THIRD PLACES TO WORK IN THE DIGITAL AGE:

IMPLICATIONS FROM COWORKING SPACE USERS' MOTIVATIONS

AND PREFERRED ENVIRONMENTAL FEATURES

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ABSTRACT

In light of the continued growth of the digitization and changing economy, work is increasingly not an identifiable place to go, but a virtual network containing individuals who still need to be connected with the support of a tangible community. The trend has fueled the rise of the widespread coworking phenomenon, referring to a style of work commonly adopted by independent, mobile workers. The objective of this research was three-fold: (1) to understand the importance of physical workplace in motivating people to use the coworking spaces; (2) to evaluate the importance and satisfaction of environmental features; and (3) to generate design toolkit for third places to work in the digital age. As the main methodology, Coworking Space Survey was developed and tested with 75 participants recruited from the current coworking communities. This research has implications for evaluating, creating, or reimagining the third places to work in the new era.

BIOGRAPHICAL SKETCH

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1. INTRODUCTION

It used to be that there was a clear distinction among where a person lives (i.e., first place or home), where a person works (i.e., second place or office), and where a person spends time in between (i.e., third place). Urban sociologist Oldenburg (1989) defined the third place as a "generic designation for a great variety of public places that host the regular, voluntary, informal, and happily anticipated gatherings of individuals" and listed public places like cafés, coffee shops, community centers, general stores, and bars as exemplary third places (p. 15). The distinction across the three types of places, however, is no longer pertinent, due to blurred boundaries. For example, cafés and coffee shops nowadays are often synonymous with workspaces, as flexible workers often choose to work at such third places that are neither their homes nor offices.

This phenomenon of working at third places is reinforced with the continued advancement of digital technology and the rise of the gig economy, where independent consultants, short-term contractors, and freelancers create portfolios of work in lieu of full-time jobs, thus transforming the way we work by disconnecting work from the office (Mulcahy, 2017). The gig economy has been building up in recent years as many of us have been accepting its artifacts—Uber/Lyft drivers, Airbnb hosts, TaskRabbit taskers, and Postmates delivery men—as part of our everyday routines. As Heller (2017) suggested in his *New Yorker* article, gigging could be the future of

American work that is already here. The gig economy is able to thrive due to continued technological advancement, as mobile and wireless technologies are providing the on-demand platforms that enable people to work whenever, wherever. This economy has given birth to new types of workers like "digital nomads" who use telecommunication technologies to earn a living in different parts of the world (Mohn, 2014). According to the forecast by Intuit, a business and financial software company, the on-demand economy comprised about 36% of the U.S. workforce in 2015 and is expected to reach 43% by 2020 (Intuit Inc., 2015).

Because humans are social beings, it is natural for us to seek for connection and interaction with other people. However, the opportunity to do so seems to be increasingly lacking for the emerging workforce who are joining the gig economy. While the ability to work flexibly and independently has its own benefits, the real-time people connection significantly lacks for gig workers who are often limited to working with people in the virtual world. This seems to be the similar sentiment felt throughout the gig workers, as the TaskRabbit tasker said, "The gig economy is such a lonely economy" (Heller, 2017). Understandably, the rise of coworking spaces that supports "working alone together" has been widely attributed to the benefits of feeling less lonely (King, 2017). Even though technology has initially driven people to move away from the traditional office scene, it is also pulling people together to gather in new types of workplaces. Namely, the coworking spaces, or

shared office environments for independent professionals, have been increasing rapidly as the middle ground (Spinuzzi, 2012).

Considering the "loneliness epidemic" and problems associated with having inadequate social connections prevalent among remote workers, it might not be a coincidence that several high-profile companies are taking back their work-from-home or telework policies recently (Murthy, 2017). For example, IBM, a pioneer of remote work, that prided in having more than 40% of employees working outside traditional company offices, had recently asked its teleworking employees to relocate to a regional office or leave the company. A few reasons that IBM's leaders backed their policy change included that "putting workers in the same physical space hastens the speed of work and sparks innovation" (Simons, 2017). The policy change at IBM was controversial, because although "vast majority" of telecommuters reported to have chosen to join the company offices, some workers could not relocate due to physical distance or other obligations at home (Simons, 2017). Perhaps taking cues from the third place model could inform organizations how to provide the optimum work flexibility for the remote workers.

1.1. OVERVIEW AND SCOPE

In light of the continued growth of the digitization and changing economy, work is increasingly not an identifiable place to go, but a virtual network containing individuals who still need to be connected, engaged, and managed with the support of a tangible community. This trend has fueled the

rise of the widespread coworking phenomenon, referring to a style of work commonly adopted by mobile, independent workers. Coworking and shared workspace industry totals around 27 million square feet today, and the demand is unprecedented (JLL, 2016).

This research is interested in addressing the value of physical workplace as it evolves to adapt to the changing nature of work. Humans' psychological needs at workplace, suggested by the Self-Determination Theory (SDT), are reviewed in alignment with the current technological and social trends that inform the redefinition of "place" for work in the digital age. The SDT provides a framework for understanding the three dimensions of workplace—technological mobility, social connection, and physical workplace. The emphasis is on the physical workplace, and coworking spaces are identified as the epitome of third places to work in the digital age.

The review of relevant literature and market research depicts a general picture of the current trends in coworking spaces. The sources suggest that there are clear social and cost-saving advantages of coworking spaces. Some prior questionnaires used in the coworking space research explored the critical considerations for planning or starting the spaces, but there is a lack in the research that investigates the physical workplace design aspect.

Developing upon the current literature, a draft survey tool for evaluation of coworking spaces was generated. Using the Delphi method, the experts in the coworking industry were approached and interviewed for the primary

purpose of validating the draft survey tool. The experts also provided insights on the current trends in the coworking space design as well as thoughts on the value of this research. After a round of interviews with the experts, the final version of the pilot survey was generated.

The Coworking Space Survey was distributed online to the current users of coworking spaces via e-mail communication with the individual space operators or public invitations on online coworking community forums. The gathered data from the survey provided qualitative insights regarding the coworking space users' motivations for using coworking spaces. The survey also informed the users' preferred environmental features based on their evaluation of satisfaction and importance with spatial feature items that ranged from design aesthetics to environmental quality and control. Different user characteristics are analyzed separately to look for possible significant differences across the user types.

As a synthesis of findings from the pilot survey, a design toolkit documenting the observed patterns is presented. The survey used in this study is also suggested as a comprehensive version of the questionnaire that can be customized to meet the individual needs of gathering user inputs in the future. Ultimately, the findings from this coworking space research will have implications for evaluating, creating, or reimagining the third places to work in the new era.

1.2. RESEARCH OBJECTIVE

The overarching question that inspired this research is as follows: **How will the workplace adapt to and support the changing nature of work in the future?** Inspired by this initial question, the objective of this research is three-fold: (1) to understand the importance of physical workplace in motivating people to use the coworking spaces; (2) to evaluate the importance and satisfaction of environmental features; and (3) to generate design toolkit for third places to work in the digital age. Accordingly, the following research questions are identified and explored in this research:

- What are the motivations (drivers) and demotivating factors (barriers) that affect the users' decisions to work at coworking spaces?

- What are the key environmental features of the physical workplace that characterize an ideal third place to work as suggested by the current coworking space users?

- What are the differences in the satisfaction or importance ratings of environmental features across *motivation types* (i.e., self-selected vs. employer-selected), *user types* (i.e., owner/staff vs. member/user) or *generations* (i.e., Millennials vs. Gen X)?

2. LITERATURE REVIEW

Considering the new emerging conception of work, this literature review is interested in how to redefine the physical sense of workplace in the digital age by reviewing the SDT and its relevance in the context of this research. In the first section of the review, the components of the SDT are assessed in alignment with the key dimensions of workplace. In the second section, current trends in coworking spaces are reviewed via literature review and market research. Moreover, relevant coworking space studies that deployed questionnaires are reviewed to inform the draft survey development.

A combination of keywords such as "coworking", "third place", "shared workspace", "workplace design", "gig economy", "sharing economy", "information age", "digital age", "digital technology", "sense of place", and "community" were used to initially search for articles from academic journals in online databases. Snowballing technique was also used to review references cited in the initial search result of the literature. There were two main selection criteria for inclusion in this literature review, which were (1) the article's relevance to three dimensions of workplace as inferred from the SDT and (2) the timeliness of whether the article was published within the time frame relevant to the evolution of the coworking pre-model in 1995 and the first official "coworking space" in San Francisco in 2005 (Foertsch & Cagnol, 2013).

2.1. THREE DIMENSIONS OF WORKPLACE

The Self-Determination Theory (SDT) suggests that human beings thrive in social-environmental conditions that support the three basic psychological needs of autonomy, competence, and relatedness (Ryan & Deci, 2000). Autonomy refers to self-initiation, volition, and willing endorsement of one's behavior; competence refers to the propensity to experience challenge and mastery in one's activity; and relatedness, or the "need to belong" refers to the tendency to be oriented towards forming strong and stable interpersonal bonds (La Guardia & Patrick, 2008; Baumeister & Leary, 1995).
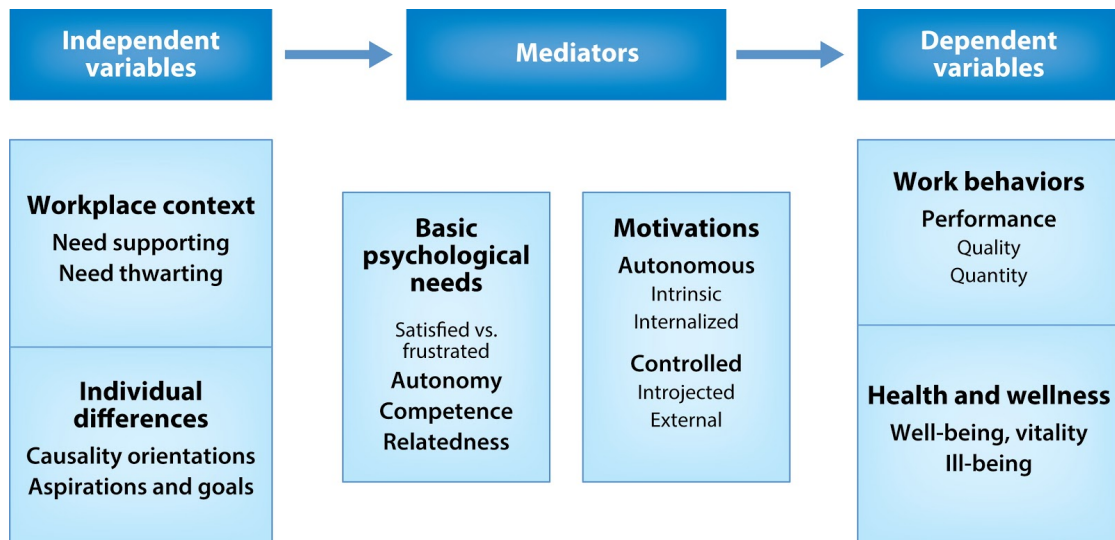

Figure 2-1. "The Basic SDT Model in the Workplace" (Reprinted from Deci et al., 2017, *Annu. Rev. Organ. Psychol. Organ. Behav. 4*, 19-43).

Previous studies exploring the SDT have found that, achieving the autonomy-competence-relatedness triptych is crucial in facilitating motivation

and thus engagement and performance (Karanika-Murray & Michaelides, 2015). According to the review of SDT research relevant to the workplace, satisfying the SDT's basic psychological needs promotes both high-quality performance and wellness (Deci, Olafsen, & Ryan, 2017; **Figure 2-1**). Based on this understanding, it is important to consider the implications of the SDT in designing the physical workplace.
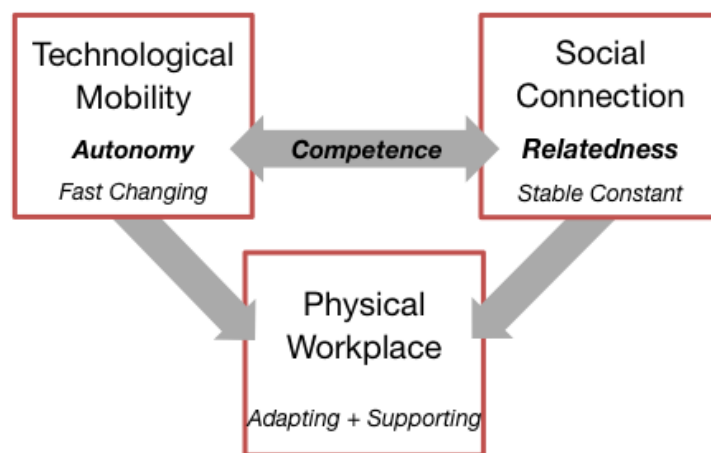

Figure 2-2. Three Dimensions of Workplace.

The SDT triptych is closely aligned with the two momentums of technological mobility and social connection that inform the design of the physical workplace (**Figure 2-2**). The fast changing trend of technology enabling autonomy and the stable human longing for social connection that facilitates relatedness are linked with a person's competence or ability to flexibly navigate the two realms. As suggested by the following literature review, the three dimensions of workplace can be largely categorized into (1) technological, (2) social, and (3) physical factors. Specifically, the literature

review is focused on the technological and social considerations that inform the coworking space, which represents the merging of the three dimensions as it is the physical manifestation of the link between technology-enabled work and community culture.

2.1.1. TECHNOLOGICAL MOBILITY

The advancement of digital technology in the past few decades has affected the working world by automating much of the work processes and enabling virtual connection with people. Digital technology has made it possible to create and maintain relationships as well as accomplish tasks remotely without necessarily connecting with others face-to-face. Starting in the 1980s, with the advent of the World Wide Web, the digital age has dawned upon us and continues to affect all aspects of our lives. The digital age as referenced in this paper can be defined as follows:

> Sometimes referred to as the information age, or computer age, the concept captures the ubiquitous nature of computing and the prolific use of technology in almost all aspects of human activity such that digital interaction is a defining characteristic of human activity (Wang & Torrisi-Steele, 2016, cited in IGI Global, n.d.).

Brynjolfsson and McAfee (2016) had reviewed the emerging digital innovations and synthesized broad conclusions on the progress of the digital age or digitization. According to their synthesis, digitization is significantly improving the physical world, but it is not without the challenges. Digitization

would lead to two possible results that will most likely happen as a mixture of both—substitution and augmentation. As computers become more powerful, organizations could substitute certain kinds of workers with technology, most likely middle-skill workers in different industries—for example, manufacturing (i.e., automakers), retail (i.e., cashiers), or banking (i.e., tellers). At the same time, high-skill workers will thrive as they have the needed competencies to work with technology. This is why, as the authors said, "there's never been a better time to be a worker with special skills or the right education, because these people can use technology to create and capture value" (Brynjolfsson & McAfee, 2016, p. 11).

The knowledge workers, who "have high degrees of expertise, education or experience, and the primary purpose of their jobs [involving] the creation, distribution or application of knowledge", are the population of workers who are redefining the place for work in the digital age (Davenport, 2005). They are the workers who have the capability to use digital technology to accomplish tasks and thus have the flexibility to choose where to physically work. Hines & Carbone (2013) analyzed the social and technological forces or catalysts shaping the future of knowledge work and concluded four possible scenarios of *Virtual Teams Collaborating*, *Back to Basics*, *Socially Centric Work,* and *Personalized Professions: Work-Life Blending* (**Figure 2-3**). In all four scenarios, a key building block that facilitates the knowledge work is workspace, the trend for which is affected by digital

technology. The third scenario of *Socially Centric Work* suggests the most relevant picture of third places to work in the digital age. The authors imagine that virtual workforce is more valued and new support systems are created, such as "co-working centers, expanded 'third-space' options, and digital guilds that help provide businesses with … 'credentialed' [freelancers]" (Hines & Carbone, 2013). In other scenarios, ubiquitous connectivity and telecommuting lead to decentralized work, giving rise to home offices and workplace flexibility. In any case, all knowledge workers need some kind of workspace equipped with the necessary technology, such as secure Wi-Fi connection or video conferencing tools.
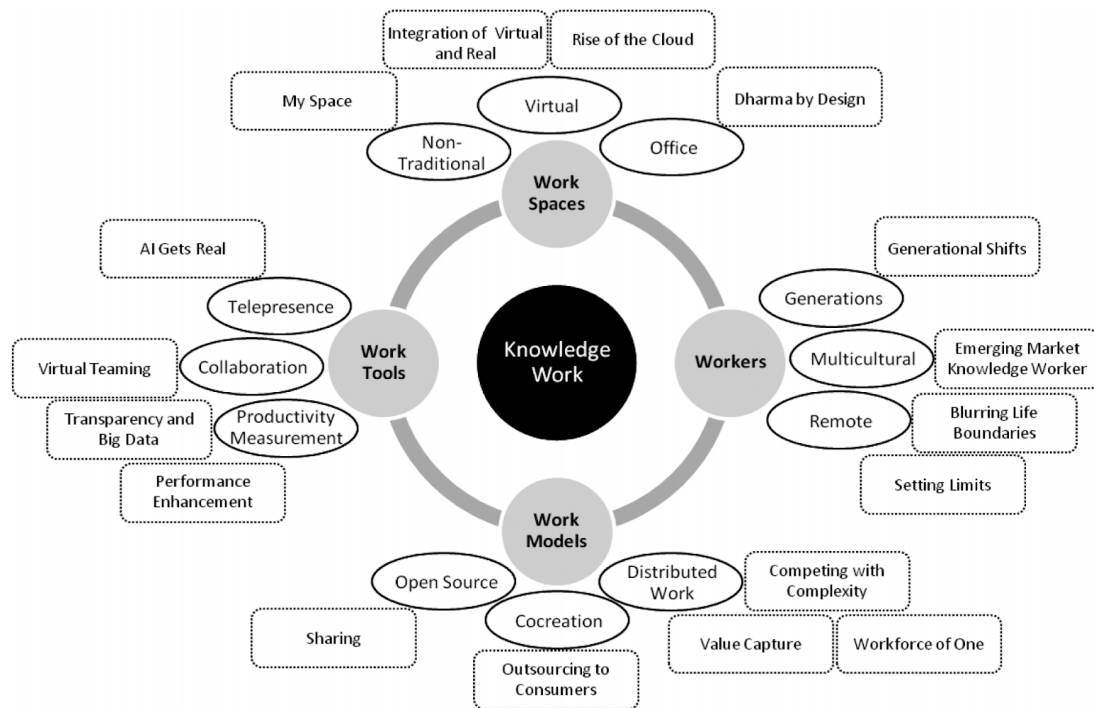
Figure 2-3. "Catalysts Shaping Knowledge Work" (Reprinted from Hines & Carbone, *Work. Empl. Rel. Today, 40*, 1-17).

Joroff (2002) suggested the need for the "mind shift" to harness the connective power of technology as an integral part of workplace design. For example, Microsystem integrated physical and cyberspace by offering flexible work policy that allowed its employees to work wherever they can be most effective, including at their homes or at one of the company's satellite offices across a variety of locations providing corporate amenities and reservable shared offices (Joroff, 2002). Field Services Group at Hewlett Packard had networked portfolio that provided access to places and services by external organizations related to the employees' jobs, such as mailboxes, shipping outlets, FedEx delivery service, or Kinko's copy (Joroff, 2002). The aforementioned cases were early precedents of today's coworking spaces that are essentially networked satellite offices equipped with work-related services and amenities. In order for the connective technology to become an enabler of people's work, there needs to be a proper physical and digital infrastructure supporting workplace flexibility and productivity.

