WATCH OUT! CAN'T YOU SEE THAT THERE'S A RED JACKET ON THE CHAIR?

ON MODERN OFFICE DESIGN AND PRIMITIVE HUMAN NEEDS

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Watch Out! Can't You See That There's a Red Jacket on the Chair? : On Modern Office Design and Primitive Human Needs

Abstract:

Thanks to digitalization and advanced mobile technology, work is no longer associated with a fixed place. Employees can now work from anywhere - at any time - and when the number of employees working on-sight decreases offices struggle to reach full capacity. This leads many companies to reconsider their office design. The activity-based office - with no fixed workstations or private office rooms - has become an increasingly popular alternative due to its cost-efficiency and flexibility. But what happens when territorial boundaries such as private office rooms and fixed workstations disappear? How are employees affected psychologically, by not having a space of their own in the office? This study investigates the fascinating subject of organizational territoriality and its effect on employees in two different office settings: the traditional, cellular office versus the activity-based office. A quantitative survey was distributed internationally across Europe and was filled in by 258 respondents from the two different office types. The results showed that territorial behaviors occurred in both office types and that there were significant correlations between territoriality and the psychological factors assessed (stress, personal control, place attachment, self-efficacy, job satisfaction and satisfaction with the physical environment). Territorial behaviors can have significant consequences for organizations, yet organizational territoriality seems to be a vastly overlooked area of research within both managerial and organizational studies as well as in psychology and architecture. This study adds onto the existing body of research on territoriality within organizations.

Keywords:

Organizational Territoriality, Office Design, Personalization, Psychology, Activity-based Offices

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Prologue

It is your first day in the new office. The company you work for has decided to redesign the whole office space, switching the old and dusty cubicles to something new and fresh. As the activity-based office design – notorious for its cost saving benefits and its promise to foster social interactions - had gained popularity the last few years, the managers were unhesitant to go for the new office concept.

You walk into a light and vibrant space that oozes modernity and ambition. It reminds you of the cool office spaces of Google and Facebook. You no longer have your own desk, instead you get a small locker to house your belongings. Every day, you will work in a new zone that best fits your current work task. Everyone is smiling towards you and you get a profound sense of communion ship. This is the future!

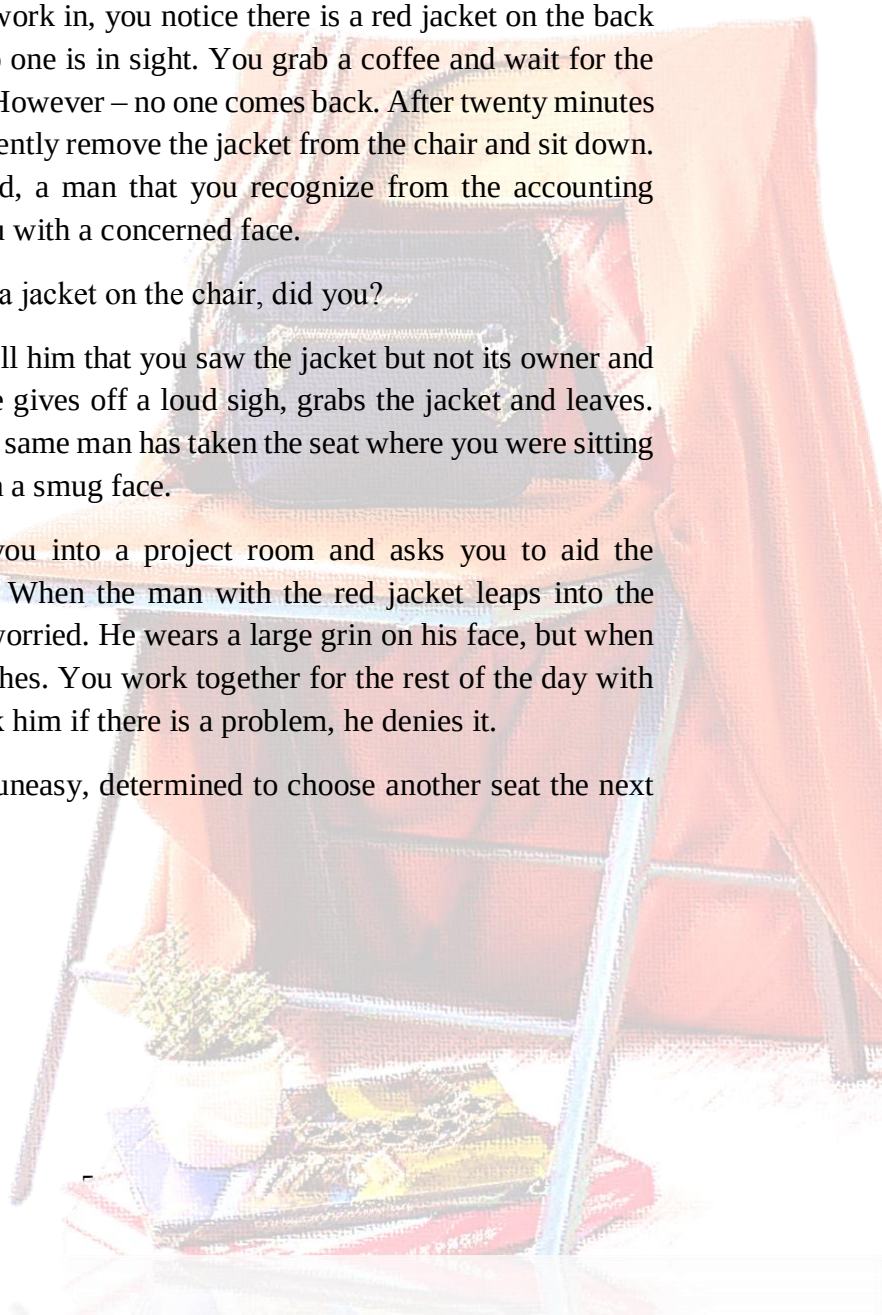
When you finally find a free spot to work in, you notice there is a red jacket on the back of the chair. You look around, but no one is in sight. You grab a coffee and wait for the jacket-owner to return to their space. However – no one comes back. After twenty minutes of chatting to a nice co-worker, you gently remove the jacket from the chair and sit down. When a couple of hours have passed, a man that you recognize from the accounting department slowly walks towards you with a concerned face.

- You didn't see that there was a jacket on the chair, did you?

He whispers, visibly annoyed. You tell him that you saw the jacket but not its owner and therefore decided to take the seat. He gives off a loud sigh, grabs the jacket and leaves. When you return from lunch, the very same man has taken the seat where you were sitting before lunch. He looks up at you with a smug face.

The next day your manager pulls you into a project room and asks you to aid the accounting department on a project. When the man with the red jacket leaps into the project room, you instantly become worried. He wears a large grin on his face, but when he sees you, the smile instantly vanishes. You work together for the rest of the day with clear tension in the air. When you ask him if there is a problem, he denies it.

You exit the office that day slightly uneasy, determined to choose another seat the next day.



1. Introduction

Technology has evolved at a rapid pace during the past decades. Thanks to the advances in digitalization and mobile technology it is now possible to work from anywhere, at any time. Work is no longer associated with a fixed place and this has led to increasingly empty office spaces (Toivanen, 2015). The sudden decrease in density of on-sight employees and the costs related to empty offices has created a new trend: a growing amount of companies are now reconsidering their office design. This need for a radical optimization of space has made the flexible, activity-based office a popular alternative.

The reason for choosing an activity-based office design is primarily to lower costs, but also because it represents a modern and social way of working (Toivanen, 2015). Activity-based offices are easily adapted to the current needs of the companies and are therefore considered suitable in an epoch characterized by constant change (Gunne, 2013).

In an activity-based environment, employees have no fixed desks or office rooms of their own. They are expected to share workstations and change seats according to the level of concentration or teamwork that their work tasks require. Because of their flexibility and lack of physical boundaries, offices like the activity-based office are called non-territorial offices.

In the prologue, we saw an example of organizational territoriality – the need to establish and mark territories. Employees and individuals all over the world experience and engage in territoriality daily, both in their everyday life and in their work life (Brown et al., 2005). Despite this, territoriality is a vastly overlooked aspect of organizational life, both in research and practice. What we know so far is that territoriality seem to be mirroring a fundamental human need and that territorial behaviors have been shown to improve the well-being of employees (Brown et al., 2005). The aim of this thesis is to investigate how office design affects territorial behaviors and what the psychological impact of territoriality is on employees.

This introductory chapter will further present the history of office design, discuss the problem statement and research questions as well as addressing the research gap and the expected knowledge contribution of this thesis.

1.1. Background

The development of office design has consistently been driven by innovative technology, improved processes and a strive for efficacy. The invention of the printing press, the typewriter, the telegraph and the phone have all had significant impact on the way we work.

In the early 1900's, employees were often seated in long rows. Aside of enabling managers to gain a good overview of the employees, the goal of this rational office design was to be efficacious - creating a better work flow and streamlining the exchange of physical documents (Christiansson & Eiserman, 1998).

Figure 1. The Office of the New Orleans Item-Tribune (Newspaper), Louisiana, circa 1900

In the interwar period, between the years of 1918 and 1939, the interest for the individual grew and focus shifted to the health of the employees. The large office halls were no longer seen as beneficial. A new office design was invented, housing smaller office rooms that fitted only one or two employees per room. These small office rooms, also called cellular offices, were placed in long columns along the sides of the building. The goal was that every room would have windows and access to natural daylight. A lot of buildings were rectangular, tailor-made for the cellular office design. A factor that played a central role in the adoption of cellular offices was the increase of qualified office jobs (Christiansson & Eiserman, 1998).

At the end of the 1950's, Germany were in the forefront of a new movement, yet again advocating an efficacious and rational office design. This is when the open-office

landscapes were introduced, and employees were once again placed in large office halls. Workers would now be assigned desks in the same room as all of their colleagues. This trend spread quickly across Europe and suddenly the cellular rooms were considered to hinder flexibility and team work. Even though they still were the most suitable office design for individual work tasks, they were thought to discourage communication between employees and managers and therefore destruct the flow of information in the office (Christiansson & Eiserman, 1998).

In Sweden, however, strict laws about the three Swedish L's: "ljud, ljus and luft" meaning noise levels, light and air, delayed the adoption of the open-office landscape and the cellular office continued to be the most common office in the country for many more years. Eventually, despite this slow adoption, cellular offices and open-office landscapes both became a popular choice for Swedish office design in the late 60's (Christiansson & Eiserman, 1998).

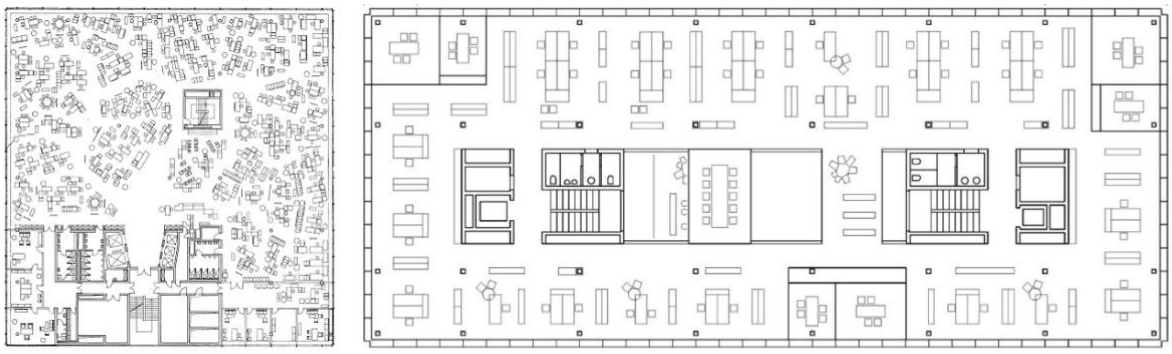


Figure 2 and 3. To the left: an early drawing of a controversial open office landscape in Germany in the 50's. To the right: An example of a modern open office landscape design.

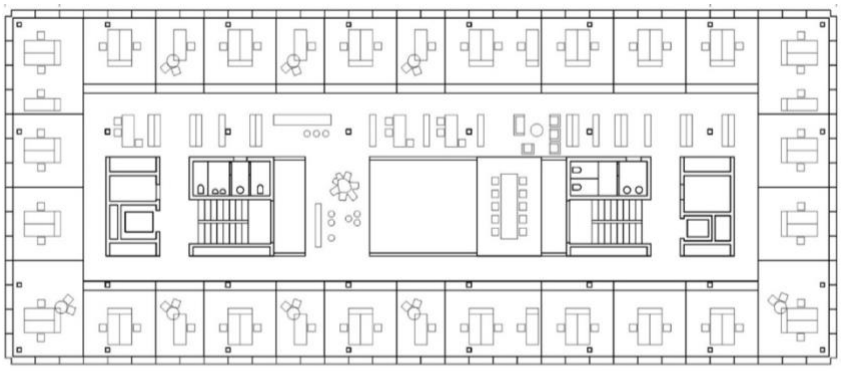


Figure 4. A drawing of a modern cellular office

At the end of the 1970's, a new trend emerged, and the combinational office was born. This was a combination of the cellular office and the open-office landscape. Once again, individuality and health were in focus. Office cells were placed along the sides of the

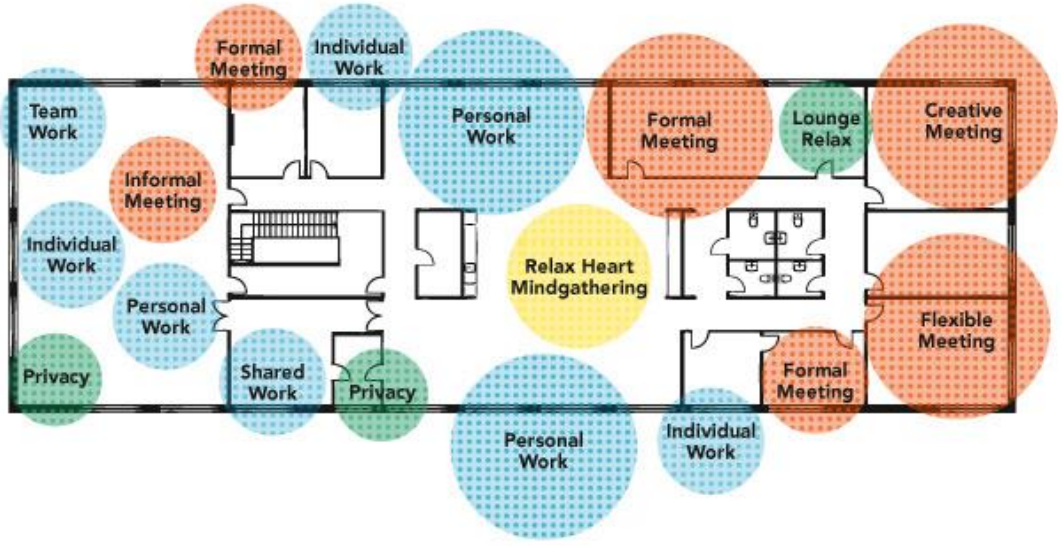
building, with large windows enabling the sun to shine in. The walls were often made of glass in order to create a light and bright office space, full of daylight. The main values of the combinational office were teamwork, well-being and connectedness.

Approaching the 1990's, the advent of new technology and IT-solutions made it possible to work from anywhere on a portable laptop or from a personal computer at home. Offices started to become emptier, with an increasing number of employees working remotely. Together with higher rent expenses for offices, this evolution led to a demand for a new cost-effective office design. This is when the flexible office was created. Flexible offices are similar to open-office landscapes and are designed to house around 60% to 75% of the employees of the company at the same time. The layout was once again open in order to foster interactions between employees. The employees would no longer have an assigned desk or a workstation of their own but choose their work spot according to their current tasks. The space was flexible and non-territorial. Documents in these offices were no longer paper based but stored digitally on a shared server and physical objects were stored in flexible lockers. The flexible offices became particularly popular in companies where teamwork and remote work were at the center. This type of office was the predecessor of the activity-based office, which would become popular a few years later.

An activity-based office consists of different zones for different purposes, e.g. quiet zones, team-based zones and telephone booths. The employees have no fixed desks and they choose to work in the zone that is appropriate for their current work tasks. The difference with a flexible office is that the employee can choose other types of working places than a desk, for example a large table or a couch.

Many large companies are now following the trend of activity-based ways of working and are redesigning their offices to house less people and allow for more flexibility (Telenor, Atrium Ljungberg, SBAB, Svenskt Vatten och Avfall, Swedbank, Kriminalvården, Trafikverket are some of the companies adapting this modality of office in Sweden). But what do we know about the consequences of choosing a specific office design? How does the design of the office affect employees? There is little empirical research on activity-based offices so far and many companies have implemented the design without actually knowing how it will affect their employees.

Figure 5. A schematic example of an activity-based office.



