentioned the feeling of not being listened to when raising issues, and being interrupted in small meetings while she was coaching other employees. This led to Charlotte being unsure of whether to remain in the

current environment. Matthew had a separate view of management, where employee decisions were not always supported. This feeling of distrust also extended to ambiguity around promotions and whether there was favoritism in the selection process. Candid conversations and keeping connected with employees on a routine basis, while allowing for questions about decisions and promotions, could also be part of the solutions available.

The office environment where many people work remotely and others are in the office provides management an opportunity to develop new solutions to these emerging issues. Samuel stated that an important aspect is "the trust that comes with feeling like you are empowered to do your job," and being "very aware of the fact that I'm not a morning person…I function better later in the day." Camera requirements during virtual meetings also bring up trust factors from the employee perspective. One potential solution is to use transformative leadership principles, with one example being where leaders create a strong bond with followers (Caldwell, et al. 2011). This framework has the potential to change the relationship between managers and workers, and reveal how environmental aspects of remote working are likely to impact employees.

Academia

Research into physical spaces for workers has to be actionable and relate to what is happening in various industries. One question to answer is how academia and business partners can develop the best, timely solutions to address changing work needs and environmental conditions.

The implication for research is to look at novel ways to survey employees and bring the underlying issues to the surface. This phenomenological study consisted of 16

participants, which is a relatively small number in the landscape of real estate space surveys. A survey on space with 138 respondents (The CBRE Institute, 2018) looked at what was needed for workspaces. Their conclusion was to move from open-plan to activity-based workspaces, which fits some of the current study participants' comments.

How can the academic world help address these issues? A starting point is to ask what specific kinds of workspaces are needed. Different workstyles value different types of space, and this nuance may be missed. Research could improve the workspace solution ideas by delineating what works effectively for various companies and work types and helping build potential solutions and options for employee satisfaction. A workplace of one size or style is not adequate, and generalized conclusions may only further the mindset of easy answers.

This phenomenological study used a qualitative method to explore the lived experiences of 16 participants in multiple industries. A potential survey extension could quantitatively survey the issues raised, and use that information to further define trends. The information could help refine studies relating to demographics, industry impacts, return on investment for different solutions, and action items for companies to improve communication with employees, for example, or to better design working spaces for a particular company that matches their culture.

Workplace Implications

Workspaces need to remain adaptable and focus on the worker rather than focusing on the space. Some corporate programs use the open office plan to save capital costs and ignore the employee cost in terms of lost productivity, job satisfaction, and turnover rates. If the economic outlook for a worker segment improves, this will test the

value of the organization's workspace plans. The cost of real estate is relatively small compared to the cost of employees and the impact of employee turnover, including salary and lost productivity. Remote working is one aspect that can make workers more satisfied with their position if the other challenges, including ergonomics, culture, and a feeling of belonging, are optimized.

Different workers may want different types of workspaces; however, this study has shown that private spaces of some kind are needed. The possibility of making phone calls and having private conversations in a secluded area would address several concerns. The other aspect of this study was the involvement of management with remote workers and those in an office setting. Workers want to belong to a winning team, and attention from the managers for successful work endeavors can reinforce the employees' status. It may be more difficult with remote workers, with just virtual conversations, but the engagement would help build and maintain relationships. Feelings of isolation were commonly expressed; however, it is more important that any communication that occurs is sincere.

Remote working may be more prevalent in the future, consequently ergonomics and the recognition of additional expenses should be considered as well. Workers who had to upgrade their internet connection incurred unanticipated expenses along with increased utility costs. While some costs were cut, with no commute, that was not the case for all, and it is important in this context that the concerns of all employees are considered. Besides, even in different environments some things remain the same. Recognition for a job well done and a feeling of connection to the company are vital for long-term success.

What are the next steps to address the workspace? This study found that the majority of participants wanted to work from an office for part of their work time, to take advantage of interaction opportunities with other employees. Daniel mentioned interpersonal connections as being part of a successful culture where employees want to remain. With remote working cited as creating a difficulty in remaining connected, any possible physical office time should be leveraged for maximum benefit. This may impact design aspects, as collaboration opportunities are planned for and maximized.

