

AN EXPLORATORY STUDY FOCUSED ON MOVEMENTS AND INTERACTIONS IN THE WORK ENVIRONMENT

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Abstract

This study explores how the interior layout of the workspace can affect employees' number of steps and face-to-face interactions. Eighteen participants were recruited for the study and the data was collected over ten business days. The participants completed self-report forms to report the number of steps and interactions they had daily. A positive relationship was found between distance and the number of steps and interactions. A negative correlation was found between depth, a construct of the space syntax theory, and the number of steps and interactions. The findings further examined whether the results support a social ecological model with the relationships between distance, depth, the number of steps and interaction, and moderate variables (personal, environmental, and organizational factors). Findings indicated that the number of steps, as a function of human behavior, was affected by distance and depth (as environmental factors), age and years of working (as personal factors), and work hours (as an organizational factor).

Keywords: *Work environment; physical activity; face-to-face interaction; job satisfaction; social ecological model*

INTRODUCTION

More than one third of adults in the world's industrialized nations are not active enough to receive physical health benefits (U.S. Department of Public Health Service, 1996; World Health Organization, 2011). However, based on a report by the City of New York (2010), the reality is that the majority of people spend almost 90% of their time working indoors (Tezgelen and Karaman, 2014). As their jobs are mostly sedentary, the notable problem is inactivity among workers (Stokols, Pelletier, and Fielding, 1996). Researchers have examined how the spatial form of buildings can affect human behavior and activities (Furlan and Faggion, 2016). From a multidisciplinary perspective, there are some factors that hinder physical activity in working environments besides spatial layouts. Since office chairs are designed for comfort and ergonomics, fewer movements are made, such as shifting or repositioning oneself while sitting in a chair (Wells et al, 2007). Therefore, employees can be easily observed doing these actions: they send emails instead of visiting a coworker's cubicle and roll across the room to reach something instead of standing up (Wells et al, 2007).

Undeniably, a well-designed and activity-friendly office layout can provide employees with hidden health benefits, since people's movements are largely affected by the spatial layout. Hence, countless studies about understanding the behavioral determinants of physical activities in various environments, and the effects of interventions, have been examined (Bauman et al, 2002; Dewulf et al, 2012; Sallis et al 1998; Wells et al., 2007; Zimring et al, 2005). Placing commonly used areas, such as restrooms, cafeterias, copier rooms, mailrooms, and meeting rooms, in pleasant walking distances from individual workstations can also promote walking or travel in office environments (City of New York, 2010).

Therefore, this study investigated how the interior layout of the workspace can affect employees' number of steps and face-to-face interactions. This paper builds on current literature by studying how the interior layout of the workspace can affect employees' number of steps and face-to-face interactions. The study explored whether the increased distance and depth between an employee's workstation and other destinations increases the number of steps they walk and the number of interactions they have. In the presence of positive relationships among the variables, this study investigated if the personal, environmental, and organizational factors played a moderating role on the relationships. Finally, the study examined whether the findings support the social ecological model.

LITERATURE REVIEW

Layout and Movement

Numerous studies have found that among the fundamental impacts of physical activity are positive health benefits (Paffenbarger Jr et al, 1986; Prodaniuk et al, 2004; United, 1996; World, 2011) and a positive correlation between spatial layout and movement (Penn et al, 1999; Rashid et al, 2006; Wells et al, 2007; Zimring et al, 2005). Among the building elements, stairs have the highest potential to impact physical activity, since most buildings have them and people can use them easily. For example, based on the benefits of physical activity, the City of New York (2010) developed guidelines for both architects and interior designers to consider ways to include stairs in the building layout to promote more movement among workers. There has been also an increasing interest in the effects of this kind of intervention for encouraging physical activity in working environments among researchers (Grzywacz and Fuqua, 2000; Prodaniuk et al, 2004; Wells et al, 2007; Zimring et al, 2005).