1.2. Problem statement and research question

Previous studies have shown that the lack of territories or spaces to call your own in the office can lead to decreased well-being. The lack of territorial possibilities can lead to increased stress and emotional exhaustion (Laurence et al., 2013), lack of control (Brown et al., 2005), lower job satisfaction and lower satisfaction with the physical environment (Wells, 2000) as well as difficulties to express identity (Elsbach, 2003).

Meanwhile, the non-territorial office design is becoming more and more popular, despite the fact that no one really knows how employees are affected by it. What will happen to employees when they no longer have an assigned space in the office? Will they still engage in territorial behaviors? How does (the lack of) territoriality affect employees?

The aim of this study is to study territoriality within organizations and assess whether territoriality could be correlated to the mental health of employees. The research questions guiding the process were:

RQ1 = To what extent does territoriality occur in non-territorial offices?

RQ2 = How does organizational territoriality affect employees psychologically?

RQ3 = What are the organizational implications of territoriality?

The psychological factors that this thesis will focus on are: personal control, stress, place attachment, self-efficacy, job satisfaction and satisfaction with the physical environment.

1.3. Research gap

Today, territoriality has a well-established role in history, political science and anthropology (Sack, 1986) and it has also been extensively researched in the realm of biology, social psychology and environmental psychology. However, there is little empirical research on territoriality within organizations (Brown et al., 2005; Sundstrom & Altman, 1989) and its connection to office design and organizational behaviors.

To date, research on activity-based offices is limited and the findings are inconsistent. Most of the research on activity-based offices conducted so far tends to focus on practical outcomes such as employee productivity, efficiency and costs. New office layouts are developing at a rapid pace, yet there is so little empirical research on their potential effect on employees' psychological health. The aim of this study is therefore to explore the extent of territoriality across the two office types, which in my knowledge, never has been investigated before. Since there is little empirical research on both organizational

territoriality and activity-based offices, this study is an attempt to fill and connect the two knowledge gaps by applying a variety of multidisciplinary perspectives, using research from disciplines such as psychology, architecture and organizational theory.

1.4. Expected knowledge contribution

Territoriality can serve an important purpose in organizations, both for individuals and for groups. The effects of organizational territoriality are multifold. A lack of territorial possibilities can negatively affect productivity, concentration, job satisfaction, stress, control, general well-being and eventually lead to absenteeism in offices. According to Brown (2005), territorial behaviors have the promising potential to explain many organizational issues and conflicts that are generally claimed to occur because of other distinct reasons.

Therefore, observing and understanding territorial behaviors has the potential to not only give managers a greater insight and understanding to what *actually* goes on in their organization, but it could also help them to more efficiently manage the potential consequences. If managers and organizations can analyze and efficiently handle organizational issues that stem from territorial behavior, it would not only be a cost savior - decreasing absenteeism and minimizing both conflicts and leave rates (Brown et al., 2005), but it also has the potential to generate a healthier work environment with happier employees. Understanding territorial behaviors and how employees use activity-based offices could also be of interest for architects and designers who focus on developing activity-based offices. If architects are aware of the potential effects (both positive and negative) of territoriality, the design outcomes might look completely different in the future.

1.5. Thesis outline

This thesis will start by reviewing earlier research on the psychological impacts (in terms of control, stress, job satisfaction, satisfaction with the physical work environment, place attachment and self-efficacy) of office design. The concept of territoriality and its potential psychological impact on employees will then be discussed and lead to a hypothesis generation. The hypotheses will be tested quantitatively, and the results will be discussed. Lastly the potential organizational implications, limitations, ethical considerations and suggestions for future research will be discussed.

2. Previous research and hypothesis generation

In this chapter, earlier research on the psychological impact of office design and territoriality will be discussed. The chapter will end with an in-depth review of two specific and relevant territorial behaviors. Lastly, the findings will result in a hypothesis generation. To collect the theory, numerous online databases (E.g. Scopus, Google Scholar, Science Direct, Research Gate, JStor) where used. The keywords to find articles spanned from "territoriality" and "personalization" to "office design", "office architecture", "environmental psychology", "organizational territoriality" to the many psychological aspects of the subject (stress, personal control, place attachment, etc.).

2.1. The Psychological Impact of Office Design

Extensive research has shown that the physical office environment can have a significant impact on the well-being of employees (eg. Pejtersen et al, 2011; Brunia & Gosselink 2009; Bodin Danielsson et al, 2014; Brown et al., 2005; Wells, 2000). Ambient settings such as the quality of air, noise levels and lighting (Sundstrom & Sundstrom, 1986), as well as the extent of privacy and territorial behaviors (Brown et al., 2005; de Croon et al., 2005) can affect employees' performance, satisfaction and psychological well-being in different types of offices. However, most of the studies conducted focus on cellular offices and office landscapes. Because the physical environment of the office affects several important aspects of the organizational life that could be crucial for the success of a company, there is a need for empirical research about how activity-based offices affect employees.

"In the best of worlds, employees [in activity-based offices] will have more choices and better tools to get through the workday, get their life together, feel better, have more fun at work and perform better" Gunne (2013)

The reason why so little empirical research on psychological well-being in activity-based offices is available is due to its relatively recent adoption. When Bodin Danielsson (2010) studied the effects of office design on employee health, she found that employees in cellular offices on average reported greater satisfaction with the work environment than employees in office landscapes. The employees in the cellular office were particularly satisfied with noise levels and the opportunities to work in private. Approaching the topic from a different point of view, Van deer Voordt (2003) studied the advantages of flexible offices for an organization and stated that the most common expectations on activity-based offices were that the design would improve efficiency and productivity, lower costs, attract and retain talent and improve the internal and external image of the

company. Furthermore, the activity-based office is also attractive because of its rumored ability to foster social connections, interactions, communication and team work (Appel-Meulenbroek, Groenen & Janssen, 2011). The advantages and disadvantages of activity-based offices seem to be relative to the type of office that adopts it. Hultberg (2019) discussed the current empirical research on activity-based offices in 2018 and concluded that the outcome of implementing an activity-based office design completely depends on what kind of work tasks the employees have. If the employees' work tasks are highly confidential or require a high level of concentration, the activity-based office will not be a suitable alternative (Hultberg, 2019).

The findings available from previous research mainly consist of case studies and are inconsistent and difficult to generalize. Linda Victoria Rolfö discusses this phenomenon in her article "Relocation to an activity-based flexible office – Design processes and outcomes" (2018). She mentions the research of de Croon et. Al (2005) that found an increase in perceived performance after implementing an activity-based way of working, due to improved team-work and communication. However, Rolfös earlier research (2017) and the works of Wolfeld (2010) show that the activity-based office put higher demands (e.g. finding and adjusting a new workspace every day) on employees, leading to decreased performance. Other studies on activity-based offices claim that they lead to fewer distractions (Seddigh et al., 2014), while the studies of Brunia and Gosselink (2009) and Laurence et al., (2013) found that the lack of privacy and personal territory within the activity-based office led to more distractions, lower job satisfaction and higher rates of emotional exhaustion. Interestingly though, when the employees had the chance to personalize their workspace, they felt less stressed and were less likely to experience emotional exhaustion.

Control of the work environment is another aspect that has been studied. Research has shown that employees who feel as if they are in control of their work environment, report better health and well-being (Jones & Fletcher, 2003). Studies have also shown that if the office design does not allow employees to change or personalize the work stations according to their needs, it would have a negative impact on their productivity (Brunia et al., 2016). How the physical environment is designed and decorated therefore seems to have an impact on employees in the activity-based office (Kim et al., 2016).

Some studies of activity-based offices claim that the process of designing and implementing the new office type will affect the employee satisfaction and perceived productivity, however, Rolfö (2018) argues that there are few empirical studies supporting this claim.

As explained in the introductory chapter, this thesis will examine territorial behaviors in

activity-based offices (non-territorial) and cellular offices (territorial) and assess how the potential territoriality is affecting employees psychologically.

2.2. The Concept of Territoriality

This chapter will start out by introducing organizational territoriality and its potential implications in general. It will then dig deeper into territoriality and discuss different territorial behaviors. The reader will be introduced to research on two specific types of territorial behaviors – identity-oriented and control-oriented marking – which will serve as the foundation for the study of this thesis. The potential consequences of the territorial behaviors will be discussed and the chapter will end with a hypothesis generation.

2.2.1. The Origin of Territoriality

Researchers Brown, Lawrence and Robinson defined territoriality in their 2005-article "Territoriality in organizations" as:

"An individual's behavioral expression of his or her feelings of ownership toward a physical or social object''.

Brown and Robinson further defined the concept (2010):

"Territoriality includes behaviors whose purpose is to construct, communicate, maintain and restore one's ownership over organizational objects to which one feels a proprietary attachment "

In the beginning of the twentieth century, researchers first began to study territorial behaviors in animals (Sundstrom and Altman, 1974). The focus of the research was on the biological drivers (survival, evolution) of territoriality. However, in the middle of the 1970's, researchers became interested in studying territoriality within the human population and began to see this phenomenon as a way of organizing people. Research on territoriality had started to shift its focus from the biological perspective (e.g. survival-related) to instead address the cognitive, social and organizational aspects of territoriality (Stokols, 1978).

As the focus shifted and researchers began exploring the functionality of territoriality (Malmberg, 1980) it was suggested that territoriality might be an important way to construct identity (Tuan, 1980) and that territoriality had possible positive effects on social cohesion (Lewis, 1979). Territorial behaviors could also improve group effectiveness (Sundstrom and Altman, 1989) and decrease conflicts, as Rosenblatt and Budd stated in their 1975-article "Territoriality and privacy in married and unmarried cohabitating couples". The research on territoriality therefore undertook a new dimension, looking into how people were psychologically affected by territoriality in a social context.

2.2.2. Territoriality in Organizations

In order to understand how territoriality affects organizations we need to take a look at its psychological foundation. One of the key drivers of territorial behavior is **psychological ownership** (Brown et al., 2005). Psychological ownership was defined by Pierce, Kostova and Dirks (2001) as:

"the feeling of possessiveness and being psychologically tied to an object"

The authors argued that psychological ownership stems from the need for:

1) **Self-efficacy:** Psychological ownership theorists (e.g. Pierce, Kostova and Dirks, 2001 and Duncan, 1981) claim that being in control of an environment (through various forms of psychological ownership) enables individuals to feel efficacious and capable.
2) **Self-identity:** Creating tangible (e.g. having your own desk) or intangible (e.g. through social connections) bonds to an environment is argued to facilitate the communication of one's identity and better comprehend the extent of one's own identity.
3) **A place of one's own (a "home"):** Lastly, psychological ownership is argued in Duncan's article "Home Ownership and Social Theory" (1981) to stem from the need of having a place to call your own, either physical or metaphorical. Brown, Perkins and Brown (2003) argue that the notion of home, can supply a sense of safety and act as a sanctuary that can prime positive behaviors.

In other words, psychological ownership is feelings of attachment towards an object, while territoriality is the behavioral consequence and actions that stem from those feelings (Brown et al., 2005). Individuals who express ownership of a physical space, are more likely to experience responsibility towards the space (Rodgers and Freundlich, 1998). It can be stated that psychological ownership is a "psychological state" while "territoriality is a social-behavioral concept" and needs a social setting to exist – since it is expressed through social actions in social contexts (Brown et al., 2005). Individuals and groups can behave territorial in many aspects of organizational life, not necessarily just towards a physical space or a physical object. People can also behave territorial with regards to roles, relationships, ideas and time (Brown and Robinson, 2007).

So, why is territoriality within organizations important? To begin with, we spend a large part of our lives within the organizations we work for. In fact, over 70% of the working population in America and Great Britain work in offices (Kleeman, 1982) and work is the one place, next to the home, where people spend most of their time (Donald, 1994; Brown et al., 2005). Hence, work is clearly a large part of people's lives. Furthermore, organizational life consists of daily social transactions and dependencies between individuals within the organization, and employees are likely to become attached to physical spaces or objects in the office (Brown et al., 2005). The social nature of organizations are therefore fertile grounds for territorial behaviors - a subconsciously important aspect of everyday life for employees. Earlier research has also shown many different benefits and drawbacks of territoriality within organizations. Territorial behaviors at work can, for example, lead to reduced task performance and reluctance to new ideas or collaborations, due to the fear of infringing on someone else's territory (Brown et al., 2005).

The impact of territoriality on employees and organizations will be further elaborated upon in the following chapter. With its potential influence on organizational life, it should be a priority for managers and organizations to understand the implications of organizational territoriality.

2.3. Territorial behaviors: Identity-oriented, control-oriented and anticipatory defending

Territoriality can be divided into two main categories: marking and defending. In this chapter, you will learn more about these behaviors and how they can be exerted in an organizational context.

2.3.1. Marking

Marking behaviors are split into two subcategories: control-oriented behavior and identity-oriented behavior. These two behaviors occur when employees construct or communicate to their surrounding that they have an exclusive attachment to organizational objects (Brown & Robinson, 2010).

2.3.2. Control-oriented marking

Control-oriented marking involves marking an object, within the organization, with symbols or other objects (Altman, 1975; Becker and Mayo, 1971). The employee who engages in control-oriented markings communicates territorial boundaries and psychological ownership. The employee could be placing a bag on a chair, to mark that the seat belongs to her or him. This communicates to other employees that the territory is claimed and discourages other employees from taking the "marked" chair.

2.3.3. Identity-oriented marking

Identity-oriented was defined by Sommer (1974) as the beautification or decoration of an object, as a way of expressing the identity of the owner. It also entails modification of an object (e.g. changing the height of a chair). Another common example of identity-oriented marking could be bringing a photograph of a loved one and placing it on a desk where you work (Brown et al., 2005). This behavior enables people to create and communicate their identities, both to themselves but also to their surroundings and it enables employees to create their own image and take control over how their colleagues perceive them (Brown & Robinson, 2010).

2.3.4. Defending

Defending markers could be either anticipatory or reactionary. When an individual fears that someone might trespass into their territory, or if the territory actually becomes infringed upon, then they tend to act defending towards their territory (Brown and Altman, 1981).

2.3.5. Anticipatory defenses

Anticipatory defenses are non-communicative ways of hindering infringement. An anticipatory defense action could be installing a password on a computer, to prevent other people from accessing it. In short, anticipatory defenses prevent violation of territorial boundaries (Dyson-Hudson & Smith, 1978).

2.3.6. Reactionary defenses

Reactionary defenses are reactions to an infringement and consists of an emotional expression of disagreement from the individual whose territory is infringed upon (Brown, 1987). The goal of reactionary defenses is to destabilize the infringer and reestablish the territory. An example of a reactionary defense could be sending an angry email to an individual who has taken your seat (Brown & Robinson, 2010).

This thesis will focus on marking behaviors and pay less attention to defending behaviors. This choice is due to that marking behaviors in offices have been extensively researched and previous researchers have developed reliable measures on marking-behaviors, while defending mechanisms may be difficult to assess in a self-assessment study such as this one due to their, often, subconscious nature.

2.4. The Organizational and Psychological Consequences of Identity-oriented and Control-oriented Marking Behaviors

This chapter will introduce the organizational and psychological implications of identity-oriented and control-oriented marking behaviors and will conclude with a hypothesis generation.

2.4.1. Why do employees engage in personalization?

As told in the previous chapter, one way to express psychological ownership is through territorial behaviors. Since identity-oriented marking, also called personalization, is a form of territorial behavior, it is also an expression of psychological ownership. By personalizing their work environment, employees take ownership of their workspace. Personalization is rooted in the need to create and communicate an identity and in the need of having a place of one's own (Brown et al., 2005). The term 'personalization' itself is argued to stem from environmental psychology and is another term for identity-oriented marking, which means modifying or marking a physical or social object with an individual's identity (Sundstrom, 1986).

Carrère & Evans (1994) studied a winter crew living in a research station in Antarctica and examined how design elements influenced the habitability of the isolated environment (through self-report and video logs). They found that inhabitants personalized their sterile and low-stimulus environment in order to make it feel more unique and humorous. In that case, personalization of the environment muted the negative effects of living in a confined and isolated environment (potential depression, sadness and loneliness).

One important purpose of personalization is to differentiate one's workspace from others (Wells, 2000). The objects that the employees choose to display through personalization is a way of showing the organization who they are - what they stand for and what they have accomplished (Laurence et al., 2013). This form of marking also lets individuals express multiple aspects of their identities, from their professional achievements (by displaying diplomas or degrees) to aspects of their personal lives, such as their marital status (by displaying pictures of a partner).

Brunia and Gosselink (2009) refer to researchers Van Deer Voordt and Van Meel's 2002-article (which is not translated to English) and argue that personalization not only helps employees to differentiate themselves from others in the workplace, but that it also has the potential to make employees feel at home and familiar with the workplace. The authors claim that the reasons for engaging in personalization often are either practical, recognitional, territorial or expressional (express the employee's identity). Personalization has been shown to mitigate the negative effects of adverse working conditions and employees who personalize have also shown an improved performance in negotiations (Brown and Baer, 2011) and greater attentional capacity (Raanaas et al, 2011).