Theory Implications for Affective Events

The affective events theory illustrates how physical and social environments can impact the overall work experience. Not all the participants like their current work environment. What would an organization have to do to ensure employee satisfaction? One example brought up by a study participant was to have team baskets delivered in place of the previous social gatherings such as lunch or coffee. While this would be an excellent short-term, immediate solution, the question is whether it would be a good substitute for having a more efficient workspace at home. Would ergonomic furniture, for example, be a more enduring solution? Some remote workers have no precise end date for when they will return to the office, if at all. Does it hurt or help the company to not address physical and social environments? Simply acknowledging the issue would be a start; however, the solution could be financially significant. What could be done, relatively inexpensively, to improve the working environment? Some participants offered likely solutions, such as their organization supplying equipment including monitors, keyboards, and mice. Other options might include an Internet connection stipend to acknowledge the increased speed needed to be effective while working remotely.

Theory Implications for Social Identity

The continuing research question is as follows: How does a change in the work environment impact an employee's sense of belonging (to the organization)? Is there a good substitute for virtual meetings that will further the feeling of belonging? Zoom fatigue has been defined as problematic during virtual meetings (Ramachandran, 2021), and some potential solutions were listed. Specifically, these included suggestions to remain aware of monitor size (which can exaggerate face size), turn off cameras occasionally, and realize that the meeting will reduce your ability to move around. All these solutions might contradict how virtual meetings can help the issue of belonging; therefore, it is not an easy path forward.

How can we preserve the feeling of belonging while allowing individual privacy (not always having the camera on), and what mechanism would accomplish this? If we ignore the sense of isolation that some feel while working remotely, what is the potential long-term impact on the company culture and turnover potential? Would one day spent in the office or elsewhere mitigate the issue?

What are workable next steps in exploring positive applications for social identity? These implications are closely related to communication between managers and employees, and making an effort to determine employee needs in their working environments. One employee may not mind virtual meetings with the camera on as a requirement, while another may consider it an intrusion into their personal space.

Future Research

Future research could/should extend the study to other organizations, utilizing the same format to see if the results match. The information gathered from employee surveys may allow better office environment planning and success predictability regarding remote working policies. For example, what equipment will be supplied could be covered in an organization policy that allows employees to see the workspace benefits from working at home versus just the change in commute. While the reduced commute time may be a short-term gain, inefficiencies in working from home could negate that advantage to the company if not mitigated.

Conclusion

This phenomenological study was performed while the majority of participants were working remotely. The themes developed during the study were impacted by remote working, and the same characteristics that impact the open office environment are likely to be present in the home environment. These include noise, privacy, ergonomics, communication, and lighting.

The remote environment allowed the development of information from both remote and open office environments and this researcher believes it aided the overall study results. Productivity and job satisfaction variables are present in both space types, and similar resolution of the negative aspects is possible. Ergonomic issues were prevalent in remote spaces as well as in open office environments. Computer limitations were also present, and both issues could potentially be solved if investment were to be

made in an employee's work area. An interesting component is which organizations will make that investment, and which would not, regardless of any productivity impacts. The public sector tended to not invest, while the private sector leaned towards some investment.

Management was a theme that impacted both space types, with communication for remote working rated negative. Office culture and worker communication styles have to adjust to isolation in remote environments, but not all organizations were adept at this transformation. The most successful organizations at adaptation seemed to be with workers working partially remotely, such that they could reconnect with managers and coworkers routinely. The virtual meeting environment substituted for for physical meetings, but difficulties arose with the lack of precise communication. The lack of feedback through non-verbal cues, and conversations being less spontaneous, were cited as negative aspects.

The need for coworker interactions was another theme that spanned remote and open office locations. Social isolation was common for remote workers and successful managers actively engaged workers, using a style that worked for them. The conclusion was that engagement is needed, and adaptation to different workers and their communication styles is necessary to be successful. Some workers were satisfied with a weekly meeting, while others expected short daily check-ins. The amount of interaction desired also depended on the makeup of the worker's household if they were remote workers. Families with children were less likely to need daily interaction, but had issues with noise and privacy during the workday.

Productivity and job satisfaction are impacted by open offices, but also by remote working. A small percentage of workers wanted to work completely remotely, but all the other participants wanted a hybrid approach. A company that wants to maximize productivity and job satisfaction would benefit from engaging with employees on their specific needs, and then concentrating on those aspects with the largest benefit. One significant item is consistent manager communication. Engagement is valued and can overcome negative aspects of the workspace.

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