Physical Environment and Employee Happiness in Two Public Sector Offices in Colombo District

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Abstract

Employee happiness can determine the productivity and service quality of production and distribution spaces such as offices. The study aims to examine how the workplace physical environment is associated with employee 'happiness' concerning public sector offices in Colombo, Sri Lanka. The data was collected through a structured questionnaire targeting 100 employees from two public sector offices in Colombo. Using the convenience sampling method, respondents were recruited by visiting each office from May to June of 2020. The data were analyzed using descriptive inferential statistics. The results revealed that the physical work environment of public sector offices impacts respective employee happiness. However, circumstances prevail where not all elements of the office physical environment impact employee happiness similarly. The findings add to a better understanding of the complicated links between office physical environment attributes and employee happiness. These insights may be utilized to evaluate important features of work environments to find relevant interventions in value-added management of buildings and facilities, as we add needless costs for office building development and vice versa.

Keywords: Employee happiness, office physical environment, public sector offices, Sri Lanka

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INTRODUCTION

Public sector service is significant for the development of Sri Lanka. But it is often criticized for the lack of productivity (Shanthakumary & Nirushika, 2020; Thevenes & Jathurika, 2021) low institutional capacity (Root et al., 2001; Nafeel, 2014; Shanthakumary & Nirushika, 2020), competitiveness in the marketplace (Opatha, 2012; Nafeel, 2014) likewise. An array of studies highlights employee displeasure as one of the causes of the matter (See, for example, Nafeel, 2014; Jayathilake, 2014; Mendis, 2016). Literature on organizational behavior, industrial and organizational psychology, ergonomics and so on (for instance, Richardson et.al, 2017, Judge & Church, 2000; Davis et al., 2012; Ashkanasy et al., 2014; Othman et al., 2018) brings in the premise that better physical environment of offices leads to employee satisfaction or happiness (See, for example, Leblebici, 2012; Ashkanasy et al., 2014; Hansika & Amarathunga, 2016; Mohammed, 2019; Shanthakumary & Nirushika, 2020). Organizations in the modern period face a variety of challenges as a result of the dynamic character of the environment. Organizations must meet the needs of their employees by providing superior working circumstances to increase their competence, robustness, productivity, and job dedication. In this regard, workplace happiness and employee performance are some of the major challenges for all organizations (Tampubolon, 2016) today. After 2009 the postwar in Sri Lanka, there has been an increase in government investment in building, renewing and renting modern office spaces for public sector organizations. According to the Department of Buildings (2017), the total investment in such projects ranged from LKR 3917.38 Mn in 2016 to 5262.40 Mn in 2017. For instance, the investment on Sethsiripaya Stage III (Administrative complex) was LKR 16.7 Million (UDA, 2019), the District Election Secretariat office was LKR 58.03 Million, the S. M. Barracks Buildings improvement project investment was valued at LKR 140.48 Million, the Narahenpita District Secretariat office investment was LKR 50 Million and the Government Analyst's Department Building Complex investment was LKR 1 Billion (Department of Buildings, 2021). Here, an investigation would be important which look into, whether investments have contributed

positively to employee happiness at work which could lead to productivity, institutional capacity and market competitiveness within the public sector.

There are several elaborations as to what constitutes the physical working environment of an office and what could be referred to as employee happiness. The definitions that convey the sense of this paper well are taken as the working definition of the study. Accordingly, an employee's physical working environment entails work arrangements, personalized workspaces, and surrounding materials (Kamarulzaman et al., 2011; Davis et al., 2012; Mendis, 2016). Employee happiness at work has been defined as positive and pleasant emotions and attitudes they possess towards their job (Fisher, 2014; Palihakkara & Weerakkody, 2019) which can be attributed to three variables: awareness, sensation and reaction (Ulluwishewa et al., 2021; Roessle & Gloor, 2021). Even though numerous researchers have found that physical office environments do correlate with employee happiness (see, for example, Geethika & Chandrika, 2015; Amaresena, 2019; Thevenes & Jathurika, 2021; Vischer, 2007; Awada et al., 2019), such relationships can still vary, depending on the sector as well as the geographical context. In the light of these contexts and premises, the paper aims to examine whether the physical environments of offices are associated with the happiness of employees of the public sector. It is expected that the study's findings would pave the path for contemporary public sector enterprises to be aware of the physical environmental factors that influence workers' happiness at work.

LITERATURE REVIEW

Physical Environment of Offices

After modernity, offices have become spaces where people spend most of their day times (Kamarulzaman et al., 2011). These are also spaces where employees interact to perform their duties with work arrangements (Kamarulzaman et al., 2011; Amofa et al., 2016). The scholarly works that discuss what dimensions come under the physical environment of an office have brought multiple classifications to the fore. Kamarulzaman et al., (2011) stated that the physical environment of the offices consisted of noise, lighting, temperature, wall colours and window views. Haynes (2008); Lottrup et al., (2013) have categorized the physical environment of the

working environment into space (layout, layout, privacy), ergonomics (workstations, controls), and interior design (colour and quality). Ashkanasy et al., (2014) describe the physical environment in an office as having four elements: personal space, spatial density, workplace identity and workflow interdependence. Referring to the Sri Lankan context, Hansika & Amarathunga (2016) considered that a better office space design would have elements such as furniture, noise, lighting, temperature, and spatial arrangement. According to Leblebici (2012), a well-arranged office space includes furniture and spatial arrangements (informal meeting places, formal meeting areas, silent areas, privacy, personal storage, generic storage, work area desks, and circulation space), as well as a comfort level (ventilation, heating, natural and artificial lighting, cleanliness and overall comfort). Ergonomic point of view Moran (2010) and Asante (2012) claim that office place comforts are depended on how workstations are designed with chairs, keyboards mouse and monitors, workplace lighting, safety instruments, noise level and thermal comfort. Amofa et al. (2016) argue that an appropriate physical office environment should take into account the location of the building and office equipment, as well as the size and form of the workplace. Other variables to consider include ventilation, lighting, convenient locations, capacity for future development, and the availability of essential personnel, among others. According to Armstrong (2012) and Kok et al. (2015), the office physical environment includes not only the bounded "office" space but also how the offices are linked to their immediate surroundings. In that sense, the other amenities that both the office and its workers need can also be included as a part of the physical office environment. The open-plan office has an idealistic landscape setting and the internal surrounding environment provides more opportunities for employees to interact with each other (Armstrong, 2012; Wong, 2013). According to Armstrong (2012), open place offices are indicated with limited closed working spaces with acoustical materials, and a naturalistic landscape environment setting to foster more teamwork opportunities for employees. Subsuming all, the study adapts four main categories to describe

the physical environment of offices: (i) location (ii) basic amenities (iii) interior design and (iv) architectural design.