Unsurprisingly, the need to personalize differs amongst employees and organizations. However, Wells (2000) argues that the primary predictors of personalization are not personal but organizational. She argues that company policies on personalization and whether employees have a workspace of their own, will affect the amount of personalization in a larger extent then the employees' personal needs for psychological ownership. Donald (1994) found that organizations with a strong restrictive policy on personalization had a higher risk of experiencing conflict and apathy amongst their employees, which in turn could lead to decreased productivity.

2.4.2. Personalization in a non-territorial office environment

In non-territorial offices, personalization is often limited and at times even prohibited (Brunia and Gosselink, 2009). The extent of personalization also depends on how accessible the office is for visitors and clients. Personalization exists in a higher extent if an office is only accessible for employees and managers. If an environment is accessible to visitors and clients, organizations often choose to strive for company uniformity and therefore implement a cohesive personalization policy, often strictly limited to the organization's desire for a certain type of image (Scheiberg, 1990).

However, despite strict policies against personalization in non-territorial offices, it still occurs. The findings from Brunia and Gosselink's (2009) study on personalization in non-territorial offices showed that territoriality within a non-territorial office was more common that hypothesized. Many employees engaged in territorial behaviors, through both identity-oriented and control-oriented marking. It was common for employees to choose the same spot to work in every day, despite the lack of desk ownership and despite

that the managers encouraged the employees to follow the activity-based way of working by working in different zones. Employees also personalized spaces that did not "belong" to them. According to the study, it was the employees' way of signaling that they often used the space they had marked. At all floors of the office building there were unspoked rules between employees about which desk belonged to whom, despite that the office officially was a non-fixed desk workplace. Brunia and Gosselink (2009) concluded that the act of personalization and marking territory seemed to be a human need. It was a way for employees to humanize an otherwise sterile and performance-driven organization. When they personalized, they felt differentiated from other employees, similarly to what was discussed previously by Wells (2000). The differentiation made them feel less replaceable and less like a "cog in a machine". Lastly, the researchers also concluded that personal control was a key aspect of territoriality. The employees of the non-territorial environment did not like the aspect of not being in control of the environment. Due to the open design of the office, they were not able to choose privacy. They did not have any doors to close behind them and therefore they could not flee from distractions. This made them highly dependent on the good behavior of co-workers. Due to restriction policies on personalization and due to a lack of desk ownership in non-territorial offices, it is also plausible to think that employees in a non-territorial setting would personalize less. That leads us to a first hypothesis:

H1: Employees in a non-territorial office personalize less, than employees in a traditional office

In the next chapter, I will elaborate upon a few psychological factors and phenomena that earlier research has connected to the act of identity-oriented marking. At the end of each part, I will present one or more hypotheses that connect to the findings presented below.

2.4.3. Control

Numerous researchers have claimed that identity-oriented marking has a significant impact on feelings of control (Wells, 2000; Wineman, 1986; Halpern, 1995). As previously discussed, personalization has been suggested to lead to a stronger sense of personal control in the office (Edney and Buda, 1976). The need for personal control might be one of the key reasons as to why people personalize (Wells, 2000; van der Voordt and van Meel, 2002). Personalization could though also be a way of showing others that one has one's own "personal zone of control" (Sundström, 1986). However, personalization is not just a way to control the environment – it could also be an attempt to take control of one's identity (Baldry, 1999).

Brunia and Gosselink's (2009) study on a non-territorial office environment is especially interesting with regards to personal control. In their study, employees in the non-territorial, activity-based office reported that they experienced a lack of control due

to the open space. Therefore, personalization was their way of taking control of the environment. Employees who engaged in personalization said that they created a "recognizable" and "familiar" work environment, crafting a feeling of certainty knowing that their preferred workstation would belong to them. The territorial marking and the certainty that came with it, gave the employees a sense of tranquility. They did not have to worry whether someone else had taken their space, because they had already marked it as theirs.

Assuming that personalization leads to a higher sense of control, it leads us to the second hypothesis of this study:

H2: Personalization of the workspace is positively correlated to personal control, in both the traditional office and the non-territorial office

The aforementioned research also suggests that there would be a difference between a traditional office setting and a non-territorial one. The reports of unwanted interruptions, low levels of privacy and restriction policies on territoriality in the non-territorial office, give reason to believe that employees in a non-territorial office might experience lower sense of control than employees in a traditional office. This, due to the lack of control over the environment, leads to the third hypothesis:

H3: Employees in a non-territorial office experience lower sense of control, than employees in a traditional office

Personalization is not the only territorial behavior used to feel in control, however, the employees in the non-territorial office engaged in control-oriented marking to a high extent. They had their favorite work spots in the office, and they gave clear signals to their environment that the seat belonged to them (despite being in discordance with the office policy). They put clothes on chairs and coat racks to mark that they were present, so that no one else would claim their seat. To test if this result is generalizable I want to explore to what extent control-oriented marking occurs in both the traditional and non-territorial office. There should be no need for control-oriented marking in the traditional office space, since desks are already assigned to the employees and they should not feel the need to mark them again. However, in the non-territorial office setting, control-oriented marking could occur (e.g. Brunia & Gosselink, 2009). That leads to the fourth hypothesis:

H4: Control-oriented marking exists in a higher extent in the non-territorial office, than the traditional office

2.4.4. Implications of personal control

As we have seen, personal control plays a fundamental role in organizations because it seems to be related to other aspects of employee health and well-being in the workplace. Satisfaction, stress, performance and emotional exhaustion are some of the aspects studied so far (Averill, 1973 and Barnes 1980, Becker, 1990 and Lee & Brand, 2005) but personal control has also been linked to improved mental health and well-being of employees (Jones & Fletcher, 2003; Halpern, 1995).

2.4.5. Place Attachment

Place attachment could be described as a phenomenon that occurs when an individual feels comfortable and secure in a certain place. With positive feelings attached to a place, the individual can start to form an affective bond with that particular place (Hidalgo & Hernandez, 2001). This is called place attachment. Jennifer Eileen Cross further defines place attachment in her article "Processes of Place Attachment: An Interactional Framework":

"Place attachment is the interactional processes of associating place with meanings and emotional affection, which may occur at the individual, group and cultural level"

It has been argued that personalization may strengthen an individual's emotional attachment to their environment (Elsbach, 2003; Wells, 2000). Brown (1987) suggested that personalization in the home environment could lead to a strong sense of attachment towards the home. Goodrich (1986) believed that personalization of the work environment could lead to a stronger attachment to the work environment. Brunia and Gosselink (2009) also discussed, as briefly mentioned in the earlier chapter, the benefits of personalization on the employees' sense of familiarity of the work place. They concluded that employees seemed to be more attached to an environment, when it felt familiar and "homely". Since we know from Wells (2000) that personalization can be a way to make the environment more familiar – it is reasonable to assume that personalization would be positively correlated to employees' place attachment at work. Since the above-mentioned research argues that territorial behaviors could strengthen place attachment, what happens in a non-territorial context where territorial behaviors are thought to be constrained by policies and the architecture of the environment? If the possibilities to act territorial are reduced, will the sense of place attachment be lower? This leads to the hypotheses on place attachment:

H5: Employees experience lower levels of place attachment in a non-territorial setting

H6: Personalization is positively correlated to place attachment

2.4.6. Stress

One of the key triggers of emotional exhaustion is consistent stress over an extended period of time. Emotional exhaustion is a complex phenomenon, consisting of many different feelings (e.g. lack of control, depression and apathy) with costly consequences for organizations such as decreased job performances and voluntary turnover (Laurence et al., 2013; Wright & Cropanzano, 1998). Personalization has been shown to help employees to cope with stress and become more relaxed and inspired (Wells, 2000) by reminding them of their lives outside of the office (Harris, 1991) and mitigating the negative effects from insufficient privacy in the workplace (Altman, 1975). Earlier research on personalization therefore suggests that personalization could be used as a mitigator to decrease the negative impact of stress on employees.

In a study by Laurence et al. (2013), the researchers conducted a survey on 87 white-collar workers at a large Midwestern (US) University. They investigated the correlations between emotional exhaustion, experience of privacy and workspace personalization. Their hypothesis, which was supported by their study, was that personalization would have a mitigating effect on emotional exhaustion in a low-privacy context. They argued that personalization enabled the employees to create a sanctuary at work, and therefore, despite the fact that the low levels of privacy had a negative impact on the employees' health, creating higher levels of emotional exhaustion, personalization could counteract those feelings. High levels of privacy could function as a shield against distractions and undesirable interferences. Similarly, personalization of the workspace in a low-privacy context had a similar effect - calming the employees who engaged in the personalization. Hence, the results indicated that a lack of personalization intensified the negative outcome of low levels of privacy, which in turn led to increased emotional exhaustion. By personalizing the workspace with personal objects, the employees would therefore be better equipped to handle stress that stemmed both from work tasks and from distractions, which seemed to be more common in non-territorial offices than traditional office types**.**

As Barnes (1980) found that personal control could reduce stress, it is plausible to assume that, since personalization has been shown to lower levels of emotional exhaustion in a low privacy context**,** it would also have a negative correlation to stress. This could be even more true for employees in a non-territorial office, who due to the low privacy context possibly could experience a lack of control (Laurence et al., 2013). It could further be assumed that territorial behaviors in a non-territorial office could be a way of taking control of the environment and therefore reduce stress. This leads to the hypotheses:

H8: Employees in a traditional office environment experience lower levels of stress, than employees in a non-territorial office

H9: Employees who personalize their environment experience lower levels of stress than employees who do not

H10: Personalization has a negative correlation to stress

2.4.7. Job Satisfaction and Satisfaction with The Physical Work Environment

Lee and Brand (2005) investigated the effects that distraction, flexible workspace and control of the physical work environment had on perceived performance, satisfaction and group cohesion at work. They found that more personal control of the physical workspace (for example through modifications or adjustments) led to higher job satisfaction. The easy access to group interactions also led to higher group cohesiveness and job satisfaction.

Similarly, previous studies indicate that territorial behavior could be associated with psychological well-being (Wells, 2000; Brown et al., 2005; Altman, 1975; BOSTI, 1981; Sundstrom et al.,1982). According to BOSTI, Buffalo Organization for Social and Technological Innovation, employees with more room to display personal objects are more satisfied with their physical work environment, than employees with less space for personal display. Personalization has been positively linked to higher satisfaction with the physical work environment (BOSTI, 1981; Wells, 2000; Sundstrom et., al, 1980). Job satisfaction has in turn been shown to correlate negatively with depression and anxiety and has also been shown to have a positive impact on physical health. Hence, personalization could lead to better performance and higher job satisfaction (Scheiberg, 1990 and Donald, 1994).

But what would happen if personalization was prohibited in the workspace? Becker (1990) argues that it indirectly could lead to conflicts, turnover and absenteeism. Interestingly, as seen in the research from Brunia and Gosselink mentioned in chapter 2.2.3, personalization happens in the non-territorial workplace despite its prohibition. However, employees who were satisfied with the non-territorial concept, tended to personalize in a lesser extent than employees who were dissatisfied with the concept. On the basis of these observations we could assume that the allowance of personalization can lead to greater benefits for the organization, than not allowing it.

This leads us to the last hypotheses of this study:

H10: Personalization is correlated to a greater job satisfaction

H11: Personalization is positively associated with satisfaction with the physical environment

3. Methodology

This chapter will discuss the scientific approach of the study, the research design, survey design, reliability and validity, data quality.

3.1. Scientific Approach

There are three common approaches to address the relationship between theory and empiricism when conducting research in social sciences. In this chapter, a brief explanation of each concept will be presented, as well as a motivation of the concept used in this study (Bryman and Bell, 2013).

The *deductive* approach is, according to Bell and Bryman (2013), the most common in social sciences. The deductive approach is based on theoretical assumptions. Building on theory, hypotheses are created and tested. The hypotheses must be operationally effective. The theory and the hypotheses that are deducted will control how the data collection is carried out (Bell and Bryman, 2015).

However, with an *inductive* approach, the sequence differs from the one above. In this approach, theory is often the result of an empirical study. It means that general conclusions could be drawn from the observations made in the empirical study.

The third most common approach, the abductive approach, is similar to both the inductive and deductive approach. However, the abductive reasoning often emerges from "surprising facts" and the research process is designed to explore that phenomena (Saunders et al., 2012).

For this study, a deductive approach was chosen. Even though there is not yet much research regarding the concept of non-territorial offices, there is a vast amount of research of the subject of territoriality and marking behaviors. The goal of the study was to examine organizational territoriality and its potential implications on various psychological factors such as perceived personal control, experienced stress, job satisfaction and satisfaction with the environment. Therefore, several hypotheses were drawn from existing theory to see if the theory could be applied to a non-territorial setting. A deductive approach was deemed suitable to test the accuracy and relevance of existing theory within a new context. The advantages of a deductive approach are the possibilities to measure correlations quantitatively and the potential possibility to generalize results (Gulati, 2009). The hypotheses are in other words *deducted* from theory, to then be tested.

The aim of this study was to have an ontologically positivist approach. Ontology is defined by Blaikie (2010) as: "The science or study of being" and could roughly be explained as how the researcher approaches the nature of reality. Is the researcher subjective or objective? Positivist research aims to be objective and independent of

social actors, with a low interference of the researcher. Since this study was a quantitative study, distributed online through random device engagement technology, the interference of the researcher was considered to be low.

3.2. Research design

For the purpose of collecting data on territoriality and its potential psychological impact on employees, a cross-sectional (measuring how participants feel during a single point in time) and quantitative method was chosen. Even though a qualitative method would have been interesting to further investigate the deeper meanings and patterns of organizational territoriality, the aim of this study was not primarily to discover deeper meanings behind the behavior, but to detect if the behavior was present in a non-territorial setting and how the differences in the extent of territorial behaviors affected the employees, in terms of a number of psychological factors. The study was comparative, comparing employees in a cellular office with employees in an activity-based office. Since there are reliable and validated quantitative measures on territorial behaviors and the psychological factors chosen for the study, the quantitative approach was further deemed to be the most appropriate. The study is relational and descriptive, since it seeks to measure potential correlations between variables and to describe the extent of territorial behaviors in different work environments (Bryman and Bell, 2013).

To quantitatively test the generated hypotheses, an online, self-completion survey was assessed the most suitable. According to Bryman & Bell (2013) a self-completion survey is the most common way of collecting data in quantitative research. Due to the relatively sensitive nature of territoriality and the psychological factors of the study, the potential anonymity of an online survey was also deemed beneficial. Furthermore, an online survey makes it possible to gather a great amount of data from a large area in a short time. This sample in this study is white-collar workers from all over Europe, which made the online survey a suitable option. Since many of the psychological factors studied in this thesis could be difficult to observe (Bhattacherjee, 2012), a quantitative approach through self-administration was also deemed to be the best method for the intended purpose.

3.3. Survey Design

The survey consisted of eight blocks. In total there were 44 questions, many of them presented in matrixes. After every block, participants were given the opportunity to write a comment in a comment section. To give an overview of the study, the different blocks will be presented briefly below. You will find the actual questionnaire in the appendix (2). The overview of the table will be followed by introductions to each measure used in the questionnaire.

Table 1. Overview of the questionnaire

Block	About
#1	Introduction. The participants were shortly introduced to the study. They were told that the aim of the survey was to explore how they felt in their office environment and what their relationship to their workspace was
#2	General questions regarding office type
#3	General questions regarding work life
#4	Satisfaction with the physical work environment
#5	Territorial behaviors
#6	Assessment of stress
#7	Attitude towards work, personal control and self-efficacy.
#8	Final questions on job satisfaction, age, gender and for how long the participants had been employed at their current employer. Lastly, participants were encouraged to upload a picture of their office. They were also asked to rate the usefulness and comprehensiveness of the survey

3.3.1. Job Satisfaction

Job Satisfaction was assessed by a 1-item scale by Björklund and Sjöberg (1995). The participants rated how satisfied they were with their job in general, using a 7-point Likert-scale ranging from 1 (= Extremely dissatisfied) to 7 (=Extremely satisfied). It is difficult to assess the reliability of a single-item measure, however research by Wanous and Reichers (1997) suggests that single-item scales on overall job satisfaction generally show high validity. They estimate a Cronbach's alpha close to 0.70 for single-item measures on general job satisfaction.