Notwithstanding the positive effects from physical activity, an individual's intention, among other personal factors that play a moderating role, is the most significant factor in determining one's movements. Zimring et al (2005) define three different types of activity: 1) recreational physical activity is the byproduct of activity for recreation or pleasure as a purpose such as working out at gyms, 2) instrumental physical activity is routine activity without any pleasure purposes, such as walking to a bus stop, and 3) hybrid physical activity is choosing to be active, even though the choice is not the primary goal, such as walking instead of driving a car. Hybrid physical activity is the most ideal type of activity, but it requires some degree of intention to perform it. Therefore, to encourage hybrid physical activity, designers need to acknowledge the relationship between layout and personal intention. Even though most individuals prefer to follow along the most direct and shortest line, there are always available choices to choose a path, depending on the preference of the individuals.

Movements in different environments have been studied for the last couple of decades. For example, technology has been developed during the past 100 years to make everyday burden at home as well as in the working environment easier (Wells et al, 2007). Bassett, Schneider, and Huntington (2004) explored the relationship between technology and physical activity and found that the Amish walk roughly 2.5 times more than Americans, on average, Amish men walk 18,425 steps per day, and Amish women walk 14,196 steps per day. Another example is a guideline for the optimal distance between the stove, sink, and refrigerator, which is known as the "Cornell kitchen triangle" or "kitchen work triangle" to minimize the steps for housewives (Child, 1914; Fischer et al, 1989). However, what is paradoxical here is that, even though people want to ease the burden by reducing steps, now this view has changed by realizing that having more steps can be beneficial in many ways. Undoubtedly, a shorter path is not always the best. For example, the path through a museum can be designed to be long because people might want to appreciate every masterpiece in that museum. Furthermore, for retail environments, the longer the customers' path, the higher the chance they would be exposed to goods, which could lead to

higher sales. In short, the notion about and relationship between layout and movement can be changed, depending on the function of the space.

Movement and Interaction

Interactions generally take place when at least one person shows his or her availability for conversation when someone is passing by (Penn et al, 1999). People tend to look straight ahead while walking and keep their heads down while working to indicate their unavailability and intention not to be disturbed. However, as soon as people turn to look at the common work area or other people, or even look up, they can be considered to be available for interaction. Individuals talk to roughly 65% of all other available people, regardless of the distinction of different types of interaction (Peponis et al, 2007). Additionally, interaction can typically be defined as formal planned meeting conversations and informal unplanned interactions in office organizations (Penn et al, 1999). Work-related and social interactions are the highest common interaction (Peponis et al, 2007). Over 80% of work-related conversation was observed as unplanned conversation by Backhouse and Drew (1992). In terms of the duration of interactions, more than 70% of conversations lasted less than 30 seconds and 90% of conversations lasted less than two minutes (Penn et al, 1999).

After studying ongoing interactions at four different offices, the result indicated that the majority of interactions take place within the individual's workspace (Rashid et al, 2006). Moreover, Hua, Loftness, Kraut, and Powell (2010) found that workers perceived high support and low distraction from work environments having a longer distance between the workstation and amenities. Ultimately, the study suggested that having a shared service and amenity area in working environment can play a significant role in encouraging workers to engage in spontaneous encounters, leading to interactions for socialization, information exchange, and creative development (Hua et al, 2010).

There are several other factors determining the pattern of interaction in working environments. Density of occupation and the average of spatial integration, which is a spatial characteristic, play an important role in defining levels of interaction (Hillier et al, 1993). Furthermore, the notion that information exchange and communication, which eventually influence job productivity, can be affected by design and layout is supported by a flow model and a serendipitous communication model (Peponis et al, 2007). Based on the serendipitous communication model, people can come out of their workstations for visiting the places that serve as informal interaction nodes, such as cafes. Hence, frequent unplanned interaction can make workers' range of communication rather broader (Peponis et al, 2007). Furthermore, visibility, openness, accessibility, and hierarchy can either support or restrict chance encounters that make meaningful interactions (Rashid et al, 2006). For example, people who are in the more accessible spaces in the building are greatly visible and reachable because a person's location can determine the possibility of interaction with others (Penn et al, 1999).