Happiness

Philosophers and social studies have defined happiness in many ways. Emotional psychology theorists believe that happiness is a basic emotion (Gupta, 2012; Kaczmarek, 2017). Happiness in the workplace is essentially about how people meet their deepest emotional and psychological needs through work (Judge & Illies, 2004; Bhatia & Mohsin, 2020). From the perspective of human resource management, Fisher (2010); Opatha (2019) defined happiness as a feeling of pleasure, satisfaction, or being pleased. Accordingly, happiness has two meanings: (i) a feeling of pleasure and (ii) a deep feeling of human well-being. Ashkanasy, (2011) discussed happiness as a subject of ongoing research in organizational behaviour has seven proxies: job satisfaction, organizational commitment, job involvement, happy emotions, thriving and vigour, flow and intrinsic motivation affect at work to achieve competitive advantages in organizations. The happiness of a human being is influenced by external stimuli and internal stimuli. External stimuli include the income level, connection between the staff, recognition of the society, physical environment, etc. (Naghibakht et al., 2015; Othman et al., 2018; Roy & Konwar, 2020). Accordingly, what this study demonstrates is how the physical environment as an external stimulus is associated with employee happiness. Internal stimuli on the other hand include joy, peace, a sense of involvement, excitement for life and positive emotions that are related to internal happiness (McMahon, 2004; Delle Fave et al., 2011). If so, happiness can be different from one employee to another even if they work in the same organization using the same resources (Roy & Konwar, 2020). These subsume that happiness has subjective elements and is somewhat a difficult phenomenon to assign attributes (Kesiber & Deiner, 2009; Fisher, 2010; Blanchflower & Oswald, 2011; Rothmann, 2013). Thus, employing reflective variables would be the way to overcome this. Out of such reflective variables that have been used to identify happiness levels, this paper adapts three variables that relate to the study objectives. These include awareness and recognition, sensation, and reaction. Awareness and recognition can be defined as people's behaviour

regulated by their perceptions such as like and dislike by feeling the object or incident and recognizing it through their soft-wired brains as positive, negative or neutral (Ulluwishewa et al., 2021). It is constituted of an idea about the sufficient environment and its helpfulness towards recognizing it as positive, negative or neutral (ibid). In the working environment, employees have to identify and understand their role in the jobs within their working environment within this framework. Then our body is overwhelmed by the sensation of either pleasure or pain defined as sensation (Veenhoven, 2017; Ulluwishewa et al., 2021). Accordingly, employees' feelings and emotions about the comfort of the working place and their job are the variables of the sensation. These pleasure or pain sensations, in turn, activate which prompts us to react to the sensation (Ulluwishewa et al., 2021; Roessle and Gloor, 2021). Employee participation in extra activities, employee working days, and working times, their desire for the job, and communications with staff can be used to measure employee reaction (Ulluwishewa et al., 2021, Oldham and Rotchford, 1983).

Empirical Works on Physical Environment of Offices affecting Employees

The scholarly works studying office physical environment on employee happiness are more broadly associated with the terms employee happiness, happiness plentifully, satisfaction, performance or production likewise which often prove to have a positive relationship. Amir, (2010) found that the workplace layout plan, spatial arrangement and office comfort have been the most important factors that impacted job satisfaction in finance management institutions in Dares Salaam Region, Tanzania. The proper physical layout and spatial arrangement of the workspace and the efficient management process play an important role in improving employee productivity with greater happiness in the banking sector in Turkey (Leaman & Bordass, 2001; cited in Leblebici, 2012). Lottrup et al. (2013) in the context of nine Swedish Cities showed that physical workplaces have physical and visual access to workplace greenery is positively related to work attitude and decreased levels of stress in male employees. Amofa et al. (2016) study show that in Ghana, the physical environment of office places in terms of noise, temperature, and the furniture arrangement of the

selected banks was positively associated with employees' productivity. In the context of a Jordanian engineering company, Al-Omari and Okasheh (2017) show that the physical environment elements such as air quality, temperature, sounds, light and colours with the proper spatial arrangement are positively related to the job performances of the employees. Hansika & Amarathunga (2016) concerning the banking sector in Sri Lanka highlight similar results-office design elements such as furniture, noise, lightning, temperature and spatial arrangements have a significant positive impact on the employees' productivity. In a similar vein, Amarasena (2019) found that the working environment of academic staff in public universities is a significant factor affecting their job satisfaction.

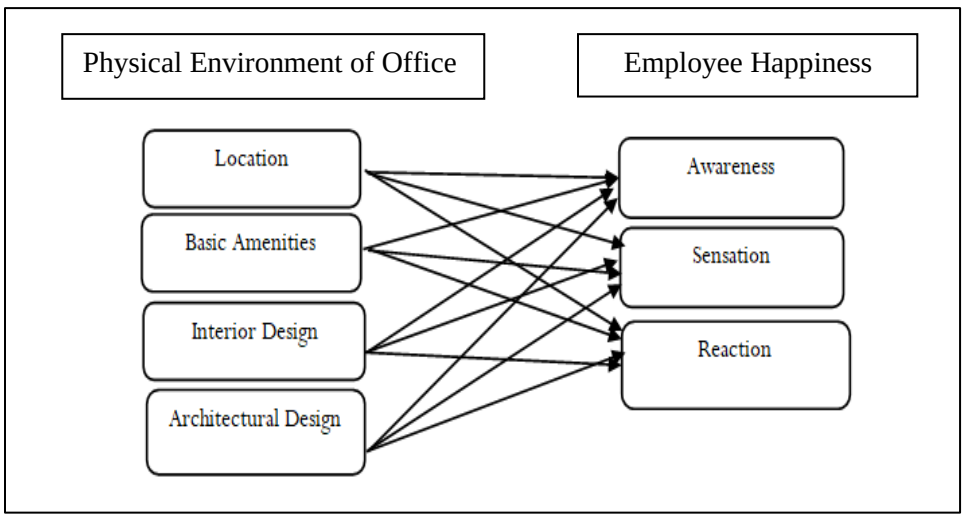
Some studies have argued the opposite that the office physical environment has no significant connection to employee happiness, job satisfaction or job performance in certain sectors in Sri Lanka. Geethika & Chandrika (2015) in the context of manufacturing companies in Sri Lanka show that employees' satisfaction with physical environmental attributes such as workplace location, design, illumination, noise and colour of the working place had neither a positive nor negative effect on their job satisfaction. Ranaweera et al. (2018) study concerning the university library physical environment in Sri Lanka also shows similar results. i.e. no significant relationship between the staff's job happiness and physical working characteristics such as ventilation, furniture arrangement, hygiene facilities and availability of necessary tools and equipment in the work environment. Chandrasekara, (2011) study which was about workplace physical environment impact on public sector employee performances also showed that ventilation, noise, spatial arrangement and lighting physical environment characteristics in the workplace do not have any significant relationship to their job performances. These studies imply that circumstances can exist in Sri Lanka where the physical environment would not always become a factor affecting employee happiness.