3.3.2. Satisfaction with the Physical Work Environment

To measure the participants satisfaction with the participants' physical work environment, the Veitch, Farley and Newsham scale "Environmental Satisfaction in Open-plan Environments" was used. The scale was inspired by, and partially based on, the Stokols and Scharf scale for assessing employees' ratings on facility performance (1990). The original measure consisted of 21 questions but only 17 items were deemed relevant for this study. One additional question was added to the measure: Satisfaction with the physical design of the office. The items showed an internal consistency measured through Pearson's correlation of $r > 0.44$. The reason why the internal consistency is not higher is that the measure assesses different aspect of the environment. Therefore, the

items will not necessarily be strongly correlated (e.g. view and sizer of workspace). However, the measure had an excellent Cronbach's alpha of 0.942.

3.3.3. Territoriality

To assess the occurrence and extent of territorial behaviors, "The Territoriality Measure" by Graham Brown (2005) was used. Brown developed this measure since he could not find any other measures on organizational territoriality in previous research. Since it is a novel scale, its validity and reliability could be questioned. However, Brown did rigorous tests of the measure where it showed satisfactory validity and reliability (Brown et al., 2005). The measure originally consisted of 27 items, however 11 items were chosen for this study. Many of the original items were thought to be overlapping and due to the overall length of the study the extensive original measure was thought to impose a risk of causing participant fatigue. The main focus was on identity-oriented markings. However, a few items assessing control-oriented, anticipatory defending and reactionary defenses were also included. The 11-items were assessed in terms of how frequently the participants engaged in organizational territorial behaviors and was measured on a 7-point Likert Scale ranging from 1 (= Not at all) to 7 (= All the time). The different marking behaviors have shown to not necessarily be correlated to one another (Brown et al., 2005). This means that one could be engaged in identity-oriented marking, but not anticipatory defending. The internal consistency was therefore measured by using Pearson's correlational coefficient for each type of marking behavior. Identity-oriented marking showed a good internal consistency, greater than 0.62, while control-oriented marking had an internal consistency of 0.83. Anticipatory defending and reactionary defenses showed an internal consistency of $r > 0.61$. All items together had a Cronbach's alpha of 0.936.

3.3.4. Personal control

To assess perceived personal control, three items from the "Intresse för jobbet (Interest in work)" survey constructed by Lennart Sjöberg and Christina Björklund (1995) was used. An example of an item could be: "I have control of my job and everything related to it". The correlation between items was satisfactory ($r > 0.58$) and indicated a good internal consistency. The items in total showed a Cronbach's alpha of 0.839. Due to its good internal consistency, the measure was indexed.

To further assess personal control at work, participants completed Rigotti, Schyns & Mohr's (2008) "Occupational self-efficacy scale". The scale consisted of six items, that participants were to assess on a 6-point Likert scale (from 1= "Not at all true" to 6 = "Completely true"). An example of an item could be: "I can remain calm when facing difficulties in my job because I can rely on my abilities". High values on the scale meant high occupational self-efficacy. Self-efficacy has been connected to personal control in previous studies (Bandura, 1977) and was therefore deemed an additional measure of personal control in the workplace. For this study, there was a good internal consistency

with correlations between all items greater than 0.55. The items in total further showed a high reliability with a Cronbach's Alpha of 0.915, considered an excellent internal consistency. Due to its high internal consistency, the measure was indexed.

3.3.5. Place Attachment

Participants' feelings of attachment to their workplace was assessed using Williams and Roggenbuck's (1989) "**Place Attachment Scale**". It originally consisted of 13 items but was narrowed down to four items for this study. Participants were asked to evaluate items like: "This place means a lot to me", on a 5-point Likert scale ranging from 1 (= Definitely not) to 6 (= Definitely yes). The items showed good internal consistency ($r > 0.5$) across all items and a Cronbach's alpha of 0.876, which was considered to be good. Due to its good internal consistency, the measure was indexed.

3.3.6. Perceived Stress

To assess participants perceived stress levels, the "Perceived Stress Scale (PSS)" by Cohen, Kamarack and Mermelsten (1983) was used. It originally consisted of 14 items but was first narrowed down to four items showing the highest internal consistency. The participants had to assess how frequently they had experienced feelings of stress during the last month on a 5-point Likert scale ranging from 1 (=Never) to 5 (=Always). An example of an item could be "Felt nervous and stressed". The internal consistency for all items in total was high ($r > 0.65$). The Cronbach's alpha for these items were 0.903, which was deemed excellent. Due to its good internal consistency, the measure was indexed.

3.3.7. Variables

The *independent* variable of the study was the office type the participant belonged to. They either worked in an activity-based office or a cellular office. This was thought to have an impact on several psychological factors, such as such as perceived control, stress, satisfaction with the physical environment and job satisfaction. Hence, the psychological factors were the *dependent* variables of the study. Territorial behaviors were both used as independent and dependent variables.

3.4. Pilot test

Before the main study was distributed, a pilot study was run to test the quality and comprehensibility of the questions. A pilot study tests the quality of the study and can lead to an improved main study in terms of reliability and validity (Bryman and Bell, 2013). A pilot study was considered especially important since the study was distributed to participants all over Europe and the risk for language barriers therefore increased. The survey was constructed in Qualtrics and distributed through the PollFish polling service.

3.4.1. Procedure

The distribution through PollFish was based on RDE - random device engagement. The randomized nature of this method helps to ensure external validity. Participants were offered a potential reward (20€ gift card on Amazon) in exchange for their participation. The number of participants in the pilot study was 50, as recommended by Malhotra (2008). The aim of the pilot study was to test if participants understood the questions and primarily to see how participants responded on multiple-choice questions regarding office types.

There was one screening question of the pilot study: "Do you work in an office with more than 20 people?". This was recommended by Wells (2000) to ensure that the participants worked in an office that was a socially dynamic setting. Since territoriality needs a social setting to exist, it was important to not include offices with fewer employees than 20.

3.4.2. Sampling and sample

The participants of the pilot study consisted of 50 white-collar workers from all over Europe. The requirements to participate in the study was to be employed for wage and be over the age of 18. To see the distribution of gender for the sample, see Appendix (1). Another requirement was that participants would work in an office with more than 20 employees, as recommended by Wells (2000) due to the fact that territorial behaviors might be difficult to detect and analyze when the context entails less than 20 employees.

3.4.3. Results

Firstly, participants were to describe their office environment by choosing from several options in a multiple-choice question. Many participants chose only one alternative (e.g. "I have a fixed desk") but did not choose what kind of office environment they were in. This was problematic since the rest of the survey was dependent on the office-type variable. There was no clear introductory text on what the different office types meant, which could have led to confusion if participants were not aware of the name of the office type they worked in.

The screening question presented above made it possible for employees of all kinds of office environments to take part in the study, therefore, another screening question was added to the main study. In the second screening question, participants would choose if they worked in either a cellular office, an activity-based office or another type of office. If the participant chose the last option, they would be opted out before starting the survey. A goal quota of 50% was set for each answer option, to ensure that it would be a balance between the different office types.

3.5. Main study

After the results from the pilot study were analyzed, the multiple-choice questions were removed and simplified. Instead of being able to choose from a multiple office types, including open office landscapes, participants could choose if they worked in a cellular office, an activity-based office or none of them. The different offices types were introduced and clearly described in the screening question to ensure that participants knew what the different office types meant. The language used was considered to be simple and not overly complicated for non-English speakers. The participants who reported that they did not work in any of the office types were disqualified from the study. Lastly, the participants were assured anonymity and the participation was fully voluntary.

3.5.1. Procedure

The main study was distributed through the polling service PollFish. PollFish is an online survey platform with a global reach, distributing surveys by using RDE – random device engagement. This method is according to PollFish the "future of market research" since it engages participants in their natural habitat. In order to use PollFish, you need a username and a password. Through PollFish it is possible target certain populations by specifying requirements regarding e.g. age, employment and location.

3.5.2. Sampling and sample

The participants of the main study consisted of 280 white-collar workers, based in offices all over Europe. They completed the survey in exchange for a variety of rewards (e.g. 20£ gift card on Amazon). Initially, the questionnaire was reached by 709 people all over Europe. Only participants who were employed for wage and were over the age of 18 were targeted. Two initial screening questions through PollFish were presented. The aim of the screening questions was to ensure that the participants worked in an office environment consisting of more than 20 people and that they either worked in an activity-based office or in a cellular office.

The number of participants who passed the screening questions through PollFish were 280. However, in order to ensure validity, one of the screening questions was repeated after the participants had been re-directed to the Qualtrics survey. If the participants gave different answers on the first screening question (through PollFish) and the second screening question (through Qualitrics), by choosing the option that they did not work in either office types (for the second screening question), they were immediately

disqualified. Out of the 280 participants who were re-directed to the survey, 7 were screened out in the second screening. The final response data therefore consisted of 273 participants.

The aim was to get an even spread of employees from both office types, applying a quota of 50/50 for each office type.

3.6. Statistical methods

The statistical software used to analyze the results was IBM SPSS Statistics. The aim of the analysis was to assess descriptive statistics, correlational values and see if differences between the office types were statistically significant. Correlations were tested through bivariate-analysis, using the Pearson correlation coefficient (*r*). Statistical significance regarding the difference in means was analyzed through Independent samples tests and One-way ANOVA (Welch's test). The internal reliability of each measure was tested using Pearson's correlational coefficient and Cronbach's Alpha.

3.7. Reliability and validity

Reliability concerns the consistency, conformity and reliability of a measure or a study. Two crucial factors to take into account when assessing the reliability of a measure are stability and internal consistency reliability (Bryman and Bell, 2013). Stability means that if a measurement is consistent over time, the measurement should produce the approximately the same results if the study was replicated. Internal consistency reliability tells how well a measure is measuring what it is supposed to measure.

Because of time limitations, it was not possible to replicate or re-test the study within the time constraint and the stability of this study could therefore not be decided. Because of this, it is impossible to say if the study would generate the same results if it was conducted again. Internal consistency was measured by applying an advanced (and automated) split-half method on each measurement used in the study to assess that they generated a Cronbach's alpha of 0,7 or above. A Cronbach's alpha below 0,7 is considered an acceptable level of internal consistency (Bryman and Bell, 2013). The majority of the measures used in this study have also shown high internal consistencies in previous studies. Lastly, since the conduction of a pilot test also is claimed to increase reliability (Bryman and Bell, 2013), the reliability of this study was considered satisfactory.

Validity concerns if a measure actually measures what it was intended to (Bryman and Bell, 2013). There are many ways to assess the validity of a study. External validity is

one way to measure construct validity and concerns whether the results of a study could be generalized or not (Bryman and Bell, 2013). The participants of this study were a randomized selection of white-collar workers from all over Europe. Participants were reached through RDE (random device engagement) and were therefore thought to be independent of each other. Unlike most studies on activity-based offices, this study is not a case study. Therefore, the participants are more likely to make up a sample that is representative of the general population. However, since the study only focuses on white-collar workers, nothing can be said of its generalizability on other types of job environments, e.g. for blue-collar workers. The sample population could therefore only be claimed to be generalizable for contexts consisting of white-collar workers. The number of participants working in the cellular was approximately half of the number of participants that worked in activity-based offices. The relatively low number (N=89) of participants from the cellular office could negatively impact the external validity, making it more difficult the generalize the results.

Internal validity often concerns causality and whether one variable causes the effect on another variable (Bryman and Bell, 2013). One way to ensure internal validity is to avoid systematic selection bias by randomizing the assignment of the study. Since the participants in this study were chosen through random sampling (randomized device engagement), the risk for bias is eliminated which strengthens the internal validity.

Ecological validity, also called Mundane validity, tells us if the results from the study mirrors what is happening in the real world. To increase ecological validity, a study can be made as similar as possible to a real-life situation (Brewer, 2000). Although it is impossible to pinpoint the exact location of the participants (if they were at work, at home, etc.), the participants were reached by the study while engaged in an app on their own portable device. They were asked questions about their everyday work-life and their own feelings. The theme of the study concerned the participants real life and not a simulated situation or experiment. The ecological validity was therefore believed to be satisfactory. If the study had used a qualitative method, for example by conducting interviews, there is a risk that the ecological validity would have been affected. An interviewing situation could be perceived as unnatural and therefore have a negative impact on the validity (just as in the Hawthorne-experiment!) (Bryman and Bell, 2013). However, even if a quantitative study such as this one aims for high validity in all aspects, participants could experience the situation of answering a questionnaire to be unnatural and inconvenient. The questionnaire was also quite extensive, which could make participants tired and remind them of the unnatural character of the situation of filling in a survey. This has the potential to negatively affect the ecological validity (Bryman and Bell, 2013). Despite this, the ecological validity of the study was considered satisfactory.

3.8. Data quality

Data cleansing was performed on the final data from the 273 respondents in order to strengthen the quality of the results (Malhotra, 2008). After the data was cleansed, 258 cases remained. Out of the 273 respondents, 15 of the cases were either incomplete or considered inoperable and therefore removed as recommended (Bryman and Bell, 2013). Six participants had stated that they were below 18 years old. Two participants had written comments in the comment section that they in fact worked in non-white collar jobs. For example, one of the participants worked as a chef but had access to a cellular office once in a while. This was deemed problematic and the cases were therefore excluded. The rest of the excluded participants had left multiple questions unanswered. All in all, 15 cases were removed after the data cleansing. After the cleansing, the quota of participants in each office type was 34% (cellular office) resp. 66% (activity-based office).

4. Results

In total, 258 responses were analyzed. The quota of 50/50 for the different office types was not reached and the final results included 88 participants (34%) from cellular offices and 169 participants (64%) from activity-based offices. The mean age for participants was 37 in the activity-based office and 40 in the cellular office. The participants consisted of 113 women, 144 men and 1 person who did not want to state their gender. In this chapter, the results will be presented in the same order as the hypotheses were introduced in the theory chapter. Each hypothesis will be tested.

Table 2. Sample demography

	Activity-based office	**Cellular office**
Mean age	37	40
Females	70	43
Males	99	45
Other / Prefer not to say, n	0	1

Activity-based office, n = 169. Cellular office, n = 89.

4.1. Personalization

The first hypothesis explored the extent and frequency of personalization within the different office types. The number of respondents from the activity-based office was 169, and the number of respondents from the cellular office was 88.

Table 3. Identity-oriented markings and personalization

Office type	**Activity-based office**		**Cellular office**	
Identity-oriented markings	M	SD	M	SD
A) Brought in personally meaningful photographs (eg. friends, family, pets, activities)	3,89	1,715	3,80	1,648
B) Displayed artwork in my workspace	3,92	1,681	3,57	1,824
C) Displayed quotes, expressions, motivational phrases in my workspace	3,92	1,759	3,44	1,982
D) Posted personal achievements (e.g., qualifications, awards) in my workspace	3,91**	1,747	3,11**	1,873
E) Put things in the workspace that represent my personal hobbies and interests	4,09	1,632	3,66	1,819
F) Brought in items or changed the workspace to make me feel at home	4,03	1,652	3,94	1,645
G) Personal items in total at your workplace	4,53	4,396	4,64	3,650

**. Correlation is significant at the 0.01 level (2-tailed).

The descriptive report showed minor variations in the extent of personalization in the different office types. In the cellular office, the most engaged in identity-oriented marking behavior was F) "Brought in items or changed the workspace to in order to feel like home" (M=3.94, SD=1.645). It was the second most engaged in identity-oriented marking behavior in the activity-based office as well (M=4.03, SD=1.652), after E) "Put in the workspace that represent my personal hobbies and interests" (M=4,09, SD=1.632).

In the descriptive report, the employees in the activity-based office seem to personalize in a marginally higher extent than the employees in the cellular office. However, after performing an independent samples t-test to assess if the difference in means were statistically significant, only one marking differed significantly between the office types. There was a significant difference in the means for posting personal achievements (e.g., qualifications, awards) in the cellular office (M=3.11, SD=1.873) and in the activity-based office (M=3.91, SD=1.747) conditions; t(166)=3.03, p = 0.003. See appendix (1) for the detailed results from the independent samples test. These results suggest that employees in activity-based offices engage in posting personal achievements in a slightly higher extent than employees in a cellular office.

With regards to the number of personal items at the workplace, there were no notable differences between the office types. The activity-based office stated that they had an average of 4,53 personal items at their workplace, while the cellular office had an average

of 4,63 personal items at their workplace. After conducting an independent samples t-test, these minor differences were not statistically significant.

4.2. Personal control

Since the three items measuring person control showed good internal consistency (Cronbach's alpha = 0.839) the items were indexed.

To test the H2 (Personalization of the workspace is positively correlated to personal control, in both the traditional office and the non-territorial office), a bivariate-analysis using Pearson correlation coefficient was conducted. The findings suggest that there was a positive correlation between personalization and personal control, but only in the activity-based office. In the activity-based office, although they were small, there were statistically significant and positive correlations between all types of identity-oriented marking (except for displaying artwork) and personal control. In the cellular office, bringing in personally meaningful photographs showed a positive ($r = 0.215$) and statistically significant ($p < 0.05$) correlation between personalization and control.

