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Impact of Self Determination Theory Components on Employees' Performance: a Comparative Study in the Context of Open Plan Offices and Coworking Spaces

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ABSTRACT

Purpose- The main purpose of this research is a comparative study to develop human resource management knowledge in the field of open plan office and coworking spaces in order to fill research gaps.
Aims- This study aims to investigate the effects of autonomy, competence, and affiliation on job satisfaction and performance in open plan offices (OPOs) and coworking spaces (CWS); the impact of satisfaction on employee performance; and the mediating role of satisfaction in the relationship between the Self determination theory (SDT) components and performance.
Methodology- Using the survey method, employees who work in OPOs and CWS were selected as the samples. A total of 315 employees were selected using convenience method. The main basis of data analysis is the SEM.
Finding- The results show that SDT components in OPOs and CWS have different influences on satisfaction and performance. In OPOs, where workers are present on a non-voluntary basis in the context of hybrid work, these elements reduce employees' tolerance for distractions, disrupt their concentration, and reduce job satisfaction and performance. In CWS, the presence is usually voluntary, and there is a focus on working together and being in a group by creating a social atmosphere. Hence, working in CWS has no significant effect on job satisfaction, but it increases performance.
Limitation- First, the research only covers employees in OPOs and CWS in Quebec. The data for both contexts were collected online, which may have reduced the quality of the responses. The number of questions for variables could be increased to reduce bias.
Contributions- This paper highlights the effects of high levels of SDT components on satisfaction and performance in two contexts. Also, it used job satisfaction as a mediating and the SDT components as independent variables. It identifies conditions under which the OPOs and CWS can promote SDT components to increase job satisfaction and employees' performance.

KEY WORDS

Open Plan Office, Coworking Space, Self Determination Theory, Job Satisfaction, Performance

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1 INTRODUCTION

In today's world, organizations are constantly looking for efficient solutions to improve employee performance and achieve sustainable competitive advantage. Despite increasing organizational budgets in this regard, employee performance does not always meet managers' expectations. For example, the annual expenditures of organizations on upgrading information technology, computer services, employee support, etc. have not led to the expected increase in performance (Nickerson, Owens, & Boddie, 1995; Tornatzky & Klein, 1982). Thus, optimal solutions may lie in the trend towards post-bureaucratic models (Kraus, Ferraris, & Bertello, 2023; Waters-Lynch & Duff, 2021) which are influencing configurations and uses of workspaces and changing working practices and organizational and personal relationships (Halford, 2005). Open plan offices and coworking spaces are two relatively new concepts that have been thought to contribute to achieving these organizational goals in the past few decades.

In the open space and coworking literature, there are many studies that have identified them as new places for business initiatives (e.g., Tremblay & Scaillerez, 2021), have described the open place and coworking workplaces (e.g., Lai, Chau, Davies, Kwan, 2020; Bouncken & Reuschl, 2018), have examined the effects of some organizational variables on work-life reconciliation, effects on employees burnout (e.g., Danielsson & Theorell, 2024) etc. Other studies have also been conducted on various topics in OPOs and CWS such as employees' reactions to work in these places (e.g., Gerdenitsch, Scheel, Andorfer & Korunka, 2016), employees' satisfaction (e.g., Navai & Veitch, 2003), ergonomics in OPOs and CWS (e.g., Norton, Ayoko & Ashkanasy, 2021) etc., but less empirical attention has been paid to the effects of self-determination theory components (Deci & Ryan, 2012; Gagné & Deci, 2005) on employees' performance in these workplaces. In particular, there is very little information on the impact of autonomy, competence, affiliation, interaction, and privacy on employees' performance in OPOs and CWS. Also, almost all these studies have focused on only one of these centers. Comparative studies to compare the elements in these two contexts simultaneously have rarely been conducted, although they become important work contexts.

Given the gap in this field, the current study seeks to develop a model and test it to understand the effects of selected self determination theory components on workers' performance in OPOs and CWS. Considering the relationship between the SDT factors and satisfaction (Bachmann, 2024), and satisfaction with employees' performance (Sukowski, 2023), investigating the mediating role of satisfaction becomes important. Hence, the study aims to investigate: 1) the effects of autonomy, competence and affiliation on employees' satisfaction and performance in open plan and coworking spaces; 2) the effect of satisfaction in these two workplaces on employees' performance; and 3) the mediating role of satisfaction in the relationship between self determination theory components and performance. The study uses a sample of Quebec employees using open plan offices and work in CWS to test the aforementioned relationships. The paper examines the relationships by following the scientific research structure.

2 THEORETICAL FOUNDATIONS AND PROPOSED MODEL

Today, many employees, whether by choice or by force, spend a significant portion of their time in open plan offices and coworking spaces. Therefore, both the conditions of the workplace and individual characteristics of employees can have a significant impact on organizational variables such as performance. Furthermore, authors (e.g. Gagné et al., 2022; Kong et al., 2016) emphasize the role of self-determination theory as a critical determinant of employee outcomes. According to self-determination theory, satisfaction of psychological needs such as autonomy, competence and affiliation, influences employees' outcomes due to it effects on employees' motivation and satisfaction (Deci, Olafsen & Ryan, 2017). Studies (Ünlü & Dettweiler, 2015; Koestner et al., 1996) indicate that more intrinsic and internalized motivations are associated with more positive outcomes than extrinsic and less internalized motivations. Thus, self-determination and intrinsic motivation are essential for employee well-being at work because they are correlated with positive outcomes such as engagement, satisfaction, commitment, creativity, innovation, concentration, productivity, and resilience.

Recognizing this, determining what may influence the performance of employees in CWS and OPOs has become a crucial issue for many organizations. CWS make it possible for their users to share a physical space offering the entire infrastructure that can be found in an office and to take advantage of the pooling of equipment and sharing of expenses in exchange for lower monthly rental costs (Scaillerez, Tremblay, 2016). These are above all places composed of seating space and offices (Scaillerez, Tremblay, 2016). Offices can be open (open space) to facilitate meetings or closed for more privacy. These two forms of offices are in all cases designed to counter the isolation of coworkers.

Open-plan designs refer to offices with individual workstations placed within an open space; sometimes divided by panels, but also including conventional shared offices with several workers in an office space (Smith-Jackson & Klein, 2009). The advantages of open-plan work environments are diverse, and the most important benefit is probably economical; a higher occupant density, an increased net usable area and adjustability of the work environment will lead to financial advantages (Gorb, 1992). Also, communication and interaction between colleagues has been mentioned as an advantage, although that has never been scientifically proven (Kaarlela-Tuomaala, Helenius, Keskinen, & Hongisto, 2009).

Studies (Orel & Alonso, 2019; Marceau & Tremblay, 2024) indicate CWS can facilitate relationship-building and effective collaboration, making them ideal for team meetings and business conversations.

However, their casual atmosphere may hinder productivity and performance. Often, people can work from home a few days a week and in the CWS the rest of the week, but many also work there full time (Scaillerez & Tremblay, 2024). In this research, performance is defined as ''the level of productivity of an individual employee, relative to his or her peers, on several job-related behaviors and outcomes'' (Karatepe et al., 2006). In contrast, the results of studies on open plan offices are different. Some studies (Kim & De Dear, 2013; Monaghan & Ayoko, 2019) show that working in these offices can lead to better communication, increased collaboration, greater creativity, and higher employee morale, as long as individuals' privacy is respected, but according to some other research (Roelofsen, 2008; Haapakangas et al., 2018), despite the privacy, irrelevant speech in open offices contributes to mental workload, stress, fatigue and poor concentration.