METHODS

Study Design

The purpose of the study is to investigate whether the physical environment of offices is associated with employee happiness within the public sector. Accordingly, comparing employee happiness levels of two public sector headquarters offices that have different physical environmental conditions was well suited to this study. For ethical reasons, the paper uses pseudonyms for offices: Office A and Office B. The study hypothesised that there would be a significant positive relationship between employee satisfaction with their physical office environment and their happiness at work (Figure 1).

Figure 1: Conceptual Framework of the Study



Source: Authors (2020)

Physical Environmental Context of Offices A and B

Employees of two public sector head offices (Office A and Office B) located within the Colombo district were chosen to collect the required data. Office A located in the new administrative capital of Colombo Suburbs is a newly built (2018) fourteen-storey building with a basement. Its public sector headquarters offeing administrative services to the public. The office is featured with relatively modern architecture and new layouts and

facilitated with spacious and multi-purpose cubical, smart storage places, air quality systems, modern fire protection systems, generators, CCTV cameras and state of art interior designs with indoor plants and coloured walls. The office is facilitated by an in-house café and restaurants, bank facilities, first-aid and shops, staff transport and has sufficient blue and green views from windows. Following sustainability values, the building was constructed to run with minimum electricity. Public sector Office B is one of the oldest four-story offices (more than a century old) located in a relatively congested environment edging the central business district of Colombo. Location wise it is connected to public transport facilities such as buses and rail, restaurants and cafés and other complementary facilities such as banks etc. The building is old-fashioned but it has a spacious setting to work, parking spaces for employees and modern surveillance such as CCTV systems. However, the building interior is not modernised and not very well maintained and, the general work setting has no air-conditioned environment.

Sample Design and Data Collection

The population of the study was the total number of employees of offices A and B, which was 1120 and 345 respectively. Keeping the questionnaire open for all permanent staff members of offices A and B from all divisions, the participants for the study were recruited using a convenience sampling method. Convenience sampling is a sort of non-probability sampling in which the sample is selected from the population that is nearby and accessible practically to anybody. One of the reasons it is so popular is because of the multiple benefits it offers. i.e. this approach is exceedingly fast, simple, easily obtainable, and inexpensive, making it an appealing alternative for most researchers (Hu & Qin, 2018). According to Beins (2017), a simple approach for estimating sample size may be used to compute the number of constituents to be chosen from each level. With a population of 1120 and 345 in offices A and B respectively, the sample for the study was decided to be 98 and 96 respondents from offices A and B. This sampling was based on G*Power (Ahmad & Mohamad Shafiq, 2018) worked out for 90% degree of confidence and e=0.1. Accordingly, the questionnaire was administered until the number of respondents reaches

100 employees from Office A and Office B each. Respondents were recruited by visiting each office from May to June in the year 2020, just after the first wave of Covid-19 where social distancing and health and amenity in offices were much appreciated.

Survey Instruments

A questionnaire survey was conducted with Likert scale questions to collect the required data in both Office A and B. The appropriateness of this method for the inquiry is validated by many other prior studies (Amir, 2010; Geethika & Chandrika, 2015; Hansika & Amarathunga, 2016; Al-Omari & Okasheh, 2017) which examined the impact of the physical environment of workplaces on employee job satisfaction, happiness, and performance in several employment sectors. The questionnaire for the study was divided into three parts. The first part included the demographic information of the respondents such as age, gender, employment, working experience, educational attainment and marital status. The second part focused on employees' satisfaction with their office physical environment (Table 1). Based on 5-point Likert Scale questions (1= strongly dissatisfied, 2= dissatisfied, 3= neutral, 4= satisfied, 5= strongly satisfied) employees of both public sector offices A and B were inquired about their perception of workplace location (access to bank, café and restaurant, parking, transportation and health care), basic amenities provided (working space, hygiene, furniture, noise, air quality), interior design (open spaces, indoor plants, wall colour, window view, lighting), and architectural elements (design of the building, lifts, fire exits and safety). Part three of the questionnaire inquired about measuring employee happiness (Table 2). Here too the 5-point Likert scale was defined as 1= strongly disagreed 2= disagreed, 3= neutral, 4= agreed and 5= strongly agreed. Employees of both public sector offices A and B were inquired about their happiness through reflective variables; awareness and recognition, sensation and reaction.

Table 1: Variable and Sub-variables to Measure Employee Satisfaction in Physical Office Environment

(A)Location		
Sub-variables	A1	The office has enough parking area
	A2	The office has easy access to complementary facilities such as banking, cafe and restaurant facilities etc.
	A3	The office has enough green and pleasant views from the windows.
	A4	The office is close to the main road and/or transportation system for easy commuting
	A5	The office is located in a place that you feel proud of
(B)Basic Amenities		
Sub-variables	B1	The office has enough space for all workers (from senior staff to minor casual workers) to work and keep required materials without disturbing other workers
	B2	The office has a sufficient number of canteen spaces and toilets
	B3	The office is noise and disturbance free
	B4	The office is clean and in good hygienically condition
	B5	The office has good Air quality and conditioning
(C)Interior Design		
Sub-variables	C1	There are sufficient and pleasant interior open spaces
	C2	There are pleasant Indoor plants and ornaments
	C3	There are comfortable and pleasant furniture and fittings
	C4	The office is painted with calming and inspiring colours
	C5	There are good lighting facilities at the workplace
(D)Architectural Design		
Sub-variables	D1	The office building has a nice overall design
	D2	The office partitioning and division of spaces for different units have ensured the work efficacy
	D3	The office building is safe and free from any form of hazards (e.g., fire, accidents)
	D4	The office is equipped with required lifts, stairways, and corridors for efficient circulation of staff members and visitors.
	D5	Under (the COVID-19 situation), the office spacing could be adapted to keep physical distancing

Table 2: Variables and Sub-variables to Measure Employee Happiness

(E) Awareness and recognition		
Sub-variable	E1	In this office, I have a clear grasp of my career objectives.
	E2	I know the work procedures very well within the scope of my work.
	E3	I know the contribution this office makes at large to the economy and society
	E4	I feel very valued at work
	E5	In this office, I'm doing my job at full capacity.
(F) Sensation		
	F1	I enjoy my work at the office
	F2	I feel I have completed a task at the end of the day.