Rashid et al (2006) found that, even though the offices offered collaborative workspace to encourage interaction outside the individual's workspace, most interactions occurred in the workstation, based on the analysis of four different large offices' spatial layouts and behavior patterns. However, there was a considerable difference between other locations' supporting interactions, such as the corridors and other common areas, depending on the different spatial cultures of interaction in the office organization (Rashid et al, 2006). The spatial culture of interaction was a crucial factor, since the other locations for interaction were largely affected by the spatial culture of interaction. Those factors can drive workers to prefer having face-to-face interaction in individual workstations as well. The authors emphasize that organizational function and culture are factors substantial in determining the pattern and the goal of interaction, by providing plentiful evidence in terms of accessibility, visibility, and organizational hierarchy through a space syntax analysis (Rashid et al, 2006).

THEORETICAL FRAMEWORK

Social ecological model

The social ecological model formed the theoretical framework for this study, by explaining how humans' behavior is affected by their surroundings. The social ecological model was originally developed from the ecological perspective; significant progress in mostly health-related practices has been made due to this perspective (Green and Kreuter, 2005). According to the social ecological model, physical and social environments characterize the ecological view interdependently (Stokols, 1996) with multidimensional and multilevel standpoints, which are personal, organizational, and environmental factors (Green and Kreuter, 2005; Grzywacz and Fuqua, 2000). The social ecological model has been adopted to explain the multiple relationships of physical activity with those multidimensional factors (Grzywacz and Fuqua, 2000; Prodaniuk et al, 2004; Sallis et al, 1998; Zimring et al, 2005). Based on the article of Zimring et al (2005), environmental factors, such as urban design, site design, and building spatial design, have a direct relationship with physical activity. However, both personal factors (e.g., demographics, health variables, and attitudes) and organizational factors that might support or impede physical activity (e.g., social structures, organizational supports, and philosophies) can moderate the environmental factors' roles (Zimring et al, 2005).

The social ecological model demonstrates complex and associative correlations among individuals and environments as rather more comprehensive understandings and highlight the importance of behavioral influences from the three multiple levels (Grzywacz and Fuqua, 2000; McNeill et al, 2006; Sorensen et al, 2003; Zimring et al, 2005). The most important point of the social ecological model is the fact that behavior is affected by environmental factors and individual factors at the same time (McNeill et al, 2006). Therefore, a social ecological perspective suggests an interaction that is individual as well as social within a physical environment and states the need to increase the concept of a "person-environment fit" (Stokols, 1996).

However, personal, environmental, and organizational factors can be too broad and ambiguous to conduct research, especially when they are considered together. Indeed, Sallis, Johnson, Calfas, Caparosa, and Nichols (1997) declared that such a broad range of factors, like biological factors having effects on physical activity, might lead to insignificant correlations between physical activity and the environment. Hence, Grzywacz and Fuqua (2000) argued that, before conducting research, there is a need to define personal, organizational, and environmental factors specifically, and to acknowledge the fact that possible contributors such as various individual characteristics, can produce different results on physical activity. Researchers can obtain the benefits of a social ecological perspective by narrowing and defining these three factors. In this way, more unequivocal implications about the relationships among variables can be created and these specific implications can help researchers to apply the findings further (Grzywacz and Fuqua, 2000).

Owing to these advantages of social ecological perspectives, there has been a tendency to conduct studies to find out the potential working environmental factors to encourage employees' physical activity, based on an ecological approach (Stokols et al, 1996; Wanzel, 1994). Due to the fact that the environments where people interact are the key interest of the ecological model, to scrutinize a wider spectrum of a person's life surroundings having an intervention, the ecological approach has been utilized (Gauvin et al, 2001). To summarize, when researchers examine the environmental influence on physical activity, the environmental factors should be included (Prodaniuk et al, 2004).

Hypothesis

Based on the social ecological model, the following two hypotheses were developed for this study.

- Hypothesis 1: The increased distance and depth between an employee’s workstation and other destinations will increase the number of steps they walk and the number of interactions they have.
- Hypothesis 2: The personal, environmental, and organizational factors will play a moderating role on the relationships.

