

**The Effects of Physical Work Environment
Satisfaction and Shared Workspace Characteristics
on Employee Behaviors Toward Their Organization:
Using Environmental Control as a Mediator.**

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Chelsea MacMillan

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Abstract

This study investigated personal control of the work environment, at the individual level, and how it may act as a mediator for employee reactions towards their organization based on specific workspace characteristics and physical work environment satisfaction (PWES). Accordingly, this research aimed to contribute to management understanding of the way that providing employees' control of their workspace environment could benefit an organization by fostering greater commitment and positive workplace behaviors.

The theoretical model suggests that the three predictor variables (PWES, need for privacy, and social density) would have a direct relationship with a) the four employee behaviors: affective commitment (AC), psychological strain, organizational citizenship behaviors-individual (OCBI), and counterproductive workplace behavior (CWB), and b) with perceived environmental control. The model also suggests that perceived environmental control would mediate the relationships between each of the predictor variables and the employee behaviors.

An online questionnaire was completed by 133 employees working in open plan office environments in New Zealand. PWES was found to have a positive relationship with AC and perceived environmental control. Need for privacy related positively with CWB, and negatively with AC, positive wellbeing, and perceived environmental control. Finally, social density was also found to relate negatively with AC and perceived environmental control. Environmental control was a significant mediator for 5 of the 15 (30%) mediation relationships predicted: PWES and AC,

need for privacy and AC, need for privacy and positive wellbeing, need for privacy and CWB, and finally social density and AC. Indirect effects were found for 3 of the 15 (20%) predicted mediation relationships: PWES and AC, need for privacy and AC, and need for privacy and CWB.

The major implications of this research are that it is important for organizations to acknowledge the physical and control aspects of the work environment as well as the social and management aspects. This research shows that open plan organizations in New Zealand could benefit from providing their workforce with greater environmental control. This means finding ways to enhance the work environment through greater privacy design and less socially dense work spaces should be considered by management and organizational psychology professionals in New Zealand as effective steps to organizational success. Further implications of this study and directions for future research are discussed in the final chapter.

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Chapter 1

Introduction

The nature of the labour market in New Zealand is changing. There has been an increase in employment within the tertiary sector, consisting of service industries such as banking and communication services, while manufacturing and construction industries are becoming less prominent. Forecasted employment growth over the next five years within New Zealand is expected to remain highest in the retail trade (increasing by 30,300), followed by hospitality (increasing by 26,600), and business services (increasing by 21,500), with the strongest number of occupation opportunities being for specialized managers (41,400), followed by housekeeping and restaurant services workers (11,400), and finance and sales associate professionals (10,200) (Department of Labour, 2011). This shift in the type of work to largely indoor environments, quite often office settings, brings a new challenge to the fields of organizational psychology and human resource management.

The role that work plays in people's lives is considerable, with approximately a third of a person's time spent at work (Grant & Shields, 2006). This means a poor work environment has the potential to impinge upon an individual's wellbeing. Studies in social and environmental psychology have demonstrated that characteristics of the physical environment have a substantial effect on an individual's behavior and attitude (Lee & Brand, 2005; Robertson & Huang, 2006). The tasks that people perform, the jobs and roles they hold, and the machines and interfaces they use do not exist in a vacuum. How effectiveness, safety, health, and satisfaction, are achieved will be affected by how well people fit with their physical workspace and physical work environment. Research shows a clear association

between an individual's working environment and their experience of good health, both psychological and physical (Sutherland & Cooper, 1993). Creating a comfortable and supportive working environment can therefore potentially enhance an individual's sense of wellbeing.

Guest and Conway (2004) define employee wellbeing in terms of six key areas: a manageable workload; some personal control over the job; support from colleagues and supervisors; positive relationships at work; a reasonably clear role; and a sense of control or involvement in changes at the workplace. It is maintained in the literature (Bandura, 1986; McGuire & McLaren, 2009; Spreitzer, 1996) that individual perceptions of the working environment are important as they impact upon the ability of the individual to take control of their work and the level of stress they experience within the workplace.

There are, however, serious issues surrounding the provision of healthy and efficient workplaces and environments. Di Martino and Corlett (1998) raise a few of these issues, such as the position from which an individual works (working zones, lines of sight, work heights); clearances (movement space, activity space); workstation layout (display and control positions, display-control relationships); and the physical environment (lighting, noise, climate, and space). However, most research on the impact of the physical work environment was conducted in the 1970's and 1980's with a gap in attention until recently.

Researchers have been re-establishing a focus on the ways in which the physical work environment impacts upon employee productivity, stress, satisfaction, and effectiveness (O'Neill, 2010; Robertson & Huang, 2006; Robertson, Huang, & Chang, 2004). Furthermore, personal control over the workplace environment has

recently established ground within ergonomic, environmental, and applied psychology literature as contributory to employee satisfaction and employee outcomes. There appears to be an ongoing need for office work environments that can support the goal of enhancing individual and group effectiveness without increasing risks to worker health (Robertson & Huang, 2006).

One possible way for organizations to enhance individual and group effectiveness is by granting employees a level of control over their workspace environment. Control can be provided through a wide variety of architectural, interior, and furniture design features such as flexible meeting spaces, movable partition walls, spare workspaces, movable storage units, and adjustable shelving. Furthermore, portable communication and computing devices enable people to work from a wide variety of locations and times. However, organizations typically develop plans for workspace design and technology applications in isolation from employee requirements and work habits (O'Neill, 2010), which can create a dysfunctional work environment and dissatisfied workers. An organization's physical environment has in the past been designed with little, if any, consideration for the effects that layouts might have on staff. Dumesnil (1987) observed that designers traditionally created interior spaces focusing on the needs of those paying the bill rather than the needs of the user, creating aesthetic environments with perhaps a strong visual impact but limited functionality.

Environmental control in the workplace has been examined in past research as a mediator between work environment characteristics and individual employee reactions such as stress, effectiveness, and satisfaction (Robertson, Huang, & Chang, 2004). However employee reactions relating to the organization itself, for example

organizational commitment and counterproductive workplace behavior, have been scarce in the environmental control literature reviewed for this study.

This research focuses on how satisfied employees are with their physical environment, along with their need for privacy and experience of social density within their workspace, and whether this is associated with employees' affective commitment (AC), organizational citizenship behavior – individual (OCBI), psychological strain, and the extent to which counterproductive workplace behaviors' (CWB) are displayed. A model of the direct relationships between the predictor variables and employee reactions is presented in Figure 1.

A model of the direct relationships between the three predictor variables and perceived environmental control is presented in Figure 2. These direct relationships are worth examining to find out the way in which environmental control may impact upon work environment satisfaction, and aid the regulation of both workplace privacy and social density. Furthermore, the findings could assist in the understanding of any mediation effects found. Finally, it was hypothesized that the impact of the four employee behaviors' (AC, psychological strain, OCBI, and CWB) would be mediated by perceived personal control over the environment, that is, whether employees consider themselves as having an element of control over their workspace or not. A model of these mediated relationships is presented in Figure 3.

The remainder of this chapter is organized into three sections: (1) a description and literature review of the variables, (2) a discussion of the variables in relation to the hypotheses proposed, and (3) a summary of the hypotheses proposed for this research.

Theoretical Framework

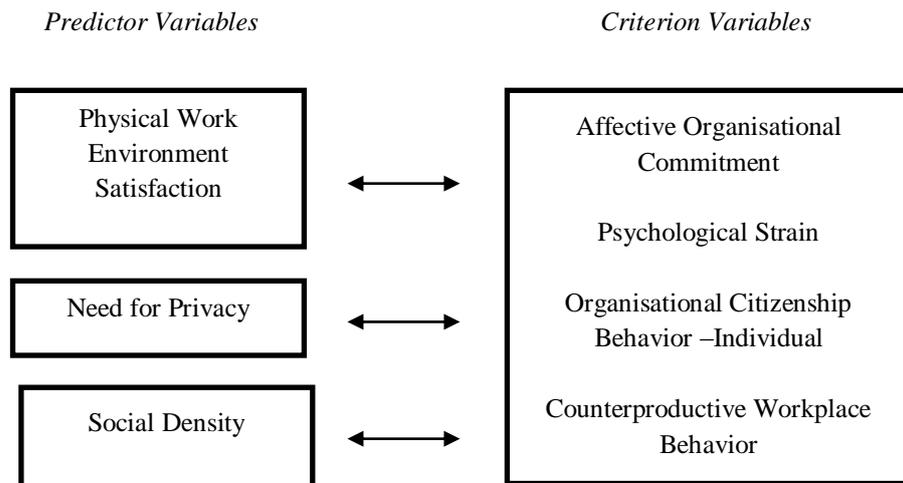


Figure 1. Model of direct relationships between the Predictor Variables and Employee Behaviors.

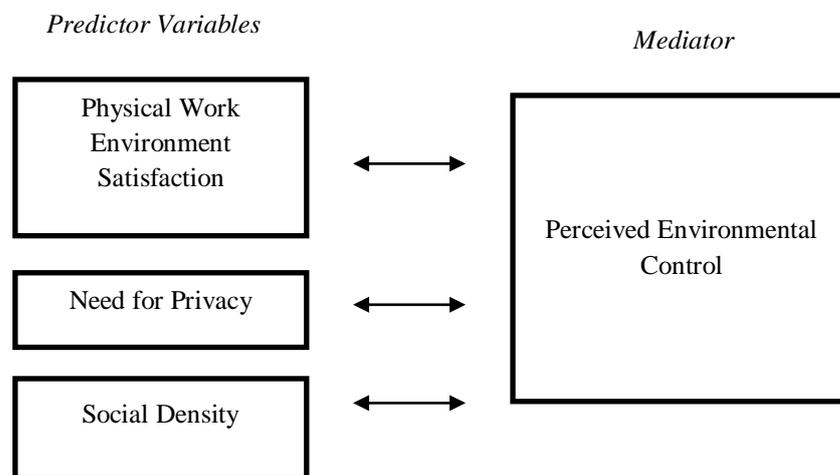


Figure 2. Model of direct relationships between the Predictor Variables and Perceived Environmental Control.

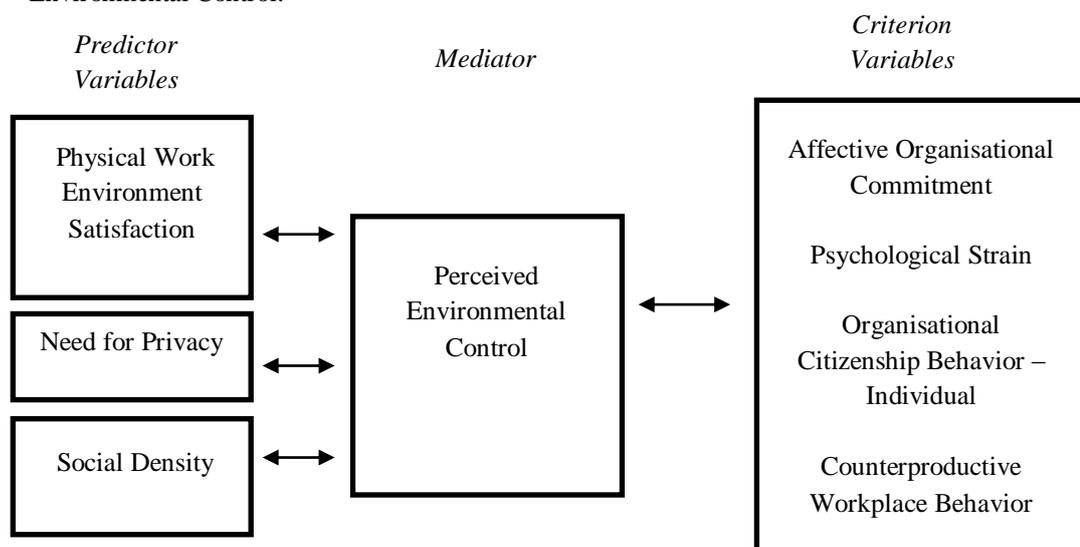


Figure 3. Model of Perceived Environmental Control mediating the relationships between the Predictor Variables and Employee Behaviors.

Description of Variables

Physical Work Environment Satisfaction (PWES)

The work environment can be defined as the physical and social conditions in which an individual must function (Spector, 2008). Physical work environment satisfaction equates to the extent to which employees consider themselves as being satisfied, or happy, within the conditions of their physical working environment. The physical work environment is an important component in an organization's aim to improve employee efficiency and productivity. Architectural design affects the way people behave, with designers creating conditions that can hinder, discourage, guide, support or enhance users' behavior (Goodrich, 1982).

Brennan, Chugh and Kline, (2002) conducted research into open plan office design, using a longitudinal research study consisting of three measurement periods to assess employees' satisfaction with the physical environment and their perceived job performance after relocating from traditional to open offices. Data were collected prior to the relocation, shortly following the move, and six months after the move. Employees were surveyed using the following four outcome variables: 1) satisfaction with the physical environment; 2) perceptions of the physical stress of the office environment; 3) satisfaction with team member relations; and 4) perceived job performance. The data showed that in all categories employees appeared to be negatively affected by the relocation to open offices, reporting decreases in their satisfaction with the physical environment, increases in physical stress, decreased team member relations, and lower perceived job performance. The results indicated that not only was there an initial decrease on these dimensions but also that this dissatisfaction did not abate over time. This denotes that the employees did not adapt

to the new office environment but rather continued to find the increase in the number of disturbances and distractions to be counterproductive.

Brennan et al., (2002) concluded that the findings of this study should be interpreted in light of research by Marans and Yan (1989), Sundstrom, Town, Rice, Osborn, and Brill (1994), and Spreckelmeyer (1993), which all suggested that small-scale attributes such as workstation lighting, size of individual work surfaces, office privacy, and noise account for incremental variance in employees' satisfaction with their work environment above and beyond office design alone. This could mean that providing employees' with attributes that counter the overall effect of an open plan office space, such as privacy and an adequate workspace, could serve to increase satisfaction levels in spite of the overarching feelings of dissatisfaction towards the open plan office space as a whole.

Need for Privacy

Altman (1975) provided the most systematic approach to understanding people's privacy needs. In Altman's model, the need for more or less privacy stems from an internal comparison in which a person's desired level of privacy is balanced against the level achieved. Privacy needs represent the motivational basis for achieving the proper amount of social exchange, which in turn serves certain basic functions, such as completing one's work, making friends, contemplating life, or recovering from stressful events (Haans, Kaiser, & de Kort, 2007). Altman (1975) believes there is a single process to simultaneously explain both a person's subjective need for more or for less privacy; if the desired privacy exceeds the achieved privacy, a person experiences too little privacy, and therefore, is motivated to withdraw from social interaction. Too much privacy, in contrast, can make people

desire greater social interaction. If there is no discrepancy between a person's desired privacy and his or her encountered or actual privacy, there is no reason to alter the present social situation. Evidently, if privacy is perceived subjectively, it is generally done so as a need, which essentially implies motivational significance (Haans et al., 2007).

In their research, Haans et al., (2007) found that open-plan offices do promote both a need for privacy and a need for social interaction; people who worked in open-plan offices experienced slightly higher needs for both socializing and privacy than those working in closed offices. This finding could suggest that open-plan offices may exceed their goal by unintentionally stimulating a desire for social interaction beyond the original baseline. Alternatively, it could also mean that open-plan offices obstruct both socializing and acquiring privacy.

Research has shown that individuals do not just put up with a lack of privacy and continue their work as though unimpeded. Workers use informal, non-verbal cues to induce others who share the office to leave, and some staff work back late after others have left their immediate surroundings or go somewhere else entirely to work (Dean, 1980; Goodrich, 1982). Becker, Gield, Gaylin, and Sayer (1983) found this to be a flight response. Individuals who work in open-private spaces make themselves less available as compared with those who work in close-private spaces; essentially workers use avoidance of their co-workers as a coping strategy for their lack of privacy. Furthermore, Becker et al. (1983) found that workers change the quality and nature of communication, for example, refraining from giving out sensitive information when in a shared office environment as one may be easily overheard.

Social Density

Social density refers to the number of people within a distance of a target employee, which represents the potential for employee interactions and/or interferences (Fried, Slowik, Ben-David, & Tiegs, 2001). Previous research has shown (Oldham & Fried, 1987) that some individuals feel more crowded, confined, distracted, and uncomfortable when there is little distance between them and a co-worker than when there is a substantial distance. Hence, individuals who are positioned close to other employees within their office could maintain the perception of being in a socially dense environment, in spite of the actual size of the overall office space.

Social density is an aspect of the shared office that employees often struggle with and which can have a great impact on their reactions towards their workplace. From a conceptual standpoint, researchers have expected to find that high social density within workspaces would negatively impact employees' behavioral and attitudinal reactions. Higher workspace density can result in more uncontrollable interfering contact from employees in the work setting (Fried et al., 2001). This, in turn, would reduce people's experience of personal control at work, and reduce their ability to concentrate and complete their tasks (Oldham, Cummings, & Zhou, 1995). As a result, socially dense work settings are likely to produce adverse behavioral (e.g. performance) and psychological (e.g. job and social satisfaction, organizational commitment) reactions (Evans et al., 1994; Fried et al., 2001; Sundstrom & Sundstrom, 1986).