On the other hand, various studies (e.g. Grolnick & Ryan, 1987; cited in Deci & Ryan, 2002) have emphasized that individuals' intrinsic motivation, which is influenced by autonomy, competence, and affiliation, is associated with better learning, satisfaction, performance, and well-being. Self-Determination Theory (SDT) "postulates three innate psychological needs, which have to be satisfied for individuals to flourish" (Deci & Ryan, 2000), namely autonomy (i.e., engaging in a behavior with a full sense of volition), competence (i.e., the experience of mastery and efficacy), and relatedness (i.e., the need to feel connected to other people in a meaningful way) (Deci & Ryan, 2000; Ryan & Deci, 2017). In this regard, White (1959) suggested intrinsically motivated activities, as activities that individuals find interesting and that are performed even in the absence of discrete agentic consequences, play an important role in the experience of efficacy and competence in employees' activities. The concept of intrinsic motivation is also consistent with Ducharme's (1968) view that individuals have a primary motivational tendency to feel causal agency in their activities (Vansteenkiste, Lenz, & Deci, 2006). Thus, the primary function of identifying the need for self-compliance and efficacy (in relation to intrinsic motivation) is to provide a means of predicting the social conditions and task characteristics that increase or decrease employees' satisfaction and performance by affecting intrinsic motivation.

Against this backdrop and given the existence of a research gap in open plan and coworking contexts, this study develops and tests a model (Figure 1) that investigates effects of self-determination theory elements on employees' performance in these two workplaces, considering the mediating role of satisfaction. This is a comparative study in which the relationships among the variables in the model are examined comparatively in OPOs and CWS. Since it is expected that the employees' demographic in these workplaces might also affect both employees' satisfaction and performance, the influence of these characteristics has also been considered in the proposed model.

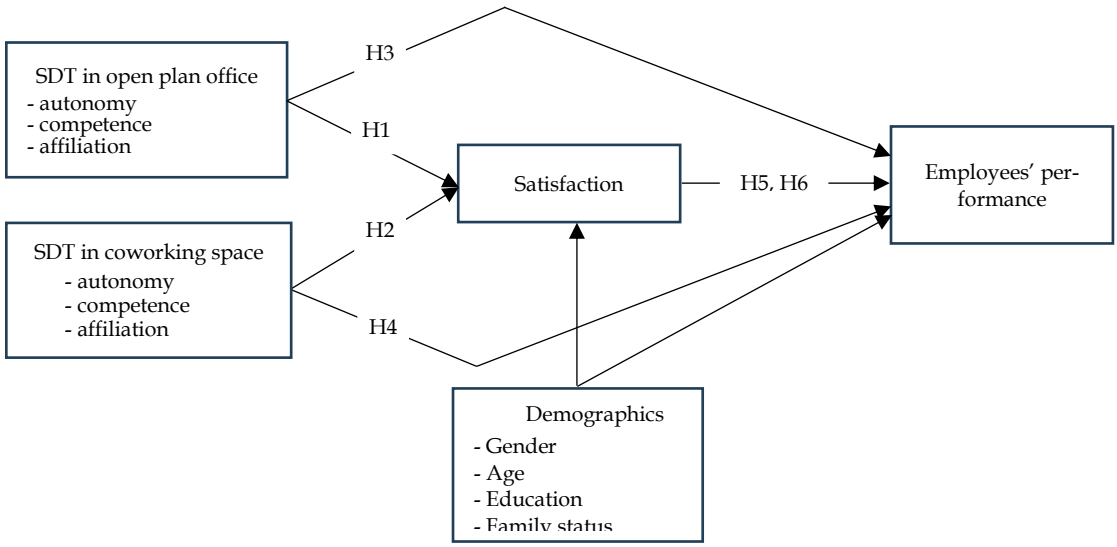

Fig 1. The Proposed Research Model

Source: Authors' own work

There are various reasons for developing the proposed model, some of which have been mentioned, but the most important reason is the gap in studies on the impact of SDT elements on employee performance in OPOs and CWS, which have been used by many organizations in the last two decades. Also, the mediating role of satisfaction, which is affected by the workplace conditions, is a determining

factor that has been added to the model. Finally, the comparative study of these elements simultaneously in this research is another innovation. Thus, the results of this empirical study provide useful practical guidelines for managers and organizations to decide whether or not to use this type of workplaces.

3 HYPOTHESES DEVELOPMENT

3.1 EMPLOYEES' SATISFACTION

Satisfaction is one of the main constructs in employees' motivation and SDT and it is defined as "a multifaceted concept that refers to the contentment and fulfillment that individuals derive from their work. It's a measure of how well an employee's expectations, aspirations, and needs align with their actual experiences at an organization" (Masionis, 2023). According to an important principle of self determination theory, satisfying employees' basic psychological needs at workplace, including autonomy, competence, and affiliation, is required for high-quality motivation, job satisfaction, and performance (Blechman et al., 2022). Current studies (Van den Broeck et al., 2016) indicate that basic needs satisfaction at workplace (autonomy, competence and affiliation) are associated with "key indicators of employee well-being, including adaptive job attitudes (e.g., job satisfaction, lower turnover intentions) and behaviors (e.g., task performance, lower absenteeism)" (Blechman et al., 2022).

Nguyen, Taylor & Bradley (2003) found that "perceived job autonomy is a highly significant determinant of five separate domains of job satisfaction (pay, fringe benefits, promotion prospects, job security and importance / challenge of work). Other similar studies (Zychová et al., 2024; Sageer et al., 2024; Blechman et al., 2022) also emphasize that autonomy, as one of the essential human needs, affects employees' internal motivation and drives job satisfaction. In addition, research (Renyut, et al., 2017; Gunawan et al., 2019) also shows that employees who are perceived as competent in their organizational roles are generally more satisfied. Thus, feeling competent and capable of performing tasks well and performing at a high level, are expected to contribute significantly to positive job satisfaction levels. According to studies (Mohammed et al., 2023), a strong sense of workplace affiliation, which means a sense of connection and belonging to an organization, generally has positive effects on job satisfaction. Relatedness or affiliation meets the human need for social connection within the organization and can lead to increased participation, commitment and job satisfaction.

Although previous research has provided valuable insights into the impact of SDT components on motivation and job satisfaction in organizations, few studies have examined these relationships in the context of OPOs and CWS. Open-plan offices are still often designed in large rooms where all employees work together. In an open-plan office, employees are no longer alone in their small offices, but share the space with their team (Lai, Chau, Davies, & Kwan, 2021). Such a space is often formed over short distances for quick layout, without intrusive doors. Hence, employees' privacy is somewhat lost, their concentration can be disrupted, and they find themselves constantly under the direct supervision of managers and the gaze of others. It seems reasonable to expect that employees in OPOs would feel less independent and would perceive the constant supervision of the manager as an intrusion into their work.

Unlike OPOs, a coworking space is an environment that is designed to accommodate people from different companies or self-employed who come to do work (Hogarty, 2021). They are community centers, collaboration hubs, and social spaces where workers from different backgrounds can come together to share expertise, explore new ideas and promote skills and competencies (Bednář et al., 2023). Thus, they aim to integrate informal social and formal productive and functional elements into a working environment that encourages a range of beneficial interactions; facilitates the sharing of information, contacts, knowledge, skills and ideas (Brown, 2017) and creates a community platform for members to communicate and collaborate as well as break down professional or organisational boundaries through knowledge sharing (Rese, Kopplin, & Nielebock, 2020) and social exchange (Amir, 2020), thereby promoting collaborative innovation. These spaces also provide opportunities to enhance flexibility, networking, collaboration and creativity (Clayton, Feldman, & Lowe, 2018). These have a positive impact on employees' mental health (Kinsman et al., 2024), reduce employees' stress levels (Wu & Zhang, 2024) and most probably increase job satisfaction.

Although there is not much information about employees' feelings of autonomy, competence, and affiliation in CWS, based on the characteristics of these spaces, it is possible to assume positive effects. So, based on theoretical foundations and the research objective, the following hypotheses are proposed.