Table 4. Correlation between identity-oriented markings and personal control

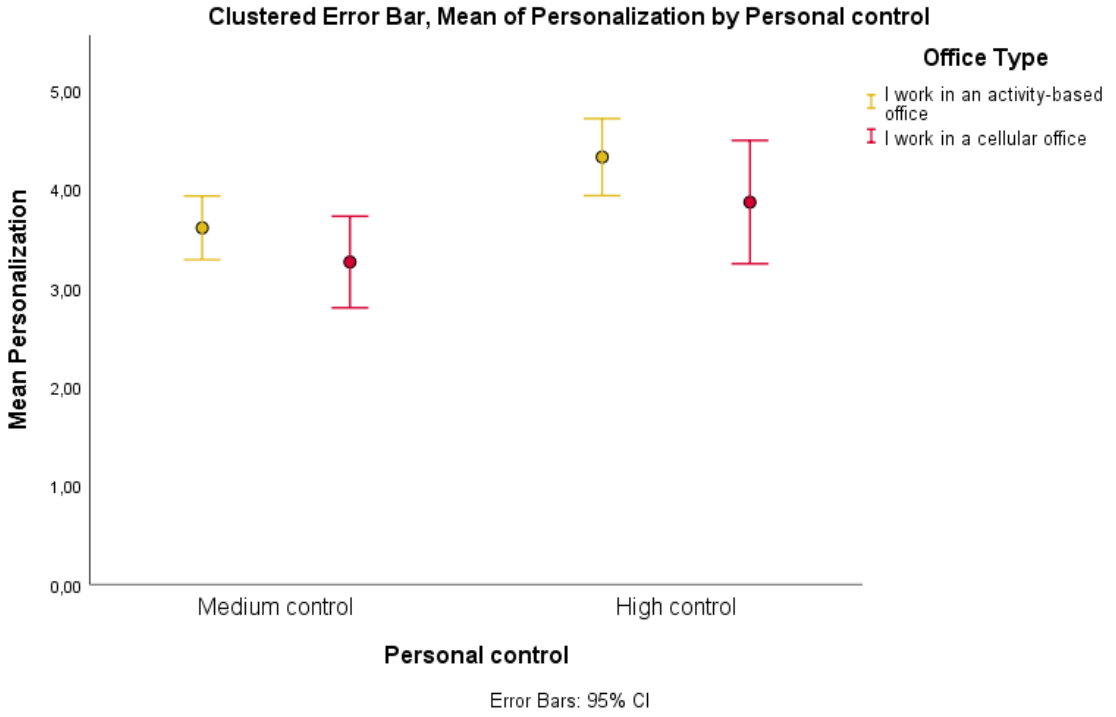
Identity-oriented markings	Activity-based office	Cellular office
(ID-OR) Brought in personally meaningful photographs (e.g. friends, family, pets, activities)	,217**	,215*
(ID-OR) Displayed artwork in my workspace	0,120	0,040
(ID-OR) Displayed quotes, expressions, motivational phrases in my workspace	,157*	0,063
(ID-OR) Posted personal achievements (e.g., qualifications, awards) in my workspace	,176*	0,063
(ID-OR) Put things in the workspace that represent my personal hobbies and interests	,216**	0,164
(ID-OR) Brought in items or changed the workspace to make me feel at home	,261**	0,145

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The responses for personal control were then divided into three separate categories according to the scoring: low, medium and high control. The clustered error bar diagram below, shows the extent of personalization in relation to personal control. Employees who experience a medium sense of control seem to personalize less on average than employees with a high sense of control. This applies to both office types.

Diagram 1. Clustered Error Bar, Mean of Personalization by Personal control



As a second measure of personal control, self-efficacy, was also tested for correlation with personalization. In the activity-based office, self-efficacy showed a positive correlation to personalization of *r*=0.297, significant at the 0.001 level. However, in the cellular office, there was no significant correlation between personalization and self-efficacy.

Table 5. Correlation between self-efficacy and personalization

Office type	Activity-based office	Cellular office
Pearson's coefficient	,297**	-0,095

**. Correlation is significant at the 0.01 level (2-tailed). Activity-based office, n=169. Cellular office, n=89.

To test hypothesis H3 (Employees in a non-territorial office experience lower sense of control, than employees in a traditional office), an independent sample t-test was used. For details of the t-test, please see appendix (1). The results from the t-test showed that there were no significant difference in the scores for personal control in the activity-based office (M=2.46, SD=1.720 and in the cellular office (M=2.32, SD=1.749) conditions; t (256)=0.623, p = 0.534. Since the sample groups for the activity-based office and cellular office are unequal in size, a Welch t-test was performed to control if the p-value from the

independent samples t-test was trustworthy. The significance of the Welch t-test (also called unequal variance t-test) showed a similar non-significance to the independent samples t-test (p=0.536).

Table 6. Independent Samples T-test for control in the different office types

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Control	Equal variances assumed	0,003	0,960	0,623	256	0,534	0,14121	0,22654	-0,30491	0,58734
	Equal variances not assumed			0,620	176,491	0,536	0,14121	0,22772	-0,30820	0,59063

To test H4 (Control-oriented marking exists in a higher extent in the non-territorial office, than the traditional office) mean differences were analyzed with a one-way ANOVE (with Welch's test), to see whether the difference in means were significant or not. The employees of the activity-based office created borders around their workspace and used sign to communicate that their workplace had been taken (M=3.58 resp M=3.73, SD=1.773 resp. SD=1.801) more frequently than the employees in the cellular office (M=2.86 resp. M=2.90, SD=1.852 resp. SD=1.942).

Table 7. Control-oriented markings in the different office types

	Activity-based office		**Cellular office**		**Difference in means**
Control-oriented markings	μ_1	σ_1	μ_2	σ_2	$\mu_1 - \mu_2$
I) Created a border or physical barriers around my workspace (eg using screens or plants)	3,58	1,773	2,86	1,852	0,72
II) Used signs to communicate that the workspace has been claimed	3,73	1,801	2,90	1,942	0,83

Activity-based office, n=169. Cellular office, n=88.

Welch's test was performed to see if the differences in means were statistically significant. The differences in means between office types were shown to be significant for both items (p = 0.003 and p= 0.001).

Table 8. Welch's test of equality of means for control-oriented marking in the different office types

Robust Tests of Equality of Means (Welch's test)					
		Statistic[a]	df1	df2	Sig.
(CO-OR) Created a border or physical barriers around my workspace (eg using screens or plants)	Welch	8,831	1	170,167	0,003
(CO-OR) Used signs to communicate that the workspace has been claimed	Welch	11,043	1	165,512	0,001

a. Asymptotically F distributed.

In conclusion, all of the identity-oriented markings were positively correlated with personal control in the activity-based offices however only one type of identity-oriented marking was positively correlated to personal control in the cellular office. There were no statistically significant difference between the different office types in terms of personal control. Lastly, employees in the activity-based office were more dedicated to control-oriented marking behaviors than the employees in the cellular office.

4.3. Place Attachment

To test hypothesis H5 (Employees experience lower levels of place attachment in a non-territorial setting) a one-way ANOVA using the Welch's test was conducted.

Table 9. Average means for place attachment in both office types

Place attachment	Activity-based office	Cellular office
Mean	2,3629	2,4432
Std. Deviation	0,87331	0,93563

Activity-based office, n=169. Cellular office, n=88.

The test concluded that there were no significant differences in means for place attachment in the activity-based office (M=2.36, SD=0.873) and in the cellular office (M=2.44, SD=0.936), giving a significance through Welch's test of $p > 0.05$ ($p = 0.505$).

Table 10. Equality of means on place attachment

Robust Tests of Equality of Means (Welch's test)					
		Statistic[a]	df1	df2	Sig.
Place Attachment	Welch	0,445	1	166,135	0,505

a. Asymptotically F distributed.

To test the second hypothesis on place attachment H6 (Personalization is positively correlated to place attachment) a bivariate-analysis using the Pearson correlation coefficient was conducted. The correlation between personalization and place attachment was negative and statistically significant (on the 0.01 level) in both office types. The frequencies for personalization in relation to place attachment are presented in a boxplot diagram (below) to illustrate personalization and place attachment. Personalization was divided into three categories representing the frequency of the behavior (low, medium and high).

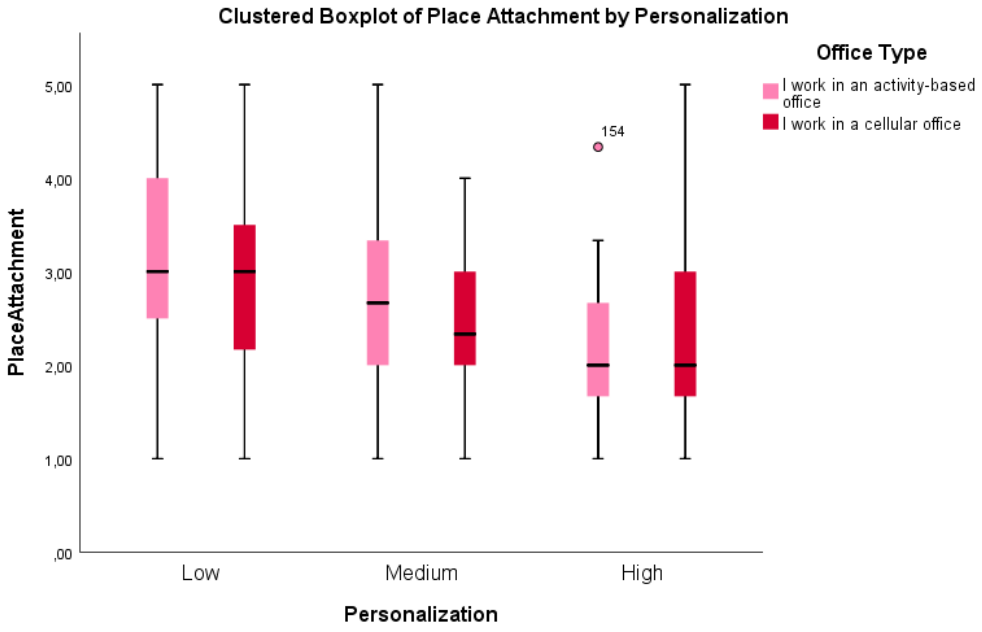
Table 11. Correlation between personalization and place attachment

	Activity-based office	Cellular office
Pearson Correlation, *r*	-,494**	-,362**

Activity-based office, n=169. Cellular office, n=88.

**. Correlation is significant at the 0.01 level (2-tailed).

Diagram 2. Clustered boxplot of place attachment by personalization



The boxplot above shows how employees who personalize in a high extent, also seem to experience a low sense of place attachment.

4.4. Stress

In this chapter, the results will focus on the relationship between stress, identity-oriented marking and the physical work environment. Stress was measured through five statements (taken from the Global Perceived Stress Scale) and rated on a 5-point Likert scale, ranging

from 1= Never to 5= Always, where the participants assessed how often they had experienced the five different symptoms of stress during the last month.

In general, to test H7 (Employees in a traditional office environment experience lower levels of stress, than employees in a non-territorial office) Welch's test was performed to assess significance in difference of means. The test showed no significance in means between the different office types with regards to stress.

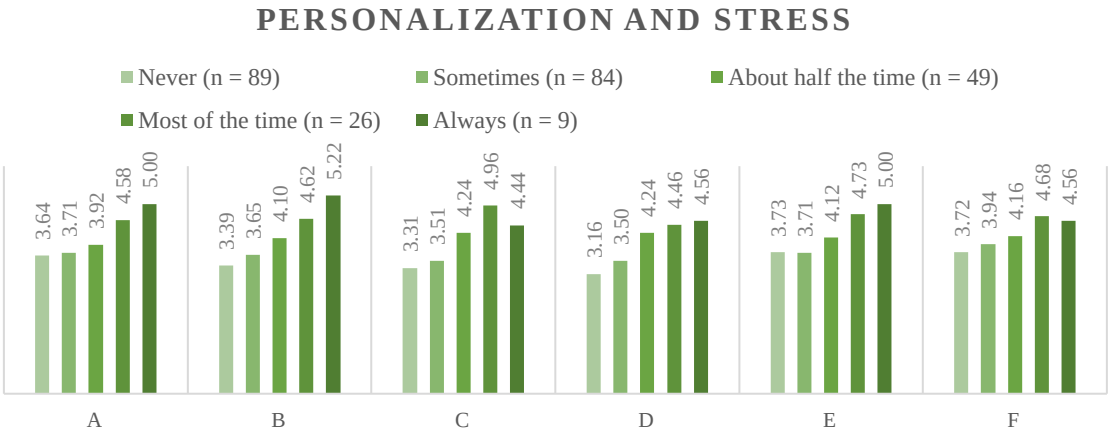
Table 12. Welch's test on the equality of means regarding stress in the different office types

Robust Tests of Equality of Means (Welch's test)					
		Statistic[a]	df1	df2	Sig.
Stress	Welch	1,662	8	53,295	0,130

a. Asymptotically F distributed.

The first hypothesis on stress was H8 (Employees who personalize their environment experience lower levels of stress than employees who do not). Across office types, the employees who experienced a high degree of stress (Always) also reported the highest extent of personalization. This is manifested in the diagram below, where each color represents a state of stress and each section (A, B, C, etc.) represent one type identity-oriented marking. The numbers above each staple represents the frequency of personalizing, as assessed by the territoriality measure. The letters for identity-oriented markings are used earlier in the results section, for clarification on what the different letters stand for, look at table 12 above. The diagram shows that consistently, across all identity-oriented markings, people who are more stressed tend to personalize more often.

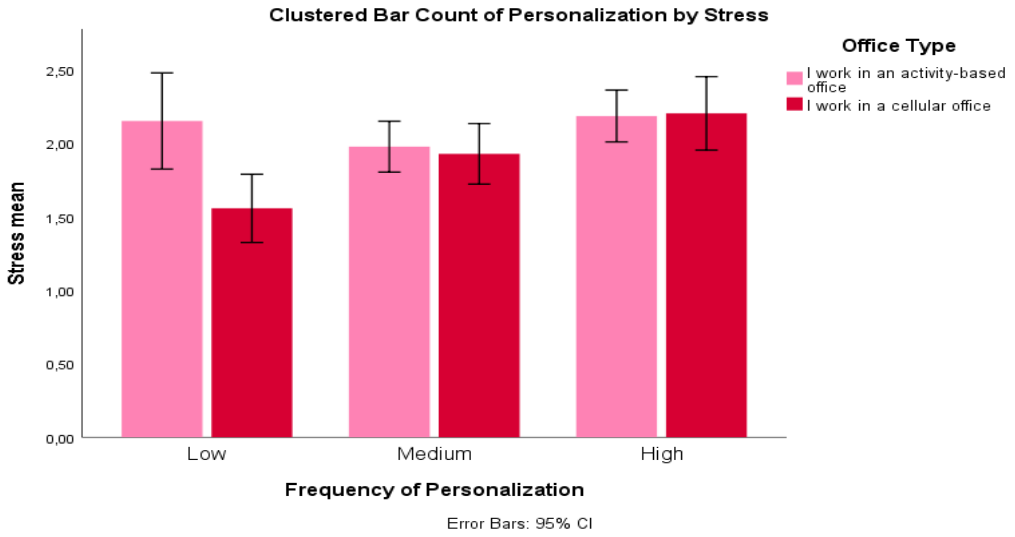
Diagram 3. Personalization and stress for both office types in total



When investigating the mean values for stress and personalization according to office type, it is impossible to detect any trends within the cellular office, as shown in the

diagram below. However, in the activity-based office, the employees who reported a low frequency of personalization, also reported low levels of stress. The more stressed the employees in the activity-based office were, the more often they seemed to personalize.

Diagram 4. Clustered bar count of personalization by stress



The last hypothesis to test on stress was H9 (Personalization has a negative correlation to stress). This hypothesis was tested using a bivariate-analysis with the Pearson correlation coefficient. Since the items for the territorial scale on identity-oriented marking showed a high internal consistency, the measure was indexed for this hypothesis testing. However, contradictory to what the hypothesis predicted, personalization showed a positive correlation to stress in both office types. This indicates that employees the employees who are stressed also personalize in a higher extent that employees who aren't stressed, which rejects the hypothesis.

Table 13. Correlation between personalization and stress in the different office types

Office type	Activity-based office	Cellular office
Pearson's coefficient	,227**	,332**

**. Correlation is significant at the 0.01 level (2-tailed). Activity-based office, n=169. Cellular office, n=89.

4.5. Job satisfaction and satisfaction with the physical environment

Job satisfaction was measured on a 7-point Likert scale, ranging from 1= Extremely dissatisfied to 7 = Extremely satisfied. The job satisfaction variable was divided into three categories of satisfaction: low (1-2), medium (3-5) and high (6-7). The categories are represented by the numbers 1 (Low), 2 (Medium) and 3 (High). Personalization is measured through the same identity-oriented marking behaviors, as previously seen in this thesis, with G not representing a behavior but the total number of personal items at work.