Oldham and Fried (1987) discussed overstimulation theory as relevant to the understanding of social density. Overstimulation theory states that certain features of the physical environment contribute to excessive mental stimulation, which leads to

a psychological state of stimulus overload. Overstimulation can derive from too many people, too many interactions, and too close a proximity to others (Paulus, 1980). In turn, studies have demonstrated that individuals perform at lower levels when in close, as opposed to far distance conditions (Sundstrom et al., 1980; Walden & Forsyth, 1981).

In regards to the present study, and taking into account the premises of the aforementioned research, the focus is on the perceived social proximity of each individual to another as opposed to the actual size of the office. In doing this, it has been taken into account that an open plan office can be set up in a great many forms; commonly, people who work together are physically located together with the geometry of the layout reflecting the pattern of the work groups (Brennan et al., 2002). Therefore it is possible that the actual size of the office space is only as important as the number of people required to work within it. For example, a physically large office space could be considered irrelevant if individual spaces are designed close to one another, enforcing a socially dense proximity to other staff members.

Perceived Environmental Control

Environmental control is the capability of individuals to modify features of their physical workplace to better support their work needs and business goals. The concept of environmental control includes: knowledge of how to act on the environment, policies that support control, and design characteristics of the workspace that permit control (O'Neill, 2007). Fundamentally, environmental control is about providing people with control over the space in which they work, as opposed to being controlled by the work space and organizational policies.

The elusive nature attributed to environmental control by researchers has since been made clear through the work of Robertson, Huang, and Chang (2004), prevalent researchers in the field of environmental control and its role in environmental satisfaction, communication and psychological strain. Robertson, Huang, and Chang (2004) anticipated that increased opportunities for environmental control should allow the worker to modify the work environment in response to changing work flow, tasks, and job demands. Thus, the availability of environmental control coupled with knowledge of how to exercise control (in the form of ergonomics training), would support workflow, enhance worker communication and environmental satisfaction, and reduce stress. It was concluded that there were several positive and significant effects of office ergonomics training on employees' perceptions of environmental control, communication, and environmental satisfaction. The trained employees applied the necessary ergonomics skills to enhance their sense of control over their work environments by rearranging their work spaces to support their tasks and job demands. Workers' satisfaction regarding the work space increased their ability to effectively use the available workstation features to organize and lay out their work materials efficiently.

Furthermore, this increased knowledge provided the participants with a higher sense of control over the work environment and the ability to optimize the layout of their work environment to support their individual and collaborative tasks. These results suggest that environmental control does influence perceived environmental satisfaction (Robertson, Huang & Chang, 2004). However, environmental control did not appear to exert any influence on workers' levels of psychological stress. These results are somewhat consistent with earlier findings, as the degree of environmental control did not directly predict stress (O'Neill &

Carayon, 1993). Thus it seems apparent that environmental control could be more supportive in enhancing work environment satisfaction rather than alleviating psychological strain. This is in large part due to the fact that psychological strain impacts upon individuals' in different ways, providing environmental control simply may not be effective enough to reduce the effects of strain in some people.

Affective Organizational Commitment (AC)

Commitment is defined as an employee's identification with, and adoption of, an organization's values, norms, and traditions, and as such is a product of an employee's sense of well-being and satisfaction with the organization (McGuire & McLaren, 2008). *Affective commitment* is defined as the emotional attachment, identification, and involvement that an employee has with its organization and its organization's goals (Meyer & Allen, 1993; O'Reilly & Chatman, 1986).

There have been several different definitions of commitment, but all involve attachment of the individual to the organization. The original concept considers the overall construct of organizational commitment as comprising of three elements: acceptance of the organization's goals, a willingness to work hard for the organization, and a desire to remain with the organization (Mowday, Steers, & Porter, 1979). Organizational commitment has been operationally defined as multidimensional in nature, but is essentially the degree to which an individual feels a sense of allegiance to their place of work. A high level of employee commitment in an organization has been found to have beneficial consequences, for example lower employee rates of absenteeism, higher performance and lower employee turnover (Mathieu & Zajac, 1990).

Allen and Meyer (1990) proposed three separate components to the overall construct of organizational commitment. The *affective* component refers to the employee's emotional attachment to, and identification with, the organization. The *continuance* component refers to commitment based on the costs that the employee associates with leaving the organization. The *normative* component refers to the employee's feelings of obligation to remain with the organization. In essence, affective commitment reflects allegiance based on liking the organization, continuance commitment reflects allegiance based on the likelihood that the individual will find work elsewhere, and normative commitment reflects allegiance to the organization purely based on a sense of duty (Muchinsky, 2006).

Organizational commitment has found prominence in studies involving a variety of organizational variables. Meyer, Stanley, Hercovitch, and Topolnytsky (2002) conducted a meta-analysis of 155 studies showing that commitment is associated with job stress (people who perceive their jobs to be stressful have low commitment) and organizational justice (people who feel they have been unfairly treated have low commitment). However, relationships with these variables were stronger for affective commitment than either continuance or normative commitment. Cooper-Hakim and Viswesvaran (2005) also conducted a meta-analysis of nearly 1,000 studies relating commitment to several hypothesized variables proposed as consequences. Job satisfaction and job performance both related most strongly to affective commitment, whereas continuance commitment related slightly, but in the opposite direction. These results suggest that people who are working because of an emotional attachment or strong identification with their organization will tend to perform better, but those who are working because they feel they have to will actually perform worse.

Affective commitment has been selected specifically for this study as this research assesses employees' behaviors' towards their organization. The selected behaviors' were considered to be of an emotional based nature therefore affective commitment was deemed the best construct to use. Assessing normative and/or continuance commitment would not necessarily provide adequate information on how individuals feel towards their organization as a direct result of their satisfaction or control levels. For example, normative commitment and continuance commitment could be better used to assess an employee's turnover intentions, or skills transfer; more concrete dispositions than emotions.

Psychological Strain

Many authorities frame the definition of psychological strain in transactional terms, regarding it as a psychological condition which arises when there is a perception of imbalance between the demands placed upon an individual and his or her capabilities to meet those demands (Pheasant, 1991). Employers expect high productivity and performance but employees are struggling to meet these expectations due to distractions and potentially difficult work spaces that make up their physical working environment.

One of the key outcomes of concern for organizations is workplace stress. Dewe, O'Driscoll, and Cooper (2010) present some concerning statistics on work stress; for example, in 2006 stress, depression, and anxiety accounted for 195,000 new cases in Britain; 63,000 employees reported work-related heart disease attributed to work stress. Furthermore, in 2007, 420,000 employees in Britain claimed they were experiencing stress, depression or anxiety at levels that were making them ill. More concerning is the degree to which work stress affects

individuals outside of work. Dewe et al. (2010) reported that the 2004 Workplace Employment Relations Survey (WERS) data showed an increase over the period of 1998 to 2004 of 2.5% or 675,000 employees in Britain worrying about work outside of work hours. In light of statistics such as these, it can be ascertained that workplace stress plays a large role in the working domain and the overall well-being of employees. With the deleterious effects of psychological strain both widespread and varied; many people would regard it as the principal threat to human well-being in advanced industrialized societies (Pheasant, 1991).

However, there is as yet no simple answer to what causes psychological strain. The stressful aspects of working life are too diverse and idiosyncratic; strain is encountered across all occupation types and all occupations invoke their own levels and types of strain. Nevertheless, there are some important and commonly recognized sources of strain in the workplace: *interpersonal* factors such as physical overcrowding; *environmental* factors such as noise, lighting, and heat; and *task* related factors such as deficiencies of equipment design; essentially anything that prevents an individual from progressing with the subjectively important parts of their work (Pheasant, 1991). The environmental factor of noise has been considered to have a prominent impact upon incidents of psychological strain. Noise is essentially unwanted sound. Intermittent noise and noise with information content (e.g. speech) is much more irritating than continuous unstructured noise (e.g. machine noise), which tends to be more habituated; whilst all forms of noise are considered to cause more strain when trying to concentrate on something. This could potentially indicate that individuals who work in socially dense environments may experience greater psychological strain as they may be surrounded by greater and more consistent verbal noise than those who work with less people in their immediate surroundings.

O'Neill (1995) examined the relationship between job type, workstation design features, and the self-reported psychological strain and health of office workers. The study reported that for sales professionals who worked in teams, lack of control over the workstation environment was a significant predictor of psychological strain. For computer technical professionals, lack of environmental control and inappropriate layout were significant predictors of increased strain and health assessments. Furthermore, a laboratory experiment examined the effects of interior workstation adjustability on physiological stress and motivational performance levels under high workload (O'Neill & Evans, 2000). It was found that physiological signs of stress (as measured by epinephrine and urinary cortisol levels) were reduced, and motivational performance was enhanced when people had control over the adjustability of their workstation. These results lend support to the claim that control in the form of adjustability of workspace features is an important element in stress management.

Job control and work pressure have been examined in the occupational strain literature as important sources of strain in a variety of occupations (Huang, Roberston, & Chang, 2004). Glass, Singer, and Pennebaker (1977) found that the performance of complex tasks was higher and error rate lower when workers had control over an external stressor, for example an aversive noise. Other studies have shown that job control is linked to reduced stress and/or to improved health (Hedge, 1988; Karasek, 1979). Moreover, the degree of control a person has over the stressor is thought to partly determine the severity of the stress reaction. Likewise, lack of control and lack of predictability over events have been linked to reports of strain (Singer & Baum, 1983). Although environmental satisfaction is an important

component of the quality of the work environment, strain in the workplace may have greater direct costs to the individual and the organization.

Organizational Citizenship Behavior – Individual (OCBI)

Also referred to as contextual performance, OCB is a construct that describes extra role behaviors. This involves anything someone does to contribute to aspects of the organization or to persons within the organization that does not fall within the confines of the individual's job, and is not recognized by any kind of reward. Essentially OCB entails going above and beyond the call of duty willingly. McNeely and Meglino (1994) divided OCB into acts that helped other employees or individuals (OCBI) and acts that benefited the organization (OCBO).

McNeely and Meglino (1994) found that different types of OCB were related to different variables. For example, OCBI correlated with the individual's concern for others, whereas OCBO correlated with the employee's perceived equity, and both correlated with job satisfaction. Similarly, organizational commitment has been linked to both types of OCB; it is more strongly related to OCBI in the United States, but more strongly related to OCBO in Turkey (Spector, 2008). Lee and Allen (2002) reported that both OCBO and OCBI related to positive mood at work, but only OCBO related to procedural justice. The results of all these studies suggest that the two types of OCB have different combinations of causes, some shared and some unique. Based on these findings, only OCBI was assessed as the way an individual feels about their working environment is going to directly impact upon their reactions and intentions towards those around them. It is likely that OCBO would also be displayed; however this would be in a more inadvertent fashion and less likely to be seen in an individual's immediate reactions towards their surrounding environment.

OCB is also referred to as pro-social behavior, extra-role behavior, and contextual behavior. There are five dimensions to citizenship behavior that have been supported by empirical research (LePine, Erez, & Johnson, 2002): 1) *Altruism* reflects willfully helping specific people with an organizationally relevant task or problem; 2) *Conscientiousness* refers to being punctual, having attendance better than the group norm, and judiciously following company rules, regulations, and procedures; 3) *Courtesy* is being mindful and respectful of other people's rights; 4) *Sportsmanship* refers to avoiding complaints, petty grievances, gossiping, and falsely magnifying problems; 5) *Civic virtue* is responsible participation in the political life of the organization. Nielsen, Hrivnak, and Shaw (2009) reported that the regular exhibition of these OCB dimensions is considered consistently beneficial to an organization and in many cases invaluable to its success.

Several researchers have demonstrated that OCB is related to work satisfaction. One explanation for this, provided by Organ (1990), emphasizes perceptions of fairness. Organ suggested that OCB represents an input for the employee's equity ratio and one that can be more easily and safely altered than can inputs that involve the employee's formal job duties. Employees who feel fairly treated are likely to engage in OCB to maintain equilibrium between them and the organization; those who feel they are treated unfairly will withhold OCB behavior. This perspective views OCB as controlled and deliberate behavior that is primarily influenced by cognitive, rather than affective factors. However, Lee and Allen (2002) suggest a second explanation of the relationship between OCB and work satisfaction entailing the primacy of affective over cognitive factors in influencing OCB. This position is based upon the established social psychology finding that people in positive moods are more likely to help others than are those in negative or

neutral moods. In addition to helping behaviors, Lee and Allen (2002) suggested that a positive mood can also lead to extra role behaviors such as protecting the organization, making constructive suggestions, developing oneself, and spreading goodwill.

Counterproductive Workplace Behavior (CWB)

Collins and Griffin (1998) note that most definitions of counterproductive workplace behavior are characterized by a disregard for societal and organizational rules and values. In addition, they note that counterproductive behaviors can range in seriousness from low (e.g. petty stealing) to high (e.g. violence). The measure used for this research identified CWB as having five distinct dimensions, all of which are examined in the measure: abuse against others, production deviance and sabotage, theft, and withdrawal, each of which can be conducted as a response to specific behavioral categories – stressors, sense of justice, job satisfaction, and negative emotions at work (Spector, Fox, Penney, Bruursema, Goh, & Kessler, 2005).

Counterproductive workplace behavior (CWB) represents one of the more recent areas of research in industrial/organizational psychology, as well as a major area of concern among managers and the general public. As CWB's are actions that threaten the wellbeing of an organization and its members, and break implicit and explicit rules about civil, respectful, and appropriate behavior (Martinko & Zellars 1998; Robinson & Bennet 1995), there is reason for these actions to be taken seriously. An inspection of various scales used by different groups of researchers across studies shows that they each contain an overlapping set of behaviors (Spector et al., 2005) that include disparate acts with different targets. In most cases, researchers combine a checklist of behaviors into a single index or at most two, distinguishing only between behaviors targeting the organization and those targeting

persons within the organization. As a result, behaviors as different as spreading rumours and stealing from co-workers, or coming late to work and destroying an organizations property, can be combined within a single index.

However, Spector et al., (2005) succeeded in identifying five dimensions of CWB, all with different potential antecedents: 1) *Abuse* tends to be associated more with job stressors than psychological strain, and was found to be related more strongly to upsetting emotions than boredom; 2) *Production deviance* had a similar patten to abuse, therefore may share a similar underlying motivation and may reflect displaced aggression from an individual to the inanimate organization; 3) *Sabotage* was modestly correlated with interpersonal conflict, and not at all correlated with upset or bored, which may reflect the inhibition of sabotage since destroying property is something likely to be visible and may result in punishment; 4) *Theft* showed no connection with emotion and the motives behind it were concluded to be instrumental, furthermore connections with stressors were weaker than the other CWB dimensions. This all suggests that theft may have a hostile motive in some cases; 5) *Withdrawal* tended to correlate highest with strains than stressors and was found to be primarily associated with boredom and feelings of depression. Thus, individuals who engage in withdrawal might be escaping a different set of emotions, as opposed to those individuals engaging in abuse or theft. These five dimensions made up the CWB measure developed by Spector et al. (2005) and were used in this study.

Andersson and Pearson (1999) proposed a spiraling effect of CWB's in the workplace. CWB can start in low-intensity deviant behavior with ambiguous intent to harm the target individual. Uncivil behaviors are characteristically rude and discourteous, displaying a lack of regard for others. The spiraling effect refers to the

prospects that incivility can escalate into intense aggressive behavior. Glomb, Steele, and Arvey (2002) stated that, “mildly aggressive acts can have great impact when they are experienced in quantity...These overlapping effects build on each other, augmenting their impact. Eventually, repeated mild aggression can create considerable distress and oppression itself, such as that seen after periods of prolonged provocation or threat,” (pp. 229). Andersson and Pearson (1999) stated that the spiral of CWB often begins with a thoughtless act or a rude comment. This can be followed by a maligning insult, which prompts a counter insult. If the spiral of escalation continues, threats of physical attack can follow, ultimately leading to violence. It is believed there is a tipping point in the spiral where the accumulation of minor offences can escalate into forceful action (Muchinsky, 2006).

The work of Spector et al. (2005) and Andersson and Pearson (1999) reveal the heights that CWB can reach and the different dimensions it can entail. In regards to this research, employee control could have an impact on the extent to which CWB is displayed by employees. Beliefs about control determine in part whether individuals choose *constructive* or *destructive* responses. An employee who believes that constructive efforts can be effective is likely to attempt them. However, an employee who feels unable to control their situation might resort to CWB as a means of coping with the negative emotion (Spector, 2008). Furthermore, psychological strain impacts upon CWB as it often begins with stressful job conditions, such as organizational constraints and/or feelings of injustice. For example, on the day an individual assaults a co-worker; he had just lost the final appeal of his dismissal from the post office (Spector, 2008). Stressful conditions can induce negative emotions, such as anger or fear. These feelings, in turn lead to constructive behaviors, such as

developing more effective strategies to overcome the conditions, or destructive behaviors, such as CWB.