Sub-variable	F3	I feel good about the association with my office colleagues.
	F4	I usually have a peaceful and pleasant feeling when I enter the office.
	F5	I have no fear when working at the office.
(G) Reaction		
Sub-variable	G1	I would participate in the extra activities (training, recreational, team building) organized by the office.
	G2	I'm coming to the office daily.
	G3	I come to the office on time.
	G4	I wish to work in this office in the future.
	G5	I would like to work extra time in the office when needed.

Data Analysis Procedure

The analysis of the data followed descriptive and inferential statistical analysis processed by the IBM Statistical Package for Social Sciences (SPSS) version 26. The descriptive statistics included the application of mean values and standard deviation to identify employee satisfaction with the physical environment of offices and employee happiness levels. It enables data to be displayed in a logical and intelligible manner (Garth, 2018), allowing for a more straightforward analysis (Arkkelin , 2014) of the data set at hand. The relationship between employee satisfaction with the physical environment of the offices and employee happiness was assessed through Pearson correlation. It is a common approach for determining the connection (rather than the difference) between two numerical measures (interval/ratio) and the extent to which they converge (Samuels, 2014 April). The impact of the physical environment of offices on employee happiness was identified through the regression analysis.

Reliability of Data

The reliability of data was checked with Cronbach Alpha (Nunnally, 1978). Cronbach Alpha for all independent and dependent variables was higher than 0.7; the minimum acceptable level to ensure the internal consistency of the data set (Hair et al., 2014) (Table 3).

Table 3: Reliability of the Data

Factor	Office A		Office B	
	Cronbach's Alpha	**No of Items**	**Cronbach's Alpha**	**No of Items**
Location	.751	5	.732	5
Basic Amenities	.803	5	.861	5
Interior Design	.742	5	.850	5
Architectural Design	.836	5	.746	5
Awareness	.744	5	.710	5
Sensation	.810	5	.712	5
Reaction	.717	5	.707	5

Source: Field survey (2020)

RESULTS AND DISCUSSION

Demographic Profile of Respondents

Office A is in administrative services, and the responding employees were from personal training, finance and administration units. The majority of these respondents were females (79%), married (77%), between the ages of 30-49 (64%) and were in the permanent employee category (77%). Their educational qualifications vary from G.E.C. O/L and A/L to graduate levels. Their experience levels with the respective offices also varied from less than one year to more than 15 years whilst the majority had more than 1-5-year experience. Office B is related to providing land services. Accordingly, employee respondents were from the administration, printing, examination and planning divisions. Having 53% male and 47% female, the gender composition of respondents was more or less at an equal level compared with office A. Moreover, the age groups of the respondents were also comparatively spread across all age groups from 20-59. The civil status of the respondents was however similar to office A recording 67% of respondents were married employees. Whilst all Office B employee respondents fell under the permanent category, level of education wise most of them were G.C.E A/L holders (51%) and degree holders (35%). Unlike Office A, all employees at Office B had more than one year of work experience whilst 50% of them had 1-5 years experience and 30% of them had 6-10 years of working experience.

Table 4: Respondents' Profile (Survey Data, 2020)

Organization		Frequency	
		Office A (n=100)	Office B (n=100)
		100%	100%
Division	Personal Training	26	-
	Finance	22	-
	Administration	52	45
	Printing	-	15
	Examination	-	08
	Planning	-	32
Gender	Male	21	53
	Female	79	47
Civil Status	Single	23	33
	Married	77	67
Age	20-29	23	26
	30-39	41	48
	40-49	25	11
	50-59	11	15
Education Qualifications	G.E.C. O/L	01	12
	G.E.C. A/L	35	51
	Undergraduate	15	02
	Graduate	49	35
Employment	Permanent	77	100
	Trainees	23	-
Work Experience	Less than 1 year	21	-
	1-5 years	35	50
	6-15 years	32	30
	More than 15 years	12	20

Source: Field survey (2020)

Employee Satisfaction with Physical Environment of Offices

Table 5 indicates the mean distribution of employee satisfaction with the office physical environment. Mean values of A and B are equal to or greater than 3.0 indicating that on average the employees are satisfied or highly satisfied with the specific attributes. As the results highlight, with a standard deviation of less than 1.0, employees of office A were satisfied with the locational attributes of their office physical environment. All mean scores were higher than 3.0 with a standard deviation of less than 1.0. Compared to Office A, the employee satisfaction for locational attributes of the physical environment in office B was relatively lower. In office B, "*having enough green and pleasant view from windows*" (A3) scored less than average value. This is predictable as office B locates in the relatively

congested urban area closer to the Colombo city Centre. Surprisingly, despite such closeness to Colombo and Narahenpita rail station, the employee's perception of "*the office has easy access to complementary facilities such as banking, cafe and restaurant facilities etc."* (A2) and "*the office is close to the main road and/or transportation system for easy commuting*" (A4) scored relatively lower values when compared to Office A. Moreover, "*the office has enough parking area*" (A1) and "*the office is located in a place that you feel proud of"* (A5) scored higher mean values compared to Office A. However, it is noteworthy here that the standard deviation for the latter is relatively high in value.

With a mean score higher than 4.0, Office A employees show higher satisfaction for attributes under basic amenities of the office: "*enough space for all workers"* (B1), "*sufficient number of canteen spaces and toilets"* (B2), *"noise and disturbance-free"* (B3), *"clean and in good hygienic condition"* (B4) and *good air quality and conditioning*" (B5). Compared to this, office B employees rate the level of basic amenities of their office at a dissatisfied level recording all mean values less than 3.0. It is also noteworthy that the standard deviation for variables was higher than 1.0 except for employees' "*satisfaction with the office having enough space for all workers and materials*" (B1).