H_1: SDT components influence significantly employees' satisfaction in open plan offices.

H_2: SDT components influence significantly employees' satisfaction in coworking spaces.

3.2 EMPLOYEES' PERFORMANCE

Employee performance is one of the key factors considered when assessing their overall contribution to organizational performance. In its simplest definition, employees' performance is the state or quality of their performance in workplace. Thus, employees' performance is a general construct that refers to how well employees perform their tasks. In this approach, performance is considered the process of explaining the quality, efficiency and effectiveness of employees past actions. A review of the literature shows that by the late 1960s, goal achievement was the main approach for employee performance. Accordingly, performance evaluations were carried out by managers and employees' self-assessment based on the goals. Based on this approach, many organizations considered bonuses and profit sharing as a way to improve employee performance. However, many workers, for various reasons, including differences in tasks and working conditions, do not have the opportunity to receive bonuses and share in profits at work (Nelson, 1995).

In the following decades, the development of the employee performance appraisal system made it possible to use psychological methods and criteria. Since the 1980s, we have witnessed an increasing organizational focus on motivation and participation in employees' performance. This new approach, which was also considered in this current research, created a new attitude in employee performance and caused new factors, such as self-awareness, communication, teamwork, conflict reduction, ability to control emotions, workplace environment etc. to be added to the set of employee performance factors.

Increasing employee performance requires specific management actions in providing some facilities and improving the conditions of workspaces. Accordingly, since the late 20th century, the approach of managers to employee performance in some organizations has changed towards providing good working conditions for all employees (Brewer, 1996). Some open-plan offices and coworking spaces can be considered examples of organizational actions in this regard, as they can emphasize physical and behavioral aspects to increase employees' performance. Studies indicate that the workplace environment plays an important role in shaping employees' behavior on an individual basis (Zhenjing et al., 2022). As a result, the conditions and quality of workplaces affect employees' motivation to work hard, their efficiency, and their performance. Hence, "worker' levels of willingness to keep motivated, creative, engaged with colleagues, and stay loyal to an employer are all influenced by the factors of workplace environment" (Hafeez et al., 2019).

In addition, increasing employee performance requires other specific conditions. First, employees need to have mastered tasks and different skills. When people feel that they have the skills and competencies needed to succeed, they are more likely to take actions that will help them achieve their goals (Cherry, 2024). In addition, according to studies (Mohammed et al., 2023), employees who feel affiliated are more likely to be committed to their work and organization, which can lead to increased motivation (Shore et al., 1993) and job satisfaction (Zillmer, 2020). This means more than just motivation and job satisfaction, and includes factors like loyalty, engagement, and identification with the company's values and mission which will ultimately affect productivity (Hahlbrock, 2011) and job performance (Sumario et al., 2022). Also, when employees have control over their work methods, decision-making, planning, and feel autonomous, their creativity, job satisfaction, and participation in team activities increase. Thus, autonomy allows employees to feel more ownership and motivation for their tasks.

However, a review of the literature shows that the results of studies on performance in the context of OPOs and CWS are not clear. Roelofsen (2008) found that working in open-plan offices leads to lower performance, especially for tasks that require concentration and memory. Moreover, working in open plan results in face-to-face interactions and communication. These interactions are often less meaningful and job-related. This reduces employees' privacy and concentration (Jahncke et al., 2011; Smith-Jackson et al., 2009), and gives them the feeling that their autonomy in workplace is reduced. To speak face-to-face, many employees choose to leave the office to not interrupt others or avoid being overheard. OPOs therefore

cause loss of concentration (Roelofsen, 2008), influence on interactions, increased levels of stress (Ramantswana et al., 2024) and it is expected to have a significant impact on employees' performance. Poor workplace conditions significantly reduce employees' sense of autonomy, leading to reduced motivation, job satisfaction, engagement, and burnout. On the other hand, such conditions hinder their ability to learn and perform at their best, while a positive workplace can improve creativity, engagement, and overall performance levels.

The situation in CWS is different to some extent. CWS, in addition to providing access to relevant infrastructure and workstations, also provide opportunities to enhance flexibility, networking, collaboration, creativity and innovation (Clayton et al., 2018). These have a positive impact on employees' mental health (Kinsman et al., 2024) and reduce employees' stress levels (Wu & Zhang, 2024). Since social interaction is a psychosocial factor that has been reported to improve well-being/mental health (Servaty et al., 2018), it is expected coworking can affect the individuals' abilities to have flexible work arrangements with freedom to organize their own schedule, leading to influence autonomy and impacts over work (Servaty et al., 2018), affiliation, and ultimately, influence employees' performance. Despite numerous studies conducted in this area in recent years, there are many gaps. To fill the gaps, this study develops two other hypotheses.

H_3: SDT components influence significantly employees' performance in open plan offices.

H_4: SDT components influence significantly employees' performance in coworking spaces.

3.3 MEDIATING ROLE OF SATISFACTION

As previously mentioned, behavioral and physical features in workplace are two important factors that can have a significant impact on employees' behavior (Zhang et al., 2022) efficiency, and performance. These types of relationships between variables usually create a gap in assessing the specific mediating role of some factors in performance evaluation. Thus, these factors at the organization level, along with job-related factors, have been investigated with specific mediation of some employee-related factors such as motivation, adaptability, flexibility, proactivity, skill level, satisfaction, commitment etc. to assess employee performance (Diamantidis and Chetzoglou 2018). In this research, we considered this role for job satisfaction.

The direct relationship between job satisfaction and performance is not new in the psychology literature. The idea that job satisfaction leads to better performance is supported by many researchers. These studies support the idea that satisfied employees are more productive. Part of this research is also dedicated to this issue, but job satisfaction is not the independent variable in this research. It is a mediating variable. To achieve the research objectives and for measuring the effects of self determination theory components on performance, we needed facilitators that could strengthen the relationship between the workplace conditions and employee performance.

Job satisfaction, in addition, is a variable that is strongly influenced by workplace conditions. Studies show that a positive work environment generally leads to higher levels of job satisfaction, while poor workplace conditions can negatively impact stress, turnover rates, and commitment of employees. Furthermore, according to self-determination theory, employees will perform better when their psychological needs for autonomy, competence, and relatedness are well met. This relationship is expected to be strengthened through job satisfaction supported by the organization's work environment. So, we consider job satisfaction as a mediating variable and propose the following hypotheses.

H_5: Employees' satisfaction mediates the relationship between self determination theory components and performance in open plan offices.

H_6: Employees' satisfaction mediates the relationship between self determination theory components and performance in coworking offices.

4 RESEARCH METHODOLOGY

4.1 DESIGN AND TYPE OF STUDY

This study is an empirical research used a quantitative design based on the descriptive-analytical method. It used a survey method to collect primary data.

4.2 PARTICIPANTS

The target of this survey included two groups of employees. The first group includes employees who work in open-plan offices, while the second group consists of employees who use coworking spaces for their work. Their opinions were asked separately about self-determination theory, concentration and performance in these two workplaces. All these employees were from the province of Quebec (Canada), which constitutes the populations of the study. Both of the populations are considered large populations in terms of the research context, hence, the researchers used samples (Levy & Lemeshow, 2013). The sample size was determined based on the large-population sampling method (Levy et al., 2013) to obtain a sampling error of ±0.1 and a 95% confidence interval. A total of 315 completed questionnaires were received from the workplaces. For selecting samples, convenience sampling method was used by considering lists of employees who work in OPOs and CWS.

Although the sample size was likely to be normal based on the principles, the researchers took steps to reduce biases in the sampling and data collection process. First, the sample was not collected from a single location but rather it covers different cities in Quebec. In this study, samples were selected from the users of the OPOs and CWS in more than 20 cities and towns of Quebec. Second, data collection was carried out in collaboration with the OPOs and CWS of the cities and towns, which had access to a wide range of employees. That is, people who used these centers temporarily or permanently. Hence, the selected individuals had different demographic characteristics that were very similar to the real population. Finally, the researchers attempted to make the sample size tend toward infinity to make the data normal based on the central limit rule (Mendez, 1991).