Hypotheses

Physical Work Environment Satisfaction

An organization's physical environment as well as its design and layout can affect employee behavior in the workplace. It has been estimated that improvements in the physical design of the workplace could result in a 5-10 per cent increase in employee productivity, as well as maximizing employee work satisfaction (McGuire & McLaren, 2009). Organizational commitment is therefore, a vital employee reaction in aid of increased productivity within an organization and a strong outcome of employee satisfaction (McGuire & McLaren, 2009). In light of this, it is predicted that:

Hypothesis 1_(a): Satisfaction with the physical work environment will be positively related to AC.

Ergonomists have highlighted various aspects of the physical environment as job stressors including noise, lighting, temperature, air quality and workplace layout. Noise is the most well-known environmental stressor that can cause increases in arousal, blood pressure, and negative psychological mood (Carayon & Smith, 2000). Environmental conditions have been shown to affect energy expenditure, stress responses and sensory disruption which make it more difficult to carry out tasks and increase the level of worker stress and emotional irritation. Thus, it would be logical to consider that if the physical working environment is in line with employees working needs, they would experience less psychological strain and irritation. In order to assess this, it was predicted that:

Hypothesis 1_(b): Satisfaction with the physical work environment will be negatively related to psychological strain.

It has been suggested that OCB is most likely when employees are satisfied with their jobs and feel they are treated fairly (Hoffman, Blair, Meriac, & Woehr, 2007). As much of the OCB research has found this to be the case, it was considered that this result could also potentially be found in regards to an employee's satisfaction with their physical working environment; individuals may be more likely to display OCBI to those around them if they have higher level of satisfaction with their working area. Therefore, it was predicted that:

Hypothesis 1_(c): Satisfaction with the physical work environment will be positively related to OCBI.

Research conducted by Oldham and Fried (1987) suggests that the physical characteristics of a work environment can have an impact on the behavioral and attitudinal reactions of employees. Specifically, the independent and joint effects of characteristics such as darkness, enclosures, and interpersonal distance accounted for 34% of the variance in withdrawal during discretionary periods, and 31% of the variance in work satisfaction. Furthermore, Mitra, Jenkins and Gupta (1992) noted that some researchers consider absence and turnover (aspects of CWB) to be alternative reactions to workplace dissatisfaction. Both may reflect attempts by employees to escape from situations at work that they find unpleasant. In regards to these findings, it is predicted that:

Hypothesis 1_(d): Satisfaction with the physical work environment will be negatively related to CWB.

While there has been debate in the literature about the specific impact and significance of environmental control, one factor has remained constant, the physical work environment. The success of environmental control can be attributed to the presence of a number of physical work environment characteristics along with the behaviors these characteristics can evoke in workers. Statt (1994) argues that the adjustability and condition of work surfaces, chairs, and computer equipment that individuals use at work impacts upon psychological wellbeing and satisfaction. A more innovative working environment that individuals can exert some control over is associated with increased staff collaboration, higher productivity, and increased workplace satisfaction (Lee & Brand, 2005). Therefore, it is predicted that:

Hypothesis 1(e): Satisfaction with the physical work environment will be positively related to perceived environmental control.

Need for Privacy

To achieve high levels of employee commitment, organizations must ensure that the physical environment is conducive to organizational needs facilitating interaction and privacy (McGuire & McLaren, 2009). If an individual requires privacy to achieve their work goals, then that privacy needs to be accessible to them. Conversely, if an individual does not need privacy but works best in a more open work environment, then that needs to be taken into consideration by management also. If management is able to accommodate these needs, it is more likely that employees will reciprocate this support with positive actions. It is predicted that:

Hypothesis 2(a): Need for privacy will be positively related to AC.

The physical arousal associated with few enclosures in a room is expected to decrease an individual's ability to concentrate, and hence process information (Cohen, 1980), which is likely to increase stress levels. Sundstrom, Burt, and

Kamp's (1980) study showed that architectural privacy was consistently associated with psychological privacy. Furthermore, DuVall-Early and Benedict, (1992) found architectural privacy to be positively correlated with overall job satisfaction. Thus it is possible that the greater the number of enclosures around an individual's workspace and the lower the opportunity for visual scrutiny by others, the less strain will be experienced. On the basis of this, it is predicted that:

Hypothesis 2_(b): Need for privacy will be negatively related to psychological strain.

Becker et al., (1983) found that working in open plan office spaces affected the type of interactions, discussions, and feedback that individuals were willing to have with, and give one another. These findings suggest that interactions are not facilitated by unlimited opportunities for interpersonal contact but by the opportunity for privacy. Furthermore, enclosure by walls or partitions and a door was found to be positively associated with the amount of time staff reported assisting and working with colleagues (Hatch, 1987). In regards to this research, it is considered that if privacy needs are being met, individuals are more likely to be open to assisting co-workers and engage in beneficial interaction, thus it is predicted that:

Hypothesis 2_(c): Need for privacy will be positively related to OCBI.

Oldham and Rotchford (1983) showed that employees were most likely to withdraw from an office during discretionary periods when there were few partitions surrounding their individual work areas, therefore lack of privacy is more likely to result in the display of CWBs, such as spending more time out of the office than in, taking long lunch breaks, absenteeism, and withholding work effort. Increased privacy in the form of enclosures or having computer screens facing away from others in the office is likely to decrease CWBs, as individuals have the ability to

work without having their productivity and activity in general overseen by others. Research has also demonstrated that the number of enclosures surrounding an individual's workspace is positively correlated with job performance and work space satisfaction, and negatively correlated with perceptions of crowding (Oldham & Fried, 1987). Therefore, privacy could be considered an important proponent in the overall satisfaction and effectiveness of an organization's employees, and so:

Hypothesis 2(a): Need for privacy will be negatively related to CWB.

As environmental control is a construct largely based on the ability to alter physical aspects of the working environment, one of the common aspects workers struggle to alter is the level of privacy they have in their working space. Furthermore, privacy is a factor that is reported to significantly impact on individuals' perceptions of the open plan office. According to proponents of the shared office, the need for privacy is accommodated through an individual's own sense of personal space, rather than definitive space delineators such as enclosures or dividers (Mylonas & Carstairs, 2007). However, research has found that this is perhaps not the case. There is a consensus that the open plan office provides little in the way of privacy and allows individuals' to be easily overheard and observed (Hedge, 1980). Specifically, Sundstrom, Herbert, and Brown (1982) found that after relocation from enclosed offices to open plan offices, managers' satisfaction with visual and acoustic privacy declined, as did their ability to hold confidential discussions. Furthermore, Dean (1977) found that 75 per cent of staff in an open plan office indicated that they needed greater acoustic privacy and 50 per cent said that they needed more visual privacy. In light of these findings, it is predicted that:

Hypothesis 2(e): Need for privacy will be negatively related to perceived environmental control.

Social Density

Researchers have expected to find that high social density within workspaces would negatively impact employees' behavioral and attitudinal reactions. This has stood to be correct in previous research, as high social density has been associated with turnover intentions, low levels of satisfaction, and low levels of task performance (Oldham, 1988). Furthermore, continual exposure to behavioral interferences at work, brought on by a socially dense environment, increases the mental demand on an individual to meet the needs of their job, which may eventually cause work fatigue, workplace dissatisfaction, and possible psychosomatic symptoms and health disorders (Cohen, 1980; Paulus, 1980). In light of these findings, it should be considered that if an individual is working in a socially dense environment, not conducive to their work needs, they may experience serious negative reactions, which could lead to a reduction in their commitment to their organization. If an individual is working hard for their organization, but their organization is not working to assist them in that process, the potential exists for that individual to identify less with, and feel less connected to their place of work. Therefore, it is predicted that:

Hypothesis 3_(a): Social density will be negatively related to AC.

Environmental stimuli and job-related stimuli, such as complexity, compete for an individual's finite quantity of attention. Individual differences in ability to concentrate notwithstanding, this perspective suggests that job complexity competes with environmental interferences for attention from the system. This means that performing a difficult task that requires much focus in a busy workspace equates to a greater strain on mental resources in order to block out the surrounding activity and focus on the task at hand. The extended effort required to manage this competition

leads the employee to experience stress and other negative attitudinal reactions (Fried et al., 2001). Conversely, the potential interferences presented by high workspace density may have much less effect on employees when their jobs are simple and unchallenging (Oldham *et al.*, 1995; Tafalla & Evans, 1997), because simpler jobs place less of a drain on finite attention resources.

Increasing social density in an office environment is a stressor. This stressor can cause behavioural after-effects such as reduced frustration tolerance (Sherrod 1974). Constant exposure to uncontrollable environmental stressors can lead to learned helplessness, a motivational deficit with well-known connections to the affective and cognitive deficits of depression (Evans & Stecker 2004). In light of these findings, it is predicted that:

Hypothesis 3_(b): Social density will be positively related to psychological strain.

In general, previous research suggests that individuals often respond negatively to socially dense conditions (Paulus, 1980; Sundstrom, 1978). Social density can often result in feelings of overcrowding, increased noise disturbance, difficulties with temperature control, decrements in task performance, and reduction in job autonomy (Szilagyi & Holland, 1980). In cases such as this, individuals are perhaps less likely to portray OCBs such as altruism. An individual may not be willing to assist others within a socially dense space if it is not required of them. It is possible they may be struggling to focus on their own work within an environment they feel crowded in, therefore it is hypothesised that:

Hypothesis 3_(c): Social density will be negatively related to OCBI.

In the present study, participants were assessed on how crowded they felt within their work space in order to determine perceptions of social density. In doing this, it could be possible to ascertain that the actual physical size of the office in which one works is less important when compared with how close one is required to work to those the office space is shared with. It was expected that the greater the number of individuals in one space, the higher the likelihood psychological strain would be felt. It was deemed unlikely that individual's would display CWB in a less socially dense workspace as they would not be surrounded by others continuously throughout the day, potentially hindering their productivity. Therefore, it is hypothesised:

Hypothesis 3_(d): Social density will be positively related to CWB.

Social density may have quite a strong relationship with environmental control. An individual may feel they have less control over their working environment if it is structured in a way that has them working closely to other people, when their work is not conducive to a socially dense environment. They cannot remove themselves from a crowded situation if their workspace is established amongst it. In regards to this, it is hypothesised that:

Hypothesis 3_(e): Social density will be negatively related to perceived environmental control.

Perceived Environmental Control

Referring back to Figure 3, perceived environmental control has been incorporated in this study as a mediator. It is predicted that an individual's perceptions of control over their physical working environment will serve to mediate the relationships between the three predictor variables (PWES, need for privacy, and social density) and the four employee behaviors (AC, psychological strain, OCBI,

and CWB). A brief explanation for each predicted mediation relationship is provided below.

Low personal control over the environment means that an individual does not consider their surroundings to be sufficiently meeting their needs nor that they can appropriately adjust their surroundings in an effort to do so. A poor person-environment fit can result in strain when environmental characteristics perceived as negative surpass the individual's coping ability, or when the environment fails to provide the necessary resources for successful task performance (Roberts, Lapidus, & Chonko, 1997). Hence, an individual's willingness to work harder and their desire to remain with an organization could be reduced as the employee may consider their organization as having little interest in meeting their needs. This has the potential to result in lowered commitment to one's organization. It is predicted that perceptions of environmental control will mediate the relationships between the three predictor variables and AC. AC is predicted to increase if individuals feel a level of control over their environment in regards to satisfying their physical working environment needs, therefore:

Hypothesis 4_(a): Perceived environmental control will act as a mediator in the relationship between PWES and AC.

Hypothesis 5_(a): Perceived environmental control will act as a mediator in the relationship between need for privacy and AC.

Hypothesis 6_(a): Perceived environmental control will act as a mediator in the relationship between perceived social density and AC.

At the individual level, prior research suggests that environmental control over workspace components has a direct relationship to group collaboration, environmental satisfaction, and other perceptions related to health and stress

(O'Neill, 1993; O'Neill & Evans, 2000). Research suggests that if an individual can exert control over the physical environment and can increase his or her perception of enclosure and privacy, then this environmental control can mediate the stress experienced by office workers (Robertson & Huang, 2006). Furthermore, giving employees greater control over their work spaces through consultation during the design phase, and providing them with greater control over their working conditions is likely to improve satisfaction levels, and decrease experienced strain (Hedge, 1986). In regards to the findings by Hedge (1986), O'Neill (1993), and Robertson and Huang (2006), it is predicted that:

Hypothesis 4_(b): Perceived environmental control will act as a mediator in the relationship between PWES and psychological strain.

Hypothesis 5_(b): Perceived environmental control will act as a mediator in the relationship between need for privacy and psychological strain.

Hypothesis 6_(b): Perceived environmental control will act as a mediator in the relationship between perceived social density and psychological strain.

OCB has been defined variously within its extensive literature. Central to all definitions, however, is the idea that OCBs are employee behaviors that, although not critical to the task or job, serve to facilitate organizational functioning; therefore it is in an organizations best interest to find ways to foster this behavior in its staff. As has been mentioned previously, researchers have demonstrated that OCB is related to workplace satisfaction (Organ, 1990), and that individuals who view themselves as fairly treated both in their workplace and by their co-workers are more likely to display OCBs. Positive mood has also been found to affect an individual's likelihood of displaying helpful behavior (Lee & Allen, 2002). In regards to these findings, it is considered that perceptions of control over one's physical environment

would increase positive mood and workplace satisfaction, and therefore increase the likelihood of an individual displaying OCB. Furthermore, if an individual's privacy needs are being met, and they are not feeling overwhelmed by the number of people in their immediate environment, they are also likely to feel more positive and helpful towards others. On the basis of these assertions, it is predicted that:

Hypothesis 4_(c): Perceived environmental control will act as a mediator in the relationship between PWES and OCBI.

Hypothesis 5_(c): Perceived environmental control will act as a mediator in the relationship between need for privacy and OCBI.

Hypothesis 6_(c): Perceived environmental control will act as a mediator in the relationship between perceived social density and OCBI.

Counterproductive work behavior is behavior by employees that goes against the goals of an organization. It has been proposed that a person-by-environment interaction can be utilized to explain a variety of counterproductive behaviors (Spector et al., 2005). For example, an employee may engage in theft because of a lack of regard for their manager, or they may engage in withdrawal because of feelings of strain, or adverse working conditions. Interpersonal conflict in the workplace can also lead to counterproductive work behaviors. Interpersonal conflict with co-workers can lead to counterproductive work behaviors such as harassment, bullying, and physical disputes (Mount, Ilies, & Johnston, 2006). Therefore, control over the physical working environment may alleviate CWB as individuals could alter their working conditions, and potentially alter their degree of interaction with other co-workers; this could, in turn, serve to increase their level of PWES. So, it has been hypothesised that:

Hypothesis 4(a): Perceived environmental control will act as a mediator in the relationship between PWES and CWB.

Hypothesis 5(a): Perceived environmental control will act as a mediator in the relationship between need for privacy and CWB.

Hypothesis 6(a): Perceived environmental control will act as a mediator in the relationship between perceived social density and CWB.

Conclusion

Taken as a whole, the theoretical model developed for this thesis study aims to ascertain whether or not (a) direct relationships exist between the three predictor variables (PWES, need for privacy, social density) and the four employee behaviors chosen (AC, psychological strain, OCBI, and CWB), as well as (b) whether or not direct relationships exist between the three predictor variables and perceived environmental control. Lastly, the model aims to (c) examine the extent to which perceived environmental control can act as a mediator in the relationships between the predictor variables and the employee behaviors.

The remainder of this report will be laid out as follows: (1) the Method will outline the participants and procedure used for this study, in addition to factor analysis on each measure used to assess its validity, (2) the Results chapter will discuss the results of the online question, and analysis of the findings will be provided, and (3) the final chapter will discuss the results and whether or not they supported the predictions made, followed by a discussion of the implications these results could have for organizations, and directions for future research on the topic of environmental control in the workplace.

Summary of Hypotheses

Hypothesis 1_(a): Satisfaction with the physical work environment will be positively related to AC.

Hypothesis 1_(b): Satisfaction with the physical work environment will be negatively related to psychological strain.

Hypothesis 1_(c): Satisfaction with the physical work environment will be positively related to OCBI.

Hypothesis 1_(d): Satisfaction with the physical work environment will be negatively related to CWB.

Hypothesis 1_(e): Satisfaction with the physical work environment will be positively related to perceived environmental control.

Hypothesis 2_(a): Need for privacy will be negatively related to AC.

Hypothesis 2_(b): Need for privacy will be negatively related to psychological strain.

Hypothesis 2_(c): Need for privacy will be negatively related to OCBI.

Hypothesis 2_(d): Need for privacy will be positively related to CWB.

Hypothesis 2_(e): Need for privacy will be negatively related to perceived environmental control.