Employees of office A, show satisfaction with four out of five attributes of the interior design of their office. These are "*office having sufficient and pleasant interior open space*" (C1), "*comfortable and pleasant furniture and fittings*" (C3), "*painted with calming and inspiring colours*" (C4) and "*there are good lighting facilities*" (C5). However, in office A, employees rate the interior design variable of "*indoor plants and ornaments in the office is pleasant*" be dissatisfied indicating a mean score of less than 3.0. Relative to Office A, here too Office B employees rate the interior design of their workspace to a lower scale all mean values indicating scores less than 3.0. Among these the two interior design variables, office B "*having pleasant Indoor plants"* (C2) and "*ornaments painted with calming and inspiring colours"* (C4) scored mean values less than 2.0 indicating that a significant proportion of employees feel strongly dissatisfied with such aspects of the physical environment of the workplace. Here the standard

deviation for these two variables as well as for "*offices having sufficient and pleasant interior open spaces"* recorded values higher than 1.0.

In terms of architectural design, employees in office A show satisfaction by exceeding all mean values higher than 4.0 except for "*office is equipped with required lifts, stairways and corridors for efficient circulation of staff members and visitors"* (D4). This scored a mean value of 3.88. In particular, employees rated a higher mean score of 4.19 for the fact that office A "*spacing could be adapted to keep physical distance under a COVID-19 pandemic situation*" (D5). Comparatively, employees of office B indicated dissatisfaction with the architectural design elements of their office. Here the mean score of all variables is less than 3.0 with a standard deviation for all mean values of less than 1.0.

Table 5: Mean Distribution of the Physical Environment (Survey Data, 2020)

		Office A		Office B	
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Location	A1	4.01	.823	4.62	.930
	A2	3.98	.910	3.45	.999
	A3	3.97	.926	2.38	.908
	A4	4.21	.715	3.70	1.189
	A5	3.49	.893	3.81	1.143
Basic Amenities	B1	4.13	.950	2.41	.986
	B2	4.41	.950	2.52	1.210
	B3	4.12	.998	2.03	1.114
	B4	4.44	.608	2.22	1.011
	B5	4.46	.658	2.09	1.181
Interior Design	C1	3.73	.851	2.33	1.092
	C2	2.88	1.018	1.92	1.002
	C3	4.02	.964	2.45	.821
	C4	4.35	.869	1.93	1.018
	C5	4.07	.956	2.38	.951
Architectural Design	D1	4.51	.798	1.77	.709
	D2	4.17	.842	2.10	.990
	D3	4.40	.778	2.06	.908
	D4	3.88	.946	1.82	.687
	D5	4.19	.849	2.13	.950

Source: Field survey (2020)

Happiness of the Employees in the Office

Table 6, shows the employee happiness at work in offices A and B. On a 5-point Likert scale, mean scores higher than 3.0 indicate that the employees are happy at work in terms of the respective reflective variable. In office A, all variables under employee awareness and recognition, sensation, and reaction scored mean values higher than 4.0, except one variable each attribute: *I would participate in the extra activities (training, recreational, team building) organized by the office* (G1) and *I come to the office on time* (G3) scoring 3.42 and 3.31 respectively. Yet again, the scores are higher than the average happiness level. Here it is noteworthy that variables: *employee having a clear grasp of my career objectives* (E1), *employee feeling very valued at work* (E4), *an employee doing my job in full capacity* (E5), *an employee participating in the extra activities (training, recreational, team building) organized by the office* (G1) and *employee coming to the office daily* (G2) had a standard deviation greater than 1.0 whilst the rest had a standard deviation lower than 1.0. Comparatively, employee happiness at work for office B clearly showed relatively lower mean values. Only the variables: *employee having a clear grasp of my career objectives* (E1), an *employee doing my job in full capacity* (E5) under the awareness and recognition attribute, an *employee having the feeling that he/she complete a certain task at the end of the day* (F2), *employee feeling good about the association that he/she has with office colleagues* (F3) under the sensation attribute; an *employee would participate in the extra activities (training, recreational, team building) organized by the office* (G1), an *employee coming to the office daily* (G2), *an employee coming to the office on time* (G3) *and employee would like to work extra time in the office when needed* (G5) scored mean values between 3.0 - 4.0. The rest of the other variables that come under awareness and recognition, sensation and reaction attribute scored mean values of less than 3.0, indicating happiness levels concerning those reflective aspects being below the average level. Here the standard deviations scored more than 1.0 for ten variables out of all 15 variables.

Table 6: Mean Distribution of Employees' Happiness (Survey Data, 2020)

		Office A		Office B	
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Awareness and Recognition	E1	4.16	1.051	3.25	1.019
	E2	4.21	.913	2.05	.857
	E3	4.27	.962	2.08	.961
	E4	4.33	1.006	2.22	1.060
	E5	4.22	1.194	3.60	1.005
Sensation	F1	4.38	.838	2.61	.863
	F2	4.26	.981	3.93	.820
	F3	4.28	.817	3.92	.872
	F4	4.16	.849	2.00	1.082
	F5	4.37	.787	2.15	1.242
Reaction	G1	3.42	1.065	3.27	1.213
	G2	4.12	1.085	3.35	1.029
	G3	3.31	.861	3.47	1.150
	G4	4.36	.785	2.01	1.087
	G5	4.35	.773	3.36	1.030

Source: (Field survey, 2020)

Relationship between the Workplace Physical Environment and Employee Happiness

As shown in Table 7 location, basic amenities, and interior design of Office A have statically correlated with all reflective attributes for employee happiness: awareness, sensation, and reaction (sig values are less than 0.05). However, the architectural design of Office A correlates only with awareness and recognition, and reaction attributes. No relationship was shown between the architectural design and the sensation attributes of employees. Comparatively, in Office B, architectural design, basic amenities and interior design are statically correlated with all employee happiness attributes: awareness and recognition, sensation, and reaction. Here the location attribute only correlates with awareness and recognition, and sensation attributes of employee happiness. The location attribute of office B's physical environment does not show any relationship with the reaction attribute of employee happiness.