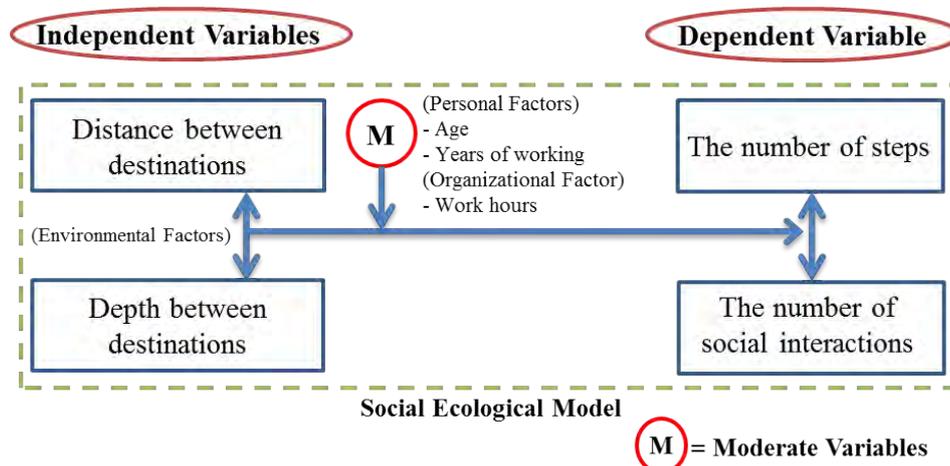


Figure 1. Conceptual model (Source: Authors).

METHODOLOGY

Eighteen voluntary participants (6 males and 12 females) at Office A, a local architecture company located in St. Paul, Minnesota, were recruited for the study. Participants’ ages ranged between 18 and 45 years old. No specifically established criteria for participation in this study were required. The study was conducted upon receiving IRB approval and the data were collected during 10 working days. According to the previous literature on open offices (Ashkanasy et al, 2014; Brennan et al, 2002; Oldham and Fried, 1987; Oldham and Rotchford, 1983), Office A can be regarded as an open office environment, since no partition exists between workstations that are side by side and the overall partitions between workstations that are facing each other are low (3’6”).

A research package, containing a self-report form with instructions, a device to count his or her steps, and one questionnaire asking basic demographic information, was distributed to every participant. At the beginning of the data collection, a training session was held to help participants fill out the self-report forms correctly. Participants were required to complete the questionnaire at the beginning because the data needed to be tracked for data analysis, such as correlation between their steps and/ or interactions, and they were asked to submit it with their initial self-report form within a sealed envelope.

The data for the number of steps and interactions were collected daily through self-reports by participants. A floor plan was given every day. Every single trip the participants made was to be reported on the daily floor plan. The participants were asked to put on a pedometer for the entire work hours, excluding when they were out of office (e.g., off-site meetings or lunch). A participant needed to mark a shape of a star representing an interaction, whenever they had a face-to-face interaction while walking through the paths in the office. The location where the interaction occurred did not need to be exact because the number of the social interactions was focused on. Only face-to-face interactions were counted.

Variables

The distance was calculated by analyzing the actual distance based on a floor plan from each participant's workstation to 12 most frequently visited places reported by the self-reports. In a similar way of defining distance, depth was determined by counting the number of axial lines from the participant's workstation to the 12 zones. Depth is one of the six constructs in space syntax theories (e.g., openness, depth, connectivity, accessibility, the degree of control, and visibility) (Hillier et al, 1993; Zeisel, 2006). Based on previous literature, people prefer to choose the shortest route (Seneviratne and Morrall, 1985; Weinstein et al, 2008). The shortest routes were used to define both distance and depth. The number of steps were regarded as an outcome: a function of human's behavior. Gender, age, and years of working at Office A are analyzed as personal factors, job title, and work hours are regarded as organizational factors. The distance and depth are considered environmental factors as well as independent variables.

Statistical Analyses

The data for this study were analyzed by using R Studio, by using a linear mixed effect model and correlation. Lmer (abbreviation of linear mixed effect regression) is one of the methods of regression in R. A linear mixed model has more flexibility of fitting in and could be extended for use in generalized linear mixed models (Bates, 2005). Specifically, the general assumption of this study is that the following effects on the steps and interaction would be changed as well, if the distance and/ or depth are different. As independent variables, distance and depth should be fixed in order to investigate the potential influence on the number of steps and interactions. More importantly, the linear mixed effect model considers random effect, so the difference between participants would be examined. Despite of the different number of self-reports of each participant, participants are regarded as a random factor by being calculated each participant's characteristics randomly.