Hypothesis 3_(a): Social density will be negatively related to AC.

Hypothesis 3_(b): Social density will be positively related to psychological strain.

Hypothesis 3_(c): Social density will be negatively related to OCBI.

Hypothesis 3_(d): Social density will be positively related to CWB.

Hypothesis 3_(e): Social density will be negatively related to perceived environmental control.

Hypothesis 4_(a): Perceived environmental control will act as a mediator in the relationship between physical work environment satisfaction and AC.

Hypothesis 4_(b): Perceived environmental control will act as a mediator in the relationship between physical work environment satisfaction and psychological strain.

Hypothesis 4_(c): Perceived environmental control will act as a mediator in the relationship between physical work environment satisfaction and OCBI.

Hypothesis 4_(d): Perceived environmental control will act as a mediator in the relationship between physical work environment satisfaction and CWB.

Hypothesis 5_(a): Perceived environmental control will act as a mediator in the relationship between need for privacy and AC.

Hypothesis 5_(b): Perceived environmental control will act as a mediator in the relationship between need for privacy and psychological strain.

Hypothesis 5_(c): Perceived environmental control will act as a mediator in the relationship between need for privacy and OCBI.

Hypothesis 5_(d): Perceived environmental control will act as a mediator in the relationship between need for privacy and CWB.

Hypothesis 6_(a): Perceived environmental control will act as a mediator in the relationship between perceived social density and AC.

Hypothesis 6_(b): Perceived environmental control will act as a mediator in the relationship between perceived social density and psychological strain.

Hypothesis 6_(c): Perceived environmental control will act as a mediator in the relationship between perceived social density and OCBI.

Hypothesis 6_(d): Perceived environmental control will act as a mediator in the relationship between perceived social density and CWB.

Chapter 2

Method

Organizational Context

A survey was conducted of employees of New Zealand organizations utilizing open plan, shared office spaces for their staff. Three organizations were approached to take part in this research on the basis that the majority of their staff (except upper management) worked in open plan office spaces, with more than one other person sharing that space. All three organizations elected to take part in the study. The organizations were a large real estate firm in Auckland, the human resources department of a large government agency in Hamilton, and a tertiary education institution in Rotorua. In order to recruit as many participants as possible, the research website getparticipants.com was also utilized. This website was developed specifically for researchers wanting to gain participants quickly for their work.

Participants

Across the three organizations, 536 invitations to participate were distributed. This equated to the entire real estate firm in Auckland, one department within the Hamilton organization, and the entire tertiary institution in Rotorua. From this sample, 108 people completed the online questionnaire representing a response rate of 20.15%. In regards to getparticipants.com, the invitation was sent by the website to 1000 registered individuals who met the criterion for inclusion, of which 25 individuals completed the online questionnaire, representing a response rate

of 2.5%. Across the three organizations and getparticipants.com, a total of 133 individuals completed the online questionnaire.

The criterion for inclusion in this study was that the employees conducted their work within an open plan shared office setting. Participants not meeting this criterion were requested not to respond. Of the 116 participants who indicated their gender, 69% were female, and 31% were male. In regards to the 115 participants who indicated their ethnicity, $N=77$ (67%) were New Zealand European, $N=10$ (8.7%) were Other European, $N=14$ (12.2%) were New Zealand Maori, $N=3$ (2.6%) were Pacific Peoples, and $N=11$ (9.6%) reported their ethnicity as being Other. Finally, of those participants who reported their age ($N=110$), the minimum was 21 years, the maximum was 65 years, and the overall mean was 44.8 years.

Further demographic data were collected on marital status, tenure within the organization, and current position within the organization. Of those 116 participants who responded to the question of marital status, $N=16$ (14%) of participants responded as being single, $N=69$ (59%) responded as being married, and $N=22$ (19%) responded as being in a defacto relationship. Across the entire sample, the average tenure of participants working for their current organization was 5.8 years, while the maximum tenure was 29 years and the minimum tenure was 1 month. A total of 117 (70%) participants indicated the position they currently worked in. The majority of respondents, $N=41$ (35%), indicated that they worked in an academic position while $N=32$ (27%) worked in administration, $N=18$ (15%) worked in a management role, $N=16$ (14%) worked in an advisory position, $N=7$ (6%) worked in IT, and $N=3$ (3%) worked in sales.

Procedure

The research and ethics committee for the School of Psychology at the University of Waikato granted ethical approval for this research. Participants were recruited using two methods. In the first method, HR managers within selected organizations were contacted to determine whether the organization would be interested in participating in the study. If the HR manager consented to consider participation they were sent information via email explaining the extent of the study (Appendix A), what would be required of the organization and respondents, and outlining the rights of the prospective participants. Once permission was granted for the organization's involvement, an email invitation was then sent to employees by the HR manager through their internal email system (Appendix B). This invitation informed employees of the study and their rights if they chose to participate, and contained a link to the online questionnaire. Three organizations participated that were approached using this method of recruitment.

The second method of participant recruitment targeted potential participants online. This was done through getparticipants.com. A profile was set up to identify the purpose of the research, along with the target demographic of individuals working in a shared office environment. It was then posted onto the website with a link to the online questionnaire. People were only able to participate if they met the target demographic through clicking a tick box, which screened out any respondents who did not work in a shared office environment.

Measures

Data in this study were collected using an anonymous online questionnaire, developed using validated scales from previous research. The questionnaire contained quantitative measures of employees' perceived physical work environment satisfaction, need for privacy, social density, perceived environmental control, affective organizational commitment, individual organizational citizenship behaviors, workplace stress, and counterproductive workplace behaviors. In the final section, participants were asked to provide information about themselves, including age, gender, ethnicity, marital status, length of time with their organization, and their current position within that organization. A sample of the questionnaire is presented in Appendix C.

All scale scores were computed by taking the mean response to items in the scale. In order to avoid losing data, missing data imputation was employed following the work of Roth, Switzer and Switzer (1999). That is, for any cases in which respondents had not answered an item within a scale, the value for the item was estimated using within-participant mean data imputation. Using this technique, the most likely value of the missing item is calculated using the rest of the responses by the individual respondent on that scale. This technique is considered effective by Roth et al (1999) as it takes into account individual differences in responding. In total 38 separate responses were replaced using this technique, representing .24% of the total data. Furthermore, 2 participants were deleted from the collected data as they responded to one section only of the nine sections in the questionnaire and therefore were not considered relevant for later analyses.

Physical Work Environment Satisfaction (PWES)

Employees' satisfaction with their physical work environment was measured using 7 items from the 37-item Physical Work Environment Satisfaction Questionnaire (PWESQ) developed by Carlopio (1996). The items not included focused on other dimensions of the physical work environment not addressed in this study. Respondents were asked to rate how satisfied they were with the conditions in their workplace, for example, "the lighting in your work area" or "the air quality in your work area". Each item was scored on a 7-point response scale ranging from 'extremely dissatisfied' (1), to 'extremely satisfied' (7).

Exploratory Factor Analysis (EFA) was conducted on the PWES scale using the principal axis factoring method. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .75 and Bartlett's test of sphericity was significant, suggesting it was appropriate to continue. One factor was extracted with an Eigenvalue of 3.9, and after examining the scree plot (Appendix D), it was decided that a one-factor solution was appropriate. This factor explained 56% of the variance. The PWES scale had a Cronbach's alpha of .87.

Need for Privacy

Employees need for privacy within their office space were measured using 13 items from the 25-item Need-For-Privacy (NFP) scale developed by Haans et al., (2007). The 13 items answered behaviors to do with the employee's office workspace, whilst the 12 items excluded focused on behaviors in other physical locations on included in this study. Respondents were asked to rate how often they took actions to achieve privacy, for

example, ‘work at home for a day’, or ‘wear headphones when in the office’. Each item was scored using a 5-point scale, the response options ranged from ‘never’ (1) to ‘always’ (5).

When EFA was conducted using the principal axis factoring method, the KMO measure of sampling adequacy was .79 and Bartlett’s test of sphericity was significant, suggesting that it was appropriate to continue. One factor with an Eigenvalue of 2.8 was extracted, consistent with the scree plot (Appendix D), thus it was decided that a one-factor solution was appropriate. This factor explained 46.6% of the variance. However, items 1, 2, 3, 4, 9, and 11 loaded onto different factors with loadings less than the decided cut-off score of .3. These items were deleted and EFA was run again in order to obtain a unidimensional factor. In the final analysis, items 5, 6, 7, 8, 10, and 11 loaded onto one factor and this was retained for all subsequent processing. The Cronbach’s alpha for perceived privacy in this study was .76.

Social Density

Social density was measured using three items developed by Oldham (1988) which assessed how crowded individuals felt in their office space. These items were: “I feel crowded while at work”, “My office does not have enough space to allow for the number of employees currently working in it”, and “Individual workstations are located too close to one another”. Respondents were asked to rate how accurate they considered each of these statements to be on a 5-point scale ranging from ‘very inaccurate’ (1) to ‘very accurate’ (5).

When EFA was conducted using the principal axis factoring method, the KMO measure of sampling adequacy was .73 and Bartlett's test of sphericity was significant, suggesting it appropriate to continue. One factor with an Eigenvalue of 2.5 was extracted (Appendix D), and this factor explained 84% of the variance. Cronbach's alpha for social density in this study was .90.

Perceived Environmental Control

Employee perceptions of personal control over their ability to influence aspects of their physical working environment were measured using the control scale developed by Lee and Brand (2005). The scale consists of six items to which respondents were asked to rate the extent that they agreed with each item, for example, "I can personalise my workspace", and "I can adjust, re-arrange, and re-organize my furniture as needed". These items were scored on a 7-point scale ranging from 'strongly disagree' (1) to 'strongly agree' (7).

EFA was conducted on the perceived environmental control scale using the principal axis factoring method. The KMO measure of sampling adequacy was .80 and Bartlett's test of sphericity was significant, suggesting that it was appropriate to continue. As expected, one factor with an Eigenvalue of 3.4 was extracted (Appendix D). This factor explained 56% of the variance. The Cronbach's alpha for perceived environmental control in this research was .84.

Affective Organizational Commitment (AC)

Meyer and Allen (1997) developed a measure of affective commitment which was designed to assess an employee's emotional

attachment to and identification with their organization. The affective commitment scale consists of 8 items, for example “This organization has a great deal of personal meaning for me”. Items were scored on a 7-point Likert scale with responses ranging from ‘strongly disagree’ (1) to ‘strongly agree’ (7).

EFA was conducted on the affective organizational commitment scale using the principal axis factoring method. The KMO measure of sampling adequacy was .75 and Bartlett’s test of sphericity was significant, suggesting that it was appropriate to continue. One factor with an Eigenvalue of 2.9 was extracted (Appendix D). This factor explained 57.5% of the variance respectively. However, items 3, 6, and 7 had loadings less than the chosen cut-off loading of .3, so these were deleted and EFA was run again in order to obtain a unidimensional factor. In the final analysis, items 1, 2, 4, 5, and 8 loaded onto one factor and this was retained for all subsequent processing. The Cronbach’s alpha for affective organizational commitment in this research was .81

Psychological Strain

The Perceived Stress Scale (Cohen, Kamarck, and Mermelstein, 1983) contains 14 items that ask about individuals’ feelings and thoughts towards life during the last month, for example “been able to control irritations in your life” and “been upset because of something that happened unexpectedly”. Adopted in this study to evaluate psychological strain, respondents were asked to indicate how often they felt or thought a certain way using a 4-point scale ranging from ‘never’ (1) to ‘very often’ (4).

When EFA was conducted on the scale using the principal axis factoring method, the KMO measure of sampling adequacy was .88 and Bartlett's test of sphericity was significant, suggesting it was appropriate to continue. Two factors with Eigenvalues of 5.6 and 2.3 were extracted (Appendix D), consistent with the scree plot, thus a two-factor model was decided upon. These two factors explained 40.2% and 16.5% of the variance respectively. Oblique Rotation (direct oblimin) was used for factor rotation as it was assumed the factors would be correlated with one another. Seven items loaded onto Factor 1 (*positive* wellbeing), and seven items loaded onto Factor 2 (*negative* wellbeing). The loadings and item descriptions can be seen in Table 1. The Cronbach's alpha for Factor 1 (*positive* wellbeing) was .87 and the Cronbach's alpha for Factor 2 (*negative* wellbeing) was .84. As the factor analysis for psychological strain resulted in positive and negative factors, the two factors will be referred to as separate constructs, *positive* wellbeing and *negative* wellbeing, for the remainder of this report.

Table 1.**Factor loadings for psychological strain.**

Items	Factor Loadings	
	<i>Positive Wellbeing</i>	<i>Negative Wellbeing</i>
1. How often have you been upset because of something that happened unexpectedly?	-.17	.49
2. How often have you felt that you were unable to control the important things in your life?	-.31	.59
3. How often have you felt nervous or "stressed"?	-.22	.60
4. How often have you dealt successfully with irritating life hassles?	.73	.19
5. How often have you felt that you were effectively coping with important changes that were occurring in your life?	.63	-.06
6. How often have you felt confident about your ability to handle your personal problems?	.73	-.02
7. How often have you felt that things were going your way?	.65	-.24
8. How often have you felt that you could not cope with all the things you had to do?	-.18	.67
9. How often have you been able to control irritations in your life?	.72	.03
10. How often have you felt that you were on top of things?	.69	-.30
11. How often have you been angered because of things that happened that were outside of your control?	.12	.68
12. How often have you found yourself thinking about things that you have to accomplish?	.23	.51
13. How often have you been able to control the way you spend your time?	.64	-.03
14. How often have you felt difficulties were piling up so high that you could not overcome them?	-.11	.81

Organizational Citizenship Behavior–Individual (OCBI)

Lee and Allen (2002) developed a measure of organizational citizenship behavior-individual (OCBI) designed to measure the regularity with which employees' help other employees' at work (Lee & Allen, 2002). Adopted for this study, the OCBI scale consists of eight items, for example "Assist others with their duties" and "Adjust your work schedule to accommodate other employees' requests for time off". Respondents were asked to rate how often they displayed these behaviors on a 5-point scale ranging from 'never' (1) to 'always' (5).

EFA was conducted on the OCBI scale using the principal axis factoring method. The KMO measure of sampling adequacy was .85 and Bartlett's test of sphericity was significant, suggesting that it was appropriate to continue. One factor with an Eigenvalue of 3.9 was extracted (Appendix D). This factor explained 56.02% of the variance. Cronbach's alpha for OCBI for this research was .88.

Counterproductive Workplace Behavior (CWB)

Spector et al., (2005) developed the Survey of Counterproductive Workplace Behavior (CWB) incorporating five dimensions, or behaviors, of CWB: abuse against others, production deviance and sabotage, theft, and withdrawal. Adopted in this study, the CWB scale is made up of 33 items measuring the five different behaviors, for example "purposely did your work incorrectly" (sabotage), "came to work late without permission" (withdrawal), "purposely did your work incorrectly" (production deviance), "took supplies or tools home without permission" (theft) and "insulted someone about their job performance" (abuse). Respondents were asked to

indicate how often they displayed the listed behaviors using a 5-point scale ranging from ‘never’ (1) to ‘every day’ (5).

EFA was not conducted on this measure as it is measuring a range of different behaviors rather than one distinct construct. When testing the reliability and validity of a CWB measure, it must be taken into account that it is measuring multiple domains that do not represent a unidimensional construct. The Cronbach’s alpha for CWB in this research was .86.

Mediation Analysis

Mediation analyses were conducted to test Hypotheses 4 – 6 according to the guidelines established by Preacher and Hayes (2004). The mediation hypotheses aimed at assessing how personal control of the work environment could act as a mediator for employees behaviors towards their organization based on their PWES, privacy needs, and sense of social density. The formal heuristic analysis often used to detect simple mediation effects is straightforward and follows directly from the definition of a mediator provided by Baron and Kenny (1986). Variable *M* is considered a mediator if:

- (1) *X* significantly predicts *Y* (i.e., $c \neq 0$ in Figure 4),
- (2) *X* significantly predicts *M* (i.e., $a \neq 0$ in Figure 4),
- (3) *M* significantly predicts *Y* controlling for *X* (i.e., $b \neq 0$ in Figure 4).

Preacher and Hayes (2004) Mediation Model.

The following figure is from Preacher and Hayes (2004).