4.3. MEASURES AND INSTRUMENTS

The measures used in this research were mainly extracted from the output of the qualitative part of this research as well as from previous studies in the related literature. A total of 25 items were considered so that all variables- autonomy, competence, affiliation, job satisfaction and performance were measured using 5 items for each. Some items that were related to other domains were adapted to measure the factors. The items were presented in the form of seven-point scale questions. The structure of the responses to the items were elicited on seven- point scales. Table 1 illustrates the scales, and the codes related to each scale.

Table 1. Seven- Point Scales and the Codes

Strongly disagree	Somewhat disagree	Disagree	Neither agree nor disagree	Agree	Somewhat agree	Strongly agree
Never	Very rarely	Rarely	Sometimes	Often	Very often	Always
7	6	5	4	3	2	1

Note: *The scale of some questions was reversed after extraction using software to rank the scores from highest to lowest.*

Source: Authors' own work

Two questionnaires were used for collecting data from OPOs and CWS separately. There were two online questionnaires using Google Forms, and the questionnaires consist of two parts. The first parts collect general information about the respondents including demographic information such as age, gender, education level, family status, etc. The second parts include items that measure the research constructs including self determination theory elements, employees' concentration and performance in open plan office and coworking space.

4.4. DATA ANALYSIS TECHNIQUES

The main basis of data analysis is the structural equation model based on IBM Amos- 29. SEM is one of the advanced and powerful statistical methods used in analyzing complex data and multiple relationships between variables. This method is used to analyze complex models and determine relationships between observed and latent variables (Bollen, 1989; Mueller & Hancock, 2018). In addition, using Amos not only

simplifies the model-building process but also enhances the interpretability of results, allowing for immediate visual feedback and easy modification of models. Also, this method is suitable for confirmatory analyses. Also, SPSS-27 was used for calculating Cronbach's α, central and dispersion tendencies, and correlation analyses to provides support for issues of reliability and internal consistency and discriminant validity. Finally, the correlation matrix was used as an input in path analysis and the hypothesized relationships depicted in Figure 1 were measured.

5 RESULTS

5.1 DEMOGRAPHIC CHARACTERISTICS

Table 2 shows the demographic profile of both groups of the respondents- OPOs and CWS. According to the table, a majority of both groups of participants are women (68% and 55% respectively). The majority (64%) of open plan office respondents are in the age group of 21 to 50 ,64% of the participants are married, and most of them have children. While 80% of coworking space respondents are in the age group of 21 to 50, 62% are married, and similar to the first group, most of them have children. In both groups, the rest are single or married people without children. A majority of the participants in both groups have reached the university level of education.

Table 2. The Participants Demographics

		Open plan office		Coworking space	
		N	%	N	%
Gender	Female	72	67.3	117	56.5
	Male	35	32.7	89	43.4
Age	< 21	-	-	3	1.4
	21 to 30	11	10,3	66	32.1
	31 to 40	24	22,4	65	32.5
	41 to 50	35	32,7	39	18.9
	51 to 60	28	26,2	27	13.1
	> 60	9	8,4	6	2.9
Education	Secondary	5	4,67	7	3.4
	College	30	28,1	32	15.5
	University	70	65.4	161	78.2
	>= master	2	1.9	6	2.9
Family status	Single without child	23	21,5	63	30.6
	Single with child	7	6,54	12	5.8
	Marrid without child	25	23,4	61	29.6
	Marrid witho child	44	41,1	66	32.1
	Others	8	7,47	5	2.4

Source: Authors' own work

5.2 DESCRIPTIVE ANALYSIS OF THE MEASURES

Before testing the hypotheses, all measures of both groups, open plan office and coworking space, were first subjected to confirmatory factor analysis to ensure their validity. As Figures 2 and 3 illustrate, one item from autonomy and one item from competence of open plan office, one item from competence, one item from affiliation and one item from performance of coworking space were removed due to poor standardized loadings (<0.4) (Debnath & Khatri, 2024). As the figures show, the coefficients of all remaining items, in both open plan and coworking space are greater than 0.4, which is within the acceptable range (Debnath & Khatri, 2024; Wong, 2019).

In addition, according to what the output of Table 3 shows, the fit of the proposed models for open plan and coworking are confirmed based on confirmatory factor analysis ($\chi 2/df$ =3.33, CFI =0.93, NFI =0.90, RFI =0.84, RMSEA=0.06) and ($\chi 2/df$ =4.11, CFI =0.95, NFI =0.90, RFI =0.82, RMSEA=0.07) respectively. The outputs indicate the standardized loadings of open plan office are between 0.41 and 0.94, and t-values are between -3,39 and 33.24 which indicates their distance from 0 and means they are

significant. In addition, the outputs indicate the standardized loadings of coworking space are between 0.42 and 0.95, and t-values are between -6,4 and 48,6 which indicates they are significant.