Table 14. Job satisfaction according to office type

Office type	**Activity-based office**		**Cellular office**	
	n = 169		n = 89	
Job satisfaction	N	%		
Low	4	2%	3	3%
Medium	72	43%	35	39%
High	93	55%	51	57%

In the activity-based office, 2% of the participants reported low job satisfaction, 43% reported a medium job satisfaction and 55% reported a high job satisfaction. In the cellular office, 3% reported a low job satisfaction, while 39% reported a medium job satisfaction and 57% reported a high job satisfaction. Job satisfaction does not differ remarkably across the office types, there are slightly more participants in the cellular office reporting a high job satisfaction in comparison to the activity-based office.

Firstly, hypothesis H10 (Personalization is correlated to a greater job satisfaction) was tested with a bivariate-analysis using the Pearson correlation coefficient. The results showed that there were positive correlations between personalization and job satisfaction in both office types (r=.343 resp. r=.269. The correlations were significant at the 0.01 level.

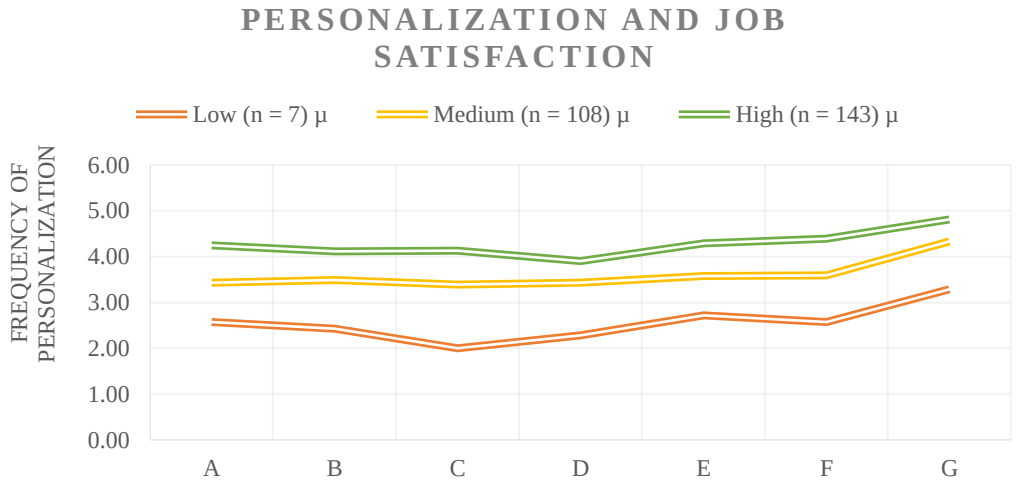
Table 15. Correlation between personalization and job satisfaction

Office type	Activity-based office	Cellular office
Pearson's coefficient, *r*	,343**	,269**

**. Correlation is significant at the 0.01 level (2-tailed). Activity-based office, n=169. Cellular office, n=89.

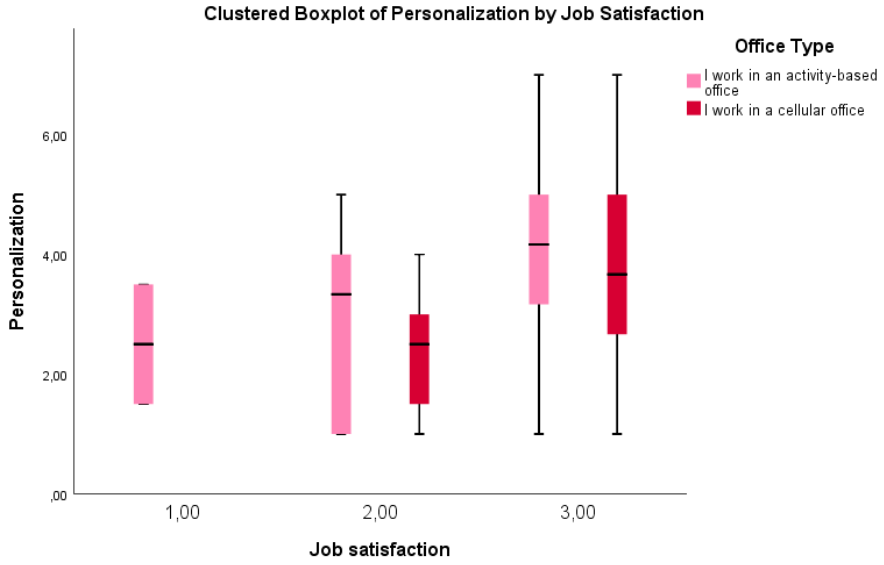
For both office types in total, people who reported a low job satisfaction seemed to engage more frequently in all identity-oriented markings (A-F, while G represents the total number of personal items in the workplace). Likewise, employees who reported a high job satisfaction seemed to engage more in personalization. See diagram below for visualization.

Diagram 5. Identity-oriented markings in relation to job satisfaction



In both offices, the extent of personalization was higher amongst employees who were satisfied with their job. See boxplot below.

Diagram 6. Clustered Boxplot of Personalization by Job Satisfaction



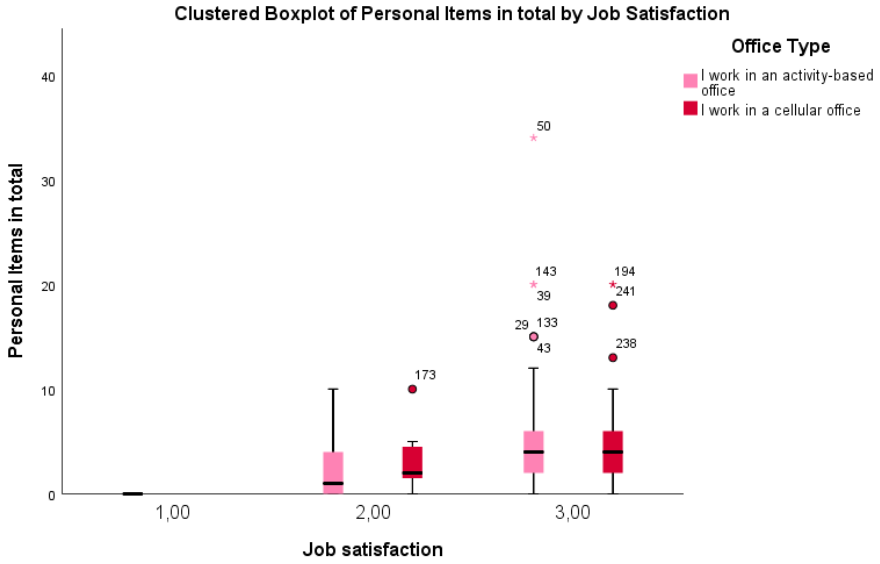
In both office types in total, participants who reported a low job satisfaction had in average 3,29 personal items, while participants who were relatively satisfied with their job reported an average number of personal items of 4,33. The participants who felt highly satisfied with their job had an average of 4,81 personal items.

Table 16. Job satisfaction and personal items in total for both office types

Job satisfaction	M	Std. Deviation
Low (n = 7)	3,29	4,645
Medium (n = 108)	4,33	4,915
High (n = 143)	4,81	3,460

The diagram below shows a visualization of personal items in total in relation to job satisfaction, divided by office type.

Diagram 7. Clustered Boxplot of Personal items in total by Job satisfaction



The differences in means regarding the number of personal items were assessed using a one-way ANOVA (using Welch's test) to see if the differences in number of personal items were significant. The test showed no significant differences between the office types with regards to the number of personal items at work.

Table 17. Equality of Means, Personal items in the difference office types

Robust Tests of Equality of Means (Welch's test)					
		Statistic[a]	df1	df2	Sig.
Personal items	Welch	0,040	1	187,637	0,841

a. Asymptotically F distributed.

To test the last hypothesis, that personalization is positively associated with satisfaction with the physical environment, a bivariate-analysis using the Pearson correlation coefficient was used.

Table 18. Correlation between personalization and satisfaction with the physical environment

Office Type	Satisfaction with the design of the physical environment	Overall satisfaction with the physical environment
I work in an activity-based office	,391**	,370**
I work in a cellular office	,218*	,235*

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Personalization showed a positive correlation to satisfaction with the design of the physical environment (*r*=.391 resp. *r*=.218) with a significance at the 0.01 level and 0.05 level. Personalization also had a positive correlation to the overall satisfaction with the physical work environment (*r*=.370 resp. *r*=.235) with a significance at the 0.01 level and 0.05 level.

4.6. Other observations

4.6.1. Favorite spots and reactionary defenses

Participants also rated their sense of agreement with the statements in table 19 on a 6-point Likert scale, with 1 = Strongly disagree and 6 = Strongly agree. The results show that it was common to have a favorite spot in the workplace, where the employees always would sit if it was available. A large number of the employees (n = 47 + 26 + 17 = 90) were negatively affected if their favorite spot were taken, while (n = 22 + 9 + 25 = 56) a third of the employees were not negatively affected if someone took their spot.

Table 19. Favorite spots and reactionary defenses in the activity-based office

Activity-based office	I have a favorite spot in my workplace, where I prefer to work (n)	I always sit in this spot if it is not occupied (n)	I am negatively affected if my favorite spot is taken (n)
Strongly disagree	8	6	22
Disagree	8	7	9
Somewhat disagree	11	15	25
Somewhat agree	40	42	47
Agree	49	36	26
Strongly agree	35	39	17
Total	151	145	146

4.6.2. Comments on why personalization was important

The participants had the possibility to write comments after each section of the questionnaire, if there was anything they wanted to add. Eight respondents added comments after the section on territoriality and personalization in particular. The comments will be shown in a table below.

Table 20. Participant's comments on personalization

I wish I had more space to personalize
I feel more content at work when I have my personal items around me
Personalization is important for motivation
Personalization makes me feel more comfortable
It [personalization] is important to me
I would feel better if I could personalize. Just like at home, I feel that I need my things sometimes.
I personalize because it's cozier like that
I want to feel at home and that is why I personalize

The respondent mentioned that personalization made them feel more comfortable and at home. One respondent said personalization makes the workplace cozier and one said that personalization was important to them. This gives a hint as to why employees personalize their workspace and makes an interesting complement to the quantitative aspect of this study. However, there were only eight out of 258 (3,1%) who explained their reasons for personalizing their workspace, so it is impossible to draw any general conclusions.

4.6.3. Anticipatory defending and reactionary defenses

Lastly, an Independent Samples test was used to test if there were any differences between the office types regarding anticipatory defending and reactionary defenses.

The employees in the activity-based office seemed to engage more often in both types of territorial behaviors than employees in the cellular office. The employees of the activity-based office used locks and passwords in a marginally higher extent (M=3.82, SD=1.867) than the employees in the cellular office (M=3.63, SD=2.086). The employees of the activity-based office also avoided leaving their workspace unattended in a higher extent (M=3.88, SD=1.782) than the employees in the cellular office (M=3.07, SD=1.805). Lastly, the employees of the activity-based office expressed disagreement or dislike when someone took their preferred workspace more often (M=3.64, SD=1.797) than the **employees in the cellular office (M=3.11, SD=1.956).**

Table 21. Group Statistics for anticipatory defending and reactionary defenses in both office types

	Activity-based office		Cellular office	
	M	Std. Deviation	M	Std. Deviation
(AD) Used locks and passwords so others cannot access my workspace	3,83	1,867	3,63	2,086
(AD) Avoid leaving my workspace unattended	3,88	1,782	3,07	1,805
(RD) Expressed disagreement or dislike when someone has taken the workspace I prefer to wo	3,64	1,797	3,11	1,956

However, the independent samples test showed that there were only statistically significant differences between employees in the two different office types with regards to avoiding to leave the workspace unattended and expressing disagreement or dislike when someone had taken the employee's preferred workspace.

Table 22. Independent Samples T-Test for anticipatory defending and reactionary defenses in both offices

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
(AD) Used locks and passwords so others cannot access my workspace	Equal variances assumed	4,340	0,038	0,819	255	0,414	0,209	0,256	-0,294	0,713
	Equal variances not assumed			0,791	160,237	0,430	0,209	0,265	-0,313	0,732
(AD) Avoid leaving my workspace unattended	Equal variances assumed	1,639	0,202	3,425	254	0,001	0,807	0,236	0,343	1,271
	Equal variances not assumed			3,411	174,749	0,001	0,807	0,237	0,340	1,274
(RD) Expressed disagreement or dislike when someone has taken the workspace I prefer to work	Equal variances assumed	1,779	0,183	2,181	255	0,030	0,531	0,244	0,052	1,011
	Equal variances not assumed			2,124	163,907	0,035	0,531	0,250	0,037	1,025

Employees in the activity-based offices were therefore engaged in both anticipatory defending and reactionary defenses in a higher extent than employees in the cellular office.

Lastly, correlations between defending behaviors and stress were assessed, to see if they could be associated. Both types of defending behaviors showed a positive correlation to stress across both office types.

Table 23. Correlations (Pearson's r) between stress and defending behaviors in the different office types

	Activity-based office	Cellular office
(AD) Used locks and passwords so others cannot access my workspace	,307**	,343**
(AD) Avoid leaving my workspace unattended	,265**	,247*
(RD) Expressed disagreement or dislike when someone has taken the workspace I prefer to work in	,327**	,488**

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). Activity-based office, n=169. Cellular office, n=89.

To summarize this chapter, the findings that are connected to the hypotheses are shown in a table below.

Table 24. Conclusions from testing the hypotheses

H1	Employees in a non-territorial office personalize less, than employees in a traditional office	Not supported
H2	Personalization of the workspace is positively correlated to personal control, in both the traditional office and the non-territorial office	Supported
H3	Employees in a non-territorial office experience lower sense of control, than employees in a traditional office	Not supported
H4	Control-oriented marking exists in a higher extent in the non-territorial office, than the traditional office	Supported
H5	Employees experience lower levels of place attachment in a non-territorial setting	Not supported
H6	Personalization is positively correlated to place attachment	Rejected (the opposite was shown)
H7	Employees in a traditional office environment experience lower levels of stress, than employees in a non-territorial office	Not supported

H8	Employees who personalize their environment experience lower levels of stress than employees who do not	Rejected (the opposite was shown)
H9	Personalization has a negative correlation to stress	Rejected (the opposite was shown)
H10	Personalization is correlated to a greater job satisfaction	Supported
H11	Personalization is positively associated with satisfaction with the physical environment	Supported

5. Discussion and organizational implications

This section will discuss the results and its potential implications for organizations. It will be divided into sections according to the themes of the hypotheses.

As discussed in the theory section, territorial behaviors affect employees and organizations in multiple ways. Brown (2005) suggests that territorial behaviors could hinder knowledge sharing and cooperation, and even make employees more resistant to change. Territoriality has also shown to limit creativity and negatively affect decision making. If employees get overly attached to their projects or ideas they can have difficulties in considering other ideas or options (Brown & Robinson, 2007).

Contradictory to what was hypothesized on personalization in the different office types, employees in the non-territorial environment seemed to personalize more often than employees in a territorial environment. It was theorized that, due to the lack of personal space to personalize and potential organizational policies, the employees in the activity-based office would personalize in a lesser extent than employees in the cellular office. However, no statistically significant difference in means were found between the office types in terms of identity-oriented markings, except for one type of marking.

The only significant difference between the offices in terms of identity-oriented marking was that employees in the activity-based office posted personal achievements (e.g. qualifications, awards) in a higher extent than the employees in the cellular office.

We know from previous studies (Brunia & Gosselink, 2009) that employees in non-territorial offices have a tendency to personalize, despite policies on its restriction. Furthermore, we know that it is common for activity-based offices to not allow employees to leave their items in the same spot overnight, forcing the employees to gather all their things and put them in a locker at the end of the workday. Therefore, it is possible that the employees in the activity-based office personalize more often simply because they must stow away their belongings at the end of their day to then take it out the next day. Therefore, it is plausible that it is the same item circulating. It is also plausible that the employees bring new items every day and replace their old ones. We cannot tell from this study if that is the case. The drawbacks of measuring identity-oriented marking in terms of frequency, is that it is difficult to assess if the difference in frequency is due to restriction policies on personalization, forcing employees to engage in personalizing daily over and over again, or if the employees are generally more engaged in personalization.