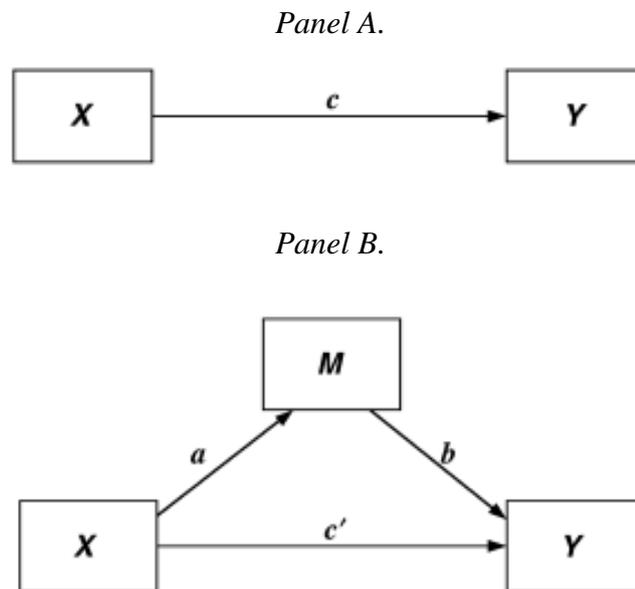


Figure 4. Panel A: Illustration of a direct effect. X affects Y. Panel B: Illustration of a mediation design. X affects Y indirectly through M.

When the effect of X on Y decreases to zero with the inclusion of M , *perfect* mediation is said to have occurred. When the effect of X on Y decreases by a nontrivial amount, but not to zero, *partial* mediation is said to have occurred. Preacher and Hayes (2004) also provided a test for an indirect effect using the Sobel test. The indirect effect of X on Y is defined as the product of the $X \rightarrow M$ path (a) and the $M \rightarrow Y$ path (b) or ab . In most situations, $ab = (c - \hat{c})$, where c is the simple (i.e. total) effect of X on Y , not controlling for M , and \hat{c} is the $X \rightarrow Y$ path coefficient after the addition of M to the model (see Figure 2.). The results of the mediation analyses are presented in Chapter 3.

Chapter 3

Results

This chapter presents the outcomes of the statistical analyses, which are presented in three sections: (1) descriptive statistics, (2) hypothesis testing of direct effects, and (3) hypothesis testing of mediation effects.

Descriptive Statistics

Descriptive statistics (SPSS) were calculated for all variables including means, standard deviations, skew and Cronbach's alpha. On average, participants reported moderate to low levels of need for privacy (2.05), social density (2.61), *negative* wellbeing (2.86), and counterproductive workplace behavior (CWB) (1.18), (5-point scale measures). On the same scale, they also reported moderate to high levels of *positive* wellbeing (3.76) and organizational citizenship behavior-individual (OCBI) (3.88), and finally participants reported high levels of affective organizational commitment (AC) (4.74). On the 7-point scale measures, participants reported on average, moderate to high levels of perceived environmental control (4.69) and high levels of physical work environment satisfaction (PWES) (4.90).

Skew was within acceptable levels across all nine variables; three variables had a negative skew whilst six had a positive skew. As no skew was greater than 3.0, all variables were considered to be normally distributed and transformations were not considered necessary. In regards to standard deviation, all nine variables had low, positive deviations which mean the data were clustered quite closely around each variable's

respective mean. Cronbach's alphas for all of the variables (Table 3) were above Nunnally's (1978) recommended internal consistency threshold of .70. This confirms that the scale scores are reliable. Correlations between all variables were calculated using the Pearson Product Moment Correlation method (Table 3).

Hypothesis Testing: Direct Effects

Physical Work Environment Satisfaction (PWES)

As hypothesised, PWES had a significant, positive correlation with affective organizational commitment ($r = .34, p < .01$). This supports hypothesis 1(a) and suggests that as people report greater levels of satisfaction with their physical working environment they also experience higher levels of affective commitment towards their organization.

PWES was not significantly correlated with either positive wellbeing or negative wellbeing; therefore hypothesis 1(b) was not supported. Hypothesis 1(c) predicted that PWES would be positively related to OCBI and hypothesis 1(d) predicted that PWES would be negatively related to CWB; however neither of these hypotheses were supported.

Hypothesis 1(e) predicted that PWES would be positively related to perceived environmental control. This hypothesis was supported as PWES had a significant, positive correlation with perceived environmental control ($r = .38, p < .01$). This suggests that as an individual's perception of control over their environment increases, so does their satisfaction with their physical work environment.

Table 2.**Correlations.**

	Mean	SD	PWES	Need for Privacy	Social Density	Control	Affective Commitment	Positive Wellbeing	Negative Wellbeing	OCBI	CWB
PWES (a)	4.90	1.18	.87								
Need for Privacy (b)	2.05	.79	-.21**	.76							
Social Density (c)	2.61	1.18	-.51**	.37**	.90						
Control (d)	4.69	1.38	.38**	-.23**	-.54**	.84					
Affective Commitment (b)	4.74	1.18	.34**	-.24**	-.38**	.38**	.81				
Positive Wellbeing (b)	3.76	.61	-.04	-.19*	.03	.03	.24**	.87			
Negative Wellbeing (b)	2.86	.69	-.04	.15	.06	-.16	-.09	.44**	.84		
OCBI (b)	3.88	.61	-.16	-.08	.06	-.09	.14	.29**	-.05	.88	
CWB (b)	1.18	.19	.01	.31**	.08	-.02	-.10	-.04	.18	-.14	.86

* significant at the $p < .05$ level

** significant at the $p < .01$ level

N = 123-133

Note. Cronbach's alphas are on the diagonal

(a) 7 point scale, (1-extremely dissatisfied, 7-extremely satisfied)

(b) 5 point scale, (1-never, 5-always)

(c) 5 point scale, (1-very inaccurate, 5-very accurate)

(d) 7 point scale, (1-strongly disagree, 7-strongly agree)

Need for Privacy

Hypothesis 2(a) predicted that need for privacy would be negatively related to affective organizational commitment. This hypothesis was supported as need for privacy had a significant, negative correlation with affective organizational commitment ($r = -.24, p < .01$). This suggests that as an individual's privacy needs decrease, their level of affective commitment to their organization increases.

Need for privacy had a significant, negative correlation with positive wellbeing ($r = -.19, p < .05$), which partially supports hypothesis 2(b). This suggests that as an individual's need for privacy decreased they experienced strain symptoms in a more positive manner. This could potentially be due to the greater availability of mental resources as the individual may not need to focus energy on blocking out invasions on their privacy as privacy is not required for them to work. Negative wellbeing, however, did not have a significant correlation with need for privacy. Therefore, partial support was found for hypothesis 2(b) in that positive wellbeing had a significant relationship with need for privacy.

Hypothesis 2(c) predicted that need for privacy would have a negative correlation to OCBI. This hypothesis was not supported in this study. However, need for privacy did have a significant, positive correlation with CWB ($r = .31, p < .01$) which supports hypothesis 2(d). This relationship suggests that as an individual's need for privacy increases, the extent to which they display CWB also increases.

Hypothesis 2(e) predicted that need for privacy would have a negative correlation with perceived environmental control. This hypothesis was supported as need for privacy had a significant, negative relationship with environmental control ($r = -.23, p < .01$). This relationship implies that as an individual's privacy needs decrease their perception of control over their environment increases.

Social Density

Social density had a significant, negative correlation with affective organizational commitment ($r = -.38, p < .01$), which supports hypothesis 3(a). This suggests that as an individual's feelings of being crowded in their work space decreases, their sense of affective commitment towards their organization increases.

Hypothesis 3(b) predicted that social density would be positively correlated to psychological strain and hypothesis 3(c) predicted that social density would be negatively related to OCBI; however neither of these hypotheses were supported. Hypothesis 3(d) predicted that social density would be positively related to CWB. However, this was not a significant correlation and consequently hypothesis 3(d) was not supported.

Social density was negatively and significantly correlated with perceived environmental control ($r = -.54, p < .01$). This relationship supports hypothesis 3(e) and suggests that as the level of social density decreases within an individual's workspace, their sense of control over their environment increases.

Hypothesis Testing: Mediation Effects

Perceived environmental control was used in this study as a mediator in the relationships between the predictor variables (PWES, need for privacy, and social density) and employee behaviors (affective commitment, psychological strain, OCBI, and CWB). As mentioned in Chapter 1, environmental control is fundamentally concerned with providing individuals control over the space in which they work, as opposed to being controlled by their work space and organizational policies. Mediation analyses were conducted to test Hypotheses 4 to 6 according to the guidelines established by Preacher and Hayes (2004), outlined in Chapter 2. Results of these analyses are presented below in Tables 3 to 14.

Physical Work Environment Satisfaction (PWES)

Hypothesis 4(a) proposed that perceived environmental control would mediate the relationship between PWES and affective organizational commitment (AC). Table 3 presents the regression equations estimated to establish a mediating relationship. In equation 1, AC (the criterion) was regressed onto PWES (the predictor) and this was significant ($c = .35$, $p < .001$). In equation 2, perceived environmental control (the mediator) was regressed onto PWES, and this was also significant ($a = .46$, $p < .001$). In equation 3, AC was regressed onto perceived environmental control while controlling for PWES which was significant ($b = .23$, $p < .05$).

Finally, AC was regressed onto PWES, while controlling for perceived environmental control, which also significant ($c' = .25$, $p < .001$). According to the

guidelines proposed by Preacher and Hayes (2004), hypothesis 4(a) was supported, as environmental control partially mediates the relationship between PWES and AC. The equation also provides the estimate of the indirect effect of PWES on AC through environmental control which was significant ($ab = .12$, $p < .01$). This means that the direct effect of PWES on AC was significantly reduced upon the addition of perceived environmental control.

Table 3.

Mediated Regression Equations Testing Hypothesis 4(a).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect(ab)</i>	<i>Sobel test</i>
1	AffCom	PWES	.35***	3.99		
2	Control	PWES	.46***	4.55		
3	AffCom	PWES	.23*	2.56		
		Control	.25***	3.36	.12**	2.66

Note: AffCom = Affective Commitment PWES = Physical Work Environment Satisfaction, Control = Perceived Environmental Control.

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 4(b) stated that perceived environmental control would mediate the relationship between PWES and psychological strain. Table 4 contains the regression equations performed to test this hypothesis with, firstly, *positive* wellbeing and, secondly, *negative* wellbeing. In equation 1, psychological strain was regressed onto PWES which was not significant for either positive wellbeing ($c = -.02$) or negative wellbeing ($c = -.02$). In equation 2, perceived environmental control was regressed onto PWES, and this was significant for both positive ($a = .47$, $p < .001$) and negative wellbeing ($a = .47$, $p < .001$). In equation 3, psychological strain was regressed onto

perceived environmental control while controlling for PWES which was not significant for either positive wellbeing ($b = -.03$) or negative wellbeing ($b = .02$).

Finally, psychological strain was regressed onto PWES, while controlling for perceived environmental control, which was not significant for either positive wellbeing ($c' = .02$) or negative wellbeing ($c' = -.08$). As only equation 2 was significant, hypothesis 4(b) was not supported and environmental control did not mediate the relationship between PWES and psychological strain. The equation also provides the estimate of the indirect effect of PWES on psychological strain through environmental control for positive wellbeing and negative wellbeing, neither of which were found to be significant.

Table 4.

Mediated Regression Equations Testing Hypothesis 4(b).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	PosWell	PWES	-.02	-.39		
2	Control	PWES	.47***	4.56		
3	PosWell	PWES	-.03	-.54		
		Control	.02	.46	.01	.45
1	NegWell	PWES	-.02	-.42		
2	Control	PWES	.47***	4.56		
3	NegWell	PWES	.02	.27		
		Control	-.08	-1.68	-.04-	-1.54

Note: PosWell = Positive Wellbeing, PWES = Physical Work Environment Satisfaction, Control = Perceived Environmental Control, NegWell = Negative Wellbeing

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 4(c) stated that perceived environmental control would mediate the relationship between PWES and OCBI. Table 5 presents the regression equations to

test this hypothesis. In equation 1, OCBI was regressed onto PWES, however this was not significant ($c = -.08$). In equation 2, perceived environmental control was regressed onto PWES, which was significant ($a = .46, p < .001$). In equation 3, OCBI was regressed onto perceived environmental control while controlling for PWES which was not significant ($b = -.08$). Finally, OCBI was regressed onto PWES, while controlling for perceived environmental control, which was also not significant ($c' = -.02$). As only equation 2 was significant, hypothesis 4(c) was not supported, therefore environmental control did not mediate the relationship between PWES and OCBI. The indirect effect of PWES on OCBI through environmental control was not significant.

Table 5.

Mediated Regression Equations Testing Hypothesis 4(c).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	OCBI	PWES	-.08	-1.79		
2	Control	PWES	.46***	4.55		
3	OCBI	PWES	-.08	-1.51		
		Control	-.02	-.36	-.01	-.35

Note: OCBI = Organizational Citizenship Behavior-Individual, PWES = Physical Work Environment Satisfaction, Control = Perceived Environmental Control.

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Finally, hypothesis 4(d) stated that perceived environmental control would mediate the relationship between PWES and CWB. Table 6 presents the regression equations estimated to establish a mediating relationship. In equation 1, CWB was regressed onto PWES, however this was not significant ($c = .001$). In equation 2, perceived environmental control was regressed onto PWES, which was significant ($a = .46, p < .001$). In equation 3, CWB was regressed onto perceived environmental

control while controlling for PWES which was not significant ($b = .003$). Finally, CWB was regressed onto PWES, while controlling for perceived environmental control, which was not significant ($c = -.003$). As equation 2 was the only equation requirement met for mediation to occur, hypothesis 4(d) was not supported. Environmental control did not mediate the relationship between PWES and CWB. The indirect effect of PWES on CWB through environmental control was not significant.

Table 6.

Mediated Regression Equations Testing Hypothesis 4(d).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	CWB	PWES	.001	.07		
2	Control	PWES	.46***	4.59		
3	CWB	PWES	.003	.15		
		Control	-.003	-.22	-.002	-.22

Note: CWB = Counterproductive Workplace Behavior, PWES = Physical Work Environment Satisfaction, Control = Perceived Environmental Control

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Need for Privacy

Hypothesis 5(a) stated that perceived environmental control would mediate the relationship between need for privacy and affective organizational commitment (AC). Table 7 presents the regression equations estimated to establish a mediating relationship. In equation 1, AC (the criterion) was regressed onto need for privacy (the predictor), which was significant ($c = -.36$, $p < .01$). In equation 2, perceived environmental control (the mediator) was regressed onto need for privacy, which was also significant ($a = -.41$, $p < .01$). In equation 3, AC was regressed onto perceived

environmental control while controlling for need for privacy which was not significant ($b = -.24$).

Finally, AC was regressed onto need for privacy, while controlling for perceived environmental control, which was not significant ($c' = .29$, $p < .001$). As the relationship between perceived environmental control and need for privacy was significant in equation 2, but the relationship between AC and need for privacy was not significant in equation 3 with the introduction of perceived environmental control, perceived environmental control was found to have a full mediation effect and Hypothesis 5(a) was supported. The indirect effect of need for privacy on AC through environmental control was also found to be significant ($ab = -.12$, $p < .05$), as environmental control had a negative indirect effect on the relationship between need for privacy and AC.

Table 7.

Mediated Regression Equations Testing Hypothesis 5(a).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	AffCom	Privacy	-.36**	-2.73		
2	Control	Privacy	-.41**	-2.63		
3	AffCom	Privacy	-.24	-1.88		
		Control	.29***	4.07	-.12*	-2.16

Note: AffCom = Affective Organizational Commitment, Privacy = Need for Privacy, Control = Perceived Environmental Control

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 5(b) stated that perceived environmental control would act as a mediator in the relationship between need for privacy and *positive* wellbeing and *negative* wellbeing. Table 8 presents the regression equations estimated to establish a

mediating relationship for firstly positive wellbeing and secondly negative wellbeing. In equation 1, positive wellbeing and negative wellbeing were regressed onto need for privacy, which were found to be significant for positive wellbeing ($c = -.15$, $p < .05$), but not significant for negative wellbeing ($c = .13$). In equation 2, perceived environmental control was regressed onto need for privacy, which was significant for both negative and positive wellbeing ($a = -.39$, $p < .05$). In equation 3, psychological strain was regressed onto perceived environmental control while controlling for need for privacy which was significant for positive wellbeing ($b = -.15$, $p < .05$), however was not significant for negative wellbeing ($b = .10$).

Finally, psychological strain was regressed onto need for privacy, while controlling for perceived environmental control, which was not found to be significant for either positive wellbeing ($\acute{c} = -.01$) or negative wellbeing ($\acute{c} = -.06$). Hypothesis 5(b) was supported in regards to positive wellbeing by way of a partial mediation effect, as the relationship between need for privacy and positive wellbeing was reduced from equation 2 to equation 3 but remained significant. However, no mediation effect was found for negative wellbeing as only equation 2 was significant. The indirect effect of need for privacy on psychological strain through environmental control was not significant for either positive wellbeing or negative wellbeing.