FINDINGS AND DISCUSSIONS

To demonstrate the hypothesis, at first, correlations between distance and depth and the number of steps and interactions were examined. After that, whether or not they had a moderating role among variables was explored. A main function of a moderate variable is either supporting or hindering a relationship between other variables. As the social ecological model suggests, personal, organizational, and environmental factors were developed. For this research, personal factors were gender, age, and the number of years of working at Office A; organizational factors were job title and work hours; and, environmental factors were distance and depth, which were independent variables as well. However, job title was excluded for further analysis because some of job titles only had one participant.

To analyze the effects of distance and/ or depth on the number of steps, three different linear regression models with a random effect of the participants were developed. According to the mixed effect models, distance and depth of their workstations simultaneously had influence on the number of steps they walked. As Table 1 describes, distance ($p=.010$) had a positive relationship for determining the number of steps with statistical significance. This finding is supported by the social ecological model notion that environmental factors, such as urban design, site design, and building spatial design, have a direct relationship with physical activity (Zimring et al, 2005). In this study, the distance between workstations is a part of the building spatial design. On the other hand, depth had a negative correlation with steps ($p=.015$). In this study, depth indicates the degree or the number of spaces people have to pass through from one space to another, which means the degree of isolation of the zone (workstation). Therefore, the negative correlation might be a result of participants' tendency to avoid passing through multiple zones.

Secondly, the effects of distance and/ or depth on the number of interactions were analyzed. Like the effect on the number of steps, distance ($p=.029$) and depth ($p=.084$) had statistically

significant effects on the number of interactions when they were applied simultaneously. This finding is also supported by the social ecological model because both distance and depth are related to environmental factor (Figure 1). However, distance and depth did not have statistically significant correlations with the number of steps as well as the number of interactions when they were applied independently (Table 1). This finding suggests that consideration of distance and depth simultaneously might have a stronger relationship with the number of interactions than when they are considered independently. Therefore, hypothesis 1 can be restated based on the findings as follows: The increased distance and the decreased depth between an employee's workstation and other destination increase the number of steps they walk and the number of interactions they have.

The moderate variables used for this linear model were gender, age, years of working in the corporation, job title, and work hours. However, since some of job titles had only one person, a comparison among different job titles would not have been accurate. Therefore, further analysis of job title as one of moderate variables was not conducted. According to Table 2, distance and depth had positive correlations with the number of steps, and the degree of the slope was statistically significant ($p=.017$). However, depth had a negative correlation with the number of steps ($p=.009$). Work hours also accounted for statistically significant differences in steps ($p=0.012$).

Table 1. Linear mixed effect models for the each effect of distance and/ or depth on the number of steps and interactions (Source: Authors).

DV	IV	Estimate	SD. Error	t-value	P-value
The Number of Steps	Intercept	477.66	1197.14	0.35	.731
	Distance	3.44	2.48	1.38	.180
	Intercept	3720.26	1543.24	2.41	.025 *
	Depth	-35.55	32.21	-1.10	.282
	Intercept	2787.12	1376.68	2.03	.056 .
	Distance	7.55	2.67	2.83	.010 *
The Number of Interactions	Depth	-91.26	34.15	-2.67	.015 *
	Intercept	0.225	8.610	0.02	.979
	Distance	0.026	0.018	1.49	.150
	Intercept	15.832	10.201	1.55	.132
	Depth	-0.060	0.203	-0.29	.770
	Intercept	9.993	9.682	1.03	.312
	Distance	0.050	0.021	2.38	.029 *
	Depth	-0.432	0.238	-1.82	.084 .