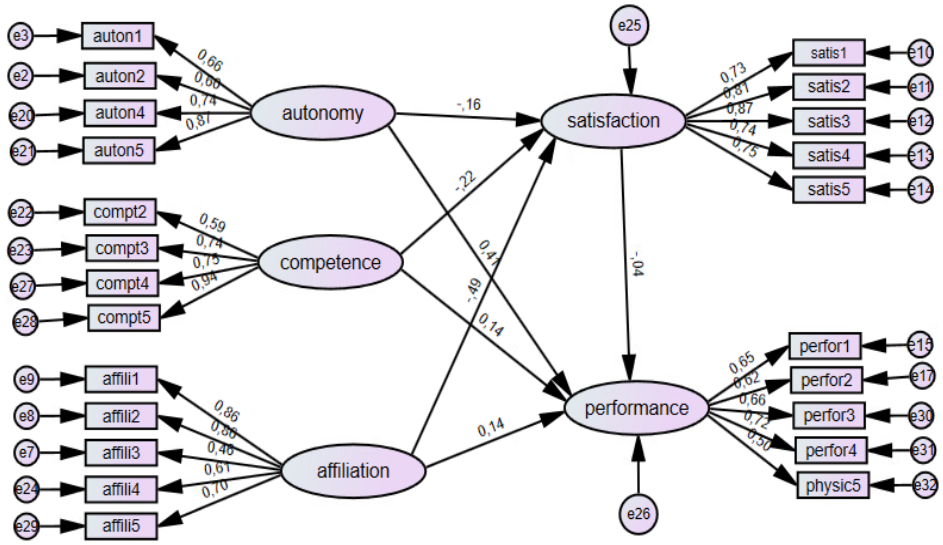

Fig 2. The Path Estimates of Open Plan Office

Source: authors own work

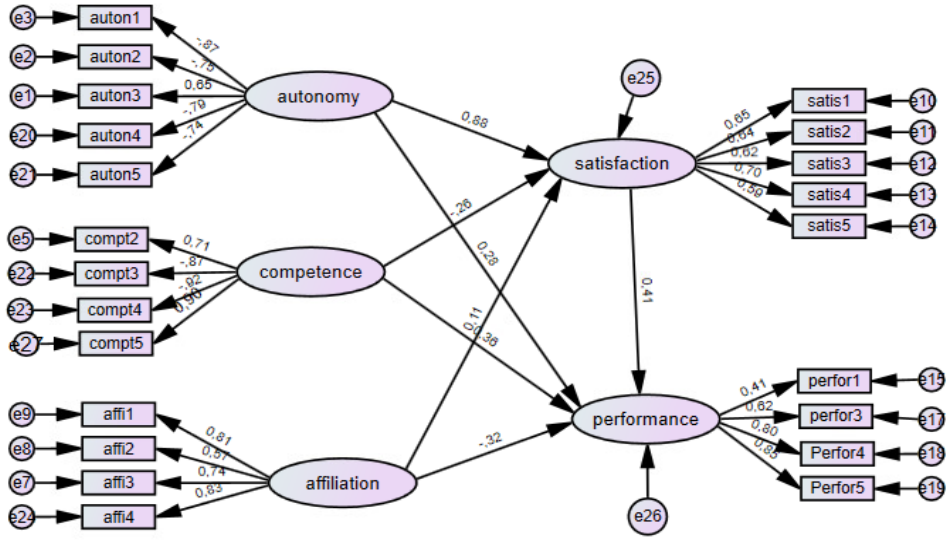

Fig 3. The Path Estimates of Coworking Space

Source: Authors' own work

Furthermore, 88% of the measures had standardized loadings greater than 0.70. Accordingly, it can be concluded that model fit statistics as well as the magnitudes of the standardized loadings with their t-values provided support for convergent validity (Anderson & Gerbing, 1988). Also, the values of alpha-Cronbach for all measures are greater than 0.7, which indicates the factors' reliability (Ekolu et al., 2019; Shrestha, 2021).

Table 3. Factors, Items, Validity And Reliability

Factor	Measure		Standardized loading	t-Values	α
Autonomy	When I am here, I feel a sense of freedom and choice in the activities I undertake	op	.66	-3,101	.824 .772
		cw	.87	26,661	
	Being in this workplace puts me in touch with the meaning of my work	op	.65	-3,460	
		cw	.75	24,508	
	When I'm here, I feel the stress of being someone I'm not.	op	<.40	-1,794	
		cw	.65	30,901	
		op	.74	-4,249	

Factor	Measure			Standardized loading	t-Values	α
	When I work here, I feel like I am always under control		cw	.79	24,585	
	I feel a great sense of autonomy when I work here		op	.81	-4,619	
			cw	.74	29,732	
Competence	When I work from here, I feel competent		op	<.40	-,302	
			cw	<.40	18,408	
	Working from here makes me feel like I'm very good at what I do		op	.59	,564	
			cw	.71	20,717	
	The atmosphere in this workplace helps me develop as a person		op	.74	-3,436	.826
			cw	.87	27,328	.779
	Most of time, when I finish a day work in this workplace, I feel a sense of accomplishment		op	.75	-3,735	
			cw	.92	27,896	
	This workplace significantly increases my confidence in my abilities to do my job well		op	.94	,926	
			cw	.90	23,642	
Affiliation	This workplace helps me connect with other people		op	.86	-9,139	
			cw	.81	34,786	
	I feel a connection with other people in this workplace		op	.86	1,551	
			cw	.51	29,667	
	I never feel lonely and isolated in this workplace		op	.48	-12,381	.803
			cw	.74	11,333	.740
	The people in this workplace are welcoming and open		op	.61	-4,202	
			cw	.83	48,583	
	I feel connected to this workplace		op	.70	15,411	
			cw	<.40	27,010	
Satisfaction	I am satisfied with the conditions of workplace (lighting, desk, chair, equipment, etc.).		op	.73	15,411	
			cw	.65	4,131	
	I have enough space to work and move around in my workplace.		op	.81	1,421	
			cw	.84	3,753	
	I am unhappy with the feeling that others are watching me and my work at the workplace.		op	.87	-,364	.894
			cw	.62	3,506	.818
	I am satisfied with the collaborative space for expanding professional network at workplace.		op	.74	3,391	
			cw	.70	5,901	
	I am satisfied with the exchanges and interactions that occur at my workplace.		op	.75	8,688	
			cw	.59	2,937	
Performance	I would rate the quality of my work in the workplace		op	.65	-6,394	
			cw	.41	26,710	
	I would rate my efficiency and productivity in the workplace		op	.62	1,000	
			cw	.62	17,764	
	This workspace promotes new ideas, creativity and innovation in the team working		op	.66	1,583	.853
			cw	.80	15,144	.730
	This workspace improves my work and employment prospects		op	.72	6,649	
			cw	.85	13,010	
	Working in this space helps promote teamwork with my colleagues.		op	.50	3,912	
			cw	<.40	24,912	
Models' fit	Open plan	coworking				
χ2/df	3.33	4.11				
CFI	0.93	0.90				
NFI	0.91	0.90				
RFI	.86	.83				
RMSEA	0.07	0.08				

Note: As mentioned, each item is measured on seven-point scales and all loadings are significant at the P<0.05 or lower (p<0.01). χ2 (Chi-square distributions), df (Degrees of freedom), RMSEA (Root Mean Square Error of Approximation), NFI (Normed Fit Index), RFI (Relative fit index), CFI (Comparative Fit Index).

Source: Authors' own work

The results of the correlation test for both groups, open plan office and coworking space, show that the correlation between the variables for open plan office is between -0.138 and 0. 757, and for coworking space is between 0.274 to 0.644. As Table 4 indicates, none of the correlation coefficients was equal to

and/or higher than 0.90, providing further evidence for discriminant validity (Tabachnick & Fidell, 1996). The means and standard deviations of the composite scores are also provided in this table.

Table 4. Correlations of the Variables, the Means and Standard Deviations

Variable	1	2	3	4	5	6	7	8	9
Gender	1								
Age	.212** .031	1							
Education	.023 .021	-,095 ,124	1						
Family Status	-.104 -.163*	,242** ,144	-.141* ,065	1					
Autonomy	-.103 -,022	,079 -,060	-.129* -,141	,124* -,028	1				
Competence	-.148* -,057	,125* -,126	-,096 -,108	,060 -,044	,239* ,644**	1			
Affiliation	-.026 -,103	,028 ,044	-049 -,095	,017 -,039	,757** ,563**	,289** ,595**	1		
Satisfaction	-.222* -,122	,041 ,057	.133 ,115	-,182* -,034	-,520** ,438**	-,138 ,450**	-,320** ,560**	1	
Performance	-.170 -,123	,133 -,012	.104 ,076	-, 189 -,054	-,674** ,458**	-,204* ,401**	-,593** ,328**	-,349* ,274**	1
Mean	1,31 1,42	3,98 3,18	2,79 3,05	2,64 3,63	3,36 5,65	3,75 5,07	2,72 5,43	5,01 4,24	4,88 5,20
St. deviation	,466 ,496	1,126 1,152	1,277 1,227	,579 0,594	1,443 1,008	,4609 ,9415	1,376 ,9259	1,649 1,348	1,605 1,369

*Notes: * p<0.05. **p<0.01. Correlations without any asterisks are insignificant.*
Source: Authors' own work

Furthermore, as the table indicates, all relationships among variables for OPOs (except one) are significant (P<.01). More precisely, autonomy has a significant correlation with job satisfaction (P<.01, r=-.52), affiliation has a significant correlation with satisfaction (P<.01, r=-.32), but competence has no significant correlation with satisfaction (P>.05, r=-.138). These three components of SDT have significant correlation with performance (P<.01 and P<.05, r=-.67, r=-.20, r=-.59 respectively). On the other hand, as the table illustrates, in CWS, autonomy, competence and affiliation have significant correlations with satisfaction (P<.01, r=.43, r=.45, r=.56 respectively). These three components also have significant correlations with employees' performance (P<.01, r=.46, r=.40, r=.33 respectively). Finally, employees' satisfaction in both workplaces have significant correlations with performance (P<.01, r=-.35, r=.27 respectively). The negative correlations mean that feelings of lack of autonomy in OPOs, for example, reduce employees' satisfaction and performance. While the positive correlation indicates that the higher sense of affiliation in coworking space, for instance, the higher employee satisfaction and the higher performance. As the table indicates, the significance level of the majority of demographic characteristics is greater than 0.05%, indicating weak effects on the variables. However, some items, such as age and education, had greater impacts which we will discuss later.