Table 8.**Mediated Regression Equations Testing Hypothesis 5(b).**

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	PosWell	Privacy	-.15*	-2.11		
2	Control	Privacy	-.39*	-2.45		
3	PosWell	Privacy	-.15*	-2.09		
		Control	-.01	-.19	.003	.18
1	NegWell	Privacy	.13	1.59		
2	Control	Privacy	-.39*	-2.45		
3	NegWell	Privacy	.10	1.24		
		Control	-.06	-1.40	.03	1.15

Note: PosWell = Positive Wellbeing, Privacy = Need for Privacy, Control = Perceived Environmental Control, NegWell = Negative Wellbeing

$N = 118$

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 5(c) stated that perceived environmental control would act as a mediator in the relationship between need for privacy and OCBI. Table 9 presents the regression equations estimated to establish a mediating relationship for this hypothesis. In equation 1, OCBI was regressed onto need for privacy, which was not significant ($c = -.06$). In equation 2, perceived environmental control was regressed onto need for privacy, which was significant ($a = -.41$, $p < .01$). In equation 3, OCBI was regressed onto perceived environmental control while controlling for need for privacy which was not significant ($b = -.08$).

Finally, OCBI was regressed onto need for privacy, while controlling for perceived environmental control, which was not significant ($c' = -.05$). As only equation 2 of the mediation requirements was met, hypothesis 5(c) was not supported. Environmental control did not mediate the relationship between need for privacy and

OCBI. There was also no indirect effect found for need for privacy on OCBI through environmental control.

Table 9.

Mediated Regression Equations Testing Hypothesis 5(c).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	OCBI	Privacy	-.06	-.85		
2	Control	Privacy	-.41**	-2.63		
3	OCBI	Privacy	-.08	-1.12		
		Control	-.05	-1.24	.02	1.06

Note: OCBI = Organizational Citizenship Behavior-Individual, Privacy = Need for Privacy, Control = Perceived Environmental Control

N = 124

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 5(d) stated that perceived environmental control would mediate the relationship between need for privacy and CWB. Table 10 presents the regression equations estimated to establish a mediating relationship for this hypothesis. In equation 1, CWB was regressed onto need for privacy which was significant ($c = .08$, $p < .001$). In equation 2, perceived environmental control was regressed onto need for privacy, which was also significant ($a = -.41$, $p < .01$). In equation 3, CWB was regressed onto perceived environmental control while controlling for need for privacy which was significant ($b = .08$, $p < .001$). CWB was then regressed onto need for privacy, while controlling for perceived environmental control, which was not found to be significant ($c' = .01$). Partial mediation was established for hypothesis 5(d) as the outcome of equation 3 being smaller than equation 2 but still being significant, therefore hypothesis 5(d) was supported. However, the indirect effect of need for privacy on CWB through environmental control was not found to be significant.

Table 10.

Mediated Regression Equations Testing Hypothesis 5(d).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	CWB	Privacy	.08***	3.62		
2	Control	Privacy	-.41**	-2.62		
3	CWB	Privacy	.08***	3.67		
		Control	.01	.67	-.004	-.61

Note: CWB = Counterproductive Workplace Behavior, Privacy = Need for Privacy, Control = Perceived Environmental Control

$N = 123$

* $p < .05$, ** $p < .01$, *** $p < .001$

Social Density

Hypothesis 6(a) stated that perceived environmental control would mediate the relationship between social density and affective organizational commitment (AC). Table 11 presents the regression equations estimated to establish a mediating relationship for this hypothesis. In equation 1, AC (the criterion) was regressed onto social density (the predictor), which was significant ($c = -.38$, $p < .001$). In equation 2, perceived environmental control (the mediator) was regressed onto social density, which was significant ($a = -.63$, $p < .001$). In equation 3, AC was regressed onto perceived environmental control while controlling for social density which was also significant ($b = -.25$, $p < .05$). AC was then regressed onto social density, while controlling for perceived environmental control which was significant ($c' = .21$, $p < .05$), establishing a partial mediation effect and supporting hypothesis 6(a). Finally, an indirect effect of social density on AC through environmental control was found to be significant ($ab = -.13$, $p < .05$).

Table 11.**Mediated Regression Equations Testing Hypothesis 6(a).**

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	AffCom	Density	-.38***	-4.56		
2	Control	Density	-.63***	-6.98		
3	AffCom	Density	-.25*	-2.56		
		Control	.21*	2.59	-.13*	-2.41

Note: AffCom = Affective Organizational Commitment, Density = Social Density, Control = Perceived Environmental Control

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 6(b) stated that perceived environmental control would act as a mediator in the relationship between social density and psychological strain. Table 12 presents the regression equations estimated to establish a mediating relationship for *positive* wellbeing and *negative* wellbeing. In equation 1, positive wellbeing and then negative wellbeing were regressed onto social density, which was not significant for either positive wellbeing ($c = .02$) or negative wellbeing ($c = .04$). In equation 2, perceived environmental control was regressed onto social density, which was significant for both negative and positive wellbeing ($a = -.65$, $p < .001$). In equation 3, psychological strain was regressed onto perceived environmental control while controlling for social density which was not significant for positive wellbeing ($b = .03$) or negative wellbeing ($b = -.02$).

Finally, psychological strain was regressed onto social density, while controlling for perceived environmental control, which was not found to be significant for either positive wellbeing ($c' = .03$) or negative wellbeing ($c' = -.09$). As equation 2 was the only requirement met in both sets of equations, hypothesis 6(b)

was not supported. Furthermore, the indirect effect of social density on psychological strain through environmental control was not found to be significant for either positive wellbeing or negative wellbeing.

Table 12.

Mediated Regression Equations Testing Hypothesis 6(b).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	PosWell	Density	.02	.35		
2	Control	Density	-.65***	-6.93		
3	PosWell	Density	.03	.59		
		Control	.03	.55	-.02	-.54
1	NegWell	Density	.04	.65		
2	Control	Density	-.65***	-6.93		
3	NegWell	Density	-.02	-.33		
		Control	-.09	-1.62	.06	1.56

Note: PosWell = Positive Wellbeing, Density = Social Density, Control = Perceived Environmental Control, NegWell = Negative Wellbeing

N = 118

* *p* < .05, ***p* < .01, ****p* < .001

Hypothesis 6(c) stated that perceived environmental control would mediate the relationship between social density and OCBI. Table 13 presents the regression equations estimated to establish a mediating relationship for this hypothesis. In equation 1, OCBI was regressed onto social density, which was not significant (*c* = .03). In equation 2, perceived environmental control was regressed onto social density, which was significant (*a* = -.63, *p* < .001). In equation 3, OCBI was regressed onto perceived environmental control while controlling for social density which was not significant (*b* = .005).

Finally, OCBI was regressed onto social density, while controlling for perceived environmental control, which was not significant ($c = -.04$). As only equation 2 of the equation requirements for mediation was met, hypothesis 6(c) was not supported. The indirect effect of social density on OCBI through environmental control was also not found to be significant.

Table 13.

Mediated Regression Equations Testing Hypothesis 6(c).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	OCBI	Density	.03	.61		
2	Control	Density	-.63***	-6.98		
3	OCBI	Density	.005	.08		
		Control	-.04	-.80	.02	.79

Note: OCBI = Organizational Citizenship Behavior-Individual, Density = Social Density, Control = Perceived Environmental Control

$N = 124$

* $p < .05$, ** $p < .01$, *** $p < .001$

Finally, hypothesis 6(d) stated that perceived environmental control would act as a mediator for the relationship between social density and CWB. Table 14 presents the regression equations estimated to establish a mediating relationship for this hypothesis. In equation 1, CWB was regressed onto social density which was not significant ($c = .01$). In equation 2, perceived environmental control was regressed onto social density, which was significant ($a = -.63$, $p < .001$). In equation 3, CWB was regressed onto perceived environmental control while controlling for social density which was not significant ($b = .02$).

CWB was then regressed onto social density, while controlling for perceived environmental control, which was also not found to be significant ($c' = .01$). As only equation 2 of the requirements for mediation was met, hypothesis 6(d) was not supported. Finally, the indirect effect of social density on CWB through environmental control was not found to be a significant effect.

Table 14.

Mediated Regression Equations Testing Hypothesis 6(d).

<i>Equation</i>	<i>Criterion Variable</i>	<i>Predictor Variable</i>	<i>Beta Coefficient</i>	<i>t</i>	<i>Indirect Effect (ab)</i>	<i>Sobel test</i>
1	CWB	Density	.01	.85		
2	Control	Density	-.63***	-6.99		
3	CWB	Density	.02	.89		
		Control	.01	.33	-.003	-.32

Note: CWB = Counterproductive Workplace Behavior, Density = Social Density, Control = Perceived Environmental Control

$N = 123$

* $p < .05$, ** $p < .01$, *** $p < .001$

Summary

Several direct relationships were found between the predictor variables and the employee behaviors. PWES was found to have a significant positive relationship with AC, however did not relate to the other three behaviors. Need for privacy had a significant positive relationship with CWB, and a significant negative relationship with AC and positive wellbeing. Lastly, social density had a significant negative relationship with AC. Furthermore, all three of the predictor variables had significant relationships to perceived environmental control; PWES had a significant positive relationship whilst need for privacy and social density both had significant negative relationships.

There were 5 significant mediation relationships found across the 15 relationships predicted. Perceived environmental control mediated the relationships between PWES and AC, need for privacy and AC, need for privacy and positive wellbeing, need for privacy and CWB, and finally social density and AC. Implications of these findings are discussed in the following chapter.

Chapter 4

Discussion

The aim of this research was to construct and test a conceptual model of how personal control of the work environment, at the individual level, could act as a mediator for employee reactions towards their organization based on their physical work environment satisfaction, need for privacy, and sense of social density. An organization's physical work environment should be an important component of its aim towards improving worker efficiency and satisfaction. Architectural design affects the way people behave, with designers having the potential to create conditions that can hinder, discourage, guide, support, or enhance users' behavior in the workplace (Goodrich, 1982). A poor working environment could have a negative impact upon an individual's wellbeing which should be considered as vital by management given that an individual spends approximately a third of their time at work (Grant & Shields, 2006). Providing individuals with a level of control over their work space so they can cater for privacy needs and counteract socially dense environments is likely to improve satisfaction levels and decrease levels of psychological strain (Robertson & Huang, 2006), which, in turn, could lead to greater productivity amongst staff.

The results of this study supported some of the relationships predicted. Physical work environment satisfaction (PWES), need for privacy, and social density were all significantly related to affective organizational commitment (AC) and perceived environmental control. Need for privacy was significantly related to psychological strain-positive wellbeing and counterproductive workplace behavior

(CWB). Perceived environmental control mediated the relationship between all three predictor variables and AC, and the relationships between need for privacy and psychological strain, and need for privacy and CWB. The implications of these findings are discussed.

This chapter is divided into five sections: (1) the major findings are reviewed; the direct relationships followed by the mediated relationships, (2) the implications of the study are then outlined and discussed, (3) a review of the strengths and limitations of this study is provided, (4) possible directions for future research are discussed based on the findings of this study, and finally (5) conclusions from this study are drawn.

Major Findings – Direct Relationships

Physical Work Environment Satisfaction (PWES).

One of the more robust findings in the literature is that of organizational commitment being related and antecedent to desire to quit one's job, otherwise known as intent to turnover (Bluedorn, 1982; Meyer, Paunonen, Gellathly, Goffin, & Jackson, 1989; Williams & Hazer, 1986). Furthermore, most of the data from these studies point to job satisfaction as a contributory factor of commitment. This is in line with previous research (Carlopio, 1996) which found that in general, employees' satisfaction with the workplace was positively related to organizational commitment. It was the measure created by Carlopio (1996) that was used in this study to assess PWES. Based on Carlopio, it was hypothesised that PWES would have a positive relationship with AC. This relationship was found to be significant and positive,

supporting the hypothesis, and also supporting the previous research linking PWES and organizational commitment. This finding suggests that employees who feel satisfied with their physical working environment also have a stronger identification and connection with their organization which is likely to lead to a stronger desire to remain with, and work hard for that organization.

It was also hypothesised that PWES would be positively correlated with perceived environmental control. Moleski and Lang (1982) suggested that user needs be redefined to recognize the importance of “freedom of choice” in personal workplace behavior patterns. This suggestion should be considered in the designing of office spaces as individuals who feel restricted by their space have the potential to experience less PWES than those who have the freedom to adjust their space as they need to. MacLaney and Hurrell (1988) used multidimensional measures of work control to assess the influence of control on task outcomes. Their results showed a positive relationship between environmental control and job satisfaction. Several researchers have found a positive association between high job control and satisfaction (Greenberger, Strasser, Cummings, & Dunham, 1989; O’Neill, 1994; Sargent & Deborah, 1998), yet little empirical research has dealt with personal control over the physical working environment.

In light of this, a positive relationship was found in this study between PWES and perceived environmental control, extending upon the literature linking control and satisfaction. This finding suggests that individuals may have higher PWES if they have control over the layout and design of their work spaces. Providing employees

with control over their physical working environment could be a beneficial step for employers wanting to improve employee satisfaction levels.

Need for Privacy

Need for privacy had a negative correlation with AC and perceived environmental control. According to shared office advocates, the need for privacy is accommodated through an individual's sense of personal space, rather than definitive space delineators such as enclosures or dividers (Mylonos & Carstairs, 2007). Therefore, an employee who feels encroached upon in his or her space, despite architectural privacy being present, may feel as much a lack of control over their personal space as if they were completely open to everybody in the office. Hence, one way to increase commitment levels is for organizations to ensure that the physical working environment is conducive to employee needs through facilitating both interaction and privacy (McGuire & McLaren, 2009).

It was found that need for privacy had a negative correlation with positive wellbeing. In regards to the measure used for this study (Appendix C) this indicates that individuals who can take measures to regularly increase their privacy needs experience a reduced sense of psychological strain. However, on the basis of the measure alone it is difficult to ascertain whether that privacy need is high and being met or not. An individual may have a high need for privacy but cannot, for example shut their door, or change their position in the office because of its design. Therefore, it can only really be ascertained that the individual has a need for privacy and can take steps to meet that need, which reduces their strain levels. Research has found that the physical arousal associated with few enclosures in a room is expected to

decrease an individual's ability to concentrate, and hence process information which can increase stress levels (Cohen, 1980). Research has found that office workers spend a quarter of their day reacting to interruptions and distractions (Wallis, Steptoe & Cole, 2006). These constant disruptions can have negative impacts on health. Long-term reactions to stressors, such as noise and distraction, can include decreased performance and negative physical conditions, such as chronic fatigue, mental strain, and burnout. This finding by Wallis et al., (2006) suggests that meeting individual privacy needs may be more important than simply assisting staff to complete their work.

Need for privacy was also found to be positively correlated with both social density and CWB. This is a fairly reasonable result in that somebody with a high need for privacy could be based in an environment they consider as having a high degree of social density. Lack of privacy could result in CWBs such as increased time spent out of the office or longer breaks from work in order to accommodate for the lack of privacy. In light of this, the likelihood of CWB occurring could be lessened by increasing the number of enclosures around an individual's workspace or by providing employees with private spaces in which to hold discussions and meetings with co-workers away from others.

Social Density

In this study, social density was measured by assessing how crowded by co-workers an employee feels in their workspace. A number of studies have shown that high levels of social density produce feelings of crowdedness (Brennan et al., 2002; Fried, 1990; Oldham & Fried, 1987). In addition, studies have shown that high social

density is related to high turnover intentions and low levels of satisfaction (Fried, 1990; Oldham & Rotchford, 1983). On the basis of this literature, it was hypothesised that social density would be negatively correlated with AC, and the evidence found supported this hypothesis. This is an important relationship given the fact that open plan office spaces have increased dramatically since the 1970's when designers touted their flexibility (Brennan et al., 2002). However, Brennan et al., (2002) found that relocating employees from enclosed offices to open plan spaces had a negative impact upon staff's PWES and feelings towards their organization which increased over time. In noting previous research and the current study, there is the potential that employees have not necessarily adjusted to socially dense environments over time but have more or less accepted them as part of their work setting. In spite of this acceptance, socially dense environments can continue to have a detrimental impact on employees' feelings of commitment to their organization.

It was also hypothesised that social density would have a negative correlation with perceived environmental control. Previous research suggests that individuals often respond negatively to socially dense conditions (Paulus, 1980; Sundstrom, 1978). McCarrey, Peterson, Edwards, and Von Kulmiz (1974) suggested that the findings of lower satisfaction in open plan offices are due to employees' perceived lack of control over input from their surrounding environment, for example, repeated interruptions from co-workers. This is supported by the concept of stimulus overload (Cohen, 1978), which posits that some workers prefer quiet workplaces where co-workers are few and far apart as overexposure to this kind of stimulus can then be controlled. These studies are congruent with the current study as social density was

found to have a strong negative relationship to perceived environmental control. This finding supports the potentially negative effects of a socially dense work environment; individuals working in close proximity to others feel less control over their space.

Major Findings - Mediated Relationships

Physical Work Environment Satisfaction (PWES)

Perceived environmental control mediated the relationship between PWES and AC; however it was a partial mediation effect. This suggests that perceived environmental control accounts for some of the variance in affective commitment due to satisfaction with the work environment. Furthermore a positive indirect effect was found which Preacher and Hayes (2004) regarded as directly addressing the primary question of interest, whether or not the total effect of AC on PWES was significantly reduced upon the addition of environmental control. This result suggests that the addition of environmental control does alleviate the effect that PWES has upon AC. Therefore, there is the potential for individuals who have a sense of control over their environment to also experience greater AC, regardless of their PWES which indicates that perceptions of environmental control almost act as a buffer between these two variables.