However, employees in the activity-based office posted personal achievements significantly more often than employees in the cellular office. In earlier research, the loss of a fixed workstation has been shown to increase the need to express identity and differentiate oneself from others (Elsbach, 2003). Elsbach studied territoriality within non-territorial offices and found that employees with high positions struggled the most

with their identity when the organization switched to a non-territorial office. When top managers lost their own rooms in exchange for the non-hierarchical activity-based space, their position was no longer clear to the other employees. The new office design made them do their daily work tasks whilst sitting next to e.g. interns, which raised the managers internal need to express their identity and showcase their power position in the company. After switching to the non-territorial office, Elsbach found that the managers started wearing more formal clothing and tried harder to differentiate themselves from the other employees in the office. From looking at Elsbach's (2003) conclusions, it does not come as a surprise that the most common way of personalizing in the activity-based office was a manifestation of power and position (showing off personal achievements, qualifications, awards). It could also be seen as a way of differentiating oneself from others. The employees in the cellular office more seldomly engage in this type of behavior, which could be the consequences of their office design. The architecture of cellular offices provides a natural territory for employees with walls, boundaries and name plates on doors creating a natural territory. Through the architecture, the employees' position in the company is commonly communicated through the size, view and position of their office (Elsbach 2003). It is not unusual that managers get the corner office with the best view. When the employees' position of power and identity distinction is already built into the architecture of the office, one can assume that the need to display qualifications and achievements might decrease. However, the reasons for personalizing a workspace can depend on numerous factors, where the need for psychological ownership seems to be a strong predictand of personalization. Although, since the difference in means for posting personal achievements were statistically significant between the two offices, it suggests that the social and physical environment of the activity-based office has an impact on the need to post personal achievements.

5.1. Control

Earlier research has argued that personal control is an important reason for engaging in identity-oriented marking (Edna & Buda 1976; Brunia and Gosselink, 2009; Wells, 2000; Sundström, 1986; van der Voordt and van Meel, 2002). Control of the physical space could also be a way of controlling one's own identity or image towards others (Baldry, 1999). Due to the low privacy of the activity-based office, employees are more dependent on the good behavior of their colleagues. The need to personalize can arise from a lack of personal control of the environment. According to the results, all identity-oriented markings were positively correlated to personal control in the activity-based office. Only the act of bringing in personally meaningful photographs showed a positive correlation to personal control in the cellular office. This is interesting because it shows a significant difference between the office types in terms of personalization and personal control. Even though there were no significant differences between the office types with regards to their general sense of control, the positive correlation between personalization and control in the activity-based office, suggests that there is a stronger

connection between personalization and personal control in the activity-based office than the cellular office.

This is in my opinion fascinating, because it could indicate that personalization would have a larger impact on personal control when the physical environment is more difficult to control (such as the non-territorial environment). Furthermore, self-efficacy was positively correlated to personalization in the activity-based office, while it showed no correlation in the cellular office. High self-efficacy is related to high internal locus of control and the results indicated that participants with high self-efficacy tend to personalize their office more than participants with low self-efficacy. Very little research however looks into the effects of personalization on self-efficacy, so it is difficult to draw any conclusions from the results. However, it would be an interesting area for future research. All in all, the results on personal control and personalization is consistent with earlier research suggesting that personalization could be connected to personal control. We cannot draw any conclusions on causality from this study, however it might be interesting for future research to investigate causalities between the two.

Another interesting difference between the office types was the occurrence of control-oriented behaviors, anticipatory defending and reactionary defenses. Employees in the activity-based office were significantly more engaged in creating borders around their workspace and using signs to communicate that their workspace was claimed. It is not surprising that the need for control-oriented marking increases when territorial boundaries are non-existent. One suggestion is that employees engage in controlling their environment as a way of establishing territories that do not initially exist. Brunia & Gosselink (2009) concluded from their study that control-oriented marking was a common behavior in the territorial office of their case study, and from this study is seems that the territorial behavior is common in multiple activity-based offices across Europe (if the participants all work in differences offices, which we do not know, there is a possibility that this sample consists of participants from 169 activity-based offices!).

The flexibility of the activity-based office is restricted if employees control and mark territories that were intended for sharing. Marking behaviors of this type could potentially create conflict (“Didn’t you see that I had my jacket on that chair?”) that has the potential to inflict on other social aspects of the work environment. Anticipatory defending and reactionary defenses also occurred in a significantly higher extent in the activity-based offices than in the cellular offices. Employees in the activity-based office avoided leaving their workspace and expressed disagreement in someone had taken the workspace that they preferred in a higher extent than employees in the cellular office. Since the focus on this study was on marking behaviors primarily and not defending behaviors, a surprising and interesting finding was the significant occurrence of defending behaviors in the activity-based office. Also, the positive correlation between stress and defending behaviors across both office types indicated that defending behaviors could have a negative impact on the mental health of employees.

The results showed that more than half of the employees in the activity-based office felt negatively affected (reactionary defenses) if someone claimed their favorite spot. The fact that so many employees stated that they felt negative emotions, in general or towards the infringer of "their" territory, means that it could have substantially negative effects on the overall organizational climate. We know from earlier research that the negative consequences of territorial behaviors can result in inexplicable organizational conflicts and issues (Brown et al., 2005). Territorial behaviors are often subconscious and can therefore lead to conflicts that are difficult to trace back to territoriality and this should be no exception.

Seeing that employees in the activity-based offices engage in control-oriented marking as well as defending behaviors in a higher extent than employees in the cellular offices, shows that this type of territorial behavior is more prominent in non-territorial workplaces than in "territorial" workplaces. When researchers so far have studied the implications of switching to activity-based offices, they have not yet taken territoriality and its potential consequences into account. The results from this study are particularly interesting because they show that territorial behaviors exist and have significant correlations to e.g. stress, control and job satisfaction, despite the potential cultural differences and differences in work tasks amongst the international sample of participants. If managers would be aware of the occurrence of this type of behavior and its potential to negatively affect employees (e.g. stress and negative emotions), they could act against this type of behavior, or change the architecture of the office to allow for more fixed desks and potential territorial boundaries. Managers could either encourage employees to switch seats more often to break the habit of needing a territory, or alternatively - since territoriality seems to be a basic human need - encourage employees to have set places in the office in order to decrease the controlling and anticipatory behaviors.

5.2. Place Attachment

There were no significant differences between the office types with regards to place attachment. However, one interesting finding was that place attachment was negatively correlated to personalization, in both office types. This indicated that the employees who were very stressed, also happened to personalize in a high extent. Perhaps, personalization was used as a means to mitigate the negative effects of not feeling at home or attached to the office or organization. Drawing from theory, the hypothesis predicted that personalization would have a positive correlation to place attachment – perhaps by making employees feel more like home. The results indicated the opposite. Is it possible that employees get *too* reminded of their lives outside of the office when they personalize in a high extent, and feel less at home when constantly looking at objects that remind them of their actual home or personal life? Maybe employees who feel like they do not belong in the office environment, try to compensate this by

personalizing their environment, expressing their identity and creating an image for themselves (Elsbach, 2003). We do not know why this correlation occurred, so we can only speculate. First and foremost, it was an interesting finding due to its unexpectedness.

5.3. Stress

There were no significant differences across the office types in terms of stress. The results showed that personalization, for both office types, was positively correlated to stress. This is contrary to what the hypothesis predicted. Employees who personalized in a high extent, were also reporting the highest scores for stress.

Scheiberg (1990) studied the reasons why employees personalize their workspace and concluded that one of the main reasons why employees personalized their workspace was because they felt that it reduced stress. In Scheiberg's study, the employees explained the calming effects of looking at their personal objects. One of the participants in the study had a large picture of a green forest and whenever she would get stressed, she would look at her artwork and just sit back and instantly feel much more relaxed. Is it possible that employees who feel more stressed, personalize more, to decrease the negative effects of the stress? One of the items that assess stress is "I feel out of control", which is clearly connected to the sense of personal control. The more out of control in general the participants felt, the more they personalized. Meanwhile, personal control, as discussed in the previous chapter, showed that employees with high personal control also tended to personalize in a high extent. However, the stress item assessed how the employees felt in general, and the personal control items assessed if the employees felt that they were in control of their job. Perhaps personalization could be used as an attempt to decrease stress by taking control of the environment.

5.4. Job satisfaction and satisfaction with the physical environment

There were no significant differences in job satisfaction across the office types. Interestingly, employees across both office types who reported a high job satisfaction, also reported the highest number of personal items (4,81 items on average compared to the employees who reported low job satisfaction who only had 3,29 items on average). Furthermore, employees who were very satisfied with their jobs also reported a higher frequency of personalization of their workspace. This is consistent with the findings of Wells (2000) that concluded that personalization was positively correlated to both job satisfaction and satisfaction with the physical environment.

The results also showed a positive correlation between personalization and overall satisfaction with the physical environment. Personalization also had a positive correlation to the satisfaction with the design of the office. Since we cannot speak on causality, we can only speculate in whether people who are satisfied with their jobs personalize more, or if the personalization in itself create a higher job satisfaction. We know from the literature review that physical control of the work space (e.g. through modifications) has been shown to lead to higher job satisfaction (Lee and Brand, 2005, Wells, 2000).

Sundström (1986) argued that personalization could be linked to psychological well-being, while both Scheiberg (1990) and Donald (1994) argued that personalization could lead to better performance and higher job satisfaction. The results from this study indicate that territorial behaviors (in this case identity-oriented marking) could have a positive impact on both job satisfaction and satisfaction with the physical environment. Employees who personalized their workspace experienced both greater job satisfaction and greater satisfaction with the physical environment.

6. Conclusion

The aim of this study was to study territoriality within organizations and assess whether territoriality could be correlated to the mental health of employees. The results showed that territoriality exists in both cellular and activity-based offices and that territorial behaviors show significant correlations to psychological factors that are crucial for the well-beings of employees (e.g. stress, control, job satisfaction). The correlations were significant to a larger extent in the activity-based offices, which could imply that territorial behaviors become more important for employees' mental health in activity-based settings. The results also showed that defending behaviors were more common in non-territorial settings. Defending behaviors can have various negative implications for organizations. As discussed in the theory section, territorial behaviors can affect employees and organizations in multiple ways. Brown (2005) suggests that territorial behaviors could hinder knowledge sharing and cooperation and make employees more resistance to change. Territoriality has also shown to limit creativity and negatively affect decision making. If employees get overly attached to their projects or ideas they can have difficulties in considering other ideas or options (Brown & Robinson, 2007). Despite this, organizational territoriality and its implications are rarely discussed in research or in practice.

In conclusion, the findings indicate that territoriality is an important aspect of organizational life. According to Brown (2005), territorial behaviors have the potential to explain many organizational issues and conflicts that are generally claimed to occur because of other reasons. Therefore, seeing and understanding territorial behaviors have the potential to give managers a greater insight and understanding of what *actually* goes on in their organization. It will also help them to more efficiently manage the potential consequences. If managers and organizations can analyze and efficiently handle organizational issues that stem from territorial behavior, it could be both a cost savior - decreasing absenteeism and minimizing both conflicts and leave rates (Brown et al., 2005) - and generate a healthier work environment with happier employees. These findings could also be interesting to architects and designers who design activity-based offices. Having territoriality in mind when designing an activity-based office could inspire new creative designs, perhaps designs that enable territorial behaviors to some extent. Perhaps, the offices could benefit from having "territorial corners" or places in the office that allows for personalization or fixed desks.

6.1. Limitations

This study mainly focuses on territorial behaviors towards physical objects in the workplace. Territoriality is however, as described in the theory section, not only concerned with physical objects. Employees could also claim ownership over projects and for example signal to other employees that the project is *theirs* and that they therefor should stay away. This aspect was not taken into account in this thesis, mostly because there was no appropriate measure for assessing territoriality towards social objects in earlier research.

Moreover, the measure on territoriality could be questioned, since it only assesses the frequency of territorial acts. When applied to a non-territorial office, the risk is that it does not assess what it was intended to. If employees in the activity-based office carry around one photograph with them every day, they would have to state that they "always" engage in personalization, while employees in the cellular office might bring one photo once and place it on their desk and state that they "Very rarely" engage in personalization. Yet the effects of the identity-oriented marking would possibly be the same, that employees in both office types look at the same photograph every day. Moreover, the measure does not tell us whether the items that are brought daily or seldomly are the same items, or different items. The measure on identity-oriented and control marking behaviors could therefore be difficult to apply and assess in a non-territorial setting. However, for the defending behaviors, the measure was considered appropriate for both office contexts since it assesses singular reactions and actions (e.g. "feeling negatively affected if my workspace of preference is taken", or "avoid leaving my workspace unattended").

Furthermore, this thesis consists of eleven hypotheses. According to Bryman and Bell (2013), it is advisable to not have more than five. Having many hypotheses on different matters can hinder the thesis from going in-depth on some results, to only do a superficial analysis of some of the hypothesis and results. However, in discussions with the thesis advisor, it was decided that since the aim of the thesis was to assess the general effects of territorial behaviors on different psychological factors, it was considered an advantage if the perspectives and hypotheses were manifold.

Something that may further affect the trustworthiness of this study is the fact that all participants were fully anonymous. This may affect their sense of responsibility to answer truthfully on the survey (Bryman and Bell, 2013). In the Qualtrics software, the survey was estimated to take 14 minutes to fill in. However, for the participants in the activity-based office, the mean time for filling in the questionnaire was 9,6 minutes. In the cellular office, the mean time that it took to fill in the survey was 13 minutes. The mean time for both office types together was 11 minutes, which is three minutes shorter than Qualtrics expected. Since employees in the activity-based office seemed to answer the survey questions faster than expected, it is possible that they rushed through the survey and did not properly think about each question. The mean value for both office types in total was however satisfactory and all in all, this should hopefully not affect the reliability of the study too much.

The fact that the survey was conducted by an independent student (me), and that is was not an internal survey within a company, could have a positive effect on the responses in terms of honesty (Bryman and Bell, 2013). The participants do not have to fear that their managers could trace back their answers to them and might therefore answer more truthfully.

Another limitation of this study is that it fails to bring in the aspects of culture and work tasks. Previous studies on activity-based offices have shown that the type of work tasks that are performed in the office has an impact on how the employees feel about their office design. This was not taken into account for this study, since all the participants come from a wide range of businesses with different work tasks. Culture is also something that could have a potential impact on territorial behaviors, however, there is yet little research examining culture and territoriality, thus it was not deemed as an appropriate perspective to use in this study.

Lastly, a limitation of this study is that research on territoriality within organizations is limited. The organizational perspective on territoriality and its implications for organizations are mostly based on the research of Graham Brown and his fellow researchers. There is therefore a risk that the implications of territoriality for organizations are somewhat one-sided and lack of nuances.

6.2. Ethical considerations

The participants were randomly assigned the study and were, after answering the screening questions through PollFish, redirected to the survey. At the beginning of the survey, they were informed what the study was about. The participants could therefore assess if they wanted to participate or not, even though they were randomly assigned to the study. Participants were ensured anonymity and were told that they could skip questions or leave the survey if they did not feel comfortable with it. The participants' personal information (e.g. IP-address) was not saved and could therefore not be traced back to them in any way. Therefore, their anonymity was secured and the responses they gave could not be used against them in any way.

However, since the participants were completely anonymous, the results from the study could not be sent to them for their approval before they were published. To avoid bias with regards to the participants' having negative or positive connotations or preconceptions of SSE, the name of the university was not mentioned specifically. This could be seen as a limitation in terms of ethical considerations, since the participants cannot see where the survey is published. However, if they do an online search of the purpose of the study given in the introduction, they should find the thesis after it is published.

Furthermore, participants were asked about their mental health. Subjects like stress and personal control could be sensitive. However, since the participants were not forced to complete those sections and could leave the survey whenever they wanted, this was not considered to be an ethical violation.

6.3. Future research

Since this study established that territorial behaviors towards physical objects existed in non-territorial offices, it would be interesting to explore territoriality towards social objects in organizations. For example, ideas, projects and relationships. This is only a speculation, but it is possible that socially territorial behaviors might have larger impact on the organizational health than "physical" territoriality, due to the social nature of organizations. Research on social territoriality seem to occur in a small extent within biology, mainly regarding studies on the behaviors of animals. Territoriality on social objects within organizations, however, seems to be very limited. Although social territoriality evidently exists in organizations (Brown, 2010), its impact and consequences for organizations are unknown. It would therefore be interesting to see future research on social territoriality and its potential consequences for organizations.

This study is cross-sectional and only tests the participants feelings at one single point in time. A longitudinal study, examining several different activity-based offices over a long period of time, would be interesting since it could assess territoriality and more importantly, its long-term effects on organizations. Interesting questions to investigate could be: Does territoriality have a direct impact on absenteeism, turnover and stress? How does a move from a territorial office to an activity-based office affect territorial behaviors in organizations – do they increase or decrease?

The quantitative and relational nature of this study also limits the findings. No causalities can be drawn, and no deeper meanings were discovered as to *why* participants engaged in territoriality (except the few comments on why some participants personalized their workspace). Combined quantitative and qualitative studies would be interesting to get a broader perspective of territorial behaviors within organizations. Experiments on personalization across different activity-based offices would be interesting to assess its impact on employees in non-territorial environments. Say for example, that a control group would be prohibited to personalize during x number of months, while the other group would be encouraged to personalize during the experiment. What would the outcomes be? Lastly, it would also be interesting to see more studies alike the study of Laurence et al., (2013) where they investigated whether personalization as a moderator could mitigate the negative effects of low levels of privacy on emotional exhaustion. It would be exciting to explore, for example, whether territorial behaviors, as moderators, could mitigate the negative effects that a lack of control has on stress in non-territorial offices.