Table 7: Correlation between the Workplace Physical Environment and Employee Happiness

	Sig. (2- tailed)					
	Office A			Office B		
	Awareness & Recognition	Sensation	Reaction	Awareness & Recognition	Sensation	Reaction
Location	.385** .000	.229* .022	.397** .000	.249* .012	.635 .028	.064 .528
Basic Amenities	.577** .000	.354** .000	.597** .000	.497** .000	.572** .000	.376** .000
Interior Design	.432* .000	.576** .000	.630* .001	.645** .000	.720** .000	.364** .000
Architectural Design	.671** .006	.170 .091	.477** .000	.634** .000	.629** .000	.392** .000

Source: Field survey (2020)

Impact of the Physical Environment of Offices on Employee Happiness

Table 8 demonstrates regression analysis results explaining the impact of physical environment attributes on employee happiness in offices A and B. The level of significance is often shown by the p-value, which is less than 0.05 and considered statistically significant. The standardized regression coefficient (ß) provides information about the size of the impact at a significant level. The larger ß value shows the higher impact of the physical environment on employee happiness.

In Office A, basic amenities, interior and architectural design of the office had a significant positive impact on employees' feeling that they were aware of their job role and being recognized (P value .000, .001 and .004 respectively). Basic amenities and architectural design have relatively higher ß values (.400 and.388), indicating that their impact levels are high on employee happiness. The locational aspect of the physical environment however did not show any evidence of having any such impact on employees' awareness and recognition. Comparatively, in office B, all the physical environmental attributes significantly impacted employees' awareness and recognition of their job roles. In office A, the interior designs

and basic amenities showed a significant influence (P Value is .031 and .003 respectively) on employees' sensations. Comparatively, in the Office B location, basic amenities and interior design significantly impacted the employee sensation. Here it is noteworthy that the ß value for interior design is as high as 0.676 demonstrating greater impact. As far as the reaction aspect of employee happiness in office A, the basic amenities, interior design and architectural design of the office were shown to have a significant impact (P values are .000, .001 and .000). The basic amenities and architectural design have relatively higher ß values: .422 and .318. Comparatively, in Office B, basic amenities and interior design significantly impacted on employee reaction aspect of happiness (P values were .047 and .010).

Table 8: Results of the Regression Analysis

		Office A		**Office B**	
		Beta	**P value**	**Beta**	**P value**
Awareness & recognition	Location	.130	.152	.238	.002
	Basic Amenities	.400	.000	.370	.007
	Interior Design	.281	.001	.289	.023
	Architectural Design	.388	.004	.355	.029
Sensation	Location	.071	.504	.218	.011
	Basic Amenities	.213	.031	.216	.033
	Interior Design	.294	.003	.676	.000
	Architectural Design	.056	.571	.091	.547
Reaction	Location	.125	.152	.051	.602
	Basic Amenities	.422	.000	.199	.047
	Interior Design	.045	.001	.134	.010
	Architectural Design	.318	.000	.127	.541

Source: Field survey (2020)

CONCLUSION

The aim of the research was to understand the connection between the public sector office physical environment and the respective employee happiness. The motivation was to identify factors that can influence productivity and quality of public service. The study recognises that the office physical environment is an area bounded as an "office" as well as an

area directly linked with the utility of the "office". It's a space that supports the work efficiency and effectiveness of employees as well as social interactions of employees. For data collection, the study normatively categorized office physical environments into four elements. Location, basic amenities, interior design and architectural elements. Happiness per se is a notion that was difficult to assign attributes to as it is more of a psychological feeling and subjective. Therefore, based on prevailing literature, the study adapted three reflective variables in a normative manner: awareness and recognition, sensation and reaction of employees. The two public offices A and B was chosen for the investigation were headquarters building complexes that offer administrative services and land-related services respectively. The former is a new built (2018) with fifteen stories located in the administrative capital and the office is surrounded by water bodies and greenery. It has parking for employees and connects with bus transportation. The latter was a four-story building more than 100 years old and where not many modern interior designs and utilities exist. Nonetheless, the office is well connected to both bus and rail and has parking facilities for employees. Following the convenience sampling method, data were collected through 100 employees from each office responding to a questionnaire. The respondent showed a mixture of different age, gender, civil status, education, and experience groups attached to different divisions in the offices.

The Pearson correlation and regression analysis we performed confirmed the study hypothesis that the physical environment of public sector offices impacts the happiness of employees. This is consistent with the findings of Amofa et al. 2016, Lottrup et al., 2013, Leblebici, 2012, Amir, 2010. However, the investigation also revealed that not all components of the physical environment affect employee happiness in the same way. Though Office A was novel and architecturally modern, those didn't influence the employees' happiness in terms of giving them a sensation about the job. If employees have sensation, they may identify and understand the job roles well. This sensation aspect was primarily driven by the physical environmental elements such as interior design and basic amenities in the case of office A and interior design, basic amenities and locational elements

in the case of office B. In a similar vein the reaction dimension to happiness which can drive the employees to engage with the workplace, fellow staff members, the job itself positively were primarily influenced by basic amenities, interior design and architectural design in the case of Office A and basic amenities and interior design in the case of Office B. The location aspect of the physical environment doesn't show any association with this reaction aspect of employee happiness. It is noteworthy that the data for the study was collected just after the first wave of Covid-19 where health and amenities and social distancing were set to be high within the value propositions of the society. Thus, basic amenities and interior design being office physical environmental elements that can influence all aspects of employee happiness can be time bounded also. These findings have implications on a policy that connects to the capital investment in public sector offices and identifying factors that can influence the productivity and effectiveness of public sector services. A qualitative study providing deeper insights on office physical spaces be optimized as social spaces to stimulate different levels of employee happiness and thereby increase the quality of public service in Sri Lanka is suggested to strengthen the research on physical working environments and employee happiness at work.

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REFERENCES

Ahmad, W. M. A. & Mohamad Shafiq, 2018. Sample Size Calculations Made Easy Using G*Power. s.l.:s.n.

Akthar, N., Zakir, U., Nadeem, I., & Rehaman, A. (2014). Impact of job stress on consumer satisfaction with role of mediating variables (employee satisfaction and employee performance): A study of Punjab emergency service. *Journal of Asian Business Strategy, 4*(5), 58.

Alfieri, L., Bisselink, B., Dottori, F., Naumann, G., Roo, A. d., Salamon, P., Feyen, L. (2017). Global projections of river flood risk in a warmer world. *Earth's Future, 5,* 171–182.