Need for Privacy

It was found that perceived environmental control fully mediated the relationship between need for privacy and AC. This suggests that perceived environmental control explains why need for privacy would be linked to employees' feelings of attachment to, and identification with their organization. An individual

who feels a sense of control over their ability to meet privacy needs may have a greater sense of AC than an individual who feels they do not have control over adjusting their workspace to suit their privacy needs.

It was also found that perceived environmental control partially mediated the relationships between need for privacy and psychological strain-positive wellbeing and between need for privacy and CWB. This suggests that environmental control accounts for some of the variance in psychological strain-positive wellbeing and CWB because of need for privacy. Feelings of greater control over altering one's environment to meet privacy needs may serve to lessen psychological strain and CWB, but without employees feeling they have that control, organizations could be faced with detrimental CWBs or staff suffering from psychological strain.

Social Density

Perceived environmental control was found to partially mediate the relationship between social density and AC. This result implies that environmental control accounts for some of the variance in AC because of social density. If an individual feels they have some control over their environment, their AC levels may be stronger regardless of the social density of the work space which, without that sense of control, was found to have a negative direct relationship with AC in this study.

Implications of the Research

The first important implication of this research concerns the finding that PWES, need for privacy, social density and perceived environmental control all

related significantly to AC. These are important findings for an organization as they suggest that employees who are satisfied with their work environment and feel as though their workspace needs are being met are more likely to feel a sense of commitment to their organization. Affectively committed employees' are seen as having a sense of belonging and identification that increases their involvement in the organization's activities, their willingness to pursue the organization's goals, and their desire to remain with the organization (Meyer & Allen, 1991). Therefore, finding ways to increase affective commitment through meeting employees' workspace needs may assist in the development of loyal and supportive staff members.

Need for privacy and social density both had negative relationships with AC. Individuals who have low privacy needs are likely to have higher AC within an open plan office environment as their organizational needs are most likely conducive to high levels of interaction. In opposition, individuals with high privacy needs within an open plan office setting are more likely to experience lower AC as their needs may involve a more confidential, private working environment. Consequently, it is important that organizations examine the tasks their employees perform and then do their best to create a working environment that collaborates with their job in order to support staff and promote organizational effectiveness.

Another implication of this research arises from the positive relationship PWES had with perceived environmental control, suggesting that an increase in PWES could relate to, or be promoted by, an increase in employees' perceived

environmental control. One of the principal factors underpinning employees' work environment satisfaction is perceived control (McGuire & McLaren, 2009). Organizations that encourage greater staff involvement in workplace design may bring about positive employee identification with the workspace and work system, and encouraging personalization of the physical environment could potentially increase employees' sense of environmental control.

However, need for privacy and social density both had negative correlations with perceived environmental control signifying that as an individual's need for privacy and sense of social density increased their perception of control over their environment decreased. This finding supports Becker et al.'s (1983) flight theory – individuals in open plan spaces who have little in the way of privacy will often use avoidance of co-workers, managers and any other individuals in their workplace as a method of managing this lack of control. In regards to socially dense environments, workers appear less satisfied with their workstations and jobs when faced with intrusions from others. Hence, organizations should note that the inability to control behaviors and activities occurring in the surrounding environment may reduce an individual's facility for meeting his/her work demands and in turn, reduce organizational effectiveness.

A third implication to be considered relates to the finding that perceived environmental control partially mediated the relationship between PWES and AC, and social density and AC. Furthermore, perceived environmental control fully mediated the relationship between need for privacy and AC. As environmental

control mediated the relationships with AC only, these findings suggest that perceived environmental control could potentially have some influence on the effects that PWES, need for privacy, and social density have on AC. A lack of control over adjusting the work environment could result in a workforce with lowered AC, putting organizations at risk of contending with absenteeism, turnover intentions, and actual turnover.

Strengths of the Research

While there have been plenty of international studies on environmental control, with most research conducted in the United States (Fried, 1990; Lee & Brand, 2010; O'Neill, 2010; Robertson & Huang, 2006), no New Zealand based research was found in the review of literature for this study. Therefore, a strength of this research is that it extends upon international research on the subject of environmental control in the workplace. The current study extends upon previous research measuring the impact of environmental control on various employee reactions and outcomes. In some cases, prior research has used environmental control as a mediator (Robertson & Huang, 2006), and in others used to measure the direct effect it has on other organizational factors such as easing distractions, job performance, and choice of environment settings (Lee & Brand, 2010; O'Neill, 2010; Veitch & Gifford, 1996). The research for this study examined employee behaviors (psychological strain, OCBI and CWB) in relation to the mediating effect of environmental control, incorporating PWES and workspace characteristics as predictors to create a model that provided information on the impact that perceptions of environmental control have within a New Zealand organizational context.

Limitations of the Research

One limitation of this study was its cross-sectional design, which prevents conclusions being drawn about any causal relationships between variables. Another limitation in the design of the study is that self-report scales were used to assess all variables. This can lead to common method bias where correlations between variables are magnified as each variable is measured using the same method (Spector & Jex, 1998). However, this is encountered in much organizational psychology research so is a common research limitation. For many of the variables measured in this study, self-report scales were the only feasible method available, for example, AC, and psychological strain. Nevertheless, for some variables there are available alternatives. Common method variance could be controlled by using peer or supervisor reports to assess CWB, for example, instead of self-report measures. CWB may not have had significant relationships with other variables (aside from need for privacy) as individuals did not wish to admit to engaging in certain behaviors so were less honest in their responses.

A second possible limitation of the study was the sample size. There were 133 participants in this study and the sample size may not be truly representative of the target population as a whole. This, it may have been more valuable to have a greater diversity of organizations.

Future Research

This study has revealed several significant relationships between the three predictor variables, perceived environmental control and AC that could affect overall

worker effectiveness and worker behaviors towards their organization. However, due to the cross-sectional design of the study, it may be valuable for future research on environmental control to investigate these significant relationships using a longitudinal study design. In regards to this study, environmental control was not found to be a prominent mediator, therefore may not have been such an important issue for participants at the time of data collection. A longitudinal study design could render greater insight into the significance of environmental control over a longer period of time in which situations, office spaces, and circumstances may change.

Furthermore, more conclusive results could be obtained about the actual effects of PWES, workspace constructs, and environmental control on employee reactions towards their organization. As the relationships between the three predictor variables and perceived environmental control have not been found in the environmental control literature reviewed for this study, they could serve as a potentially interesting and valuable basis for future research in the field of environmental control.

In addition, an objective measure of CWB could be used in future research to gauge a more accurate effect. As self-report measures require respondents to divulge “negative” behaviors and interactions within their organization, it is logical that individuals may not respond with honesty for fear of possible ramifications. Therefore, a more objective form of measurement, for example, peer reports or reports from a supervisor could be more likely to reveal occurrences of CWB than self-report.

Conclusions

The current study shows that environmental control is perhaps not such an important factor within New Zealand organizations. However, it was found to be significant in regards to direct relationships with the three predictor variables, and mediation relationships between all three predictor variables and affective commitment, which means enhancing work environments through greater privacy design and less people per office space could be a relevant way to improve workplace satisfaction and employees' sense of affective commitment towards their organization. Perceived environmental control was also found to mediate the relationship between need for privacy and positive wellbeing, and need for privacy and CWB. This suggests that perceptions of environmental control potentially account for some of the effect that need for privacy has on these specific employee reactions.

The finding that perceived environmental control did not have as strong an influence as initially predicted could have some relation to the current weak economic climate, in which workers are perhaps more resigned to the conditions of their working environment as there is little chance of greater benefits elsewhere. In spite of this, the factors investigated in this study can contribute to organizational effectiveness in regards to office design and workplace satisfaction. It is therefore important for organizations and future researchers to acknowledge the physical and control aspects of the work environment as well as the social and management aspects.

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Appendix A

Letter to Organizations Requesting Participation

Dear Sir/Madam,

My name is Chelsea MacMillan and I am a student at Waikato University in the Masters of Applied Psychology – Industrial/Organizational Psychology program under the supervision of Michael O’Driscoll. I would like to request your permission for your organization to participate in my upcoming thesis research in order to complete my Master’s degree.

The focus of my research is on the workspace environment and its impact upon employees. The purpose of this research is to generate findings that will aid management understanding of the ways in which providing employees control of their workspace environment could ultimately work to the benefit of an organization by means of encouraging greater commitment and positive workplace behaviors’.

I would consider this research to potentially be both interesting and beneficial for your organization as it could provide insight into ways to improve upon employee productivity and the effectiveness of the workplace for staff members.

The extent of your organization’s involvement in this research would be by way of staff members completing an anonymous survey. The survey will ask questions regarding perceptions of staff members physical work environment at work in addition to some workplace behaviors. This will hopefully contribute to the existing literature on physical control over the workplace environment as well as contributing to management understanding of its importance.

The survey will ideally be emailed to all staff of for completion, and will most likely take around 25 minutes to complete through an email link.

All data collected through this research will be highly confidential and at the completion of the research a summary report of the findings will be made available to you and your staff.

I greatly appreciate you taking the time to read and consider my request, and I look forward to your response.

I can be reached at cm160@students.waikato.ac.nz. If you would like to contact my supervisor, Michael O’Driscoll, you can also reach him at, m.odriscoll@waikato.ac.nz

Kind regards,

Chelsea MacMillan

Appendix B

Overview for Participants

Dear Participant:

My name is Chelsea MacMillan and I am a student at Waikato University as a student in the Masters of Applied Psychology – Industrial/Organizational Psychology program under the supervision of Michael O’Driscoll. I would like to request your participation in a survey for my thesis project entitled: *Effect of Physical Work Environment Satisfaction and shared workspace characteristics on psychological strain and employee behaviors toward their organization: Using Environmental Control as a mediator.*

The purpose of this survey is to generate findings that will aid management understanding of the ways in which providing employees control of their workspace environment can ultimately work to the benefit of an organization by means of encouraging greater commitment and positive workplace behaviors. This thesis research has been approved by Waikato University’s Ethical Board.

The following survey was developed to ask questions regarding perceptions of your physical work environment in addition to some workplace behaviors. This will hopefully contribute to the existing literature on physical control over the workplace environment as well as contributing to management understanding of its importance.

There are no identified risks from participating in this research. Your participation is valuable to the success of this research. Please click on the link at the end of this email to access the survey. The survey will take approximately 20 minutes to complete and responses will only be reported in aggregated form in the final thesis paper, as such, participants will not be able to be identified. Please carry out the survey within two weeks of receiving this email.

The survey is anonymous and confidential. If you have any concerns relating to confidentiality or ethics of this research, please contact the Convener of the Research and Ethics Committee in the School of Psychology, Lewis Bizo lbizo@waikato.ac.nz.

Participation in this research is completely voluntary and subjects may decline to participate without consequence.

Further information regarding the research can be obtained from myself, Chelsea MacMillan cm160@students.waikato.ac.nz, and/or my faculty advisor Michael O'Driscoll, m.odriscoll@waikato.ac.nz.

If you would like to know the results of this research, they will be made available to you through your organization upon the completion of this thesis research.

Thank you for participating in my research study. Your help is greatly appreciated.

Kind regards,

Chelsea MacMillan

Appendix C

PHYSICAL WORK ENVIRONMENT RESEARCH QUESTIONNAIRE

INSTRUCTIONS

Please read the following instructions carefully before proceeding.

- a) All information provided by you is confidential to the researcher.
- b) The questionnaire will take you approximately 20 - 25 minutes to complete.
- c) Please respond to the statements by clicking on the number that best indicates your response to the scale provided.
- d) Please respond to each item in a section before moving onto the next section – you will be provided with a ‘Warning’ signal if you miss an item response.
- e) Please submit the questionnaire as soon as you have completed it by clicking the SUBMIT button at the end of the final section.
- f) A summary of the results will be made available to you through your organization at the completion of this research.
- g) If you have any questions about the questionnaire, or the study itself, please contact either the researcher, at cm160@students.waikato.ac.nz or her supervisor, Michael O’Driscoll, at m.odriscoll@waikato.ac.nz.

QUESTIONNAIRE

A. Physical Work Environment Satisfaction

This section addresses your satisfaction with the design of the physical environment in which you work.

1	2	3	4	5	6	7
Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neither Satisfied nor Dissatisfied	Slightly Satisfied	Satisfied	Extremely Satisfied

How satisfied are you with....

1. The lighting in your area?	1	2	3	4	5	6	7
2. The direction of the light which enters your work area?	1	2	3	4	5	6	7
3. The air quality in your work area?	1	2	3	4	5	6	7
4. The surfaces you frequently work on?	1	2	3	4	5	6	7
5. The general atmosphere in your work area?	1	2	3	4	5	6	7
6. In general, the type of facilities provided in your work area?	1	2	3	4	5	6	7
7. The cleanliness of the facilities in your work area?	1	2	3	4	5	6	7

B. Privacy in the Office

This section looks at your need for privacy in your physical work environment and assesses the actions you may take in order to achieve this privacy.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

How often do you...

- 1. Hang a “do not disturb” sign on the door or place one somewhere else near your desk* 1 2 3 4 5
- 2. Wear headphones when you are in the office* 1 2 3 4 5
- 3. Place yourself behind office furniture or behind other objects in the office, such as a lamp or plant* 1 2 3 4 5
- 4. Work at home for a day* 1 2 3 4 5
- 5. Position yourself with your back to your colleagues* 1 2 3 4 5
- 6. Pretend to be extremely busy (i.e. Act as if you are being more active than you actually are)* 1 2 3 4 5
- 7. Maintain an unresponsive posture when sitting behind your desk* 1 2 3 4 5
- 8. Choose a desk where few people walk past* 1 2 3 4 5
- 9. Keep the office door closed* 1 2 3 4 5
- 10. At the office, talk in a softer voice than you usually do* 1 2 3 4 5
- 11. Leave the office earlier than you intend to* 1 2 3 4 5
- 12. Ask colleagues or other persons to be quieter* 1 2 3 4 5
- 13. Keep personal thoughts to yourself and do not share them with colleagues or other people in the office.* 1 2 3 4 5

C. Social Density in the Office

This section assesses the degree to which you feel crowded in your office environment.

1	2	3	4	5
Very Inaccurate	Inaccurate	Neither Inaccurate nor Accurate	Accurate	Very Accurate

How accurate are each of the following statements....

- | | | | | | |
|--|----------|----------|----------|----------|----------|
| 1. I feel crowded while at work | 1 | 2 | 3 | 4 | 5 |
| 2. My office does not have enough space for the number of employees currently working in it | 1 | 2 | 3 | 4 | 5 |
| 3. Individual workstations are located too close to one another | 1 | 2 | 3 | 4 | 5 |

D. Personal Control over the Work Environment

This section assesses the sense of personal control you feel over your ability to influence aspects of your physical work environment.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

To what extent do you agree with the following statements...

- | | | | | | | | |
|---|----------|----------|----------|----------|----------|----------|----------|
| 1. I determine the organization/appearance of my work area | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I can personalize my workspace | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I feel my work life is under my personal control | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I can adjust, re-arrange, and re-organize my furniture as needed | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The variety of work environments needed for my job is available to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

6. *I can hold small, impromptu meetings in my office or work area, as needed* 1 2 3 4 5 6 7

E. Commitment to the Organization

This section assesses your perceptions of your emotional attachment to or identification with your organization.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

To what extent do you agree with the following statements...

1. *I would be very happy to spend the rest of my career with this organization.* 1 2 3 4 5 6 7

2. *I enjoy discussing this organization with outside of it.* 1 2 3 4 5 6 7

3. *I really feel as if this organizations problems are my own.* 1 2 3 4 5 6 7

4. *I think I could easily become as attached to other organizations as I am to this one.* 1 2 3 4 5 6 7

5. *I do not feel like “part of the family” at this organization.* 1 2 3 4 5 6 7

6. *I do not feel “emotionally attached” to this organization.* 1 2 3 4 5 6 7

7. *This organization has a great deal of personal meaning for me.* 1 2 3 4 5 6 7

8. *I do not feel a strong sense of belonging to this organization.* 1 2 3 4 5 6 7

F. Behavior at Work

This section is divided into two parts and looks at behaviors in the workplace

F.1

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

How often do you...

- | | | | | | |
|--|----------|----------|----------|----------|----------|
| <i>1. Help others who have been absent.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>2. Willingly give your time to help others who have work-related problems.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>3. Adjust your work schedule to accommodate other requests for time off.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>4. Go out of the way to make newer employees feel welcome in the work group.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>5. Show genuine concern and courtesy toward co-workers, even under the most trying business or personal situations.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>6. Give up time to help others who have work or non-work problems.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>7. Assist others with their duties.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>8. Share personal property with others to help their work.</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |

F.2

1	2	3	4	5
Never	At least once a year	Monthly	Weekly	Every day

How often have you...