THANK YOU FOR READING!

I hope you found the subject as interesting as I did.

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APPENDIX

Appendix 1 – Additional statistics

	Reliability Statistics		
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Stress	0.903	0.904	4
Satisfaction with the physical environment	0.942	0.943	11
Control	0.839	0.851	3
Place Attachment	0.876	0.877	3
Self-efficacy	0.915	0.916	6
Territoriality	0.936	0.937	11

Robust Tests of Equality of Means

		Statistic[a]	df1	df2	Sig.
SelfEfficacy	Welch	0,037	1	180,204	0,848
Stress	Welch	3,112	1	203,237	0,079
Personalization	Welch	3,430	1	175,953	0,066
Control	Welch	0,333	1	176,571	0,565
How satisfied or dissatisfied are you with your job, overall?	Welch	0,309	1	187,303	0,579

a. Asymptotically F distributed.

Independent Samples Test

				t-test for Equality of Means						
									95% Confidence Interval of the Difference	
				t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
(ID-OR) Personal items in total at your workplace	Equal variances assumed	0,358	0,550	-0,189	233	0,850	-0,108	0,572	-1,236	1,019
	Equal variances not assumed			-0,201	187,637	0,841	-0,108	0,540	-1,173	0,956

	(ID-OR) Broug		(ID-OR) Put		(ID-OR) Posted		(ID-OR) Displa		(ID-OR) Displa		(ID-OR) Broug				**Independent Samples Test**
Equal varian ces not	Equal varian ces	Equal varian ces not	Equal varian ces	Equal varian ces not	Equal varian ces	Equal varian ces not	Equal varian ces	Equal varian ces not	Equal varian ces	Equal varian ces not	Equal varian ces				
	0,008		3,965		5,278		6,595		3,414		0,188				
	0,929		0,048		0,022		0,011		0,066		0,665				
0,401	0,401	1,860	1,925	3,026	3,093	1,913	1,986	1,516	1,556	0,446	0,441		t	t - t	
175,043	252	160,659	255	166,386	254	159,169	255	164,633	254	182,681	255		df		
0,689	0,689	0,065	0,055	0,003	0,002	0,058	0,048	0,131	0,121	0,656	0,660		Sig. (2-taile		
0,087	0,087	0,430	0,430	0,729	0,729	0,480	0,480	0,354	0,354	0,098	0,098		Mean Diff		
0,218	0,218	0,231	0,223	0,241	0,236	0,251	0,242	0,234	0,228	0,220	0,222		Std. Error		
-0,342	-0,342	-0,026	-0,010	0,253	0,265	-0,016	0,004	-0,107	-0,094	-0,335	-0,340	Lower	95 % Con		
0,517	0,517	0,886	0,869	1,204	1,193	0,975	0,956	0,816	0,803	0,532	0,536	Upper			

PILOT STUDY	%	n
Female	40	20
Male	58	29
Other / prefer not to say	2	1
Participants in total	100	

Appendix 2 – Main Survey

Office Design and Employee Health

Start of Block: Block 1 – Introduction

Q1.1

About the study

We spend the majority of our time in our office environment - but despite this, there isn't yet much research regarding how we are affected by it. During the past decades, many new types of office environments have evolved. There is no longer only one type of workplace, but several.

This survey aims to explore how we feel in our office environment and our relationship to our workspace. It is therefore very important to get your perspective on your office environment and how it affects you.

The survey consists of eight blocks, containing questions regarding your work environment, job satisfaction and how you relate to the physical environment of your workplace. Some questions may be similar to each other but try to treat every question independently and separately. Your answers are completely anonymous and cannot be traced back to you. You are able to opt out of the study at any time. The survey should take around 14 minutes to complete.

Thank you for contributing to this survey with your knowledge and experience.

End of Block: Block 1 - Introduction

Start of Block: Block 2 - General questions

Q2.1 This section contains a number of questions about your workplace.

Please choose the statement that best fits your particular workplace. For clarification, an "activity-based" office means that the office is separated into different zones for different work tasks (quiet zone, telephone booths, team-based zones etc). It also means that you have no desk of your own. It's also called a "flexible" office. A cellular office in this case is an office consisting of smaller rooms, divided by walls, where 1 or more people work.

If you work in none of the office types presented below, please opt out of this study. Thank you.

- ○ I work in an activity-based office (3)
- ○ I work in a cellular office (4)
- ○ None of the above (8)

Q2.2 For how long have you worked in your current office environment? E.g. If the workplace has recently been converted into an activity-based office, state how long (in years) you have worked in the newly renovated environment. Please use only numbers.

_____

Q2.3 Do you work full-time or part-time?

- ○ Full-time (1)
- ○ Part-time (2)
- ○ Other (please describe in text) (3) _____

Q2.4 Do you have any comments that you would like to add before moving on to the next block?

_____

End of Block: Block 2 - General questions

Start of Block: Block 3 - Satisfaction with the workplace

Q3.1 The following section contains some general questions about your workplace and your satisfaction with it.

Q3.2 Below are four questions about your working group, relationships with colleagues, your satisfaction with your workplace and perceived performance at your workplace.

	Extremely bad (1)	Moderately bad (2)	Slightly bad (3)	Neither good nor bad (4)	Slightly good (5)	Moderately good (6)	Extremely good (7)
How is the mood within your work group? (1)	○	○	○	○	○	○	○
How is your relationship with your colleagues? (2)	○	○	○	○	○	○	○
Do you enjoy your workplace? (3)	○	○	○	○	○	○	○
How do you assess your performance at work? (4)	○	○	○	○	○	○	○

Q3.3 Would anyone else be able to perform your work duties if you were absent from work?

- ○ Definitely not (1)
- ○ Probably not (2)
- ○ Might not (3)
- ○ Might (4)
- ○ Probably yes (5)
- ○ Definitely yes (6)

Q3.4 How many working days, except for holiday leave, do you estimate that you have taken leave or been on sick leave from work during the previous 12 months?

_____

Q3.5 On average, how many days a week do you work from home?

Please enter in numbers.

_____

Q3.6 Do you have any comments that you would like to add before moving on to the next block?

_____

End of Block: Block 3 - Satisfaction with the workplace

Start of Block: Block 4 - Satisfaction with the work environment

Q4.1 The following section is about your physical work environment.

Q4.2 To what extent are you satisfied with how the physical environment in your workplace is designed?

- ○ Extremely dissatisfied (1)
- ○ Moderately dissatisfied (2)
- ○ Slightly dissatisfied (3)
- ○ Neither satisfied nor dissatisfied (4)
- ○ Slightly satisfied (5)
- ○ Moderately satisfied (6)
- ○ Extremely satisfied (7)

Q4.3 How do you feel about the following aspects of your work environment?

	Extremely dissatisfied (1)	Moderately dissatisfied (2)	Slightly dissatisfied (3)	Neither satisfied nor dissatisfied (4)	Slightly satisfied (5)	Moderately satisfied (6)	Extremely satisfied (7)
Your work environment - an overall assessment (1)	○	○	○	○	○	○	○
View (2)	○	○	○	○	○	○	○
Ventilation (3)	○	○	○	○	○	○	○
Lighting (4)	○	○	○	○	○	○	○
Noise level (5)	○	○	○	○	○	○	○
Temperature (6)	○	○	○	○	○	○	○
Furnishings and equipment (9)	○	○	○	○	○	○	○
Size of your workspace (10)	○	○	○	○	○	○	○
Distance between workspaces/desks (11)	○	○	○	○	○	○	○
Privacy (12)	○	○	○	○	○	○	○
Noise from colleagues' conversations (13)	○	○	○	○	○	○	○

Q4.5 Please rate **how important** the following factors are, in order for you to enjoy your **physical work environment.**

	Not at all important (1)	Low importance (2)	Slightly low importance (3)	Neither important or not important (4)	Slightly important (5)	Moderately important (6)	Very important (7)
Noise level (1)	○	○	○	○	○	○	○
Opportunity to have spontaneous interactions with colleagues (2)	○	○	○	○	○	○	○
Knowing that the environment enables me to do my work tasks properly (8)	○	○	○	○	○	○	○
Privacy (3)	○	○	○	○	○	○	○
Personal items (4)	○	○	○	○	○	○	○
Possibility to change workspace/place to sit every day (5)	○	○	○	○	○	○	○
Feeling at home (6)	○	○	○	○	○	○	○
Knowing what to expect of the work environment every day (eg. regarding noise levels, number of people present, who's present) (7)	○	○	○	○	○	○	○

Q4.6 Below are some statements about how you relate to your workplace.

	Definitely not (5)	Probably not (4)	Might or might not (3)	Probably yes (2)	Definitely yes (1)
This place means a lot to me (1)	○	○	○	○	○
I identify strongly with this place (2)	○	○	○	○	○
I am very attached to this place (3)	○	○	○	○	○
I enjoy doing the type of things here more than in any other area (4)	○	○	○	○	○

Q4.7 Do you have any comments that you would like to add before moving on to the next block?

_____

End of Block: Block 4 - Satisfaction with the work environment

Start of Block: Block 5 - Work environment

Q5.1 The following section is about how you relate to your work environment.

Q5.2 To what extent do you agree with the following statement?

"I can affect the cosiness of my workplace (e.g. furnishings, flowers, curtains)"

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Q5.3 To what extent do you agree with the following statement?

"I can affect the comfort of the workplace (e.g. temperature, noise, ventilation)"

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Q5.4 Does your employer allow you to bring your personal items to work (eg photos, books, coffee mugs, plants)?

- ○ Yes (11)
- ○ No (12)
- ○ I dont know (13)

Q5.5 Below are four statements, please assess how much you agree with the statement. If you have a fixed desk or workspace, you do not need to answer this question.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Somewhat agree (4)	Agree (5)	Strongly agree (6)
When I arrive in the office, it is difficult to find an empty spot to work in (1)	○	○	○	○	○	○
I have a favorite spot in my workplace, where I prefer to work (2)	○	○	○	○	○	○
I always sit at this spot if it is not occupied (skip this one if you do not have a favourite spot) (3)	○	○	○	○	○	○
I am negatively affected if my favorite spot is taken (skip this one if you do not have a favourite spot) (4)	○	○	○	○	○	○

Q5.6 Below are six statements about different ways in which we can shape our work environment.

To what extent have you engaged in the following actions sometime **in the past year**?

	Not at all (1)	Very Rarely (2)	Rarely (3)	Occasionally (4)	Frequently (5)	Very Frequently (6)	All the time (7)
Brought in personally meaningful photographs (eg. friends, family, pets, activities you enjoy) (1)	○	○	○	○	○	○	○
Displayed artwork in my workspace (2)	○	○	○	○	○	○	○
Displayed quotes, expressions, motivational phrases in my workspace (3)	○	○	○	○	○	○	○
Posted personal achievements (e.g., qualifications, awards) in my workspace (4)	○	○	○	○	○	○	○
Put things in the workspace that represent my personal hobbies and interests (5)	○	○	○	○	○	○	○
Brought in items or changed the workspace to make me feel at home (6)	○	○	○	○	○	○	○

Q5.7 If you were to make an approximate estimate, how many personal items do you have in total at your workplace? It can be anything from photographs to newspaper clippings or your own coffee mug. (Except for 'necessary' items such as outerwear etc)

_____

Q5.8 Below are five statements about the different ways we can use our work environment.

To what extent have you done any of the actions below, sometime **in the past year**?

	Not at all (1)	Very Rarely (2)	Rarely (3)	Occasionally (4)	Frequently (5)	Very Frequently (6)	All the time (7)
1. Created a border or physical barriers around my workspace (eg using screens or plants) (1)	○	○	○	○	○	○	○
2. Used signs to communicate that the workspace has been claimed (2)	○	○	○	○	○	○	○
3. Used locks and passwords so others cannot access my workspace (3)	○	○	○	○	○	○	○
4. Avoid leaving my workspace unattended (4)	○	○	○	○	○	○	○
5. Expressed disagreement or dislike when someone has taken the workspace I prefer to work in (5)	○	○	○	○	○	○	○

Display This Question:

If Does your employer allow you to bring your personal items to work (eg photos, books, coffee mugs,... = Yes

Q5.9 Would you like to have a **greater** opportunity (than you have today) to bring your own items to your workplace? If yes, please describe why.

- ○ Yes (1) _____
- ○ No (2)
- ○ I don't know (3)

Display This Question:

If Does your employer allow you to bring your personal items to work (eg photos, books, coffee mugs,... = No

Q5.10 Would you like to have the opportunity to bring your own items (eg photos, books, coffee mugs, plants) to your workplace?

- ○ Yes (1)
- ○ No (2)
- ○ I don't know (3)

Q5.11 Do you have any comments that you would like to add before moving on to the next block?

_____

End of Block: Block 5 - Work environment

Start of Block: Block 6 - Health

Q6.1 The following section deals with your feelings and thoughts **during the last month** and consists of five different statements. For each question, you are asked to choose the option on the scale that corresponds to how often you felt or thought in a certain way.

How often have you **during the last month** ...

	Never (1)	Sometimes (2)	About half the time (3)	Most of the time (4)	Always (5)
Felt nervous and stressed (1)	○	○	○	○	○
Thought of things that you have to do (2)	○	○	○	○	○
Felt upset because something unexpected has happened (3)	○	○	○	○	○
Felt out of control (4)	○	○	○	○	○
Felt that there have been too many obstacles or difficulties for you to handle (5)	○	○	○	○	○

Q6.2 Do you have any comments that you would like to add before moving on to the next block?

_____

End of Block: Block 6 - Health

Start of Block: Block 7 - Work tasks and attitude towards work in general

Q7.1 This section contains questions about how you experience your work tasks and your job in general. Do not forget that your answers are completely anonymous.

Q7.3 Below are three statements about how you experience your work and your work tasks. Please estimate to what extent you agree with the statements.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I am in control of my job and everything related to it (1)	○	○	○	○	○	○	○
I personally can control the quality of my work (2)	○	○	○	○	○	○	○
I can control how I perform my work tasks (3)	○	○	○	○	○	○	○

Q4.4 Below are some other aspects that concern your work environment.

To what extent do the following statements align with how you feel?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I often get disturbed by background noise at my workspace (3)	○	○	○	○	○	○	○
I am often disturbed by distractions around me (5)	○	○	○	○	○	○	○
I feel there is nothing I can do to hinder the distractions (6)	○	○	○	○	○	○	○
The distractions have a negative impact on my performance (8)	○	○	○	○	○	○	○

Q7.4 Here are seven statements about how you perceive your own ability to perform your work tasks.

Please estimate the extent that you agree with the statements.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I can keep calm when I encounter difficulties in my work because I trust my own ability to handle them (1)	○	○	○	○	○	○	○
When I encounter problems at work, I can usually find several different solutions (2)	○	○	○	○	○	○	○
Whatever happens at work, I usually have the ability to handle it (3)	○	○	○	○	○	○	○
My previous work experience has made me well prepared for my upcoming professional life (4)	○	○	○	○	○	○	○
I usually meet the goals I set up for myself at work (5)	○	○	○	○	○	○	○
I am well prepared to meet the requirements that come with my work (6)	○	○	○	○	○	○	○

Most days I feel satisfied with my own work effort (7)	○	○	○	○	○	○	○

Q7.5 Do you have any comments that you would like to add before moving on to the next block?

_____

End of Block: Block 7 - Work tasks and attitude towards work in general

Start of Block: Some last questions

Q8.1 How satisfied or dissatisfied are you with your job, overall?

- ○ Extremely dissatisfied (1)
- ○ Moderately dissatisfied (2)
- ○ Slightly dissatisfied (3)
- ○ Neither satisfied nor dissatisfied (4)
- ○ Slightly satisfied (5)
- ○ Moderately satisfied (6)
- ○ Extremely satisfied (7)

Q8.2 For how long have you been employed by your current employer? Enter only in numbers. (If you worked for eg 6 months, write 0.5 in your response)

_____

Q8.3 Please state your gender.

- ○ Male (1)
- ○ Female (2)
- ○ Other or prefer not to say (3)

Q8.4 How old are you? Please state using only numbers.

_____

Q8.5 If you want to, and have the opportunity to, you are more than welcome to attach a picture of how your specific workstation or workplace looks. This is of course optional.

Q8.6 Lastly, I would like to know what you thought of this questionnaire.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
The questions were clearly formulated (1)	○	○	○	○	○
The response options were clearly formulated (2)	○	○	○	○	○
The survey is meaningful (3)	○	○	○	○	○
The survey questions tried to influence your answers in some direction (4)	○	○	○	○	○

End of Survey