Cascio & Montealegre (2016) conducted a systematic review of key breakthroughs in the evolution of technology and the disruptive effects of emerging information and communication technologies. As concluded by the authors' review, technology can be used to either enable or oppress people at work. If technology is utilized to enable people at work, it should foster self-motivations and well-being, key elements of the SDT, enhance productivity and promote job satisfaction, organizational commitment, and

citizenship behaviors among workers (Cascio & Montealegre, 2016). Feelings of oppression occur when technology leads to the lack of autonomy-competence-relatedness triptych (Cascio & Montealegre, 2016). Among the key technologies reviewed in the article, teleconferencing, or an interactive group communication through an electronic medium, is a relevant technology commonly used by mobile workers' work routines. Virtual teams are common compromises for collaborating remotely without the face-to-face interaction; however, such technological facilitations are prone to result in communication problems that are detrimental to motivation and psychological safety.

According to Miles & Hollenbeck (2013), virtual teams often suffer from a lack of social and status cues, which have potential negative effects in terms of team effectiveness. Virtual team members tend not to communicate local context to others, fail to distribute the same information to all team members, have difficulty understanding and communicating the relative importance of information, access information at different speeds, and have difficulty interpreting the meaning of silence (Cascio & Montealegre, 2016). This finding was consistent with the study conducted by Thompson & Coovert (2003), who found that members in virtual teams had higher levels of confusion and lower levels of satisfaction than their face-to-face counterparts.

2.1.2. SOCIAL CONNECTION

Social connection refers to the experience of belonging and relatedness among people, and its importance to humans' functioning and well-being has been well-established. Walton, Cohen, & Spencer (2012) found that mere belonging, or small cues of social connectedness to others, even to unfamiliar ones, can cause people to internalize goals and motivations of others. The research also suggested that people draw motivations from a sense of belonging in an intellectual community (Walton, et al., 2012). As suggested by the SDT, the need to form and maintain at least a minimum quantity of interpersonal relationships is "innately prepared" among human beings (Baumeister & Leary, 1995). However, this human need to connect is easy to get neglected in the digital age as technology is prone to limit physical contact with others. *The Atlantic* article captured the current status of declining social connection activities despite their inherent importance:

> Social connections are as important to our survival and flourishing as the need for food, safety, and shelter. But over the last fifty years, while society has been growing more and more prosperous and individualistic, our social connections have been dissolving. … We are increasingly denying our social nature, and paying a price for it. Over the same period of time that social isolation has increased, our levels of happiness have gone down, while rates of suicide and depression have multiplied (Smith, 2013).

The knowledge workers in the digital age dubbed as "lone eagles" are looking for physical places to work despite the ubiquitous technology that connects them in the virtual work environment (Moriset, 2013). This trend is a result of workers becoming tired of the loneliness of working at home or suffering from distraction in local cafes or libraries. Green (2014) called such type of workers as "the coffee shop entrepreneurs" who have migrated from their home-based offices to the nearest cafes, giving rise to a new group of startup-oriented individuals and businesses that recognize the need for innovative and functional space. According to Moriset (2013), this type of emerging mobile workforce is in need of a the third place to work. In their systematic analysis of relevant literature, Kojo & Nenonen (2014) confirmed the need for coworking spaces by concluding, "the popularization of information and collaboration technologies in the workplace in addition to global economic changes and the requisites of sociability have created a need for flexible office locations that support mobile and collaborative work."

In the context of a workplace, social connection can take many different forms, ranging from active collaborations to an informal sense of community. In line with the SDT's relatedness construct that informs employee motivation and performance, physical collaboration is an important aspect in a workplace due to its association with affective organizational commitment (AOC) and team efficiency (Morrow, McElroy, & Scheibe, 2012). AOC is a highly valued employee attitude as it suggests an employee's

identification and involvement with an organization, and organizations with committed employees ultimately result in more productive and satisfied employees who are less likely to quit (Allen & Meyer, 1990; Cooper-Hakim & Viswesvaran, 2005).

Research suggests the value of face-to-face (F2F) communication facilitated by the visibility of the work environment or collaboration opportunities available in the physical workplace. According to Stryker, Santoro, & Farris (2012), team F2F communication occurs more frequently in high-visibility work environments, and visibility is often a determining feature promoting F2F communication. In low-visibility work areas, open and low-walled workstations were related to greater F2F communication (Stryker et al., 2012). Hua, Loftness, Heerwagen, & Powell (2011) conducted a field study of 308 office workers in 27 office spaces and explored the value of shared spaces in the workplace for the perceived level of support for collaboration. Shared service and amenity spaces have the potential to create opportunities for chance encounters among workers, and they should be placed strategically to foster the desired collaboration opportunities. Varying degrees of proximity between different shared spaces and individual workstations resulted in higher perception of collaboration—for example, closer distance for meeting spaces and greater distance for kitchen areas (Hua et al., 2011). The visibility was not a promoter of collaboration, as simple

openness (i.e., a vast, open floor plan with high visibility) was not necessarily supporting the perception of support for collaboration (Hua et al., 2011).

Informal interaction is another important form of social connection that is available in a physical workplace. Gerdenitsch, Scheel, Andorfer, & Korunka (2016) explored social interaction in coworking spaces and reported the results of two studies. Study 1 (n=69 coworkers) found that social interaction in coworking spaces can take the form of social support. Social support here describes "an exchange of resources between at least two persons with the intention to help" (House et al., 1988, cited in Gerdenitsch, et al., 2016). Study 2 further investigated social support among coworkers (n=154 coworkers) and contrasted these results with those of social support among colleagues (n=609) in traditional work organizations (Gerdenitsch et al., 2016). Social support from both studies was positively related to performance satisfaction (Gerdenitsch et al., 2016). The authors concluded that coworking spaces, as modern social work settings, should align flexible work infrastructure with well-constructed opportunities for social support.

Besides active social connection (i.e., collaboration and interaction), passive social support (i.e., presence of other people doing work), is another factor that contributes to the popularity of working at third places. The concept called "social solitude" describes the behavior of individuals who seek sociality and solitude simultaneously (Coleman, 2009). In cafes today, social interaction is often frowned upon and may be even considered against

proper etiquette (McGrath, 2006). While social interactions still happen in cafes where people socialize with others, the norm today seems that such third places are primarily for being "alone together" with an unspoken pact of "mutual privacy only slightly tinctured by mutual surveillance and individual speculation" (Coleman, 2009, p. 765). Moreover, a recent study found that mental effort exertion is contagious, as the experiment found that the presence of another person influenced task performance among the participants (Desender, Beurms, & Van den Bussche, 2016).

2.1.3. PHYSICAL WORKPLACE

The importance of the physical workplace on organizational and employee outcomes has been highlighted in an extensive body of literature. Kegel (2017) conducted a structured review of relevant literature and concluded that the design of physical work environment can have positive or negative effect on outcomes in organization-level (i.e., performance, collaboration, innovation, effective human resource management, and profitability) and individual-level (i.e., engagement, performance, well-being, and satisfaction). Becker (2007) described the workplace as "a system in which physical design factors both shape and are shaped by work processes, the organization's culture, workforce demographics, and information technologies" (p.47). The emerging conception of knowledge work in the digital age has been disconnecting work from the offices where work normally took place during traditional 9-to-5 workdays. Considering this changing

landscape of the work environment, the physical design of workplace is gaining a renewed focus on the whole experience.

With more independent workforce continuing to grow, we have simultaneously seen the rise of new types of workplaces emerging as third places to work in the digital age. Coworking spaces can be considered as the optimum third places to work as they combine the best of both first and second places (i.e., working at home and traditional office) by offering "control, autonomy, and scheduling flexibility of remote work combined with optional access to the structure and community of an office if and when the worker wants it" (Mulcahy, 2017). Most independent workers who join coworking spaces had previously worked from home, where they may have suffered from feelings of isolation, among other inconvenience problems (Spinuzzi, 2012).

The rise of coworking spaces is coincidental with the shift "from a world structured by boundaries and enclosures to a world increasingly dominated, at every scale, by connections, networks, and flows … a world of less rigid, more fluid and flexible relationships" (Mitchell, 2003, cited in Coster, 2015). Digitization is projected to contribute $2 trillion to the U.S. GDP and displace up to 12 million middle-skill workers (McKinsey & Co., 2016). With much of our work processes automated in the future, the value of physical workplace will become more reliant on the human aspect, and design cues can be inspired from the human-centric coworking models.

2.2. COWORKING SPACES

The term "coworking space" has evolved to refer to an array of shared workspaces, including startup incubators and accelerators that provide coworking options. At the core of the concept, coworking space is a type of third place "at the boundary of two dominant spaces [home and office], which is not fully part of either" (Dale & Burrell, 2008, cited in Kingma, 2016). As such, coworking spaces are characterized as third places that allow workers to have the flexibility to separate work from private life in varying degrees, without the repercussions of feeling lonely at home or being forced to work at the office. For the purpose of this exploratory research, the subtle differences across various coworking space types are not emphasized, and the concept of "coworking" is interpreted with the definition by Coworking Wiki (n.d.):

> The idea is simple: independent professionals and those with workplace flexibility work better together than they do alone. Coworking spaces are about community-building and sustainability. Participants agree to uphold the values [collaboration, openness, community, accessibility, and sustainability] set forth by the movement's founders, as well as interact and share with one another. We are about creating better places to work and as a result, a better way to work.

In the following sections, the coworking space market trends, including user characteristic and design characteristics are reviewed to inform the qualitative research design of this project.

2.2.1. MARKET TRENDS

The first "coworking space" opened in San Francisco in 2005 by the programmer Brad Neuberg whose aim was "to create a new kind of space to support the community and structure that [he] hungered for" (Neuberg, n.d.). Since the start of the official coworking space, the market expanded at an exponential rate. As reported by Deskmag, an online magazine dedicated to coworking, the coworking spaces are continuing to expand as 1.7 million people are estimated to be working in around 19,000 global coworking spaces by the end of 2018 (Foertsch, 2018; **Figure 2-4**). It is widely acknowledged by the media that coworking and flexible working are now the "new normal" (King, 2018). The main drivers for the evolution of coworking spaces include new ways of working, attractiveness, work/life balance, economic efficiency, and sustainability (Kojo & Nenonen, 2017).
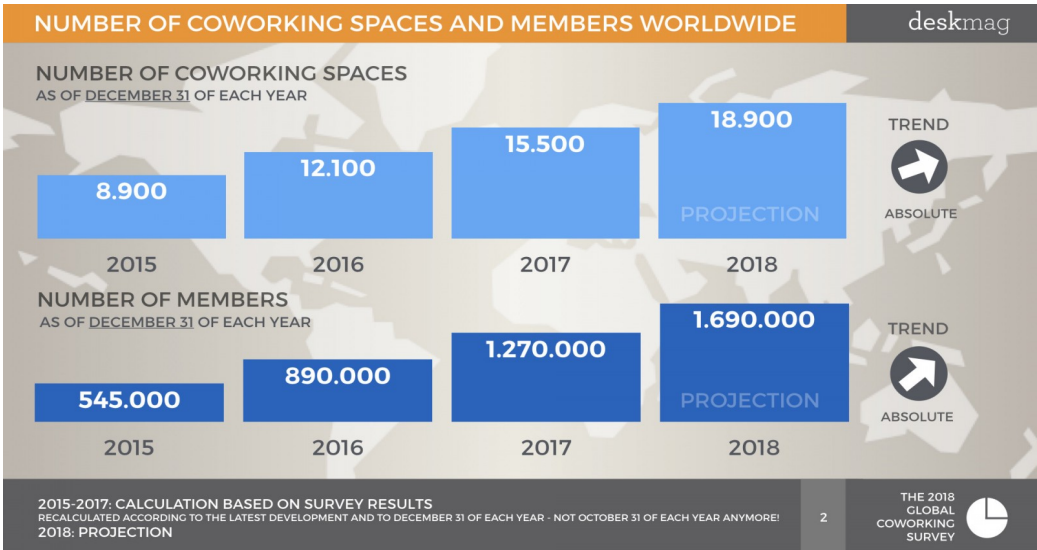

Figure 2-4. "Global Coworking Survey: The 2018 Coworking Forecast" (Reprinted from Foertsch, 2018, https://www.deskmag.com/en/1-7-million-members-will-work-in-coworking-spaces-by-the-end-of-2018-survey).

USER CHARACTERISTICS

Along with the expansion of the coworking space market, the characteristics of the member base that comprise coworking spaces are also evolving to include a wide array. Whereas the primary member base of the coworking space was traditionally comprised of freelancers and entrepreneurs, the demographic structure has been evolving to include large enterprise companies as well. For example, IBM began to lease from the coworking space giant WeWork as it signed a membership deal for one entire WeWork building in New York (Putzier, 2017). According to WeWork's head of product research, Josh Emig, members working for large companies have become the fastest growing segment of WeWork's business (Sisson, 2017). The director of EMEA research at the real estate company JLL, Karen Williamson, mentioned, "For corporations, coworking can offer a competitive edge, allowing them to tap into new products and ideas that wouldn't have been possible inside their own offices" (Stokes, 2017).

Besides the interest from the corporate world, more coworking spaces are designed to serve workers in certain professions or industries. So-called "niche coworking spaces" are emerging as competitive spaces to support the needs of specific user groups, such as lawyers, female entrepreneurs, or designers (Shapiro, 2018). For example, due to the nature of legal professions, security and professionalism are especially important, and a regular coworking space might not best suit their needs.

2.2.2. DESIGN CHARACTERISTICS

The combination of a well-designed work environment and well-curated work experience is attributed as the reason for the coworking space users' demonstrating higher levels of thriving than those working in offices (Spreitzer, Bacevice, & Garrett, 2015). Foremost, the goal of the design of the coworking spaces is often to support the core values of coworking, which include collaboration, openness, community, accessibility, and sustainability (Coworking Wiki, n.d.). A typical layout of a coworking space incorporates a hybrid of open workstations and enclosed office rooms. As highlighted in previous research on coworking spaces, more informal space types, such as "coffee corners, a kitchen, meeting rooms, 24/7 access, internet access, printer and copying facilities, lounge space", characterize the spaces (Weijs-Perreé et al., 2018). Although the design characteristics of coworking spaces vary across global locations that serve a range of audience, there is a similar trend of interior aesthetics and atmosphere, perhaps due to the common values shared by the coworking communities. A simple image search of the term "coworking space" on Google shows a result of the coworking space images that have a similar aesthetic with open work setting equipped with ample windows, pendant lightings, and varying furniture options (**Figure 2-5, 2-6, 2-7**). Attributes like "industrial", "modern", and "homelike" have been previously used to describe the interior aesthetics and atmosphere of a coworking space (Weijs-Perreé et al., 2018).

Figure 2-5. Naked Hub, Hong Kong (Reprinted from Michal, 2017, https://www.officelovin.com/2017/10/11/inside-naked-hubs-hong-kong -coworking-space-new-street/).

Figure 2-6. Industrious, Atlanta, GA (Reprinted from Industrious, n.d., https://www.industriousoffice.com/).

Figure 2-7. Bespoke, San Francisco, CA (Reprinted from Bespoke, n.d., http://www.bespokesf.co/coworking).

3. METHODS

In conducting this research project, a qualitative survey tool was developed based upon the literature review and the author's synthesis of the coworking market trends. The qualitative research design structure used in this project is outlined in **Figure 3-1**. For the draft instrument development, several relevant coworking space questionnaires were reviewed and adapted, but a significant gap in the tools evaluating the physical design of the coworking spaces was noted. The initial version of the questionnaire was generated and reviewed for validity using the Delphi method, or discipline-specific interviews with experts in the coworking industry. The pilot survey for distribution to the coworking communities was finalized based on the feedback for minor updates from the experts.

The pilot survey was designed to efficiently gather diverse user insights. The objective was to understand the current state of the coworking space design as perceived by the current users. Background questions on the user characteristics and coworking space characteristics as well as evaluative questions on the user motivations for using the coworking space and preferred environmental features were asked. The open-ended questions in the survey were analyzed using a theme analysis and word count analysis. The multiple-choice questions evaluating the users' ratings of satisfaction or importance of environmental features were analyzed by using descriptive statistics, gap analysis, and t-tests.
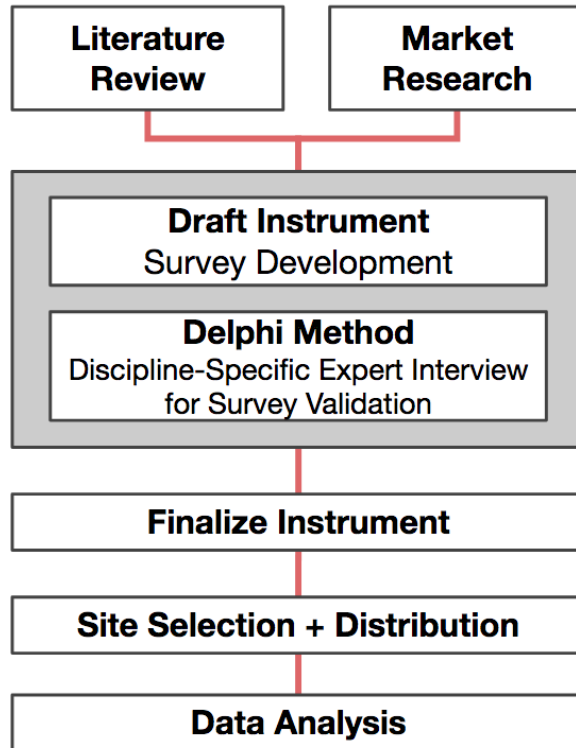
Figure 3-1. Qualitative Research Design.

3.1. COWORKING SPACE SURVEY

A draft version of the questionnaire, entitled the Coworking Space Survey, was devised as an instrument to collect data from the current coworking space users. The questions were initially developed on the basis of literature review and market research as detailed in the following section. Delphi method was conducted to confirm the topics and language used in the survey. Based on the suggestions from the experts, additional questions were added regarding demographics and important topics. The resulting final Coworking Space Survey was administered online using the Qualtrics platform. A copy of the final survey is documented in **Appendix A**.

3.1.1. QUESTIONNAIRE DESIGN

The questionnaire was designed with four key categories of items: (1) coworking space characteristics, (2) coworking user characteristics, (3) user's motivation for using the coworking space, and (4) preferred environmental features that motivate the user to use the coworking space. Most questions asked the participants to evaluate the topics and rate satisfaction with the feature in their current coworking spaces or importance of having the feature in their ideal coworking spaces. A 7-point Likert-type scale was used for the rating, which corresponded to the level of importance or satisfaction as follows: -3 (very unimportant or very dissatisfied), -2 (unimportant or dissatisfied), -1 (somewhat unimportant or somewhat dissatisfied), 0 (neutral), 1 (somewhat important or somewhat satisfied), 2 (important or satisfied), 3 (very important or very satisfied). The responses altogether informed the users' preferred environmental features in a coworking space.

DEMOGRAPHIC QUESTIONS

Questions regarding the characteristics of the participants' current coworking spaces included name, location, join date, user role (i.e., member or user, staff or employee, owner or founder), and average time spent in the current coworking space (i.e., percentage of total work time, number of hours per week). Basic demographic information (i.e., profession, age, identified generation, gender) was collected, but participants remained anonymous, as the data remained confidential and were only reported in aggregated form.

MOTIVATIONS FOR USING THE COWORKING SPACE

Regarding the motivation for using the coworking space, the participants were asked two open-ended questions to identify their primary driver(s) or motivation(s) for working in the coworking space and primary barrier(s) or demotivating factor(s) that prevented from working (more) in the coworking space. Open-ended format was chosen for the motivation questions to prompt the users to provide free-form answers using their own voices for qualitative analysis. Prior coworking space questionnaires that were reviewed had limited the motivation responses to multiple-choice answer options, which could be misleading as users are forced to select the best-fitting options that reflect their views.

Multiple-choice option questions were asked to understand additional aspects that affect the users' motivations for working at coworking spaces. The question "When you are able to choose your work environment, where do you get your work done most effectively?" and "Who made the decision for you to work at the current coworking space?" were asked to understand if the participant was primarily motivated by internal or external factors. In alignment with the SDT that informed theoretical background for this research, the participants were asked to rate the importance of Technological Resources (i.e., Wi-Fi connectivity), Community Presence (i.e., working in the presence of other people), Community Participation (i.e., social interaction, networking), and Physical Workplace (i.e., availability and quality of spaces).