Al-Omari, K., & Okasheh, H. (2017). The influence of work environment on job performance: A case study of engineering company in Jordan. International Journal of Applied Engineering Research, 12(24), 15544-15550.

Amarasena, T. (2019). Does the work environment impact job Satisfaction of academic faculty members of public universities in Sri Lanka. Internationa Journal of Education and Knowledge Management, 2(3), 1-13.

Amir, F. (2010). Measuring the impact of office environment on performance level of employees. Global Environment. Bhurban, Pakistan appraisal. Scott: Foresman.

Amofa, A., Yawson, M., & Okronipa, G. (2016). The Effect of The physical office environment on employee productivity: The case of some selected Banks in the Sekondi-Takoradi Metropolis. Ghana Africa Development & Resource Research Institute Journal, 25(4), 24-36.

Arkkelin , D., 2014. Using SPSS to Understand Research and Data Analysis. s.l.:valposcholar.

Armstrong, B. (2012). Open workspaces are here to stay. Now, How do we get any work done? Retrieved 11 15, 2014, from http://www.forbes.com/sites/barbaraarmstrong/2012/05/24/balancing-the-needs-for-collaboration-and-privacy-a-tallorder-in-workplace-design

Asante, K. (2012). The impact of office ergonomics on employee performance; a case study of the Ghana National Petroleum Corporation (GNPC) (Doctoral dissertation).

Ashkanasy, N. M. (2011, February). International happiness. Academy of Management Perspectives, 25, pp 23-29. Retrieved from https://www.jstor.org/stable/23045032

Ashkanasy, N., Ayoko, O., & Jehn, K. (2014, November). Understanding the physical environment of work and employee behavior. Journal of Organizational Behavior, 35(Editorial Team Contributers), 1169-1184. Retrieved from https://www.jstor.org/stable/10.2307/26610956

Awada, N., Johar, S., & Ismail, F. (2019). The effect of employee happiness on performance of em-ployees in public organization in United Arab Emirates. JABS, 5(5), 260-268.

Bangwel, D., Tiwari, P., & Chamola, P. (2017). Workplace design features, job Satisfaction, and organization commitment. SAGE journal, 7(3). doi:https://doi.org/10.1177%2F2158244017716708

Bhatia, A., & Mohsin, F. (2020). Determinants of colledge teachers' happiness- A comparative review. Journal of Critical Reviews, 7(9), 2020.

Blanchflower, D., & Oswald, A. (2011). International happiness: A new view on the measure of performance. Academy of Management Perspective, 25(1), 6-22.

Chandrasekar, K. (2011). Workplace environment and its impact on organisational performance in public sector organisations. International Journal of Enterprise Computing and Business Systems, 1(1).

Davidescu, A., Apostu, S., Paul, A., & Casuneanu, I. (2020). Work flexibility, job satisfaction, and job performance among Romanian Employees implications for sustainable human. Sustainability, 12, 6086.

Davis, M., Leach, D., & Clegg, C. (2012). The physical environment of the office: Contemporary and emerging issues. doi:http://dx.doi.org/10.1002/9781118311141.ch6

Delle Fave, A., Brdar, I., Freire, T., Vella-Brodrick, D., & Wissing, M. (2011). The eudaimonic and hedonic components of happiness: Qualitative and quantitative findings. Social Indicators Research, 100(2), 185-207.

Department of Buildings. (2017). Annual performance report. Colombo: Ministry of Housing and Construction.

Department of Buildings. (2021). Department of Buildings; Safe economical elegant and sustainable built environment for public sector. Retrieved from uildings.gov.lk/index.php?option=com_content&view=article&id=46:construction-of-a-new-building-complex-and-a-laboratory-for-the-govt-analyst-dept&catid=13&Itemid=172&lang=en

Fisher, C. (2010). Happiness at work. International Journal of Management Reviews, 12(4), 384-412.

Fisher, C. (2014). Happiness at Work. International Journal of Management Reviews, 12(4), 384-412. doi:http://dx.doi.org/10.1111/j.1468-2370.2009.00270.x

From happiness to flourishing at work: A Southern African perspective. In M. Wissing (Eds). (2013). Well-being research in South Africa; Cross-cultural advance in positive psychology, 123-151.

Frost, J. (2019). Estimating a Good Sample Size for Your Study Using Power Analysis. Retrieved from https://statisticsbyjim.com/jim_frost/

Frost, J. (2019). Estimating a Good Sample Size for Your Study Using Power Analysis. Retrieved from https://statisticsbyjim.com/jim_frost/

Garth, A., 2018. Analysing data using SPSS. Sheffield Hallam University: s.n.

Geethika, T., & Chandrika, K. (2015). Impact of physical working conditions on operational level employees' job satisfaction: Case Study of selected Manufacturing Companies in Sri Lanka. Human Resource Management Journal, 3(1), 53-57.

Gupta, V. (2012). Importance of being happy at work'. Institute for Research and Development India. Retrieved from http://www.irdindia.in/journal_ijrdmr/pdf/vol1_iss1/2.pdf

Hair, J., Hult, G., Ringle , C., & Sarstedt, M. (2014). A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Los Angeles, California: SAGE Publications.

Hansika, M., & Amarathunga, B. (2016). Impact of office design on employees' productivity; A case study of Banking Organizations of North Western Province in Sri Lanka. 622-634.

Haynes, B. (2008). An evaluation of the impact of the office environment on productivity. Journal of Facilities, 26(5/6), 178-819.

Hettiarachchi, P. (2020). Hydrological report on the Kelani River Flood in May 2016.

Jayathilake, M. (2014). A study on job satisfaction among extension officers in the department of Animal Production and Health in Rathnapura district. Unpublished Master of Public Administration Dissertation, Sri Lanka Institute of Development Administration.

Judge, T., & Church, A. (2000). Job satisfaction: Research and practice. In C. L. Cooper & E. A. Locke (Eds.). Industrial and organizational psychology:Linking theory with practice, 166-198.

Judge, T., & Ilies, R. (2004). Affect and job satisfaction: A study of their relationship at work and at home. Journal of Applied Psychology, 4, 661-673.

Juhari. (2016). Working Environment and its influence on employees' performance: Case study of an Oil and Gas Vendor Company in Malaysia.

Kaczmarek, L. (2017). Happiness, in Zeigler-Hill, Virgil, Shackelford, Todd K. (Eds.), Encyclopedia of Personality and Individual Differences. Netherlands: Spring Publisher.