Table 5 indicates the path analysis and hypotheses tests. According to the results, hypotheses 1 is confirmed. Path analysis indicated that the path from SDT components to job satisfaction in OPOs is significant and negative. Path analysis also indicates that the path from SDT components to job satisfaction in coworking context is not significant. Thus, hypothesis 2 is not supported, but according to the outputs, hypotheses 3 and 4 are accepted. That is, there is a significant and negative relationship between SDT elements and employees' performance in open plan context, but SDT elements in coworking context positively impact employees' performance. Moreover, as the table shows, gender and family status in open plan office affect employees' concentration and performance, but age and education did not have significant effects. On the other hand, none of the demographic variables exerted significant effects on job satisfaction and performance in CWS.

Table 5. Path Analysis and Hypotheses Testes

Demographic and hypotheses	Estimates		Significant level		Result	
	OP	CW	OP	CW	OP	CW
Influence on job satisfaction						
Gender	,246	,071	,043	,621	supported	N/A
Age	-,116	-,019	,072	,757	N/A	N/A
Education	-,075	-.168	,138	,190	N/A	N/A
Family Status	-,215	,036	,045	,533	supported	N/A
Autono >>> Satisfac	-,680	,354	.000	.000	supported	supported
Cmptnc >>> Satisfac	,791	,254	.759	,003	N/A	supported
Affili >>> Satisfac	-,748	.031	.000	,008	supported	supported
SDT >>> Satisfac	-2,306	-,321	.000	.122	supported	N/A
Influence on performance						
Gender	-.016	,159	,048	,221	supported	N/A
Age	-,118	,024	,086	,673	N/A	N/A
Education	,010	-,216	,916	,064	N/A	N/A
Family St.	-,227	,034	,029	,518	supported	N/A
Auton >>> Perform	-1,031	,204	.000	,016	supported	supported
Cmptnc >>> Perform	,270	,334	,368	.008	supported	supported
Affili >>> Perform	,755	,233	.000	,006	supported	supported
Satisfa >>> Perform	-,408	,063	.000	,000	supported	supported
SDT >>> Perform	-,920	,358	,040	.000	supported	supported
Model fit						
$\chi 2$ /(df)	3.12	4.3				
CFI	0.93	0.95				
NFI	0.90	0.90				
RFI	0.84	0.82				
RMSEA	0.06	0.07				

Notes: Gender was coded in 1 for female and 2 for male. Age was measured in 6 categories, and education in 5. Family status categorized in 4 groups based on single / married and having / do not have children.
$\chi 2$ (Chi-square distributions), df (Degrees of freedom), CFI (Comparative Fit Index), NFI (Normed Fit Index), RFI (Relative Fit Index), RMSEA (Root Mean Square Error of Approximation).
Source: Authors' own work

Finally, according to tests, the direct relationships between variables are confirmed, but we need to test the mediating role of job satisfaction in the link between the SDT components and performance. Figure 4 shows the outputs of the direct relationships. Using this data and Sobel test, the mediating role of job satisfaction in open plan and coworking space are confirmed. So, both hypotheses 5 and 6 are accepted.

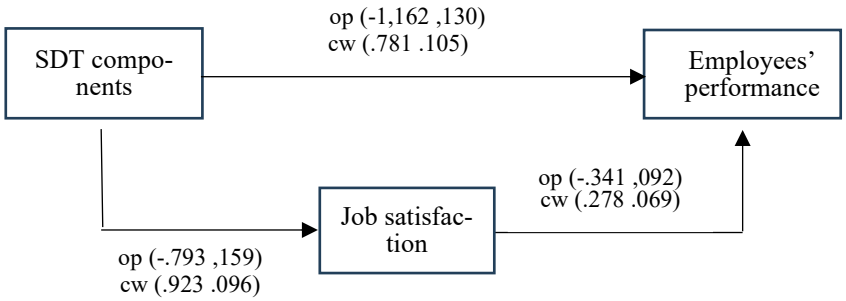

Fig 4. Direct Relationship Among the Variables

Source: Authors' own work

As Table 6 indicates, the p-value for both, open plan and coworking space are ($p<0.01$). Thus, they are statistically significant. The coefficients of the indirect relationships are -27% and 25.6% respectively. It tells us that the SDT components influence the employees' performance 27% and 25.6% through job satisfaction.

Table 6. Mediating role of job satisfaction

	Test statistic	Std. Error	P-value
Open Plan Office	-2,974936	0.09089	0.002
Coworking Space	3.715912	0.069052	0.000

Source: Authors' own work

6 DISCUSSION

6.1 DIRECT LINKS BETWEEN THE SDT COMPONENTS, SATISFACTION AND PERFORMANCE

In this study, we examined the relationships between the components of self determination theory and employee performance in OPOs and CWS, considering the mediating role of satisfaction. Overall, we found that work autonomy has a negative impact on job satisfaction and employee performance in open-plan offices, but this relationship is positive in coworking spaces. Factor analysis suggests that several factors are involved in the formation of these relationships. First, working in OPOs leads to a decrease in employees' personal autonomy and creates a sense of discomfort for them. They feel little freedom in these offices and have little choice in the activities they perform while in CWS, employees feel more autonomy. They feel more freedom in working in these spaces as they have usually chosen to do so and have the option to choose the activities they perform.

According to the findings, one of the reasons for the low sense of autonomy in OPOs is that there is no private office for employees, as all employees work in a shared workspace. Thus, based on the findings of this research, employees in OPOs feel that they are constantly being watched by managers, staff, and even clients. In this situation, they feel that their privacy is being invaded. In addition, organizational decisions force the employees to work in OPOs, while the users of coworking spaces usually make the choice to do so. In other words, it is not a personal decision of employees to work in an open plan office, while workers often use CWS at their own discretion to overcome loneliness in working and isolation. They can do part or all of their working hours and even their meetings in these workplaces. Thus, we can conclude that from the employees' point of view, coercion is a major factor reducing autonomy at workplaces.

The results of a study conducted by David Rock and Christy Pruitt-Haines (2021) on mandatory vaccinations for employees during the COVID-19 era support the findings of this study in this regard. They believe employees' reaction to coercion or mandatory presence in the workplace is similar and even more intense than vaccination. According to them "59% of workers say they would not work for a company that required them to come into a physical office five days per week" (Smith et al., 2025). Unlike employees in OPOs, employees' participation in CWS is more often voluntary and not mandatory. Also, due to the organizational characteristics of OPOs, decisions are usually made from the top down, and all employees must follow established procedures, as well as a minimum number of days presence. Based on the results, such cultures may not prioritize employee input or feedback and lead to limited autonomy and decreased employee self-confidence. While employee participation in CWS is more often a personal decision.

In this context, the result of this research is consistent with some similar studies. Ramantswana et al. (2024), for example, showed that OPOs lead to a decrease in employees' personal autonomy (Ramantswana et al., 2024). Older studies (Brennan et al., 2002; Danielsson & Bodin, 2009) also show that the lack of privacy and personal space leads to discomfort, stress and a decrease in the sense of autonomy, which can have an impact on employees' well-being. The findings of this study are also consistent with Herzberg's theory of motivation (Peramatzis et al., 2022), which states that job autonomy as a motivating factor in an organization is directly related to employee job satisfaction and affects performance. In contrast, the output of the data analysis of the coworking spaces shows that they feel more autonomy than the OPOs workers because they have more flexibility in choosing their workdays and spaces locations. Their greater sense of autonomy, as the findings indicate, leads to higher job satisfaction and employee performance than workers in OPOs.