PREFERRED ENVIRONMENTAL FEATURES

A majority of the survey was interested in exploring the importance of the design of physical workplace in motivating the participants to use the coworking spaces. The users' satisfaction and importance ratings informed their preferred environmental features of a coworking space. A draft questionnaire had originally identified 14 environmental features and related subtopics to evaluate. One additional feature and a few subtopics were suggested by the experts and were included in the questionnaire. The final environmental features relevant to a coworking space and their selected sources are listed in **Table 3-1**.

Table 3-1. Final Coworking Space Survey Topics.

ENVIRONMENTAL FEATURES	SELECTED SOURCES
1. Design Aesthetics	Maarleveld et al. (2009), Moriset (2013), Kojo & Nenonen (2014), Foertsch (2017)
2. Interior Decors & Finishes	Hartog et al. (2017)
3. Consistent Brand Identity	Delphi Method
4. Access to Indoor Natural Elements	Kellert & Calabrese (2015)
5. Access to Outdoor Nature	Kellert & Calabrese (2015)
6. Spatial Layout & Openness	Kojo & Nenonen (2014)
7. Availability of Collaborative Spaces	Hua et al. (2011), Kojo & Nenonen (2014)
8. Availability of Individual Workspaces	Kojo & Nenonen (2014)
9. Furniture - Quality	Maarleveld et al. (2009), Asmui et al. (2012)
10. Furniture - Flexible Arrangement	"Work Space Requirements Questionnaire" (2002), Hartog et al. (2017)
11. Lighting Quality	Maarleveld et al. (2009), Asmui et al. (2012)
12. Control of Lighting	Maarleveld et al. (2009), Asmui et al. (2012)
13. Control of Visual Privacy	"Work Space Requirements Questionnaire" (2002), Maarleveld et al. (2009)
14. Control of Acoustic Privacy	"Work Space Requirements Questionnaire" (2002), Maarleveld et al. (2009)
15. Thermal Comfort	Hedge et al. (2005), Maarleveld et al. (2009)

3.1.2. DELPHI METHOD

The Delphi method is a technique used to survey and collect the opinions of discipline-specific experts on a particular subject, which in this case is the design of coworking spaces. Delphi is generally characterized as "a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem" (Linestone & Turoff, 1975, cited in Yousuf, 2005). Accordingly, using the Delphi method, the author conducted interviews with nine experts involved with the coworking space industry for the purpose of validating the content and language of the initial draft of the Coworking Space Survey. **Table 3-2** summarizes the nine experts who participated in the interviews. Following the principles of the Delphi method, the experts' personal identifiers (i.e., name, company) are kept anonymous.

Table 3-2. Expert Interview Participants for Survey Validation.

EXPERT #	PROFESSION	INTERVIEW
E1	Co-Founder and Manager at a Coworking Space	Phone, March 2018
E2	Project Manager at a Coworking Space	Phone, March 2018
E3	Real Estate Manager at a Technology Company	Video Call, March 2018
E4	Operator at a Coworking Space	E-Mail, March 2018
E5	Co-Founder at a Coworking Space	Phone, April 2018
E6	Workplace Researcher at a Coworking Space	Phone, April 2018
E7	Design Researcher at a Workplace Consultancy	Phone, April 2018
E8	Founder and Architect at a Coworking Space	E-mail, April 2018
E9	Co-Founder and Manager at a Coworking Space	Video Call, April 2018

All experts were initially contacted via e-mail to ask for their interests in supporting the research, sharing their coworking industry insights, and reviewing the draft questionnaire for validation. The interviews were conducted via phone, video call, or e-mail. All participating experts had extensive experiences of planning, designing, developing, researching, or consulting in the coworking space context. Most experts were coworking space founders or operators, and others were workplace consultants or design researchers in the field. Eight out of nine experts agreed that the Coworking Space Survey and the findings from this research could be useful resources in the future. The positive feedback for the draft questionnaire included the comprehensiveness of the content and strength of the questions. Some critical feedback included the long length of the survey that could result in low completion rate and possible language barriers across different coworking spaces that could use different vocabulary for certain features. For example, the "Play Space" included in the Spatial Program question could be interpreted differently on a case-by-case basis (E7).

Initially, 14 key environmental features and related subtopics were identified for inclusion in the survey. Most experts agreed that all topics included in the draft survey are important and relevant. With the recommendations from several experts, an additional feature of "Consistent Brand Identity" (E1) and a subtopic of "Transparency (i.e., Use of Glass Walls or Partitions)" (E6, E7) were included in the final version of the survey.

Moreover, the importance of differentiating the two aspects of the sense of community—"Community Presence (i.e., working in the presence of other people)" and "Community Participation (i.e., social interaction, networking)"— was brought up, and the corresponding motivation question was updated accordingly (E7). There were also suggestions for consideration of operational and maintenance aspects such as "cleanliness" (E2) and "food odors" (E9); however, for the scope of this research interested in the physical design of a coworking space, those items were not included.

While the design of coworking space is commonly acknowledged as an important aspect, the experts agreed that there is less time spent on considering the design of coworking space. One interviewee mentioned, "The design side of coworking is severely inadequately discussed … I find it disturbing and surprising how so little is spent on design, when the cost of construction and monthly rent are the two biggest costs" (E8). Considering this, the Coworking Space Survey has the potential to highlight the importance of the design of physical workplace in the context of coworking spaces and third places to work in general. Although the coworking space prioritizes the sense of community and inclusion, the users were often not involved in the design process of their spaces. Only one of the experts mentioned that he actively encouraged the community members to get involved with the design of the space by hosting committee meetings for renovating the space and rearranging the furniture (E9).

3.2. DATA COLLECTION

The Institutional Review Board (IRB) at Cornell University approved the project's exemption status on April 3, 2018 (**Appendix B**). The data collection process initiated shortly after the IRB approval, for the duration of a four-week period from April to May 2018.

3.2.1. PROCEDURE

The final version of the Coworking Space Survey was administered online using Qualtrics. The survey participants were recruited using two primary strategies of (1) direct e-mail recruitment of individual coworking spaces and (2) recruitment posts on online coworking forums. For the first distribution method, approximately 30 individual coworking spaces that were identified as best practices from the online sources were initially contacted via e-mail (**Appendix C**). The e-mail contacts for potential coworking spaces were retrieved from the respective websites' contact information pages. After initial contact was established, further information about the research study was shared to determine if the interested coworking spaces were willing to participate in this research. The participants for the survey were recruited with the help from the owners or operators of the participating coworking spaces. Five individual coworking spaces participated and assisted with the distribution of the e-mail with the survey link to the member database via e-mail communication (**Appendix D**). A few participating spaces helped with sending out reminders for survey one or two weeks after the initial letter.

In order to reach more coworking space audience, the second survey distribution method was conducted via public postings on online coworking community forums. The selected forums were identified from online search as well as recommendations by experts interviewed in the Delphi method. The survey recruitment letter (**Appendix D**) was posted on four online forums: Google Coworking Discussion List (https://groups.google.com/forum/#!forum /coworking), GCUC Coworking Forum (https://www.facebook.com/groups/ 1448257235481712/), Coworking Worldwide Facebook Group (https://www. facebook.com/groups/cowoworld/), Coworking Leadership Slack Channel (https://coworkingleadership.slack.com/). After initial posting on each forum, one reminder was posted about a week prior to closing of the survey.

3.2.2. SUBJECTS

The subjects' criteria for inclusion in the study included that they have experience using the coworking spaces as their workplaces. They could have possible roles of members/users, staff/employees, or owners/founders at their current or previous spaces. The purpose was to gather as much feedback from the general users or occupants of the coworking spaces. The participants were provided with an informed consent providing the research overview on the first page of the survey link (**Appendix A**). While there was no payment for participating, the participants had the option to provide their e-mail addresses to enter into a random drawing to win one of four $25 Amazon gift cards, which were distributed via e-mail after survey closing.

4. RESULTS

Over a four-week period from April to May 2018, the current users of coworking spaces were surveyed to understand the current state of the design of coworking spaces and what might be the key environmental features to consider in designing the third places to work. The survey questions evaluated the users' motivations for working at coworking spaces and their satisfaction and importance levels of the environmental features identified in the previously described synthesis of literature and market research. Specific items corresponding to each environmental feature, such as the descriptors for the interior design aesthetics and availability versus importance of different space types, were explored in more detail.

The collected data from the online-based Qualtrics surveys were transferred to Excel spreadsheets for analysis. Theme analysis and word count analysis were conducted for the responses to the open-ended questions on motivations and demotivating factors. Additional qualitative analysis was conducted to analyze responses to supplementary commentary sections throughout the survey. Descriptive statistical analysis was conducted for all demographic questions and environmental feature rating questions. Independent-samples t-tests were conducted to analyze any significant differences in the satisfaction or importance ratings of environmental features across motivation types (self-selected vs. employer-selected), user types (owner/staff vs. member/ user), and generations (Millennials vs. Gen X).

4.1. SAMPLE DEMOGRAPHICS

In total, 75 responses (54 complete and 21 partial responses) were collected and included in the analysis. The participants were from 40 unique coworking spaces in 31 cities in both the U.S. and international locations. For reference, the full list of coworking spaces represented by the sample is listed in **Appendix E**. 59 responses were collected from 21 cities in the U.S. with most responses from New York, NY (23). 16 responses were collected from 8 other countries including United Kingdom (5), India (3), Taiwan (2), Canada (2), Brazil (1), Italy (1), Tunisia (1), and Vietnam (1). Most coworking spaces used by the participants were located in urban regions (88%), and some were located in suburban regions (12%). On average, the participants spend 63.65% of their total work time in their current coworking spaces and approximately 30.59 hours per week.

Of the 75 participants, approximately half were members or users (54%) at their current coworking spaces and the other half consisted of owners or founders (23%) and staff or employees (15%). The participants' professions were diverse and distributed, with the top four professional fields represented in the sample as the following: management (i.e., community, membership, office, product managers; 16%), business development (i.e., founders, CEOs, partners; 16%), IT (i.e., programmer, developer, engineer; 14%), sales or marketing (12%). The age of the coworkers in the sample ranged from 20 to 62 years with the average of 38.63 years and standard

deviation of 11.39. Consistent with the age distribution, the participants identified themselves with the corresponding generations. Two key generations represented in the sample were Millennials or Generation Y (born: 1981-1995; 48%) and Generation X (born 1965-1980; 40%). Responses from female (60%) were slightly higher than those from male (40%). Detailed characteristics of participants are summarized in **Figure 4-1** and **Appendix F**.

Participants: Role at Coworking Space (n=75)
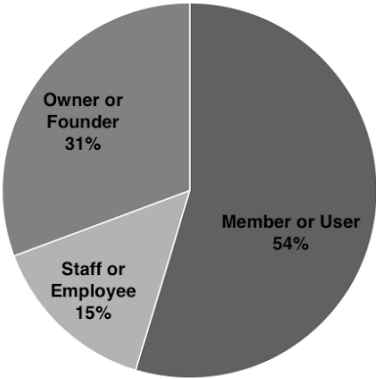
Participants: Identified Generation (n=52)
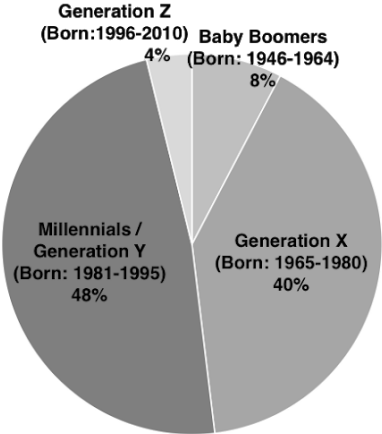
Participants: Profession (n=50)
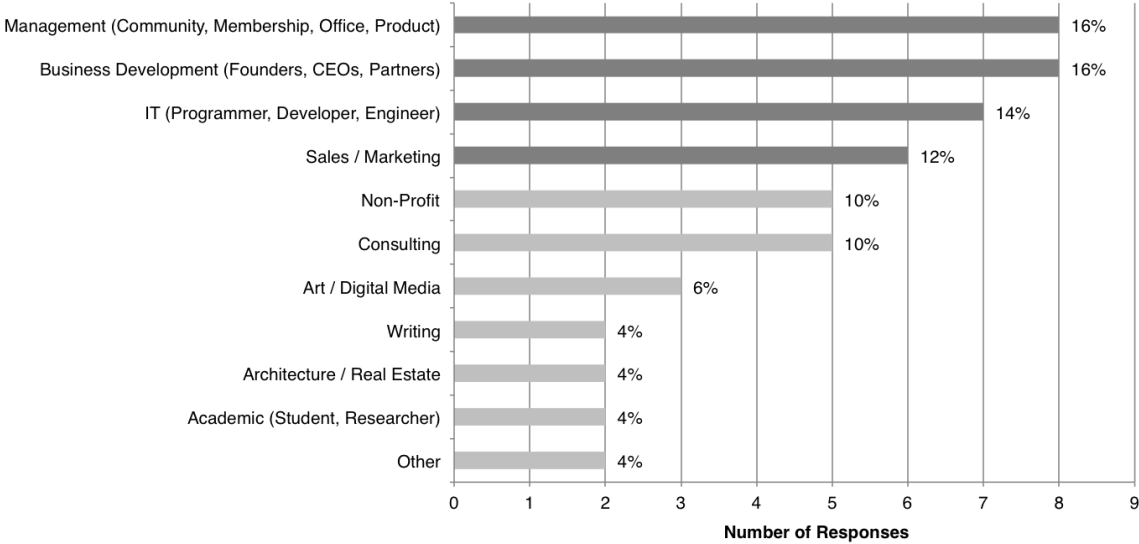
Figure 4-1. Characteristics of Participants.

4.2. MOTIVATION FOR USING COWORKING SPACE

When able to choose their work environment, most participants said they get their work done most effectively at coworking space (65%), followed by home (15%), office (12%), other (4%), cafe (3%), and library (1%). The fact that the majority prefers to work at coworking spaces suggests that participants are generally motivated to work at their current coworking spaces. Most participants (81%) self-made the decision to work at their current coworking spaces, suggesting they are self-motivated, and the participants' employers made the decision to work at coworking spaces for some participants (15%) who could potentially be externally-motivated.

With regard to the key dimensions of workplace derived from the literature review, the participants rated all factors in the current coworking spaces as important for their ability to get work done. The overall average of four factors was 1.90 on a 7-point likert scale ranging from -3 (very unimportant) to 3 (very important). The averages of importance ratings for the four factors were between somewhat important (1) to important (2), suggesting that they all play important roles in motivating the users to work at their current spaces. Technological resources (i.e., Wi-Fi connectivity; 2.55) had the highest importance average, followed by physical workplace (i.e., availability and quality of spaces; 2.26), community presence (i.e., working in the presence of other people; 1.66), and community participation (i.e., social interaction, networking; 1.15). The combined average for the sense of

community, including both presence and participation, was 1.40. The data confirms the importance of considering the design of physical workplace for motivating the users. **Figure 4-2** summarizes the descriptive statistics for the participants' motivations for using coworking spaces.
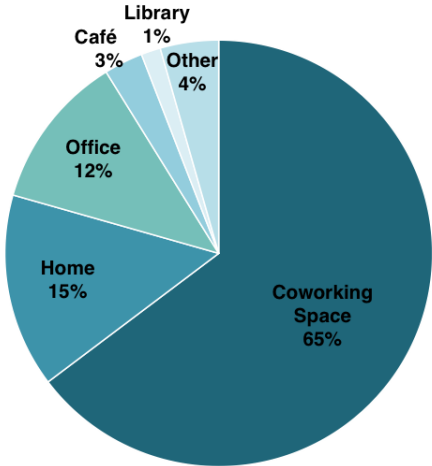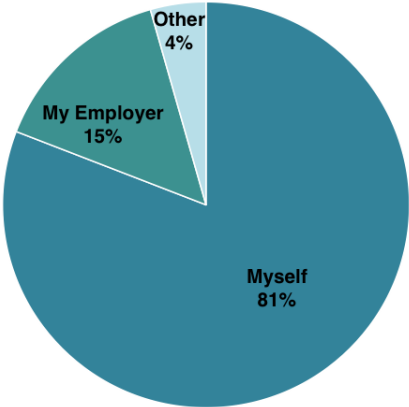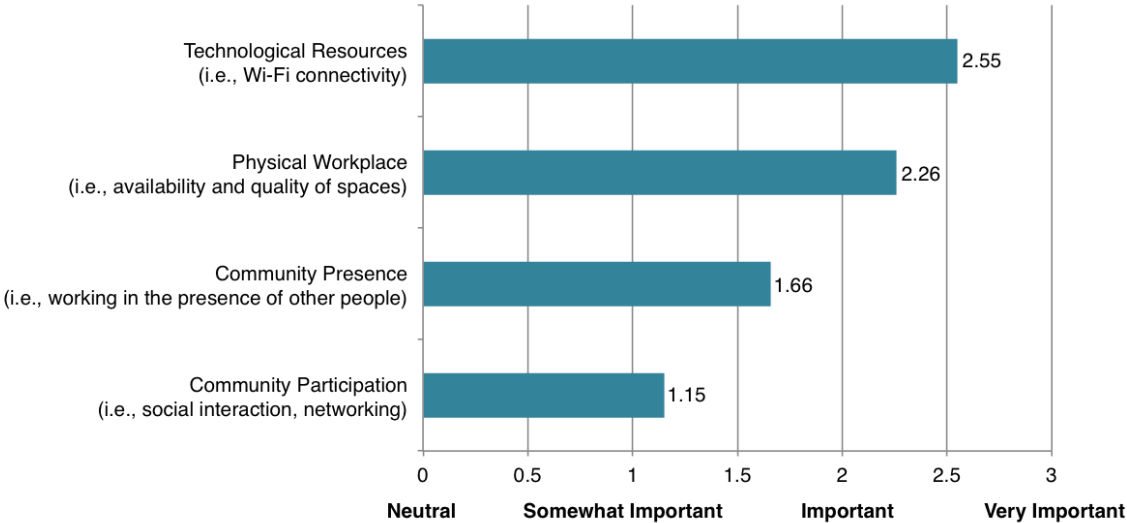

Figure 4-2. Motivations of Participants.

4.2.1. QUALITATIVE ANALYSIS OF MOTIVATIONS

A total of 66 responses were collected for the open-ended question asking the participants' primary driver(s) or motivation(s) for working in the coworking space. The author analyzed the responses by assigning codes and counting the frequency of certain codes in order to conceptualize the underlying patterns for the factors that contribute to the participants' motivations to work at coworking spaces. Nine key patterns emerged with a set of subtopics associated with each pattern. Codes corresponding to each pattern are documented in **Table 4-1**. A supplementary word count analysis of the key terms mentioned across the themes was conducted. This analysis was used to generate a word cloud that visually illustrates the frequency of keywords by displaying the words with more frequent mentions in a darker and larger font (**Figure 4-3**). The top three patterns are elaborated below.

Community and connection was the most frequently mentioned pattern (56%). Many participants used the exact language of the pattern as the primary motivation, and it was captured in several responses: "community and connection, I have been working as a freelancer and I miss 'showing up' somewhere and seeing familiar faces" (P39); "connection, community, and inspiration" (P66). The participants attributed meeting and making connections with new, diverse, or similarly minded people as important motivations: "the opportunity to meet diverse entrepreneurial people" (P74); "access to … many other small businesses, independent consultants … and

folks working in a variety of fields" (P14); "I'm an entrepreneur … and wanted to be around others like me" (P46). Merely having other working people present in the same space was considered as motivating the users, as responses noted the "desire to be around others while working" (P29) or "[liking] having other people around" (P13).