- | | | | | | |
|---|----------|----------|----------|----------|----------|
| <i>1. Purposely wasted your employer's materials/supplies</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>2. Purposely damaged a piece of equipment or property</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>3. Purposely dirtied or littered your place of work</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>4. Come to work late without permission</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |

5. Stayed home from work and said you were sick when you were not	1	2	3	4	5
6. Taken a longer break than you were allowed to take	1	2	3	4	5
7. Left work earlier than you were allowed to	1	2	3	4	5
8. Purposely did your work incorrectly	1	2	3	4	5
9. Purposely worked slowly when things needed to get done	1	2	3	4	5
10. Purposely failed to follow instructions	1	2	3	4	5
11. Stolen something belonging to your employer	1	2	3	4	5
12. Took supplies or tools home without permission	1	2	3	4	5
13. Put in to be paid for more hours than you worked	1	2	3	4	5
14. Taken money from your employer without permission	1	2	3	4	5
15. Stolen something belonging to someone at work	1	2	3	4	5
16. Told people outside the job what a lousy place you work for	1	2	3	4	5
17. Started or continued a damaging or harmful rumour at work	1	2	3	4	5
18. Been nasty or rude to a client or customer	1	2	3	4	5
19. Insulted someone about their job performance	1	2	3	4	5
20. Made fun of someone's personal life	1	2	3	4	5
21. Ignored someone at work	1	2	3	4	5
22. Blamed someone at work for error you made	1	2	3	4	5
23. Started an argument with someone at work	1	2	3	4	5
24. Verbally abused someone at work	1	2	3	4	5
25. Made an obscene gesture (the finger) to someone at work	1	2	3	4	5
26. Threatened someone at work with violence	1	2	3	4	5
27. Threatened someone at work, but not physically	1	2	3	4	5
28. Said something obscene to someone at work to make them feel bad	1	2	3	4	5
29. Done something to make someone at work look bad	1	2	3	4	5
30. Played a mean prank to embarrass someone at work	1	2	3	4	5

- | | | | | | |
|---|----------|----------|----------|----------|----------|
| <i>31. Looked at someone at work's private mail/property
without permission</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>32. Hit or pushed someone at work</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
| <i>33. Insulted or made fun of someone at work</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |

H. Feelings towards Life

The questions in this scale ask you about your feelings and thoughts towards your life during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question.

0	1	2	3	4
Never	Almost Never	Sometimes	Fairly Often	Very Often

In the last month, how often have you....

- | | | | | | |
|--|----------|----------|----------|----------|----------|
| <i>1. Been upset because of something that happened unexpectedly?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>2. Felt that you were unable to control the important things in your life?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>3. Felt nervous and "stressed"?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>4. Dealt successfully with irritating life hassles?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>5. Felt that you were effectively coping with important changes that were occurring in your life?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>6. Confident about your ability to handle your personal problems?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>7. Felt that things were going your way?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>8. Found that you could not cope with all the things that you had to do?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>9. Been able to control irritations in your life?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| <i>10. Felt that you were on top of things?</i> | <i>0</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |

- 11. Been angered because of things that happened that outside of your control?** 0 1 2 3 4
- 12. Found yourself thinking about things that you have to accomplish?** 0 1 2 3 4
- 13. Been able to control the way you spend your time?** 0 1 2 3 4
- 14. Felt difficulties were piling up so high that you could not overcome them?** 0 1 2 3 4

I. Demographic Data

This information is being collected in order to describe the general characteristics of the people who participated in this research. The responses to the following information are confidential to the researcher. If you have any queries as to confidentiality, please contact Lewis Bizo, Convenor of the Research and Ethics Committee in the School of Psychology, at lbizo@waikato.ac.nz, at lbizo@waikato.ac.nz.

1. How old are you? []

2. What gender are you? Male | Female

3. What is your marital status?
Single | Married | Defacto | Separated | Divorced | Widowed

4. What is your Ethnic Origin?

New Zealand European []
Other European []
New Zealand Maori []
Asian []
Pacific Peoples []
Other []

5. How long have you worked for your organization? Years [] Months []

6. What is your Current Position? (Tick the box most indicative of your role)

- Management []
- Academic []
- Administration []
- IT []
- Sales []

Questionnaire Complete!

Please submit your completed questionnaire by clicking the SUBMIT button.

Thank you for participating in this research.

A summary of the findings will be made available to your organization soon.

Appendix D

Scree Plots

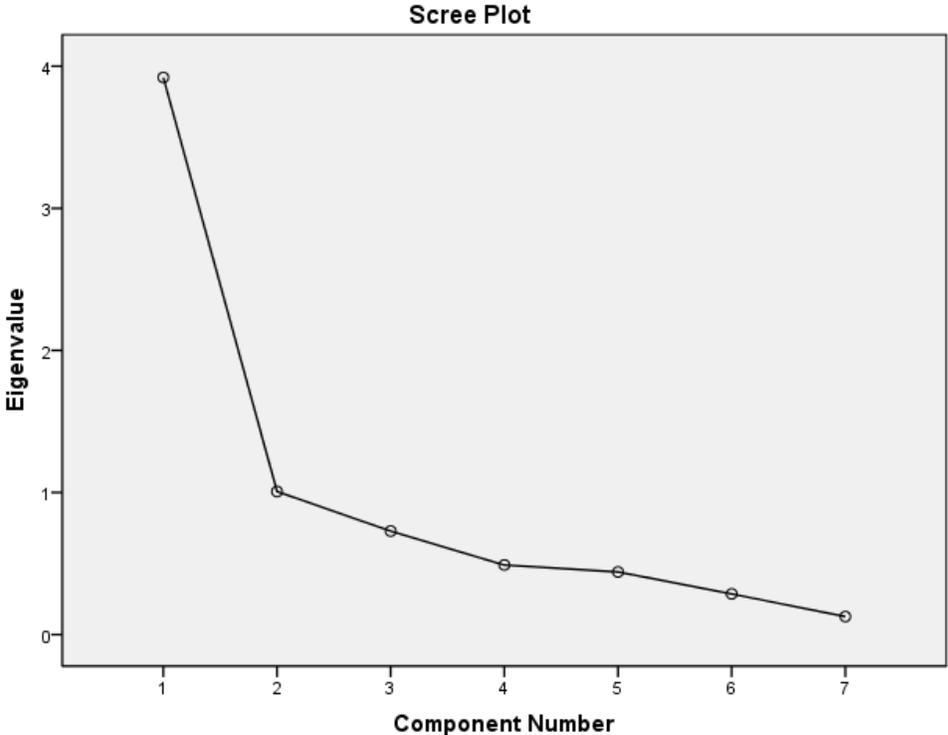


Figure 5.1. Scree plot for the Physical Work Environment Satisfaction scale.

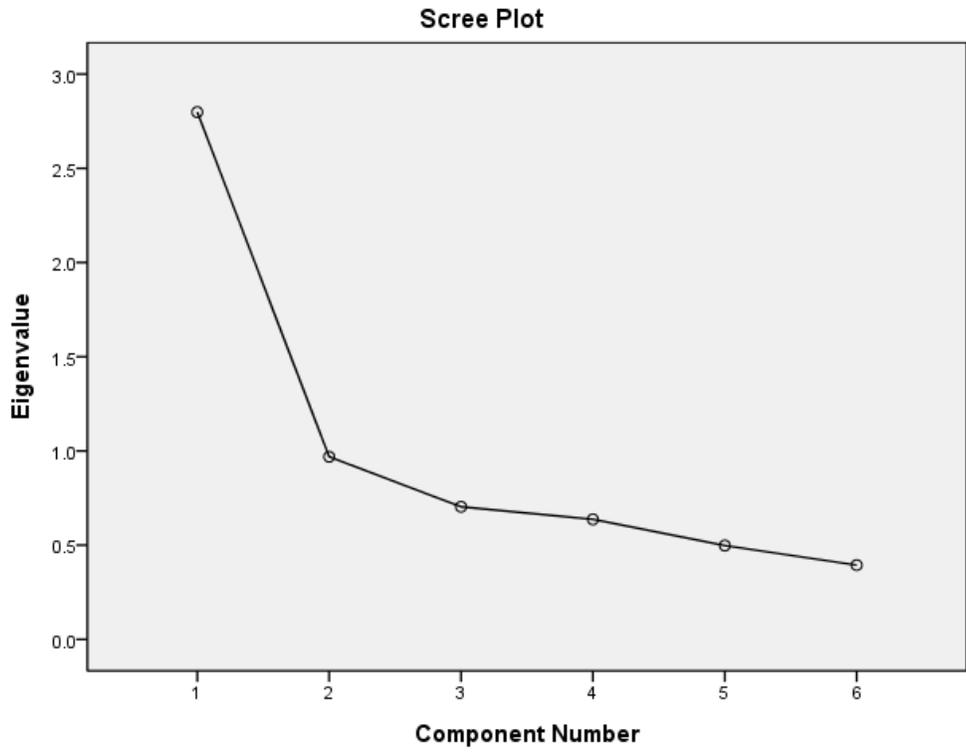


Figure 5.2. Scree plot for the Perceived Privacy scale.

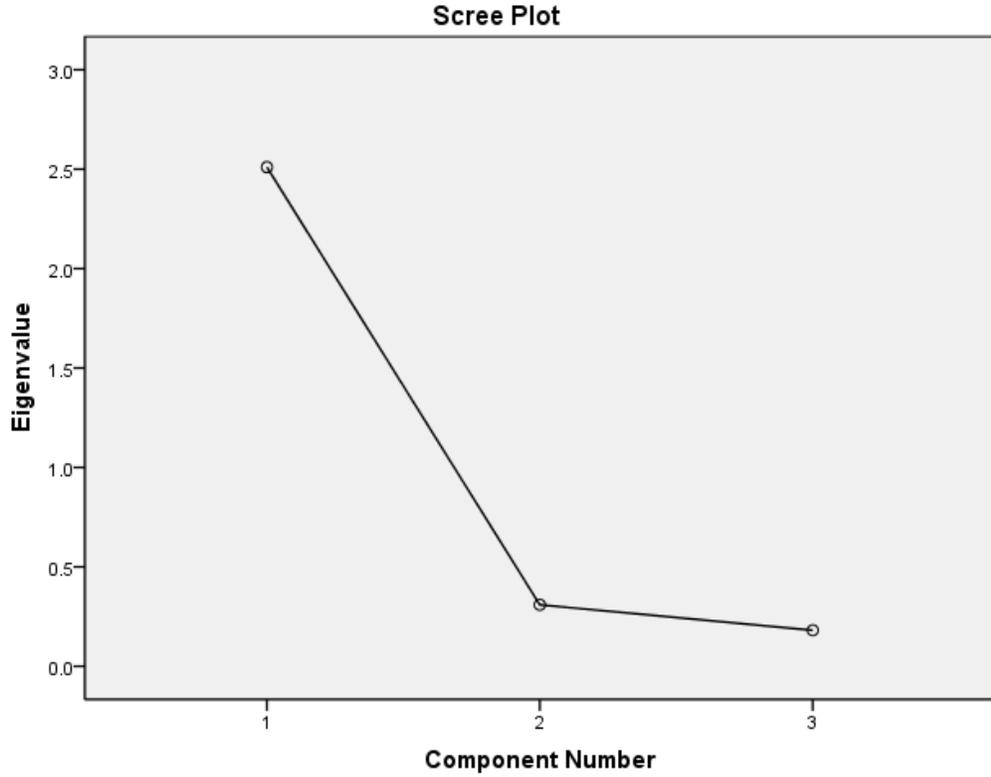


Figure 5.3. Scree plot for the Social Density scale.

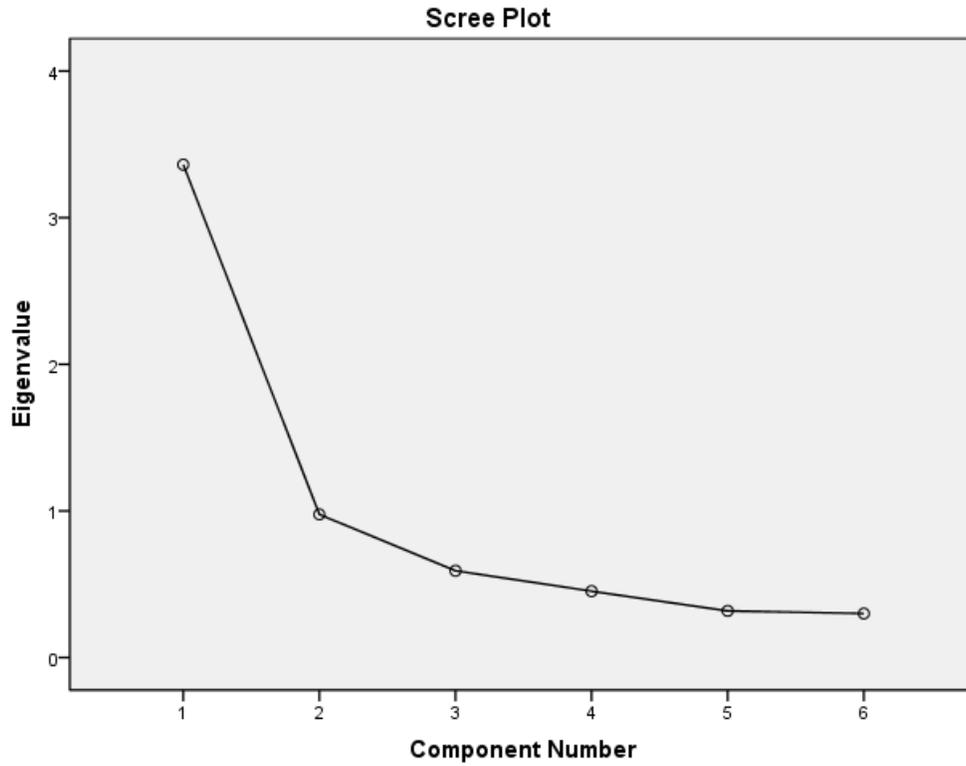


Figure 5.4. Scree plot for the Perceived Environmental Control scale.



Figure 5.5. Scree plot for the Affective Organizational Commitment scale.

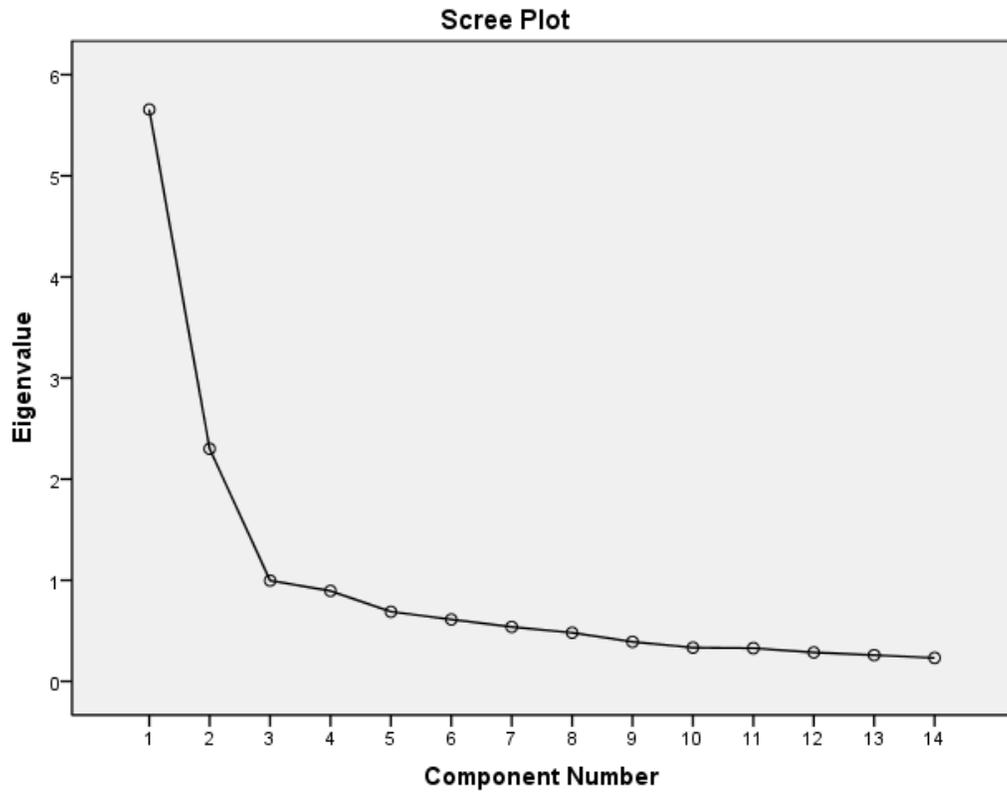


Figure 5.6. Scree plot for the Psychological Strain scale



Figure 5.7. Scree plot for the Organizational Citizenship Behavior – Individual scale