The findings also show that feeling competence in open plan offices has no significant impact on job satisfaction, but it influences employees' performance. In CWS both relationships are significant and

positive. The findings show that employees in open-plan offices feel less competent than those in coworking spaces. The work environment is one of the factors that influence this feeling. From the perspective of employees, the least that an organization should provide is a suitable workspace where there is no noise, privacy is maintained, and they do not feel constantly watched. The results show that OPOs generally lack these conditions, from the perspective of employees. Therefore, it can be expected that a lower sense of competence will have a negative impact on the job satisfaction and employee performance in open plan offices, and conversely, a higher sense of competence of employees in coworking spaces will increase their job satisfaction and performance.

Theoretically, the results of this research can be confirmed in this regard. Job satisfaction is often influenced by a complex combination of factors beyond the level of skills and competencies. In OPOs, work environment conditions, organizational culture, relationships with colleagues and supervisors etc. often have a stronger impact on job satisfaction than competence. That is, a highly competent employee may still be dissatisfied if other working conditions are not ensured in the workplace. Lack of privacy in OPOs, for example, can make people feel lack of autonomy, overwhelmed and anxious, which can lead to losing concentration and dissatisfaction. Moreover, the constant movement of employees in OPOs can be disturbing and make it overwhelming for some people. People's usual conversations, formal and informal meetings, phone conversations, and more can distract employees in OPOs. All of these have a greater impact on job satisfaction than competence.

On the contrary, one of the important features of CWS is being together, collaborating and sharing ideas and plans with others, in a voluntary manner. In other words, the philosophy of going to CWS focuses on teamwork or voluntary cooperation, not the compulsion similar to what exists in OPOs. It has a significant impact on employee self-confidence, as data analysis shows. With this approach, it can be concluded that the feeling of competence, workspace and quality of interactions in OPOs and CWS have a significant impact on job satisfaction and employee performance. Also, the findings indicate, in coworking space, employees use their knowledge and experience with more confidence and voluntarily to influence the results of teamwork. This has a significant impact on developing the employees' knowledge, skills, and competencies while often employees work more individually and involuntarily in OPOs.

The relationship between affiliation and performance in both OPOs and CWS are similar. Based on the results, affiliation in OPOs and CWS increase job satisfaction and employee performance. Despite the criticisms of work conditions in these offices, the results show they strengthen communication channels. Employees can easily walk up to their colleagues' desks and even their own bosses and ask for help and advice. Effective face-to-face communication not only increases job success but also increases emotional connections among employees and a sense of relatedness to organization. Also, both OPOs and CWS create an equal work environment for all employees. A sense of equality in the workplace, eliminates the feeling of being inaccessible and intimidating figures to colleagues, especially managers, and increases the sense of equality and affiliation to the organization. It also improves employee acceptance by colleagues and managers, significantly increasing job satisfaction and boosts employee performance.

The findings of this research in this regard are in line with the previous studies. Tuck (2025) and Bernstein et al. (2018), for example, found that working in OPOs had a positive effect on affiliation and loyalty by fostering a sense of community and belonging among employees. However, some studies (Kohll, 2019; Lai et al., 2021) show on the contrary that OPOs can have negative effects on affiliation, such as a decrease in employee happiness and job satisfaction. In this regard, Ashforth et al. (2024) argue that in CWS the "workplace" and the "organizations for which people work" are two separate entities, both conceptually and geographically distinct. They believe that these different entities can influence their sense of affiliation or relatedness to the organization, although how these members experience the transition from the initial phase of dispersion to a sense of belonging to a community in their workplace requires more research.

6.2 MEDIATING ROLE OF JOB SATISFACTION

Overall, the results explored that job satisfaction mediates the relationship between the SDT components and employees' performance in both contexts, open plan office and coworking space. More precisely, job satisfaction mediates the links between autonomy and affiliation with employees'

performance in open offices but does not in the relationship between competence and performance. However, this role is significant among all components of SDT with performance in a coworking context. The findings of this study show that when employees feel more autonomy in OPOs and CWS, job satisfaction plays a higher facilitating role in increasing employees' performance. Figure 5 (left) shows the mediating role of job satisfaction when employee autonomy is in its highest level in both contexts. As the figure indicates, the slopes of the relationship between the variables are positive in both cases. That is, when employees have more autonomy in the workplaces, they are more satisfied, which in turn has an increasing effect on employees' performance. Also, the slope of open plan graph is steeper than in CWS. This means that if employees have more autonomy in open plans, they will be more satisfied than employees in CWS, and their performance will increase more.

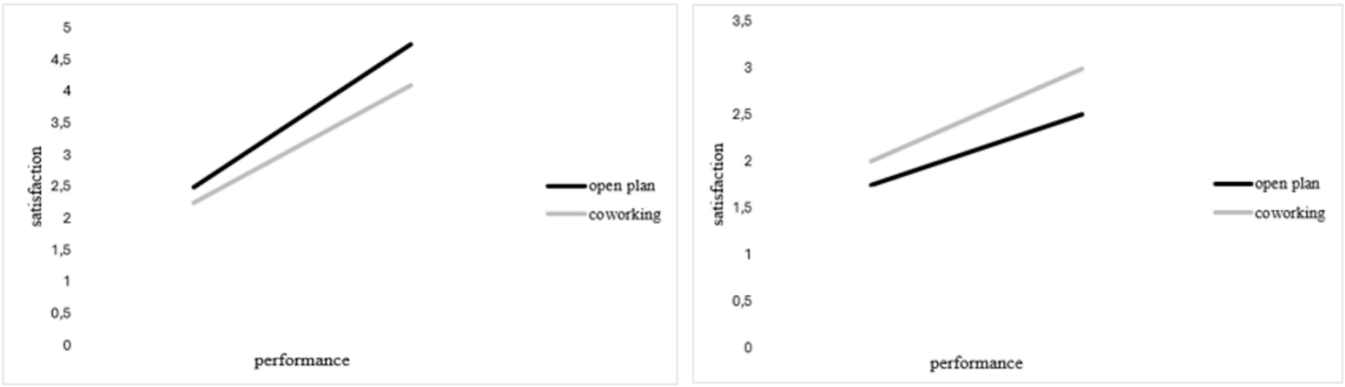

Fig 5. Relationship Between Satisfaction and Performance When Autonomy is Max (left) and Min (right)

Source: Authors' own work

Figure 5 (right) shows the mediating role of job satisfaction when employee autonomy is at its lowest in both contexts. As can be seen, the relationship is less steep in OPOs than in CWS. This means, when employees in open offices have little autonomy, they are less satisfied, which in turn has a negative impact on employee performance, but in CWS employees feel enough autonomy. Thus, the influence on satisfaction and performance is applied with a lower coefficient.

The results also show that job satisfaction does not mediate the relationship between competence and performance in OPOs, but it plays a positive mediating role in coworking context. Figure 6 (left) shows the mediating role of job satisfaction when feeling of competence is at its highest level in both contexts. As can be seen, the relationship lacks a significant slope in open plans, while it is positive in coworking space. This means, the more competent the participants feel in CWS, the greater their satisfaction and higher performance than the employees in open plan offices. On the other hand, as figure 6 (right) indicates, when the feeling of competence is at its lowest level in both contexts, the negative impact of job satisfaction on performance is greater in CWS than in open offices.