Affordability was the second most popular motivating factor (32%). The coworking space option was quoted as "low cost", "economical", and "budget friendly" office solution, especially for entrepreneurs and small business owners. They also appreciated the benefit of saving costs by having the operational and management side of office taken care by the coworking spaces: "I wanted a space that provided amenities of a larger business without accruing expenses that would be unaffordable to my business" (P46). The responses had several mentions of how the coworking spaces are cheaper and more convenient than renting standard offices: "the cost of a private office in a coworking space is far lower than having our own office" (P2); "less expensive than managing an office, someone else sets up and manages printers" (P54).

Access to spaces, resources, and services was another recurring pattern for motivation (30%). The well-designed and well-managed spaces were considered attractive features of the coworking space: "the space is well designed with appropriate opportunities for privacy and open collaboration" (P7); "everything I needed in one space" (P57); "it's a nice

environment and the space is separated well" (P51). The sense of professionalism was also considered a key motivation, as responses cited the importance of coworking space providing "business address", "collaborative spaces", "conference rooms", "place to meet clients that's not home or coffee shop". Other amenities and services, such as "fast Wi-Fi", "coffee/snacks", "gym/yoga classes", were highlighted as motivating factors.

Table 4-1. Patterns for Motivations for Using Coworking Space (*n*=66).

PATTERNS AND CODES	COUNTS
1. Community & Connection	**37**
Networking, Interaction, Meeting New/Diverse People	
Presence of Other Working People	
Collaboration, Team Meeting	
2. Affordability	**21**
Low Cost, Save Cost, Cheaper than Office	
3. Access to Spaces, Resources & Services	**20**
Well-Designed Spaces, Separated Spaces, Private Spaces, Collaborative Spaces, Conference Rooms	
Professionalism, Business Address, Client Meeting	
Sharing, Learning, Classes, Workshops, Events	
Amenities, Fast Wi-Fi, Coffee/Snacks, Gym/Yoga	
4. Work-Life Balance & Flexibility	**17**
Convenience, Control, Stability, Outside Home	
5. Focus Work	**15**
Ability to Focus/Concentrate, Less Distraction, Productive, Quiet	
Dedicated Workspace, Outside Home	
6. Design Aesthetics & Atmosphere	**12**
Cozy, Relaxed, Informal, College-Like	
Engaging, High-Energy	
Professional	
7. Culture	**6**
Entrepreneurial, Creative, Innovative, Inspiring	
8. Location	**6**
Proximity to Home, Walkable	
9. Employment	**6**
Company Requirement	

Figure 4-3. Word Cloud Generated from Motivation Responses.

4.2.2. QUALITATIVE ANALYSIS OF DEMOTIVATING FACTORS

A total of 57 responses were collected for the open-ended question asking the participants if there were any primary barrier(s) or demotivating factor(s) that prevented them from working (more) in the coworking space. Of the recorded responses, 9 participants responded with "none". The patterns were accordingly analyzed using 48 responses. Seven key patterns emerged with a set of subtopics associated with each pattern (**Table 4-2**). A word cloud is generated to illustrate the keywords mentioned in the responses with the larger and darker words reflecting higher frequency of mentions (**Figure 4-4**). The top three patterns are elaborated below.

Noise and privacy issues were the most frequently mentioned pattern (29%). The issue of noise and lack of acoustic privacy is a key barrier reported by many participants who raised their concerns: "loud, noisy environment and bad for phone calls and video conferences" (P61); "limited privacy for phone calls and meetings" (P35); "the space can be noisy, I've had some irritating neighbors" (P16). Besides acoustic issues, the lack of visual privacy and distractions were also critical demotivating factors that were mentioned several times. One response raised the issue of open workplace where an individual can get self-conscious about other people viewing his or her private work: "I often would not want my coworking members to peep into the work I am getting done in the open areas. It is not a demotivating factor … but is at the back of my head!" (P19).

Commute time and distance from home were commonly brought up as demotivating factors (27%). Just as with any workplace, the participating coworkers reported the long commute or far distance from home as key barriers that prevented them from working (more) at the coworking spaces. One participant mentioned, "I am not [very] close to the coworking spaces … so there's a bit of a commute. I don't always have access to a car so my commute can take quite a long time. If I just have to send out … emails etc. I'll often work from my house" (P64). As suggested in the responses, the coworking spaces' location and access to transportation are important factors for consideration in overcoming the barriers.

Personal conflicts were also often addressed as barriers for coworking space use (25%). The comments in this pattern mostly referred to the external factors that are usually difficult to control, such as obligations at home, client requirements, or business travels. The lack of time and scheduling issues were also brought up. Some responses included "kids, schedule, meetings off-site" (P27); "need to perform job duties that require leaving the building" (P71); and "I have a day job (8 a.m. - 4 p.m.)" (P23). Moreover, home was referred to as a dominant barrier to using coworking spaces as the participants occasionally preferred to work at home: "some days I don't feel like leaving my house to get work done, some days I'm more productive at home" (P6).

Table 4-2. Patterns for Demotivating Factors for Coworking Space (*n*=48).

PATTERNS AND CODES	COUNTS
1. Noise & Privacy Issues	**14**
Noisy, Loud, Limited Privacy, Phone Calls	
Distractions, Neighbors, People	
2. Commute Time & Distance from Home	**13**
Commute, Distance, Transportation Access	
3. Personal Conflicts	**12**
Schedule, Lack of Time, Job Requirements, Clients, Travels	
Home, Obligations at Home, Personal Life, Energy	
4. Cost	**9**
High Overhead Costs, Price Point	
5. Crowding	**5**
Too Many People, Team Outgrowing the Space, Inefficient	
6. Lack of Access	**4**
Inflexible Policies, Membership Plans, No After-Hours Access	
Parking Issues, Location, Access to Resources	
7. Design Aesthetics & Atmosphere	**3**
Lack of Professionalism (i.e., for lawyers), Too Corporate, Sterile	

Figure 4-4. Word Cloud Generated from Demotivating Factors Responses.

4.3. IMPORTANCE AND SATISFACTION RATINGS OF THE ENVIRONMENTAL FEATURES

A total of 60 participants rated the following 15 environmental features in terms of importance in an ideal coworking space and satisfaction in their current coworking space: (1) Design Aesthetics, (2) Interior Decors and Finishes, (3) Consistent Brand Identity, (4) Access to Indoor Natural Elements, (5) Access to Outdoor Nature, (6) Spatial Layout and Openness, (7) Availability of Collaborative Spaces, (8) Availability of Individual Workspaces, (9) Furniture - Quality, (10) Furniture - Flexible Arrangement, (11) Lighting Quality, (12) Control of Lighting, (13) Control of Visual Privacy, (14) Control of Acoustic Privacy, and (15) Thermal Comfort. A 7-point Likert-type scale ranging from -3 (very unimportant/dissatisfied) to 3 (very important/satisfied) was used.

As summarized in **Figure 4-5**, all features were generally evaluated as important, with the overall average of 1.79 (SD=1.22), supporting that the environmental features asked in this survey are important topics to consider. When collectively analyzed, 87% of the 60 respondents rated all features as very important (32%), important (36%), or somewhat important (19%). The remaining 8% of the respondents were neutral, and 5% rated the features as somewhat unimportant (2.6%), unimportant (0.8%), or very unimportant (1.4%). In the order of highest importance, the following features were evaluated as especially important with an average rating of approximately 2: Availability of Individual Workspaces (M=2.31, SD=0.82); Lighting Quality (M=2.29, SD=0.85); Design Aesthetics (M=2.10, SD=1.07); Control of Acoustic Privacy (M=2.02, SD=0.97); Thermal Comfort (M=1.97, SD=0.96); Availability of Collaborative Spaces (M=1.95, SD=1.17). Among all features, Consistent Brand Identity (M=0.93, SD=1.22) was rated with the lowest importance of having in an ideal coworking space. Access to Outdoor Nature (M=1.29, SD=1.44) was also rated with relatively low importance.

Regarding the performance of the environmental features in the respondents' current coworking spaces, most features were rated as satisfactory, with the overall average of 1.66 (SD=1.43). When collectively analyzed, 78% of the 60 respondents rated all features as very satisfied (37%), satisfied (26%), or somewhat satisfied (14%). On average, 13% were neutral, and approximately 9% rated the features with some level of

dissatisfaction, with 6% somewhat dissatisfied, 2% dissatisfied, and 1% very dissatisfied. Descriptive statistics for the satisfaction ratings are summarized in **Figure 4-6**. The features with high satisfaction ratings were Design Aesthetics (M=2.34, SD=0.93), Interior Decors and Finishes (M=2.25, SD=1.01), Spatial Layout and Openness (M=2.15, SD=0.96), Consistent Brand Identity (M=2.12, SD=1.10), Furniture - Quality (M=2.10, SD=1.00), Lighting Quality (M=2.07, SD=1.18), Availability of Individual Workspaces (M=2.00, SD=1.10), and Furniture - Flexible Arrangement (M=1.90, SD=1.22). Two features that were rated with relatively low level of satisfaction were Control of Acoustic Privacy (M=0.49, SD=1.84) and Access to Outdoor Nature (M=0.53, SD=1.49).

Environmental Features: Importance (n=60)
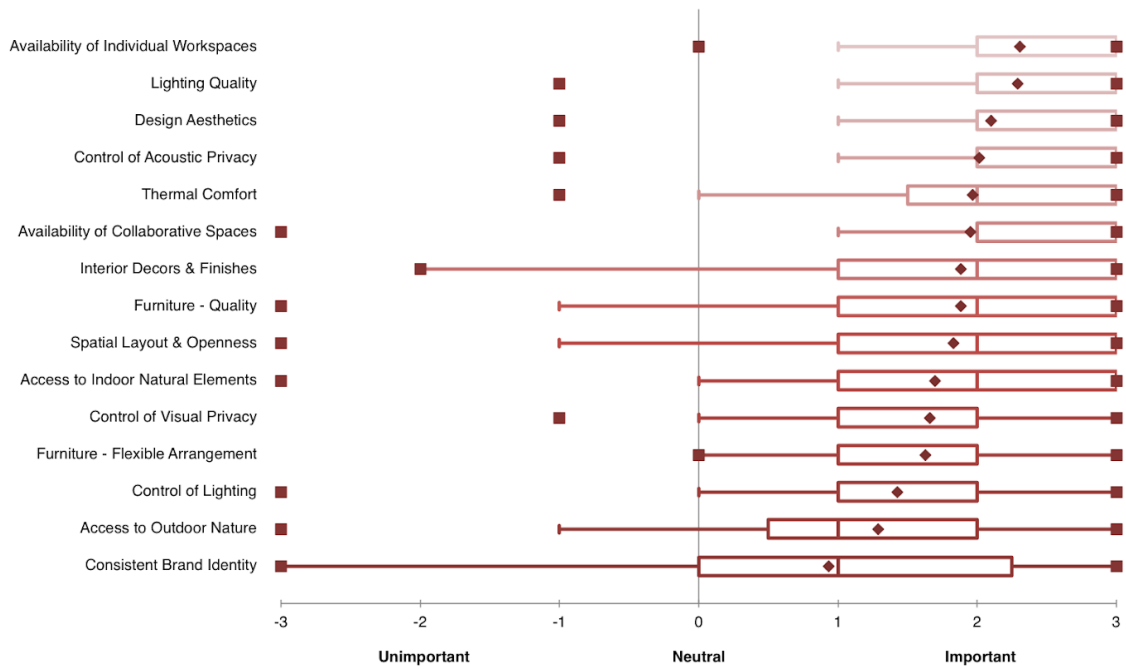
ENVIRONMENTAL FEATURES (*N*=60)	MEAN	MEDIAN	MODE	ST. DEV.
Availability of Individual Workspaces	2.31	2	3	0.82
Lighting Quality	2.29	2	3	0.85
Design Aesthetics	2.10	2	3	1.07
Control of Acoustic Privacy	2.02	2	2	0.97
Thermal Comfort	1.97	2	2	0.96
Availability of Collaborative Spaces	1.95	2	2	1.17
Interior Decors & Finishes	1.88	2	2	1.12
Furniture - Quality	1.88	2	3	1.15
Spatial Layout & Openness	1.83	2	2	1.25
Access to Indoor Natural Elements	1.70	2	2	1.28
Control of Visual Privacy	1.66	2	2	1.09
Furniture - Flexible Arrangement	1.63	2	2	0.96
Control of Lighting	1.42	2	2	1.26
Access to Outdoor Nature	1.29	1	1	1.44
Consistent Brand Identity	0.93	1	3	1.82
Average Importance	1.79	2	2	1.22

Figure 4-5. Evaluation of Importance in Coworking Spaces.

Environmental Features: Satisfaction (n=60)
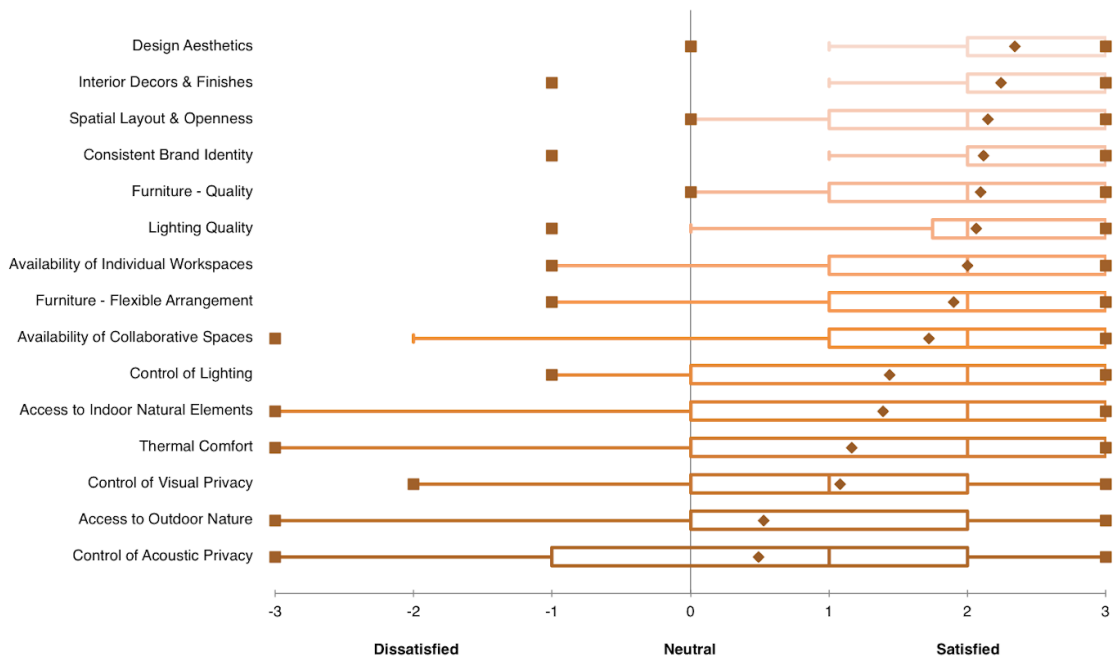
ENVIRONMENTAL FEATURES (*N*=60)	MEAN	MEDIAN	MODE	ST. DEV.
Design Aesthetics	2.34	3	3	0.93
Interior Decors & Finishes	2.25	3	3	1.01
Spatial Layout & Openness	2.15	2	3	0.96
Consistent Brand Identity	2.12	2	3	1.10
Furniture - Quality	2.10	2	3	1.00
Lighting Quality	2.07	2	3	1.18
Availability of Individual Workspaces	2.00	2	3	1.10
Furniture - Flexible Arrangement	1.90	2	3	1.22
Availability of Collaborative Spaces	1.72	2	3	1.46
Control of Lighting	1.44	2	3	1.44
Access to Indoor Natural Elements	1.39	2	3	1.44
Thermal Comfort	1.17	2	3	1.70
Control of Visual Privacy	1.08	1	2	1.42
Access to Outdoor Nature	0.53	0	0	1.49
Control of Acoustic Privacy	0.49	1	3	1.84
Average Satisfaction	1.66	2	3	1.43

Figure 4-6. Evaluation of Satisfaction in Coworking Spaces.

RECOMMENDATION RATINGS

Relevant to the overall high satisfaction ratings, the likelihood of the participants' willingness to recommend their current coworking spaces to their friends or colleagues was high with average rating of 2.54 (*SD*=11.39) on a scale from very unlikely (-3) to very likely (3). As summarized in **Figure 4-7**, a total of 35 participants responded that they are very likely (74%), likely (11%), somewhat likely (9%), or neutral (6%). While the majority of owners or founders (13/14) who responded to the question said they were very likely to recommend, the ratings by members or users varied with the half of the group rating very likely (8/16), and the remaining half responding likely (4/16), somewhat likely (3/16), or neutral (1/16). All staff or employee respondents said they were very likely (5/5) to recommend their coworking spaces.

A correlational analysis was conducted between the recommendation rating and satisfaction ratings of all 15 environmental features to look for any relations between satisfaction of a certain feature and the likelihood to recommend the coworking space. As summarized in **Table 4-3**, Pearson's correlation coefficient *r* and correlation probability *p*-values were calculated and compared. After a Bonferroni correction for 15 tests, four environmental features with *p*-values lower than or close to 0.0033 were considered to have significant correlation trend with the recommendation rating, in the order of significance: Interior Decors and Finishes (r=0.558, p=0.001), Furniture - Quality (r=0.531, p=0.001), Design Aesthetics (r=0.516, p=0.002), and Control

of Lighting (r=0.483, p=0.004). The users who were satisfied with the four features were more likely to recommend their current coworking spaces to their friends or colleagues. With a bigger sample, these correlational trends could be more pronounced and inform important features to consider in future design decisions.

Figure 4-7. How Likely Would You Recommend Your Current Coworking Space to a Friend or Colleague? (n=35)
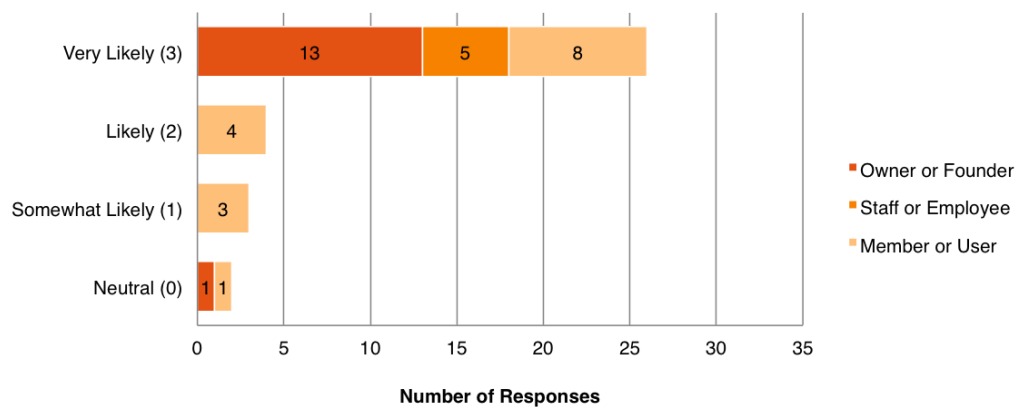
Table 4-3. Correlation Analysis of Recommendation Ratings and Satisfaction Ratings of 15 Environmental Features.

Correlations with Recommendation (n=35)	Pearson's r	p-value*
1. Design Aesthetics	0.5162	**0.0018**
2. Interior Decors & Finishes	0.5578	**0.0006**
3. Consistent Brand Identity	0.2864	0.1005
4. Access to Indoor Natural Elements	0.3864	0.0240
5. Access to Outdoor Nature	0.0300	0.8662
6. Spatial Layout & Openness	-0.0187	0.9163
7. Availability of Collaborative Spaces	0.0728	0.6824
8. Availability of Individual Workspaces	0.1961	0.2663
9. Furniture - Quality	0.5310	**0.0012**
10. Furniture - Flexible Arrangement	0.3219	0.0633
11. Lighting Quality	0.2903	0.0959
12. Control of Lighting	0.4825	**0.0039**
13. Control of Visual Privacy	0.3284	0.0579
14. Control of Acoustic Privacy	0.3543	0.0398
15. Thermal Comfort	0.2727	0.1187

* Significant at p<0.0033.