Note. DV=Dependent Variable, IV=Independent Variable, SD=Standard Deviation, '.' $p<.1$, * $p<.05$, ** $p<.01$, *** $p<.001$

Based on the linear effect model (Table 2), ANOVA test (Table 3) was conducted to see how much each variable has influence on the number of steps accompanying with the effect of distance. Referring to Table 3, the three moderate variables show that differences existed among the groups such as age, years of working, and work hours, when the model was considering the effect of distance on the number of steps. In other words, each variable had a relationship with the steps. The model itself explained that different distance ($p=.043$) and depth ($p=.002$) had an influence on walking more or less and it is greatly supported statistically. The heterogeneous groups of age ($p=.045$) and years of working ($p=.024$) at the corporation differed in the number of steps. Besides those findings, work hours also had significantly supportive statistic value on the

difference for the number of steps ($p=.039$). However, based on the findings from the linear mixed effect model and the ANOVA test, different gender does not differ in steps with statistical significance. This finding show consistency in a positive relationship between distance and the number of steps and a negative relationship between depth and the number of steps when considered with personal factors (age and years of working) and organizational factor (work hours). This finding is supported by the social ecological model idea that environmental, personal, and organizational factors affect human behavior (Zimring et al, 2005).

Table 2. A linear mixed effect model for the effects of distance, depth, age, years of working, and work hours on the number of steps (Source: Authors).

	Estimate	SD. Error	t-value	P-value
Intercept	504.80	1669.82	0.30	.767
Distance	6.07	2.24	2.71	.017 *
Depth	-97.29	32.60	-2.98	.009 **
Age: 26-35 yr	947.29	1145.79	0.83	.422
Age: 36-45 yr	713.91	1005.60	0.71	.489
Y of W.: 2-5 yr	615.83	918.12	0.67	.513
Y of W: 6-10 yr	-712.83	769.00	-0.93	.369
Y of W: 11-20 yr	-715.78	669.42	-1.07	.303
Work Hours	355.82	156.87	2.27	.039 *

Note. Y of W=Years of Working, SD=Standard Deviation, ‘.’ $p<.1$, * $p<.05$, ** $p<.01$, *** $p<.001$

Table 3. ANOVA test for the effects of distance, depth, age, years of working, and work hours on the number of steps (Source: Authors).

	Df	Sum Sq.	Mean Sq.	F-value	P-value
Distance	1	2723775	2723775	4.92	.043 *
Depth	1	7838849	7838849	14.17	.002 **
Age	2	4289588	2144794	3.88	.045 *
Years of Working	3	7079978	2539993	4.27	.024 *
Work Hours	1	2845248	2845248	5.14	.039 *
Residuals	14	7742820	553059		

Note. Df=Degree of Freedom, ‘.’ $p<.1$, * $p<.05$, ** $p<.01$, *** $p<.001$

The potential effects of moderate variables on the relationships between distance and/ or depth and the number of interactions were further analyzed. The moderate variables applied to the models are gender, age, years of working at the corporation, and work hours. However, unlike the models used for the number of steps, none of the models showed that the moderate variables have a statistically significant effect on the relationships among distance, depth, and the number of interactions. In the present study, the number of steps in the social ecological model was the only variable that was influenced by personal, environmental, and organizational factors (Figure 2). Therefore, hypothesis 2 can be restated based on the findings as follows: The personal, environmental, and organizational factors play a moderating role on the relationships of distance and depth only when considering the number of steps.

Specifically, distance and depth together had a relationship to the number of steps. There was no significant difference in the number of steps based on gender. However, different ages and years of working influenced the number of steps the participants made. The older the participants were and the longer they had worked for the corporation, the less number of steps

they were likely to walk. In terms of organizational factors, work hours had not only a very strong positive correlation with the number of steps, but also had a statistically significant value.