Kamarulzaman, N., Saleh, A., Hashim, S., Hashim, H., & Abdul-Ghani, A. (2011). An overview of the influence of physical office environments towards employee. Procedia Engineering, 20, 262-268.

Kesebir, P., & Diener, E. (2009). In pursuit of happiness: Empirical answers to philosophical questions. Science of Well-being, 59-74.

Kok, W., Titus, S., Hollis-Turner, S., & Bruwer, J. (2015). The influence of open plan work-environments on the productivity of employees: The case of engineering firms in Cape Town.

Leaman, A., & Bordass, B. (2001). Assessing building performance. Building Research and Information, 29(2), 129-143.

Leblebici, 2. (2012). Impact of workplace quality on employees productivity: Case study of a Bank in Turkey. Journal of Business,Economics and Finance, 1(1), 3840.

Lottrup, L., Stigsditter, U., Meilby, H., & Claudi, A. (2013). The work place window view: A determinants of. Routledge, 58-70.

MCMahon, D. (2004). From the happiness of virtue to the virtue of happiness: 400 BC–AD 1780. Daedalus, 133(2), 5-17.

Mendis, M. (2016). Workplace design and job performance: A study of operational level employees in the Apparel Industry of Sri Lanka. International Journal of Scientific and Research Publications, 6(12), 148-152.

Merzenich, M. (2013). Soft-wired: how the new science of brain plasticity can change your life. San Fransisco: Parnassus Publishing.

Mohammed, A. (2019). Workplace happiness and positivity: Measurement, causes and consequences. International Journal for Research in Engineering Application & Management, 5(2). doi:10.35291/2454-9150.2019.0007

Moran, G. (2010). Home office ergonomics. Retrieved May 17, 2012, from http://www.aarp.org/work/self-employment/info-09-2010/home-office-ergonomics.html

Nafeel, A. (2014, December). SLIDA News letter: Productivity in the public sector organizations empowering workforce for the wellbeing of the people.

Naghibakht, N., Mirmahdi, S., & Abdollahi, L. (2015). Identifying and ranking the effective factors on happiness among students of elementary level in Islam city. Journal UMP Social Science and Technology Management, 3(3), 247-250.

Nunnally, J. C. (1978). Psychometric theory. New York: McGraw-Hill.

Oldham, G., & Brass, D. (1979). Employee reactions to an open-plan office: A Naturally Occurring Quasi-Experiment. Administrative Science Quarterly, 24, 267-283.

Oldham, G., & Rotchford, N. (1983). Relationships between office characteristics and employee reactions: A study of the physical environment. Administrative Science Quarterly, December, 542-556.

Opatha, H. (2019). Sustainable human resource management. Sri Lanka: Author.

Opperman, C. (2002). Tropical business issues. Partner Price Water House Coopers. International Business Review.

Ornstein, S. (1986). Organizational symbols: A study of their meanings and influences on perceived psychological climate. Organizational behaviour and human decision process, 38, 207-229.

Othman, A., Mahmud, Z., Noordin, F., & Noranee, S. (2018). Measuring employee happiness: Analyzing the dimensionality of employee engagement. International Conference on Kansei Engineering and emotion research (pp. 863-869). Singapore: Springer.

Palihakkara, N., & Weerakkody, W. (2019). The impact of employee happiness on organizational citizenship behaviour: A study of

executive level employees in selected mobile telecommunication companies. Kelaniya Journal of Management, 8(1), 57.

Ranaweera, R., Si Li, & Bodhinayaka, D. (2018). Job satisfaction of Library Staff: A study based on university libraries in Sri Lanka," International Journal of Human Resource Studies, 8(3), 5359.

Richardson, M., Maspero, M., Golightly, D., Sheffield, D., Staples, V., & Lumber, R. (2017). Nature: A new paradigm for well-being and ergonomics. Ergonomics, 60(2), 292-305.

Roessler, J., & Gloor, P. (2021). Measuring happiness increases happiness. 4, 123-146. Retrieved from https://doi.org/10.1007/s42001-020-00069-6

Root, H., Hodgson, G., & Vaughan-Jones, G. (2001). Public Administration Reform in Sri Lanka. International Journal of Public Administration, 24(12), 1357-1378. doi:10.1081/PAD-100105943

Rothe, P., Lindholm, A., Hyvonen, A., & Nenonen, S. (2011). User preference of office occupiers: Investigating the differences. Journal of Corporate Real Estate, 13(2), 81-97.

Roy, R., & Konwar, J. (2020). Workplace happiness: A conceptual framework. International Journal of Scientific & Technology Research, 9(1), 4452-4459.

Samuels, P., 2014 April. Pearson Correlation. Birmingham City University: s.n.

Shanthakumary, M., & Nirushika, G. (2020). The effects of work environment on employees' job satisfaction in selecting State sector Organizations in Jaffna District. Journal of Business Management, 3(1), 165-178.

Silva, B. (2016). Office Market: An overview of Colombo CBD office market and a literature review of rent determine factors. Finance E-Journal.

Somiah, M. K., Aidoo, I., & Braimah, A. (2017). An empirical enquiry into the attributes of residential satisfaction that predict students' satisfaction in public halls of residence in Technical Universities in Ghana. 39.

Thevanes, N., & Jathurika, M. (2021). Employee happiness and its relationship with job satisfaction: An empirical study of academic staff in a selected Sri Lankan University.

Ulluwishewa, R., Uthumange, A., Weerakoon, R., & Perera, D. (2021). Some reflections on achieving happiness at the workplace through practical Buddhism. The Palgrave Handbook of Workplace Well-Being, pp 1-23. doi:10.1007/978-3-030-02470-3_21-1

Urban Development Authority. (2019). Proposed engineering design & Construction of high-rise Office complex at Sethsiripaya premises stage III. Retrieved from http://www.uda.gov.lk/cms/storage/procurements/272/RoBonPVLFd.pdf

Veenhoven, R. (2017). Measures of happiness: Which to choose?. Metrics of Subjective well-being; Limits and Improvements, 65-84.

Vischer, J. (2007). The effects of the physical environment on job performance: Towards a theoretical model of workspace stress. Stress and health, 23(3), 175-184.

Wong, V. (2013). Ending the Tyranny of the Open-Plan Office [Online. Retrieved 10 29, 2014, from http://www.businessweek.com/articles/2013-07-01/ending-the-tyranny-of-the-open-plan-office.