4.3.1. GAP ANALYSIS

A gap analysis between the ratings of importance and satisfaction of 15 environmental features was conducted to evaluate which features are outperforming or underperforming (**Figure 4-8**). The average satisfaction rating was subtracted from the average importance rating to calculate the gap for each feature. If the resulting gap was below 0, the feature was considered outperforming. Consistent Brand Identity (-1.21) was considered the most outperforming feature. If the gap was above 0, the feature was considered underperforming with action recommended to address the issue. Control of Acoustic Privacy (1.64) was the most underperforming feature, suggesting it needs the most attention. Thermal Comfort (0.88), Access to Outdoor Nature (0.70), and Control of Visual Privacy (0.62) were also considered slightly underperforming with a gap above 0.5.

Gap Analysis between Importance and Satisfaction for Environmental Features (n=57)
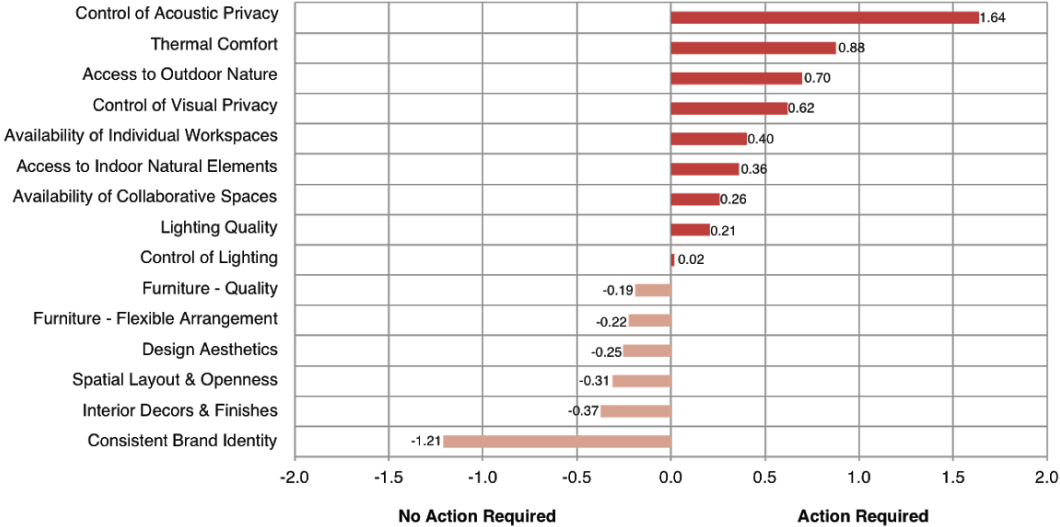
Figure 4-8. Gap Analysis.

4.3.2. PREFERRED ENVIRONMENTAL FEATURES

The characteristics associated with each environmental feature were analyzed to inform the users' design preference in a coworking space. For each feature asked in detail, the responses were analyzed with reference to the importance and satisfaction ratings of the corresponding feature. Additional open-ended questions were reviewed to supplement the analysis.

DESIGN PROCESS

Regarding the design process, 58% of the participants (*n*=62) said that they were not involved, and the majority in this group were members or users (81%). For those who were involved with the design process, the reason for achieving current design aesthetics was due to preference (26%) or budget constraints (15%). One other response (2%) said the reason was "creating a space to inspire creativity and productivity". Owners or founders (65%) was the most involved group in the design process. Distribution of the user groups who responded to the design process question is summarized in **Figure 4-9**.

Figure 4-9. Design Process: Reason for the Current Design Aesthetics (*n*=62).
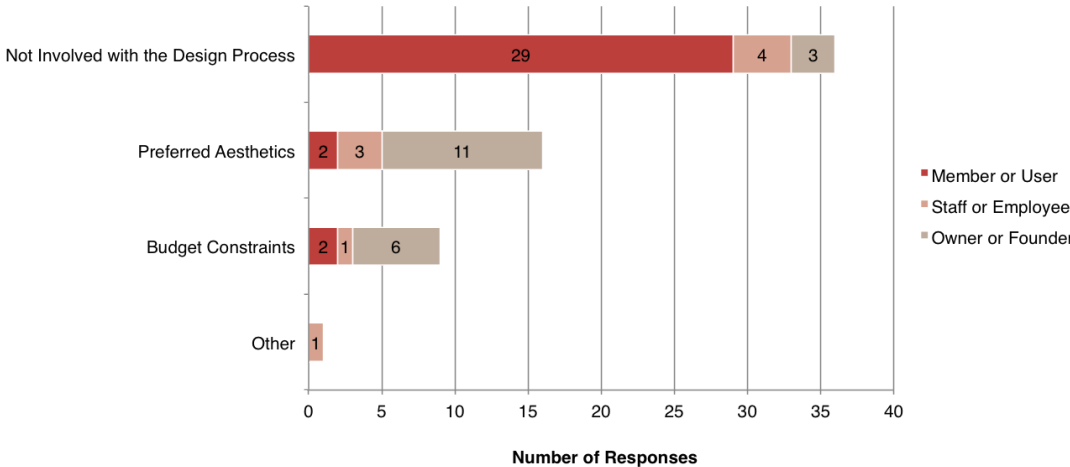
DESIGN AESTHETICS

Among the 15 environmental features, Design Aesthetics was one of the outperforming features that was rated with third highest average importance (2.10) and highest level of satisfaction (2.34). High performance of the feature suggests that the participants' responses on characteristics used to describe their spaces could inform their preferred aesthetics. A summary of distribution of the level of satisfaction for corresponding characteristic is provided in **Figure 4-10**. The majority of the respondents (n=55) described their current spaces as "modern" (84%). "Cozy" or "homey" (45%) and "green/environmentally-friendly" (44%) were also commonly selected descriptors used to characterize the coworking spaces. "Industrial" (33%), "local design" (31%), and "signs of history" (24%) were also selected by the respondents, supporting the validity of the terms in describing the current coworking spaces' aesthetics. "Raw" (11%) was a relatively less popular descriptor. Other responses (11%) that provided their own descriptors included "zen-like", "soothing", "sophisticated", "inspiring", and "colorful".

INTERIOR DECORS AND FINISHES

Interior Decors and Finishes was an environmental feature with second highest satisfaction average (2.25) with a negative gap suggesting high performance. This feature plays a role in creating the overall design aesthetics of a physical workplace. The satisfactory rating of all design characteristics of Interior Decors and Finishes suggested their relevance in the coworking

space design. Considering the importance average of 1.88 for Interior Decors and Finishes, "material/texture" (*M*=2.07, *SD*=0.88) and "color" (*M*=2.02, *SD*=0.97) were rated most satisfactory and high-performing (**Figure 4-11**). "Transparency" (*M*=1.79, *SD*=1.34), "branding" (*M*=1.70, *SD*=1.12), and "artwork" (*M*=1.56, *SD*=1.33) were also considered satisfactory. "Natural elements" (*M*=1.15, *SD*=1.68) was rated with the lowest average satisfaction among the interior characteristics. Other responses included "comfortable, informal furniture choices" and "views", which were rated very satisfactory (3). "Storage … too many things [outside], making the office look messy" was a feature rated as somewhat dissatisfactory (-2). The participants (*n*=44) also provided additional comments on satisfactory interior features. Most common themes that were brought up included well-lit/bright space, views, openness, high-quality finishes, cleanliness, and calm colors.

FURNITURE QUALITY

Furniture Quality was a relatively high-performing feature with a negative gap of -0.19. Satisfaction of the characteristics of Furniture Quality were evaluated. "Aesthetically pleasing" feature (*M*=1.88, *SD*=1.13) and "comfort level" (*M*=1.79, *SD*=1.14) were rated most satisfactory, followed by "movability" (*M*=1.48, *SD*=1.47), "flexible arrangements" (*M*=1.42, *SD*=1.50), and "variety of options" (*M*=1.31, *SD*=1.23; **Figure 4-12**). Several open comments on furniture mentioned the importance of furniture providing "solid-feeling", "consistent design", "enough space", and "comfort".

Figure 4-10. Design Aesthetics of Current Coworking Spaces (*n=55*).
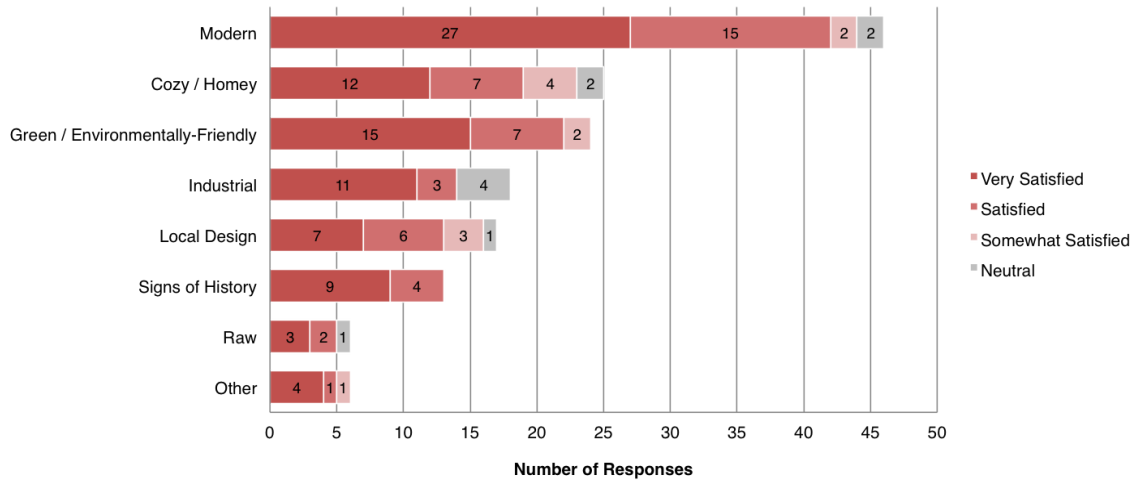
Figure 4-11. Interior Decors and Finishes: Satisfaction of Features.
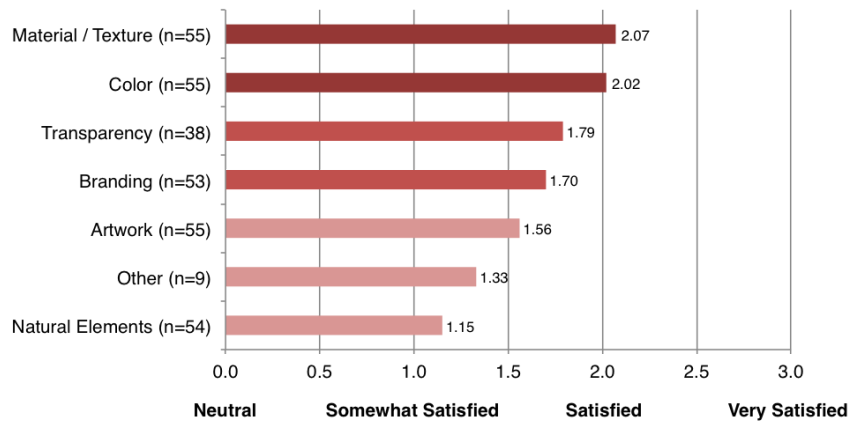
Figure 4-12. Furniture: Satisfaction with Qualities (*n=52*).
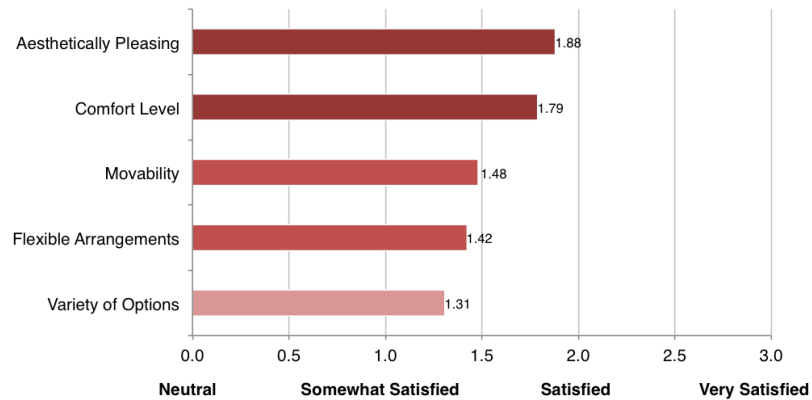
SPATIAL LAYOUT AND PROGRAM

As summarized in **Figure 4-13**, the majority of 52 respondents said that their current coworking spaces have semi-open layout (i.e., combination of open spaces and private rooms; 77%). Open layout (i.e., large open spaces; 21%) and closed layout (i.e., mostly enclosed and separate spaces; 2%) were less popular plans. Participants in open layouts (n=11) placed less importance on Spatial Layout and Openness with average rating of 1.55, compared to participants in semi-open layouts (n=40) that had average importance rating of 2.11. Average satisfaction ratings were similar across participants in open layouts (M=2.18) and semi-open layouts (M=2.20).

Figure 4-13. Spatial Layout of Current Coworking Space (n=52).
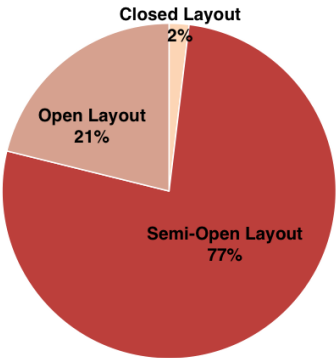
With regard to the spatial program, the respondents (n=49) said most space types asked in the survey were available at their current coworking spaces (**Figure 4-14**). Conference room (98%), lounge/comfortable seating area (96%), kitchen/cafe (94%), enclosed group space/team room (90%), open workstation (90%), event space (84%), telephone booth/nook (78%) were the most common space types that more than 75% of the respondents

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said they were available. The least available spaces included play space (16%), which could be due to unclear definition of the space type. Mother's room (24%) and meditation room (37%) were also relatively less available.

As shown in **Figure 4-15**, conference room (*M*=2.67, *SD*=0.63) was rated with the highest importance. Kitchen/cafe (*M*=2.52, *SD*=0.95), telephone booth/nook (*M*=2.35, *SD*=0.97), enclosed group space/team room (*M*=2.07, *SD*=1.27), lounge/comfortable seating (*M*=2.06, *SD*=1.23) had the average importance rating between important (2) and very important (3). Play space (*M*=-0.74, *SD*=1.58), meditation room (*M*=-0.06, *SD*=1.62), and mother's room (*M*=0.29, *SD*=1.68) were the least available spaces and had the lowest average importance. In almost all cases, people who responded "yes" to the availability of the space type in their coworking spaces rated the corresponding space type with higher average importance than those who responded "no". This pattern of behavior suggested that people who place higher importance on a certain space type choose to work in coworking spaces that have the importantly considered spaces available. One case where the importance average for "no" respondents (*M*=2.00) was slightly higher than "yes" respondents (*M*=1.86) was open workstation (*M*=1.88, *SD*=1.33). Moreover, there were very small differences between "yes" and "no" average importance ratings for kitchen/cafe (2.52 vs. 2.50) and telephone booth/nook (2.39 vs. 2.10), which could mean that they are considered highly important regardless of the availability.

Figure 4-14. Availability of Space Type in Current Coworking Space (*n*=49).

Percentage of Responses
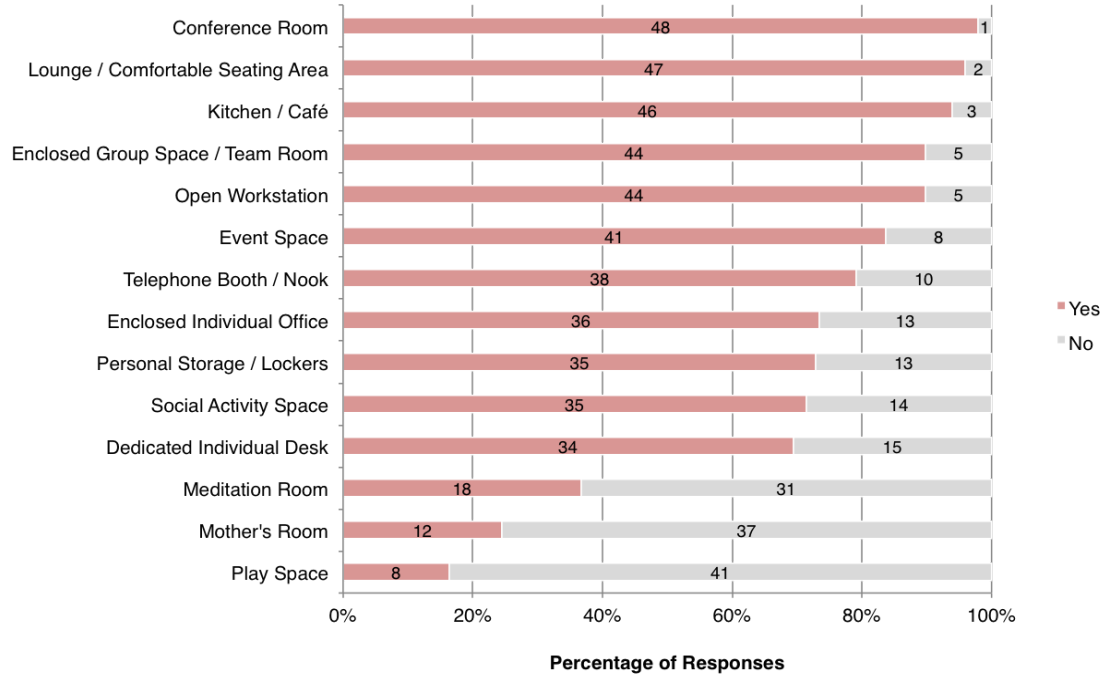
Figure 4-15. Importance of Space Type in Current Coworking Space (*n*=49).
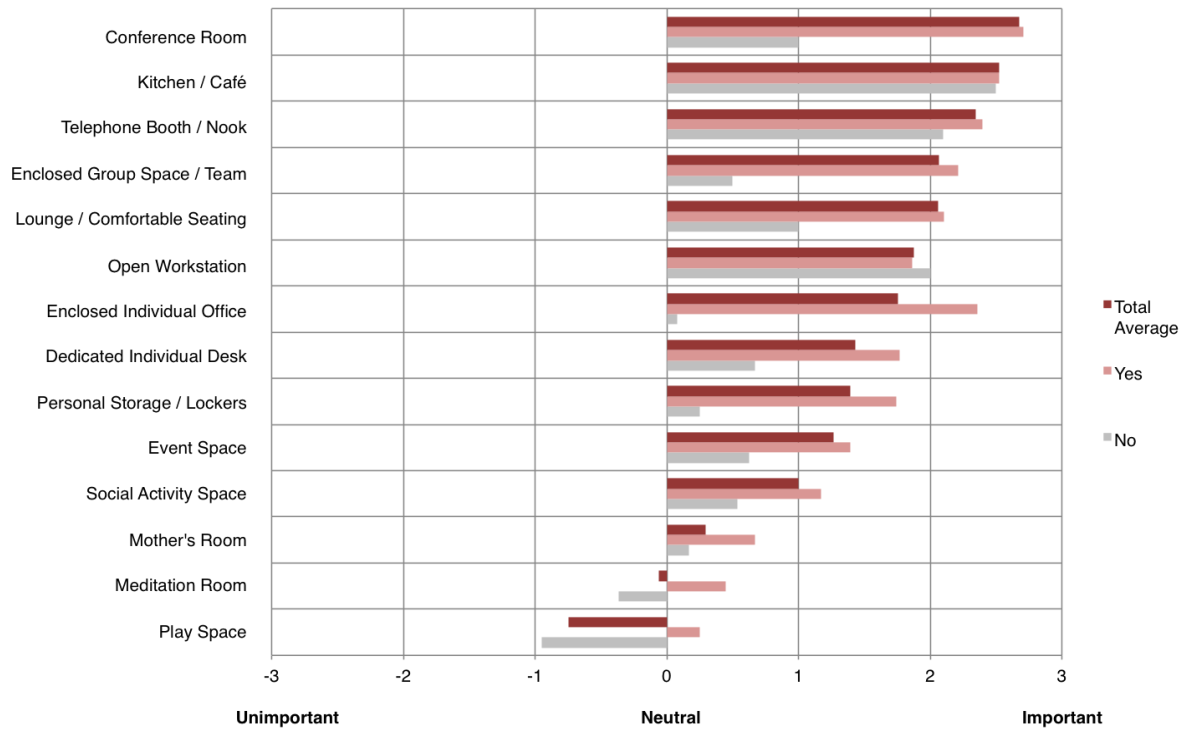
ENVIRONMENTAL QUALITY AND CONTROL

Five key environmental qualities and the sense of control for each of them were evaluated. The respondents (*n*=44) rated all qualities as important for having the ability to control in an ideal coworking space, in the order of highest average rating: Acoustic Privacy (*M*=1.90, *SD*=1.23), Thermal Comfort (*M*=1.82, *SD*=1.17), Visual Privacy (*M*=1.61, *SD*=1.26), Artificial Lighting (*M*=1.60, *SD*=1.21), and Daylight (*M*=1.44, *SD*=1.49). Despite the high importance ratings, more respondents reported that they do not have the ability to control the environmental qualities. Artificial Lighting (59%) was the only quality that more than half of the respondents had control of. Acoustic Privacy (50%), Daylight (39%), Thermal Comfort (36%), and Visual Privacy (34%) lacked controllability for most participants (**Figure 4-16**).