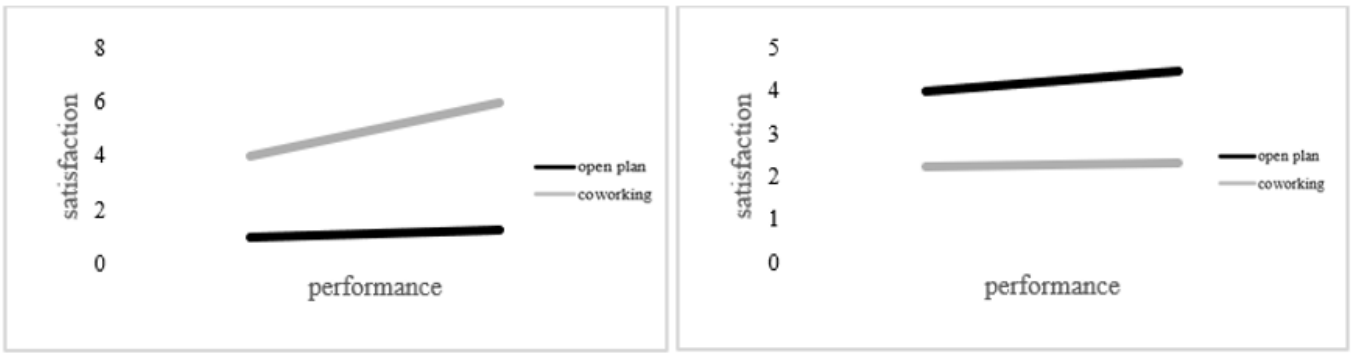

Fig 6. Relationship Between Satisfaction and Performance When Competence is Max (left) and Min (right)

Source: Authors' own work

Finally, Figure 7 (left) illustrates the mediating role of job satisfaction when employee affiliations are in highest levels in both contexts. As the figure shows, the slopes of the relationship between the variables

are positive in both contexts. This means that when employees feel more affiliation to the workplace, they have more satisfaction, which in turn has a positive impact on employee performance. As can be seen, the slope of open plan is steeper than coworking space. This means, if employees have more affiliation in open plans, they will have more satisfaction than employees in coworking, and their performance will increase further. Figure 7, to the right, shows that when employee affiliation is at its lowest, the impact of job satisfaction on performance is greater in OPOs than in CWS.

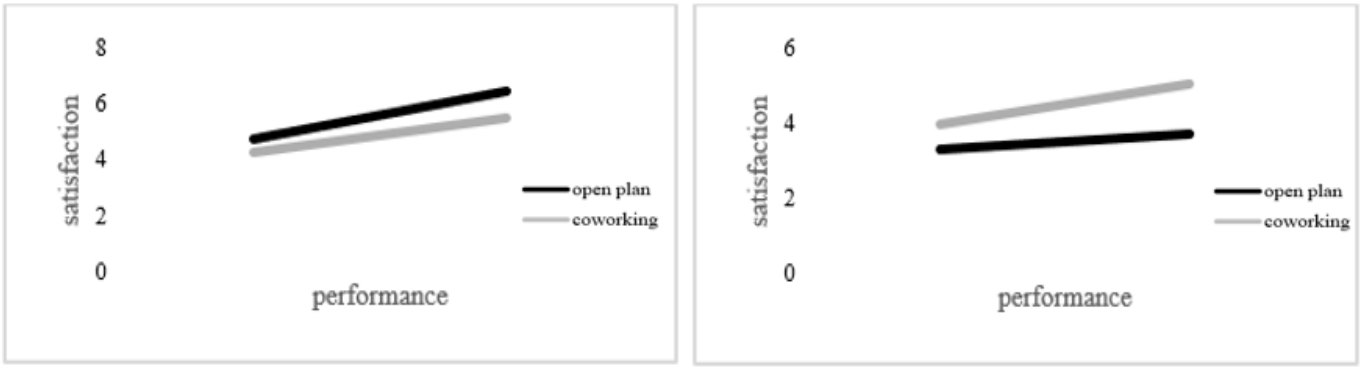

Fig 7. Relationship Between Satisfaction and Performance When Affiliation is Max (Left) and Min (right)

Source: Authors' own work

7 CONCLUSION AND RECOMMENDATIONS

In general, according to the research findings, it can be concluded that open plan offices and coworking spaces which are both influenced by physical conditions, autonomy, competence, affiliation, interaction and privacy status have relatively different effects on employees' satisfaction and performance, although the type and intensity of the effects vary depending on the circumstances. Since employees in OPOs work involuntary and often more individually in these offices, they feel more lack of autonomy than employees in CWS, which influences job satisfaction negatively and reduces performance. Thus, it can be concluded that the workplace conditions in both contexts, especially in open offices, have a significant impact on the levels of the SDT components which ultimately affect job satisfaction and performance.

Although the variables mentioned above directly affect employees' performance, job satisfaction plays a mediation role among them. In other words, as autonomy, competence and affiliation in workplaces change, the performance is affected as well through job satisfaction. Clearly, a decrease in job satisfaction is not a good sign in workplaces. Accordingly, organizations should take important steps to improve the physical conditions of the workplace, as well as introduce measures to increase the feelings of autonomy, competence, and affiliation. They should, first, improve working conditions and eliminate the factors that cause employee distress. They can, for example, have special rooms and halls for group meetings, teamwork, and the tasks which require more concentration, but often there are not enough of these in OPOs. These types of measures can greatly reduce the workplaces' distractions, as well as increase employees' concentration and satisfaction in the workplaces.

The sense of autonomy, competence and affiliation have high coefficients in employees' self-confidence, which can not only improve their interactions, eliminate high work stress and bring positive states such as enjoyment and concentration, but also guide co-workers' positive perceptions of innovative activities and promote their creativity and innovative performance. Therefore, managers should reinforce offices' atmosphere with moderate freedom and flexibility in OPOs and CWS and set a reasonable degree of autonomy by providing more flexible office hours and more selective use of the space to enhance the sense of pleasure at work. Finally, employees in these contexts, particularly in OPOs, should be given networking and collaboration opportunities. That is, opportunities that provide knowledge and experience exchange, and strengthen collaboration with like-minded people. Sharing the knowledge and experience, increasing creativity, and empowerment of employees should be the main goals of managers in these offices and spaces.

7.1 STUDY CONTRIBUTIONS AND LIMITATIONS

This study contributes theoretically to the development of the literature on self-determination theory, its elements in open-plan offices and coworking spaces, as well as the human and organizational factors associated with these workplaces. It highlights the effects of high levels of autonomy, competence, and affiliation on job satisfaction and employees' performance in OPOs and CWS. Also, the role of managers and policymakers is unavoidable in improving workplace conditions, facilitating positive interactions among employees, enhancing their skills and competencies, and instilling a spirit of autonomy that enhances job satisfaction and performance. Thus, developing capable leaders within these spaces strengthens the relationships between employees and their organizational leaders. Collaborative decision-making models in the workplace, especially in OPOs, can help to increase autonomy and job satisfaction, and ultimately employees' performance. This type of decision-making increases creativity among employees and reinforces the feeling that employees have the power to make important decisions about the work they do. In addition, allowing workers to create schedules and make decisions for their workplaces, such as remote work, are effective ways to address the need for greater autonomy. These strategies create more friendly work environments, which can also help increase affiliation and job satisfaction. The conceptual model, factors, and measures used here provide important resources for developing different models in future studies. Also, including demographic characteristics in the analyses helps to understand the impact of these variables on employee focus and performance with respect to their autonomy, competence, and affiliation.

However, this research has limitations. First, it only covers employees in OPOs and CWS in Quebec. Therefore, the results may not be generalizable to other parts of the country, or other countries. A broader and more diverse range of studies could provide more generalizable results. In addition, having more data from across the country and even other countries could increase the validity of the research findings. Also, the data for both contexts were collected online, which may have reduced the quality of the participants' responses, but online questionnaires are more frequently used, and respondents have come to appreciate them. Moreover, although this study attempted to use at least five questions to assess the variables, the number of questions could be increased to reduce bias and increase accuracy. Also, this study used job satisfaction as a mediating variable and the SDT components as independent. Future research could change their positions. Autonomy, competence, and affiliation could also play mediating roles. Moreover, if there was a larger sample, it would have offered better results and made it possible to address a more extensive scope of the investigation. Finally, in this study, efficiency and productivity, as components of the dependent variable, were evaluated through the participants self-reporting, while direct assessment can provide a more accurate assessment.

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