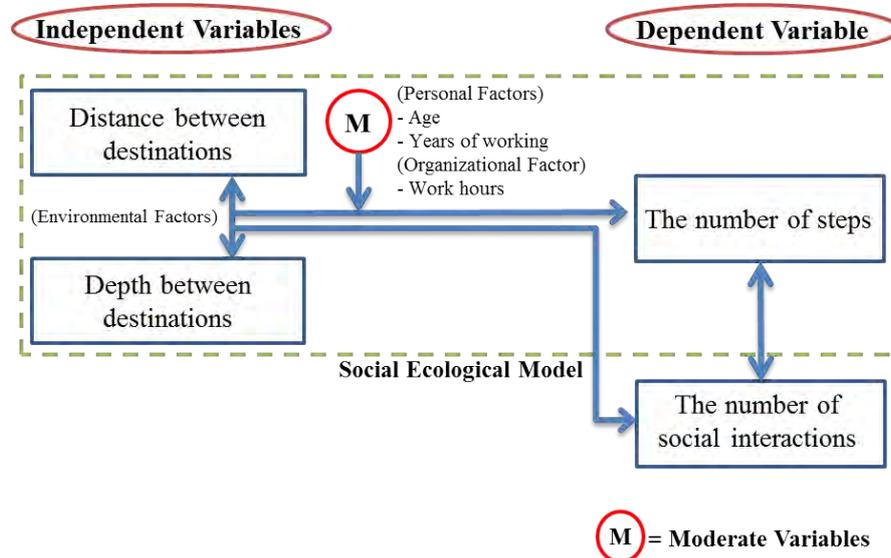


Figure 2. Conceptual model based on the findings (Source: Authors).

The overall effects on the number of steps were investigated by considering all the moderate variables together at the same time. When considering the independent variables as environmental factors, distance, depth, age, years of working, and work hours showed relationships to the steps through the linear mixed effect model (Table 2). Thus, the number of steps as a function of human's behavior was affected by distance and depth (as environmental factors), age and years of working (as personal factors), and work hours (as an organizational factor), according to the social ecological model. In short, since all three factors influenced the number of steps, this study supports the social ecological model. This research further examined the effect of moderate variables on the number of interactions, since interactions can be viewed as human behaviors and can be greatly influenced by the participants' individual differences. However, the moderate variables did not influence the relationship between distance and depth and the number of interactions.

The results from this study were greatly tied with the social ecological model (Figure 2). In terms of the social ecological model, the number of steps, which was the outcome of people's behaviors, was affected by personal, environmental, and organizational factors. All three types of factors from the social ecological model played a moderating role on the results of people's movement and communicating behavior. In conclusion, this research provides supportive implications to the social ecological model.

CONCLUSION

This study supports the social ecological model. The results indicated a correlation among distance, depth, the number of steps and interaction, and moderate variables (personal, organizational, and environmental factors). Results showed that the number of steps, as a function of human's behavior, was affected by distance and depth (as environmental factors), age and years of working (as personal factors), and work hours (as an organizational factor). The limitation of this research was the small sample size, where only 18 participants' data were examined. For example, some of the job titles included only one person. In other words, making

comparisons between different job titles would not have had solid justifications because those differences might be a result of various personal characteristics or other factors rather than of the diverse job titles.

Another limitation of this research is its low reliability. Because the data collection was largely dependent on participants, the reliability of the study might be questionable due to human error. To put it another way, since the majority of the data were self-reported, the data might have low reliability.

The high possibility of changing the participants' behavior is another limitation of this research. The fact that they knew that they were participating in the research and needed to report some information every day might have simply and easily changed their behavior. In addition, they likely understood the main interests and goals of this study as they completed the self-reports and questionnaires.

Finally, the distance was determined based on the assumption that the path participants reported would be a shorter route. However, the assumption that participants would use a shorter route might not have been accurate because their paths could have been longer routes or they could have had multiple destinations. The distance calculated for this research might not have been a strong independent variable affecting the total number of steps.

The following recommendations for future research can address some of the limitations of the present study. Since using self-reports can result in low reliability, an objective measurement would improve reliability. If an objective measurement were used for collecting routine data such as steps or interactions, then the participants' natural behavior would not be interrupted because they would not have to put any efforts on reporting their behaviors.

By conducting a triangulation method consisting of an objective measurement and self-reports for collecting data of physical activity, the research can be more reliable because each measurement would then compensate for the limitations. In addition, by comparing data from self-reports with ones from an objective measurement, researchers can investigate whether the general perception towards walkable distance corresponds with the actual walking distance. Workers' satisfaction and their perceived comfort with the walking distance and the spatial layout can additionally be examined within the research.

Studying more than two different workplaces would also make future research suitable for making comparisons among them, especially with regards to environmental and organizational factors. For instance, future research would be able to examine the differences in employees' behaviors between the office which has open-plan or private offices and/ or the height of partitions (examples of environmental factors), the office which has flat or hierarchical work environments, retention of employees, and/ or flexible or rigid work schedules (examples of organizational factors). In addition to that, by recruiting a large sample size, the spectrum of the participants would be broader.

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