The order of highest average satisfaction of the environmental qualities were the exact reverse of importance: Daylight (*M*=1.62, *SD*=1.43), Artificial Lighting (*M*=1.57, *SD*=1.27), Visual Privacy (*M*=1.02, *SD*=1.19), Thermal Comfort (*M*=0.86, *SD*=1.54), Acoustic Privacy (*M*=0.35, *SD*=1.68). Gap analysis of importance and satisfaction shows the biggest gap in Acoustic Privacy with 1.55, suggesting the lowest performance among the five qualities (**Figure 4-17**). Daylight was relatively high-performing with -0.18 gap.

As described in **Figure 4-18**, "yes" respondents who said they have the control of the environmental quality evaluated average importance and satisfaction higher than "no" respondents. When people did not have the

control, they were significantly more dissatisfied with the environmental quality. The participants who had no control of acoustic privacy had a negative average satisfaction of -0.36, compared to the average satisfaction of 1.14 by participants with the control. This pattern of different behavior was consistent throughout all qualities: thermal comfort (0.37 vs. 1.80), visual privacy (0.69 vs. 1.79), artificial lighting (1.39 vs. 1.84), daylight (1.26 vs. 2.41).

Figure 4-16. Environmental Control: Availability (*n*=44).
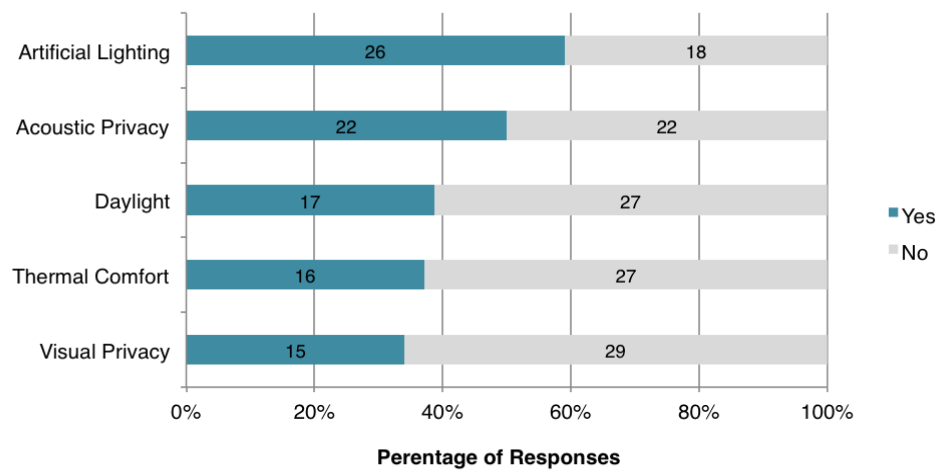
Figure 4-17. Gap Analysis: Environmental Quality (*n*=44).
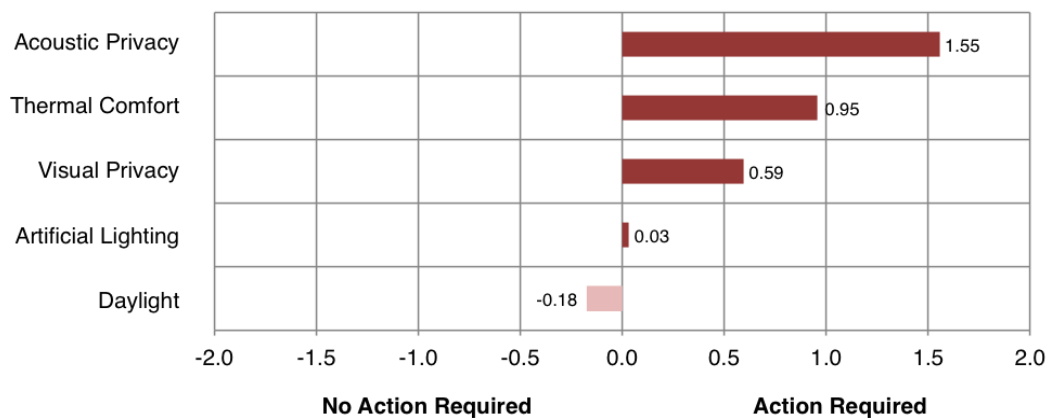
Figure 4-18. Environmental Quality: Importance and Satisfaction (*n*=44).
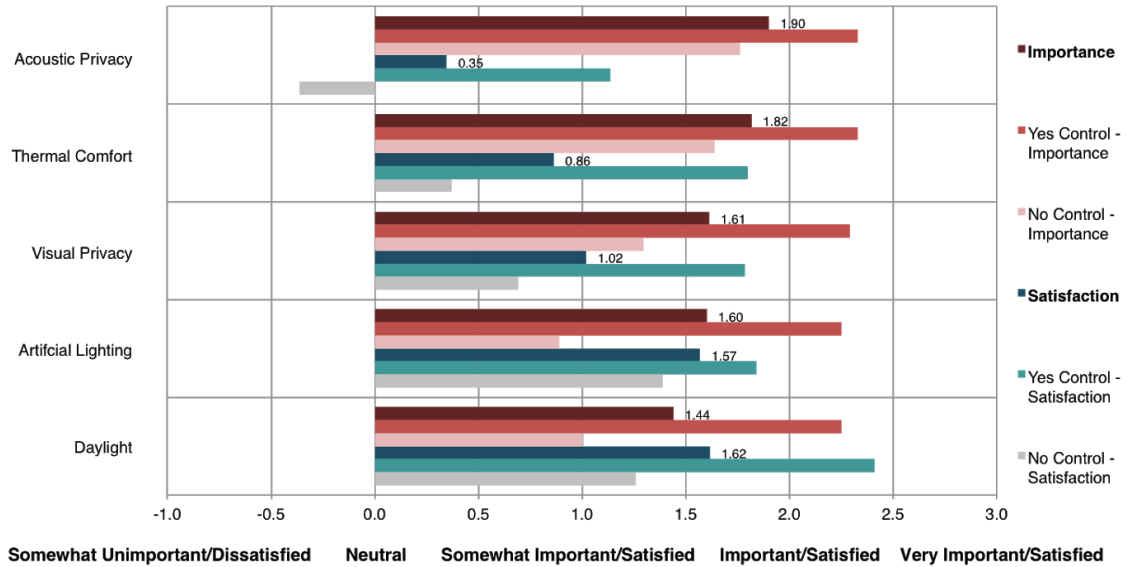
4.4. COMPARISONS ACROSS PARTICIPANT CHARACTERISTICS

As described in the demographics section, there were several different user groups that participated in the survey. In order to analyze any significant differences in the satisfaction or importance ratings of environmental features, independent-samples *t*-tests were conducted. *T*-tests were chosen as the appropriate method for statistical analysis because two key characteristics emerged for the categories of motivation types, user types, and generations.

4.4.1. MOTIVATION TYPES

The response to the question "Who made the decision for you to work at the current coworking space?" informs potential motivation that influenced the participant to choose to work at the coworking space. Two primary responses were myself (81%) and my employer (15%). The satisfaction

ratings of the 15 environmental features were analyzed using an independent-samples *t*-test between the two groups of self-selected and employer-selected motivations. The analysis for the effect of motivation type on satisfaction failed to reveal a significant difference between the two motivation groups for all features. The feature that had the most difference between the two groups was Control of Acoustic Privacy, $t(57)=1.10$, $p=0.278$. On average, the self-selected motivation group ($n=50$, $M=0.64$, $SD=1.84$) was 0.765 units more satisfied with the Control of Acoustic Privacy than the employer-selected motivation group ($n=8$, $M=-0.125$, $SD=1.81$). The effect size was computed as $d=0.42$, which represents an approximately medium effect. Cohen's (1992) guidelines for *t*-tests suggests d values for small (0.2), medium (0.5), and large (0.8) effect sizes.

4.4.2. USER TYPES

The key user types that participated in the study were owner or founder (31%), staff or employee (15%), and member or user (54%). Since most owners or founders in the study spent majority of their total work times in their coworking spaces, they were grouped together with staff or employee users. The satisfaction ratings of the 15 environmental features were analyzed using an independent-samples *t*-test between the two groups of owner or staff ($n=25$) and member or user ($n=36$). The analysis for the effect of user type on satisfaction revealed significant differences between the two groups for the following 7 environmental features in the order of lowest p-value:

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Control of Acoustic Privacy (*t*[60]=-4.29, *p*=<.0001), Furniture - Quality (*t*[60]=-2.61, *p*=0.011), Thermal Comfort (*t*[60]=-2.55, *p*=0.013), Control of Lighting (*t*[60]=-2.37, *p*=0.021), Control of Visual Privacy (*t*[60]=-2.10, *p*=0.040), Furniture - Flexible Arrangement (*t*[60]=-2.07, *p*=0.043), Availability of Collaborative Spaces (*t*[60]=-2.00, *p*=0.050). According to the *t*-test statistics, the owner or staff group on average had significantly higher satisfaction than the member or user group on the aforementioned 7 features, with the Cohen's *d* values suggesting medium to large effects (**Table 4-4**). For the remaining 8 features, the user type did not have any significant effect.

Table 4-4. *T*-Test Analysis of User Type on Satisfaction by Features.

Satisfaction of Features (*Df*=60)	Mean	St. Dev.	*t*-value*	*p*-value	Cohen's *d*
Control of Acoustic Privacy					
Owner/Staff (*n*=25)	1.56	1.29	-4.29	<.0001	**1.15**
Member/User (*n*=36)	-0.25	1.81			
Furniture - Quality					
Owner/Staff (*n*=25)	2.48	0.82	-2.61	0.011	**0.70**
Member/User (*n*=36)	1.83	1.03			
Thermal Comfort					
Owner/Staff (*n*=25)	1.80	1.35	-2.55	0.013	**0.68**
Member/User (*n*=36)	0.71	1.79			
Control of Lighting					
Owner/Staff (*n*=25)	1.96	1.33	-2.37	0.021	**0.63**
Member/User (*n*=36)	1.09	1.42			
Control of Visual Privacy					
Owner/Staff (*n*=25)	1.54	1.18	-2.10	0.040	**0.56**
Member/User (*n*=36)	0.78	1.50			
Furniture - Flexible Arrangement					
Owner/Staff (*n*=25)	2.28	1.06	-2.07	0.043	**0.55**
Member/User (*n*=36)	1.64	1.27			
Availability of Collaborative Spaces					
Owner/Staff (*n*=25)	2.16	0.99	-2.00	0.050	**0.54**
Member/User (*n*=36)	1.42	1.66			

* Significant at p<0.05.

4.4.1. GENERATIONS

The participants were asked to identify the generation they are part of. There were only a few respondents who were part of Baby Boomers (Born: 1946-1964; 8%) and Generation Z (Born: 1996-2010; 4%). The other two groups of Generation X (Born: 1965-1980; 40%) and Millennials (Born: 1981-1995; 48%) were similar in size and represented most of the participants. The two groups' satisfaction ratings and importance ratings of the 15 environmental features were analyzed using independent-samples t-tests to evaluate any significant differences between the two generations.

SATISFACTION OF ENVIRONMENTAL FEATURES

The analysis for the effect of generation on satisfaction revealed significant differences between the Generation X and Millennials for one environmental feature: Control of Visual Privacy, $t(44)=-2.50$, $p=0.016$. According to the t-test statistics, Generation X ($n=20$, $M=1.70$, $SD=1.17$) was on average 0.98 units more satisfied with Control of Visual Privacy than Millennials ($n=25$, $M=0.72$, $SD=1.40$). The effect size was computed as $d=0.72$, which suggests an approximately large effect.

Although the generation factor failed to reveal any significant effect for the other environmental features, a slight trend of difference was observed in the following 5 features, in the order of lowest p-value: Control of Lighting ($t[44]=-2.00$, $p=0.05$), Interior Decors and Finishes ($t[44]=-1.90$, $p=0.064$), Design Aesthetics ($t[44]=-1.90$, $p=0.064$), Spatial Layout and Openness

(t[44]=-1.78, p=0.082), Furniture - Quality (t[44]=-1.73, p=0.091). For all of them, Generation Z on average had slightly higher satisfaction than Millennials, with the Cohen's d values suggesting medium effects (**Table 4-5**).

IMPORTANCE OF ENVIRONMENTAL FEATURES

The analysis for the effect of generation on importance revealed significant differences between the Generation X and Millennials for 3 environmental features, in the order of lowest p-value: Furniture - Quality (t[44]=-2.43, p=0.019), Interior Decors and Finishes (t[44]=-2.22, p=0.032), Lighting Quality (t[44]=-2.06, p=0.046). According to the t-test statistics, Generation X placed higher importance than Millennials on Furniture - Quality by 0.83 units, on Interior Decors and Finishes by 0.70 units, and on Lighting Quality by 0.52 units. The effect sizes were computed as d=0.74, d=0.68, d=0.52, respectively, which suggests medium to large effect.

Although the generation factor failed to reveal any significant effect for the other environmental features, a slight trend of difference was observed in Thermal Comfort (t[44]=-1.80, p=0.078). Generation Z (n=21, M=2.19, SD=0.81) rated Thermal Comfort as 0.52 units more important than Millennials (n=24, M=1.67, SD=1.09). The Cohen's d value of 0.54 suggests medium level of effect (**Table 4-6**).

Table 4-5. *T*-Test Analysis of Generation on <u>Satisfaction</u> by Features.

Satisfaction of Features (*Df*=60)	Mean	St. Dev.	*t*-value*	*p*-value	Cohen's *d*
Control of Visual Privacy					
Generation X (*n*=20)	1.70	1.17	-2.50	0.016	**0.76**
Millennials (*n*=25)	0.72	1.40			
Control of Lighting					
Generation X (*n*=20)	1.89	1.32	-2.00	0.052	**0.63**
Millennials (*n*=25)	0.96	1.62			
Interior Decors and Finishes					
Generation X (*n*=20)	2.55	0.83	-1.90	0.064	**0.58**
Millennials (*n*=25)	1.96	1.17			
Design Aesthetics					
Generation X (*n*=20)	2.65	0.81	-1.90	0.064	**0.58**
Millennials (*n*=25)	2.12	1.01			
Spatial Layout and Openness					
Generation X (*n*=20)	2.50	0.83	-1.78	0.082	**0.54**
Millennials (*n*=25)	2.04	0.89			
Furniture - Quality					
Generation X (*n*=20)	2.45	0.88	-1.73	0.091	**0.53**
Millennials (*n*=25)	1.92	1.12			

* *Significant at p<0.05.*

Table 4-6. *T*-Test Analysis of Generation on <u>Importance</u> by Features.

Importance of Features (*Df*=60)	Mean	St. Dev.	*t*-value*	*p*-value	Cohen's *d*
Furniture - Quality					
Generation X (*n*=21)	2.33	0.79	-2.43	0.019	**0.74**
Millennials (*n*=24)	1.50	1.38			
Interior Decors and Finishes					
Generation X (*n*=21)	2.29	0.72	-2.22	0.032	**0.68**
Millennials (*n*=24)	1.58	1.28			
Lighting Quality					
Generation X (*n*=21)	2.52	0.51	-2.06	0.046	**0.52**
Millennials (*n*=24)	2.00	1.06			
Thermal Comfort					
Generation X (*n*=21)	2.19	0.81	-1.80	0.078	**0.54**
Millennials (*n*=24)	1.67	1.09			

* *Significant at p<0.05.*

5. DISCUSSION

All in all, the findings from the Coworking Space Survey supported the research objectives. The importance of the design of physical workplace in motivating people to use coworking spaces was confirmed. Most participants self-made the decisions to work at their current spaces and said that they would prefer to get their work done at coworking spaces. The responses revealed that users are generally self-motivated to work at their spaces, implying that survey findings on their preferred features are relevant considerations for motivating people to use the coworking spaces.

Among the top motivators that encouraged the participants to use the coworking spaces were "Access to Spaces, Resources, and Services" and "Design Aesthetics and Atmosphere", highlighting the importance of physical workplace in motivating the users. The same two factors could be double-edged, as "Lack of Access" and "Design Aesthetics and Atmosphere" were also mentioned as demotivating factors that could prevent the users from spending more time at coworking spaces. Environmental factors such as well-designed spaces, private collaboration spaces, dedicated workspaces that allow focus work were considered important motivators. Design aesthetics and atmosphere characterized as "cozy", "relaxed", "engaging", and "professional" were mentioned as motivating. "Noise and Privacy Issues" were the primary barriers for coworking spaces, emphasizing the need to consider designing a space that can mitigate the privacy problem.

One of the goals of this research was to shed a light on the design side of the coworking spaces that is often overlooked. All 15 environmental features surveyed were rated as important by the majority of the participants. The generally high importance ratings for all features inform the relevance of considering the features in designing coworking spaces. The most important features with the average rating of approximately 2 (Important) or higher were: Availability of Individual Workspaces, Lighting Quality, Design Aesthetics, Control of Acoustic Privacy, Thermal Comfort, Availability of Collaborative Spaces. The features with the highest importance ratings were consistent with the features identified as primary motivating factors for using the coworking spaces. The results suggest the imperative need to consider balancing individual workspaces that allow focus work with collaborative spaces. Indoor environmental qualities, especially lighting, acoustic privacy, and thermal comfort would have to be adequately addressed. Design aesthetics is also an important aspect of an ideal coworking space.

Satisfaction ratings for all features were generally high, highlighting the effective design of the coworking spaces. The participants who answered the question "How likely would you recommend your current coworking space to a friend or colleague?" provided positive responses, as majority responded with "very likely". Because the question was placed towards the end of the survey and was added midway through the distribution, roughly half of the total participants answered the question. Therefore, the responses may not

accurately reflect the recommendation rating of all participants. Most users who answered the question were owners or founders, who might naturally have the tendency to rate their coworking spaces with higher values. According to the correlational analysis, there were initial trends showing positive correlation between recommendation and satisfaction ratings of Interior Decors and Finishes, Furniture - Quality, and Design Aesthetics. The features that were most highly correlated with the likelihood of recommending the coworking space to a friend were more related to interior aesthetics and atmosphere than functional aspects. This trend has implications that the occupants' satisfaction of the overall aesthetics and atmosphere could be important for the success and marketability of the coworking space business. With a bigger sample, the correlational analysis can reveal important environmental features to prioritize in designing successful coworking spaces.

The top three satisfactory features with the highest average ratings were Design Aesthetics, Interior Decors and Finishes, and Spatial Layout and Openness. For each of the three features, a supplementary question regarding the preferred characteristics was asked. With regard to design aesthetics, "modern" was the overwhelmingly popular descriptor used to characterize the participants' current coworking spaces. Most people who selected "modern" as the descriptor rated design aesthetics as very satisfactory in their spaces. Other descriptors such as "cozy/homey" and "green/environmentally-friendly" were also popular and considered

satisfactory. When designing a coworking space, "modern", "cozy/homey", and "green/environmentally-friendly" could be considered as desired aesthetics that would satisfy the users. The author noticed a sense of rawness in the current trend of coworking space aesthetics, but "raw" was the least popular descriptor selected from the options. This could be due to uncommon use of the descriptor and possible connotations associated with "raw". As many participants mentioned that a sense of professionalism was an important motivating factor, balancing professional aesthetic with homelike atmosphere should be considered based on the targeted customer base.

Achieving the desired aesthetics can be aided by appropriate selection of interior decors and finishes as well as furniture. Material/texture and color were selected as most satisfactory features. As suggested by the participants who commented on satisfactory interior features, high-quality finishes, durable and solid materials, and calm colors should be considered. Transparency was also considered satisfactory, and the participants mentioned their satisfaction with views and well-lit spaces, which could have been supported by the ample use of glass that allowed the light to enter into the core of the space. While branding was considered satisfactory, it was the feature that was rated with the lowest average importance. This pattern could be due to that the coworking space users are usually coming from varying backgrounds and organizations. Branding of the coworking space could have a positive impact of encouraging the independent workers to feel belonged in

a larger community, but excessive branding could conflict with the users' personal or company brands. Artwork and natural elements were considered less satisfactory compared to other interior features, suggesting the potential need to address improving the two features in current coworking spaces.

Regarding the furniture, "aesthetically pleasing" aspect was considered most satisfactory and outperforming. "Comfort level" was also rated satisfactory, and its importance was reinforced in the participants' comments that mentioned the "comfortable" and "informal" qualities of the furniture as satisfactory. Ability to flexibly arrange the furniture in different configurations did not appear to be a primary need for the users as it was rated less important than the quality. In selecting the furniture for the coworking space, comfortable quality should be prioritized, and a variety of options that support different work styles should be provided.

Semi-open layouts with combinations of open and private spaces were the most common. People chose to work at the coworking spaces that provided the space types that they considered important, as people who said their current coworking spaces have the space type placed higher importance on that space type. This pattern was consistent with all space types, with the exception of "Open Workstation". People at coworking spaces without open workstations gave higher average importance rating than people at coworking spaces with them. This suggests that the lack of open workstation can be more significantly noticed than the lack of other space types.

"Kitchen/Cafe" and "Telephone Booth/Nook" space types were considered almost equally important by both groups of people who have or do not have those space types in their current coworking spaces. "Conference Room" was rated with the highest average importance, and most people said it was a space type available at their current coworking spaces. This implies that it is essential for all coworking spaces to provide some kind of enclosed space with the conferencing capability. "Meditation Room", "Mother's Room", and "Play Space" were usually not available in the participants' coworking spaces, and they were considered significantly less important than other space types. This outcome could be different based on the audience of the coworking spaces. It is interesting to note the overall negative importance placed on "Play Space". While there could have been a language barrier among people who defined it differently, the participants did not rate the play space as important as other space types that support their work. Since the coworking space emphasizes efficient use of space, with the primary purpose to support its users' work styles, the play space might not be a must-have for most users. The element of play used to be highly sought after in the workplace realm as foosball tables and game rooms were desired features for fostering creativity and socialization, but this trend seems to be fading away in the general coworking space industry. The opportunities for play might be supported in other programmatic ways through community events and other social activities.

The environmental qualities are some of the most important aspects to address in the design of coworking space. "Control of Acoustic Privacy" was considered the most underperforming with the largest gap between importance and satisfaction ratings. Other indoor environmental qualities of "Thermal Comfort", "Control of Visual Privacy", "Lighting Quality", and "Control of Lighting", in the order of largest gap, were also considered underperforming in different degrees. The hierarchy of importance was the exact reverse of the hierarchy of satisfaction. In other words, acoustic privacy had the highest importance rating but it had the lowest average satisfaction. Similarly, daylight and artificial lighting had relatively lower importance average, and they had the highest average satisfaction ratings. Most people said that they do not have the control of the environmental qualities. Artificial lighting was the quality with most availability of control. On average, people who had the control of the quality were always more satisfied than those who did not have the control. This suggests the need to consider providing access to controlling the environmental qualities in the coworking space design. People who did not have control of acoustic privacy were the most dissatisfied group, highlighting its especial importance.

There were some differences in satisfaction ratings across different user types. Owners or staff rated most of the features slightly more satisfactory than members or users. This difference was especially pronounced in "Control of Acoustic Privacy", "Thermal Comfort", and

"Control of Visual Privacy" as members or users gave average satisfaction rating below 1 (somewhat satisfied) for those features. This behavior implies that users are more likely to be affected by the discomfort from low quality or lack of control of the indoor environmental qualities. Generational difference had slight effect in the satisfaction ratings, as Generation X was slightly more satisfied with some features than Millennials. Millennials expressed relatively low satisfaction with "Control of Visual Privacy" and "Control of Lighting". Millennials appeared to be more sensitive towards visual triggers, and providing the needed sense of visual privacy and adjustable lighting should be considered for them. Generation X placed higher importance on "Furniture - Quality", "Interior Decors and Finishes", and "Lighting Quality", implying that they are especially concerned with qualitative aspects of the features.

5.1. VALUE PROPOSITION OF COWORKING SPACE

To frame this research in the context of a bigger picture, a value proposition of coworking space is reviewed. Leadership expert Simon Sinek's Golden Circle model suggests first articulating "why", or the purpose or reason for existing, followed by "how" and "what", in order for organizations to successfully differentiate themselves from their competitors (Sinek, 2009). Adding onto Sinek's Golden Circle model, business coach Lex Sisney highlights the importance of building the foundation on "who" or the customers that an organization serves, because "business doesn't exist to promote its beliefs, [but] it exists to produce results for its customers [who it

serves]" (Sisney, 2013). While a coworking space is a physical workplace, it is foremost a business model and considering Sisney's modified Golden Circle model can inform the value proposition of coworking space, which is described in **Figure 5-1**. This research was an attempt to understand the current status of the coworking space with an emphasis on "how" to design the physical workplace of the coworking space for the mobile, independent workers. As supported by the literature review and survey results, "why" coworking spaces exist and thrive is because they support the changing work styles without sacrificing the basic psychological needs informed by the SDT.

Each and every coworking space has its unique context to consider and there is no one-size-fits-all approach to designing the space. Ultimately, it is important to consider "who" the coworking space is serving, and in the context of this research, this audience is largely seen as the emerging workforce whose work styles are largely informed by technological mobility and longing for social connection. The Golden Circle for Coworking Space framework can be adapted for different target audience of choosing for current and future professionals to create a value proposition for the coworking spaces or ideal third places to work in the digital age. As one of the participants commented in the survey, "[spatial program] really depends on who the coworking space is FOR—not every space needs to respond to every need" (P74). With thoughtful considerations of the work characteristics of the target audience, the users' need for competence can be supported.

The Golden Circle for Coworking Space

Target Audience
Mobile / Independent Professionals

Purpose + Motivation
Changing Work Styles
Basic Psychological Needs
[Autonomy / Competence / Relatedness]

Coworking Space
Ideal Third Place to Work
in the Digital Age

WHO

WHY

HOW

WHAT

Start with
WHO > WHY > HOW > WHAT

Workplace Design
+ Management
Technological Resources
Sense of Community
Physical Workplace

Figure 5-1. Framework for Value Proposition of Coworking Space.

5.2. DESIGN TOOLKIT FOR THIRD PLACE TO WORK

As a synthesis of the findings from the Coworking Space Survey, the Design Toolkit for Third Place to Work is devised as a guideline for interested professionals to use as a starting point for thinking about "how" to design the physical workplace that will motivate the users to choose their spaces (**Figure 5-2**). 2x2 Matrix is adapted as a tool to address the different user needs based on the types of task (alone vs. together) and focus (work vs. social). Four possible work modes that should be considered in designing spatial support are identified: "Distraction-Free Focused Solo Work", "Frustration-Free Collaboration", "Alone-Together Social Solitude", "Community-Connect Physical Social Network". The dotted lines within the four dimensions suggest the importance of providing users with the flexibility to navigate across different work modes. "Environmental Aesthetics and

Comfort" provides the foundation of the physical workplace that facilitates all work modes as illustrated in the diagram.

Depending on the target audience and the desired culture that a workplace desires to create, more emphasis can be placed on a certain work mode over another. Moreover, this Design Toolkit should be considered in conjunction with the Value Proposition of Coworking Space framework. The findings from this study recommend a well-balanced hybrid of open and closed spaces that support each work mode with a solid foundation of providing the preferred environmental aesthetics and needed comfort.

There were clear differences in satisfaction levels of the environmental features for owners or staff versus members or users. Considering this, user inputs should be incorporated more actively in the design process. As revealed in the data, only 12% of the members were involved with the design process of their current coworking spaces. An important component of the foundation for design toolkit is Operations and Maintenance. Not only should the interested professionals ensure upkeep of the environmental features, they should also continually seek user feedback and improve underperforming features. This research supported that what owners or staff consider satisfactory are usually not what members or users consider satisfactory. In order to limit the satisfaction gap across different user groups, a data collection tool such as the Coworking Space Survey can be modified and used for gathering user insights in the design process.

Design Toolkit for Third Place to Work

FOCUS TYPE

	WORK	**SOCIAL**
ALONE	DISTRACTION-FREE **FOCUSED SOLO WORK** • **Dedicated** enclosed workspaces or individual workstations. • **Soundproofing mechanisms** to reduce noise transmission through walls and doors (i.e., placing private workspaces away from social spaces, using acoustic panels). • Overhead or task **lighting** with individual control. Access to daylight.	ALONE-TOGETHER **SOCIAL SOLITUDE** • **Open workstations** with the view of other people working. • Enough personal **desk space**. • Access to personal **storage** or lockers. • **Telephone booth** or nook space for private phone calls, equipped with soundproof materials and charging ports/outlets.
TOGETHER	FRUSTRATION-FREE **COLLABORATION** • **Conference room** with intuitive video conferencing technology. • Reservable enclosed group space or team rooms for **private meetings**. • Enclosed space with minimal exposure to open spaces or blinds to ensure **visual privacy**.	COMMUNITY-CONNECT **PHYSICAL SOCIAL NETWORK** • **Communal kitchen or café** space with a variety of comfortable seating arrangements (i.e., bar tables and stools, lounge seating). • Open **social activity or event space** for community events or workshops. • **Welcoming and engaging** atmosphere for networking and making conversations without disturbing working people.

TASK TYPE

ENVIRONMENTAL AESTHETICS + COMFORT

- **THERMAL COMFORT:** Comfortable, constant level of temperature. Access to thermostat or operable windows and blinds.
- **INTERIOR ATMOSPHERE:** Balance between professionalism and homey/cozy.
- **CONNECTION TO NATURE:** Windows that maximize views and daylight. Access to outdoor nature when available (i.e., rooftop garden, terrace). Indoor natural elements (i.e., green plants, organic materials).
- **INTERIOR DECORS + FINISHES:** High-quality, durable materials and textures with modern aesthetics and calm colors. Non-overpowering, consistent branding (i.e., use of environmental graphics and logos). Consider artworks (i.e., by local artists) that add vibrancy in the space.
- **FURNITURE:** A variety of comfortable options (i.e., lounge seating, ergonomic task chairs with caster wheels, height-adjustable desks).
- **OPERATIONS + MAINTENANCE:** Ensure cleanliness and remove indoor odors (i.e., from kitchen or bathrooms). Continually seek user feedback and improve underperforming features.

Figure 5-2. Model for Designing Third Place to Work in the Digital Age.

5.3. CONCLUSION

To sum, this research was an effort to explore the broad question of **How will the workplace adapt to and support the changing nature of work in the future?** As supported by the literature review, there are two driving forces of technological mobility and desire for social connection that inform the ever-evolving design of the physical workplace (**Figure 5-3**). Based on the theoretical background of SDT, the popularity of third places to work in the digital age can be partially explained by human's basic psychological needs of autonomy, competence, and relatedness. Coworking spaces are identified as exemplary third places to understand the importance of physical workplace in motivating people to use such spaces. The findings from the Coworking Space Survey informed "how" to approach designing the workplace that motivates the emerging mobile workforce to use third places to work when they have the flexibility to choose anywhere to work.
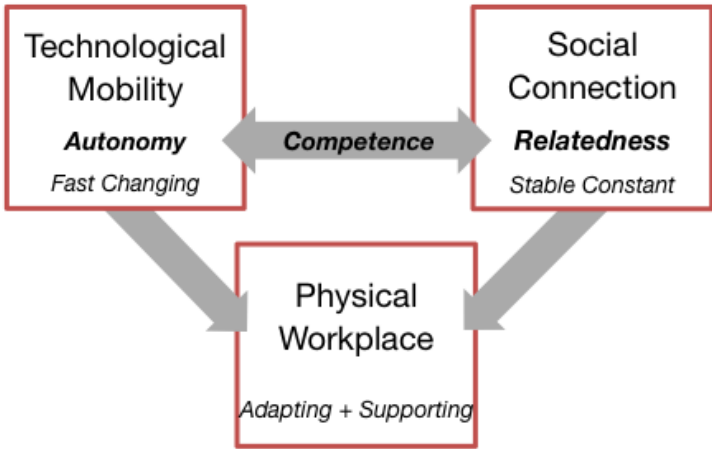
Figure 5-3. Three Dimensions of Workplace.

CONTRIBUTIONS

The Design Toolkit for Third Place to Work synthesized the research findings by providing a set of preferred environmental features to consider for the four relevant work modes of "Distraction-Free Focused Solo Work", "Frustration-Free Collaboration", "Alone-Together Social Solitude", and "Community-Connect Physical Social Network". Used in conjunction with the value proposition framework of The Golden Circle for Coworking Space, this toolkit can be a helpful resource for interested professionals who are looking to start coworking spaces, renovate their spaces, or expand to new locations.

The Coworking Space Survey itself provides a tool for collecting data from the existing coworking community to inform the design of existing or new spaces. The current pilot survey was designed to gather as much qualitative feedback as possible, and it can be adapted to meet individual needs in the future. As noted by the participants of Delphi method and the Coworking Space Survey, the design side of the coworking movement is inadequately discussed in practice and there lacks academic research exploring the importance of the physical design of coworking spaces. This research provided valuable insights regarding "who" the current coworking space users are, "why" the model thrives, and "how" to approach designing physical workplace that motivates the users.

With the freedom to choose, the mobile workers often need to be self-motivated to use third places like coworking spaces as their work

environments, but when the value proposition is successfully achieved, the physical coworking space can also be a facilitator of motivation, informing the desired reciprocal relationship with motivation (**Figure 5-4**). Striving to achieve this reciprocal relationship between motivation and coworking space is particularly important for the changing nature of work. As one of the experts mentioned in an interview, "In fact, because coworking spaces are the de facto and only workspaces for many of our members, they're not 'third spaces' at all—they're the only office spaces for them" (E8). Third places to work are increasingly becoming the norm of the workplaces in the digital age, and they are being incorporated in all sectors like educational institutions, hotels, and retail centers. Considering the associated benefits of the motivated workforce and well-designed workplace, such as productivity and well-being, achieving a physical workplace that motivates its users would be of interest for all involved stakeholders, including individual workers, business organizations, and coworking space operators.

A Reciprocal Relationship: Motivation + Coworking Space

Motivation as a driving factor for coworking space use

Physical coworking space as a facilitator of motivation

MOTIVATION
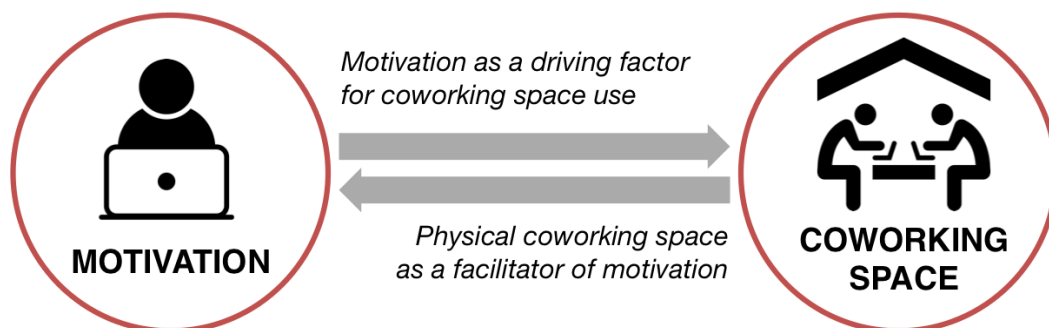
COWORKING SPACE

Figure 5-4. Desired Relationship between Motivation and Coworking Space.

LIMITATIONS AND FUTURE RESEARCH

This research acknowledged that there is no one-size-fits-all approach to designing a workplace. As such, the findings from this research may only be relevant to the study participants, especially considering the relatively small sample size. Many participants mentioned that the survey was too long. There were more people who started taking the survey than those who finished. Above all, there are multiple dimensions to a coworking space that have not been fully considered in this research. For example, costs, membership plans, and accessible location are important motivating or demotivating factors that were mentioned. This research was solely interested in exploring the physical design of the coworking space, which is limiting.

In future research, more facets of workplace management of technological resources and community culture can be explored. One participant mentioned, "There [could be] no direct relationship between 'good' spatial design features and the actual experienced quality of a coworking community—I've seen spaces … that look extremely slick but appear … dead as communities" (P74). Moreover, as coworking spaces are adapted by large corporations, the trend in "corporatization … how institutional, cookie-cutter, big-box, and impersonal some [spaces] are [becoming]" has been noted (P14). The design of future third places to work should consider finding the optimum balance between the tensions of the corporate world and the entrepreneurial-spirited, independent workers.

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Appendix A. Online Coworking Space Survey

PAGE 1 (CONSENT FORM) :

Cornell University

COWORKING SPACE SURVEY

You are invited to participate in a research titled: "Third Places to Work in the Digital Age: Preferred Environmental Features that Shape the Coworking Spaces". This study is led by Sohyun Sarah Lee from the Department of Design and Environmental Analysis at Cornell University. This research is conducted as part of a graduate thesis research for the degree of M.S. in Facility Planning and Management.

WHAT THE STUDY IS ABOUT
The purpose of this research is to evaluate the preferred design features in a coworking space that contributes to the motivation to use the space, and develop guidelines for design of future coworking spaces as the exemplary third places to work in the changing economy.

WHAT YOU WILL BE ASKED TO DO
You will be asked to participate in a survey questionnaire. The majority of questions will ask you to mark the level of your satisfaction or perception of importance regarding the design features. You will have the opportunity to add comments at the end of the survey. Your identity will remain anonymous and the survey will take approximately 10 - 15 minutes.

RISKS AND DISCOMFORTS
There are no known risks or costs if you decide to participate in this research study.

BENEFITS
The information collected may not benefit you directly. The information learned in this study should provide more general benefits for future developers or users of coworking spaces if the recommended guidelines are used.

COMPENSATION FOR PARTICIPATION
There is no payment for taking part in the study. If interested, you can enter your e-mail address at the end of the survey to enter into a random drawing to win one of four $25 Amazon gift cards as a thank you for participating in this survey. The e-mail address entered will be kept confidential and not associated with the survey response. Four individual winners will be informed on or about May 8, 2018.

PRIVACY/CONFIDENTIALITY/DATA SECURITY
Basic demographic information will be gathered in the survey but participants will remain anonymous.

TAKING PART IS VOLUNTARY
Your participation is voluntary. You may refuse to participate before the study begins, discontinue at any time, or skip any questions that may make you feel uncomfortable, with no penalty to you.

IF YOU HAVE QUESTIONS
The main researcher conducting this study is Sohyun Sarah Lee, a graduate student at Cornell University. If you have questions later, you may contact Sohyun Sarah Lee at sl2379@cornell.edu or 978-807-0400. If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) for Human Participants at 607-255-6182 or access their website at http://www.irb.cornell.edu.

* By clicking to proceed, you are agreeing that you have read the above information and consent to participating in this research. *

`>>`

PAGE 2 :

Cornell University

ABOUT THE CURRENT COWORKING SPACE

What is the name of the current coworking space you are working at?

[   ]

Where is the current coworking space located? (City, State, Country)

[   ]

How would you describe the location of the current coworking space?

○ Urban
○ Suburban
○ Rural
○ Other: Specify
[   ]

When did you join the current coworking space? Please indicate the approximate Month and Year when you first started working at the current coworking space. (i.e., March 2018)

[   ]

What is your role at the current coworking space?

○ Member or User
○ Staff or Employee
○ Owner or Founder
○ Other: Specify
[   ]

Approximately what percentage of your total work time do you spend in the current coworking space?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

% of Total Work Time

Approximately how many hours per week do you work in the current coworking space?
(Please enter a numerical value, i.e., 10)

[   ]

<<   >>

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PAGE 3 :

ABOUT YOUR MOTIVATION FOR USING THE COWORKING SPACE

What is your primary driver(s) or motivation(s) for working in the coworking space?

If any, what is your primary barrier(s) or demotivating factor(s) preventing you from working (more) in the coworking space?

When you are able to choose your work environment, where do you get your work done most effectively?

- O Home
- O Office
- O Coworking Space
- O Cafe or Coffeeshop
- O Library
- O Other: Specify

Who made the decision for you to work at the current coworking space?

- O Myself
- O My Employer
- O My Client
- O Other: Specify

Please rate the IMPORTANCE of the following factors in the CURRENT coworking space for your ability to get work done.

	Very Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Very Important
	-3	-2	-1	0	1	2	3
Technological Resources (i.e., Wi-Fi connectivity)	O	O	O	O	O	O	O
Community Presence (i.e., working in the presence of other people)	O	O	O	O	O	O	O
Community Participation (i.e., social interaction, networking)	O	O	O	O	O	O	O
Physical Workplace (i.e., availability and quality of spaces)	O	O	O	O	O	O	O

<<   >>

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PAGE 4 :

Cornell University

SATISFACTION OF ENVIRONMENTAL FEATURES

Please rate your __SATISFACTION__ with the following features in the __CURRENT__ coworking space.

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
	-3	-2	-1	0	1	2	3	N/A
Design Aesthetics	O	O	O	O	O	O	O	O
Interior Decors & Finishes	O	O	O	O	O	O	O	O
Consistent Brand Identity	O	O	O	O	O	O	O	O
Access to Indoor Natural Elements	O	O	O	O	O	O	O	O
Access to Outdoor Nature	O	O	O	O	O	O	O	O
Spatial Layout & Openness	O	O	O	O	O	O	O	O
Availability of Collaborative Spaces	O	O	O	O	O	O	O	O
Availability of Individual Workspaces	O	O	O	O	O	O	O	O
Furniture - Quality	O	O	O	O	O	O	O	O
Furniture - Flexible Arrangement	O	O	O	O	O	O	O	O
Lighting Quality	O	O	O	O	O	O	O	O
Control of Lighting	O	O	O	O	O	O	O	O
Control of Visual Privacy	O	O	O	O	O	O	O	O
Control of Acoustic Privacy	O	O	O	O	O	O	O	O
Thermal Comfort	O	O	O	O	O	O	O	O

<< >>

PAGE 5 :

Cornell University

IMPORTANCE OF ENVIRONMENTAL FEATURES

Please rate the **IMPORTANCE** of having the following features in an **IDEAL** coworking space.

	Very Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Very Important
	-3	-2	-1	0	1	2	3
Design Aesthetics	O	O	O	O	O	O	O
Interior Decors & Finishes	O	O	O	O	O	O	O
Consistent Brand Identity	O	O	O	O	O	O	O
Access to Indoor Natural Elements	O	O	O	O	O	O	O
Access to Outdoor Nature	O	O	O	O	O	O	O
Spatial Layout & Openness	O	O	O	O	O	O	O
Availability of Collaborative Spaces	O	O	O	O	O	O	O
Availability of Individual Workspaces	O	O	O	O	O	O	O
Furniture - Quality	O	O	O	O	O	O	O
Furniture - Flexible Arrangement	O	O	O	O	O	O	O
Lighting Quality	O	O	O	O	O	O	O
Control of Lighting	O	O	O	O	O	O	O
Control of Visual Privacy	O	O	O	O	O	O	O
Control of Acoustic Privacy	O	O	O	O	O	O	O
Thermal Comfort	O	O	O	O	O	O	O

<<   >>

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PAGE 6 :

PREFERRED ENVIRONMENTAL FEATURES

Design Aesthetics: Would you describe the <u>CURRENT</u> coworking space with any of the following descriptors?
(Check all that apply and add additional descriptors as you see fit.)

☐ Cozy
☐ Homey
☐ Industrial
☐ Modern
☐ Rustic
☐ Raw
☐ Green / Environmentally-Friendly
☐ Local Design
☐ Signs of History
☐ Other: Specify
　[　　　　　　　　]

Interior Decors & Finishes: Please rate your <u>SATISFACTION</u> with the following features in the <u>CURRENT</u> coworking space.

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
	-3	-2	-1	0	1	2	3	N/A
Color	○	○	○	○	○	○	○	○
Material / Texture	○	○	○	○	○	○	○	○
Branding (i.e., Environmental Graphics, Logo Use)	○	○	○	○	○	○	○	○
Artwork	○	○	○	○	○	○	○	○
Natural Elements (i.e., Plants, Greeneries)	○	○	○	○	○	○	○	○
Transparency (i.e., Use of Glass Walls or Partitions)	○	○	○	○	○	○	○	○
Other: Specify [　　　]	○	○	○	○	○	○	○	○

Interior Decors & Finishes: Please elaborate on the above features you are satisfied with. What characteristics about the interior features do you find attractive for an <u>IDEAL</u> coworking space?

[　　　　　　　　　　　　　　　　　　　　　　　　　]

Design Process: If you were involved with the design process of the current coworking space, what was the reason for achieving the design aesthetics of the current coworking space?

☐ Budget Constraints
☐ Preferred Aesthetics
☐ Request from Client
☐ Other: Specify
　[　　　　　　　　]
☐ I was not involved with the design process.

<<　　　　　　　　　　　　　　　　　　　>>

PAGE 7-1 :

Cornell University

Spatial Layout: How would you describe the spatial layout of the CURRENT coworking space?

- ○ Open Layout (Large Open Spaces)
- ○ Semi-Open Layout (Combination of Open Spaces and Private Rooms)
- ○ Closed Layout (Mostly Enclosed and Separate Spaces)
- ○ Other: Specify

Spatial Program

	Does CURRENT coworking space have this space type?		Please rate the IMPORTANCE of having the following space type in an IDEAL coworking space.						
	No	Yes	Very Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Very Important
Dedicated Individual Desk	○	○	○	○	○	○	○	○	○
Open Workstation	○	○	○	○	○	○	○	○	○
Enclosed Individual Office	○	○	○	○	○	○	○	○	○
Enclosed Group Space / Team Room	○	○	○	○	○	○	○	○	○
Conference Room	○	○	○	○	○	○	○	○	○
Lounge / Comfortable Seating Area	○	○	○	○	○	○	○	○	○
Event Space	○	○	○	○	○	○	○	○	○
Social Activity Space	○	○	○	○	○	○	○	○	○
Play Space	○	○	○	○	○	○	○	○	○
Kitchen / Cafe	○	○	○	○	○	○	○	○	○
Meditation Room	○	○	○	○	○	○	○	○	○
Mother's Room	○	○	○	○	○	○	○	○	○
Telephone Booth / Nook	○	○	○	○	○	○	○	○	○
Personal Storage / Lockers	○	○	○	○	○	○	○	○	○
Other: Specify	○	○	○	○	○	○	○	○	○

Furniture Quality: Please rate your SATISFACTION with the following qualities of the furniture in the CURRENT coworking space.

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied
	-3	-2	-1	0	1	2	3
Comfort Level	○	○	○	○	○	○	○
Aesthetically Pleasing	○	○	○	○	○	○	○
Variety of Options	○	○	○	○	○	○	○
Flexible Arrangements	○	○	○	○	○	○	○
Movability	○	○	○	○	○	○	○

PAGE 7-2 :

Environmental Quality: Please rate your SATISFACTION with the following environmental qualities in the CURRENT coworking space.

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied
	-3	-2	-1	0	1	2	3
Artificial Lighting	O	O	O	O	O	O	O
Daylight	O	O	O	O	O	O	O
Visual Privacy	O	O	O	O	O	O	O
Acoustic Privacy	O	O	O	O	O	O	O
Thermal Comfort	O	O	O	O	O	O	O

Environmental Quality & Control

	Do you have ability to control in the CURRENT coworking space?		Please rate the IMPORTANCE of having the ability to control or adjust this environmental quality in an IDEAL coworking space.						
	No	Yes	Very Unimportant	Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Important	Very Important
Artificial Lighting	O	O	O	O	O	O	O	O	O
Daylight	O	O	O	O	O	O	O	O	O
Visual Privacy	O	O	O	O	O	O	O	O	O
Acoustic Privacy	O	O	O	O	O	O	O	O	O
Thermal Comfort	O	O	O	O	O	O	O	O	O

What are the key environmental features that you would like to improve in the current coworking space to meet your expectations of an ideal coworking space?

```
[                                    ]
[                                    ]
[                                    ]
[                                    ]
[                                    ]
```

<<   >>

Cornell University

ABOUT YOU

What is your primary professional status?

○ Entrepreneur / Employer
○ Extended Worker / Employee
○ Freelancer / Self-Employed Worker
○ Student
○ Other: Specify

What is your profession?

Which of the following generations do you identify yourself with?

○ Baby Boomers (Born: 1946-1964)
○ Generation X (Born: 1965-1980)
○ Millennials / Generation Y (Born: 1981-1995)
○ Generation Z (Born:1996-2010)

What is your age? (Please enter a numerical value)

What is your gender?

○ Female
○ Male
○ Other: Specify

How likely is it that you would recommend your current coworking space to a friend or colleague?

Very Unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely
-3	-2	-1	0	1	2	3
○	○	○	○	○	○	○

If can, please provide name and location of one or more coworking spaces that you found to be especially well-designed. They do NOT have to be coworking spaces that you have worked at.

<<   >>

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Cornell University

COMMENTS

If you have any questions or comments regarding <u>your experience of using a coworking space</u>, please elaborate below.

If you have any questions or comments regarding <u>this research</u>, please elaborate below.

If you would like to enter in a random drawing of four $25 Amazon gift cards as a thank you for participating in this Coworking Space Survey, please enter your e-mail contact below.

<<   >>

PAGE 10 :

Cornell University

Thank you very much for participating in this survey. ☺

The main researcher conducting this study is Sohyun Sarah Lee, a graduate student at Cornell University. If you have any questions regarding this study, you may contact the researcher at sl2379@cornell.edu or 978-807-0400.

Appendix B. IRB Notification

East Hill Office Building, Suite 320
395 Pine Tree Road
Ithaca, NY 14850
p. 607-254-5162
f. 607-255-0758
www.irb.cornell.edu

Cornell University
Office of
Research Integrity and Assurance

Institutional Review Board for Human Participants

Notice of Exemption

To:	Sohyun Lee
From:	Amita Verma, Director, ORIA
Protocol ID#:	1803007876
Protocol Title:	Third Places to Work in the Digital Age: Preferred Environmental Features that Shape the Coworking Spaces
Approval Date:	April 03, 2018
Expiration Date:	None

Your protocol has been granted exemption from IRB review according to Cornell IRB policy and under paragraph(s) 2 of the Department of Health and Human Services Code of Federal Regulations 45CFR 46.101(b).

• Paragraph 2 allows to be exempted from IRB review research activities in which the only involvement of human subjects will be in the following category: Surveys/Interviews/Standardized Educational Tests/Observation of Public BehaviorResearch involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior if:i) information obtained is recorded in such a manner that human subjects cannot be identified, directly or through identifiers linked to the subjects; orii) any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability or reputation.

Please note the following:

° Investigators are responsible for ensuring that the welfare of research subjects is protected and that methods used and information provided to gain participant consent are appropriate to the activity. Please familiarize yourself with and conduct the research in accordance with the ethical standards of the Belmont Report (https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html).
° Investigators are responsible for notifying the IRB office of change or amendments to the protocol and acquiring approval or concurrence **BEFORE** their implementation.
° Progress reports, requests for personnel or other administrative changes, or requests for continuation of approval are not required for the study. However, upon conclusion of the study, please submit a Project Closure form: http://www.irb.cornell.edu/forms.

For questions related to this application or for IRB review procedures, please contact the IRB office at irbhp@cornell.edu or 607-254-5162. Visit the IRB website at www.irb.cornell.edu for policies, procedures, FAQs, forms, and other helpful information about Cornell's Human Participant Research Program.
Please download the latest forms from the IRB website www.irb.cornell.edu/forms/ for each submission.

Cc: Ying Hua

Appendix C. Sample E-mail for Initial Site Selection

Title: [Cornell University] Support for Coworking Space Research

Dear _____,

I hope this e-mail finds you well. My name is Sarah and I am a graduate student pursuing M.S. in Facility Planning and Management at Cornell University. I am currently working on my thesis with a tentative title of "Third Places to Work in the Digital Age: Preferred Environmental Features that Shape the Coworking Environments". I wanted to get in touch with you to ask about your interest in supporting my research on the design of the coworking spaces.

The attached PDF is a summary of my research outline for your reference. I am interested in addressing the value of physical workplace as it evolves to adapt to the changing nature of work, and I have identified coworking spaces as the epitome of the third places to work in the changing economy. Considering that _____ is a well-established coworking space, I was hoping to ask for your support with surveying your members to understand what might be the preferred design elements in a coworking space that contributes to the motivation to use the space.

The resulting product from this research will be new insights on the valuable design features of a coworking space, which could inform recommendations for future design or improvement in current design of a space. I will be happy to share the findings from my research in the near future. I would greatly appreciate your support, and would love to discuss further about the possibility of including your space in my coworking space research. Let me know if I should forward my request to another member at _____.

Thank you very much for your time and consideration. Feel free to e-mail me back with any questions regarding my research. I am enthusiastic about learning more about your space and community. I look forward to hearing back from you.

Thank you!

Best Regards,
Sarah Lee

Appendix D. Survey Recruitment Letter

Cornell University

Help Support Coworking Space Research:

Hello Coworking Community!

My name is Sarah, and I am a graduate student pursuing M.S. degree in the Department of Design and Environmental Analysis at Cornell University. My thesis is titled "Third Places to Work in the Digital Age: Preferred Environmental Features that Shape the Coworking Spaces".

As part of my research, I am currently gathering insights from users like you to understand the value of design in coworking spaces. Whether you are a member, staff, or occasional user of a coworking space, your opinions are valuable! Would you accept my invitation to participate in a 10-15 minute survey?

All your feedback is completely anonymous, and there is no known risk for you in participating in this research. You will also have a chance to join a lucky draw to win one of four $25 Amazon gift cards as a thank you for your support.

Please follow this link:

Take the Survey

Or copy and paste the URL below into your Internet browser:
https://cornell.qualtrics.com/jfe/form/SV_4OeD1v5CH6kxmW9

I'd appreciate if you could complete the survey by the end of **Monday, May 7th**. Have your voices heard and help shape the future of coworking space design!

If you have any questions regarding this research, please feel free to contact me at sl2379@cornell.edu or 1-978-807-0400.

Your participation is greatly appreciated. Thank you!

Best Regards,
Sarah Lee

Appendix E. Participants in Data Collection

COWORKING SPACE PROVIDER	LOCATION	SURVEY DISTRIBUTION METHOD
25N Coworking	Arlington Heights, IL	Public Social Network
Alley	New York, NY; Cambridge, MA; Washington, D.C.	E-mail
ATLAS Workbase	Seattle, WA	E-mail
Bench Space Coworks	San Diego, CA	Public Social Network
BLANKSPACES	Los Angeles, CA; Pasadena, CA	Public Social Network; E-mail
brightspot strategy	New York, NY	Public Social Network
Brooklyn Creative League	Brooklyn, NY	Public Social Network
Catapult	Pittsburgh, PA	Public Social Network
CLOwork	Hyderabad, India	Public Social Network
Collective Agency	Portland, OR	Public Social Network
Commerce Village	Omaha, NE	Public Social Network
Covo	San Francisco, CA	Public Social Network
Ctrl Collective	Pasadena, CA	Public Social Network
EFM	Romano d'Ezzelino, Italy	Public Social Network
EL SPACE	Tunis, Tunisia	Public Social Network; E-mail
eTribe	Delhi, India	Public Social Network
fibercove	Austin, TX	Public Social Network
Fuse Coworking	Lincoln, NE	E-mail
Indy Hall	Philadelphia, PA	Public Social Network
Input Lofts	New York, NY	E-mail
it changes	Taipei, Taiwan	Public Social Network
MakeOffices	Washington, D.C.	Public Social Network
Mindshare Workspace	Toronto, Canada	Public Social Network
OfficePort	Chicago, IL	Public Social Network
On Offices	Sao Paulo, Brazil	Public Social Network
Primary	New York, NY	E-mail
Pro Desk Space	Fullerton, CA	Public Social Network
Rising Tide Innovation Center	St. Petersburg, FL	Public Social Network
Syntrend	Taipei, Taiwan	Public Social Network
TENpod	Portland, OR	Public Social Network
The CoCo	New Jersey, NJ	E-mail
The Corner Coworking, Inc.	Alberta, Canada	Public Social Network
The Hive	Ho Chi Minh City, Vietnam	Public Social Network
The Office Group	London, United Kingdom	Public Social Network
The Shift	Chicago, IL	Public Social Network
The Shop	New Orleans, LA	Public Social Network
The Warehouse	New Orleans, LA	Public Social Network
THECUBE	London, United Kingdom	E-mail
Work.Life	London, United Kingdom	E-mail

Appendix F. Characteristics of Participants

CHARACTERISTICS	N	%	MEAN	ST. DEV.
Gender (n=52)				
Female	31	60%		
Male	21	40%		
Age in Years (n=51)			38.63	11.39
Generations (n=52)				
Baby Boomers (Born: 1946-1964)	4	8%		
Generation X (Born: 1965-1980)	21	40%		
Millennials / Gen. Y (Born: 1981-1995)	25	48%		
Gen. Z (Born: 1996-2010)	2	4%		
Who Made the Decision to Cowork (n=68)				
Myself	55	81%		
My Employer	10	15%		
Other	3	4%		
User Type (n=75)				
Member or User	41	54%		
Staff or Employee	11	15%		
Owner or Founder	23	31%		
Primary Professional Status (n=52)				
Entrepreneur / Employer	27	52%		
Extended Worker / Employee	15	29%		
Freelancer / Self-Employed Worker	8	15%		
Student	1	2%		
Other	1	2%		
Coworking Space Location (n=75)				
Urban	66	88%		
Suburban	9	12%		
Number of Months since Joining (n=75)			20.43	31.30
Hours per Week in Coworking Space (n=74)			30.59	17.83
% of Total Work Time in Coworking Space (n=74)			63.65	27.18