Original Article

Ergonomic evaluation of mobile work type office environments

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Abstract

Purpose: In recent years, there have been changes in awareness and institutional systems relating to work due to factors such as innovation in IT technology and adoption of work-life balance. In particular, some companies have introduced a new mobile work-style where employees are able to work anytime, anywhere. The aims of this research were to ascertain the current situation based on an ergonomic survey of workers who work in the mobile work-style, and to identify problems, and propose solutions.

Experiment participants and method: Our aim was to ascertain the current situation in offices by measuring satisfaction in terms of factors such as the comfort, fatigue, and ease-of-use of equipment and office furniture for people working in all workplace environments, not just conventional fixed offices. To achieve this, we prepared and administered questionnaires to 115 employees at two private companies which are especially committed to using the mobile work-style.

Results: Chairs and desks are found to influence the satisfaction by Structural Equation Modeling. The present survey found that the effects due to lighing/furniture and the satisfaction of network environment remarkably influenced the workers' satisfaction.

Conclusion: The current status of workers working in the mobile work-style was ascertained using a survey questionnaire. As a result, two points became clear. First, the physical environment in a company has a major impact on satisfaction. Second, is the inadequate understanding and low level of concern for ergonomics among workers. As a solution for the first, the possibilities are: (1) Improvement of worker satisfaction through proper layout/design and furniture/fixtures, (2) Improvement of work efficiency, such as the ability to concentrate and ease of viewing monitor screens through proper lighting, and improvement in peace-of-mind such as a sense of ease or pleasantness, and (3) improvement of satisfaction by developing the network environment and improving factors such as stress due to no assigned seats. A reduction in stress in office environments can be expected by adopting, as a measure to resolve the above two issues, company-wide education in the need for and awareness of using adjustment methods for chairs and other furniture, and equipment which is suited to the body.

Keywords: Mobile work-style, Office, Satisfaction

Introduction

The mobile work-style has been garnering attention in recent years. This is a new work-style where people do their jobs in offices with no assigned seating, or anytime, anywhere, at locations outside the office, including the home (Office Building Laboratory, 2014; Ebara, 2014; Saito, 2007; Furukawa, 2002; Furukawa, 2006; Furukawa, 2012; Nojima, 2005). To carry out a case study and ascertain the current situation, this study aimed to gather and analyze various basic data from the perspective of ergonomics, including communication, concentration during work, layout, design, motivation, and furniture/fixtures.

Experiment participants and method

The survey was carried out using a questionnaire format. The questionnaire was prepared based on the KJ method (Kawakita, 2004) in order to ascertain the current

conditions in offices from a variety of perspectives. The questionnaire was composed of roughly 30 questions. It was carried out with 4-level evaluation. In addition, multiple-response questions were provided, as well as a free comment sections for writing things like specific locations and ideas. Two types of questionnaires were prepared, a short version requiring about 10 minutes to fill out and a long version taking about 15 minutes with more free comment sections. The short version is shown in Table 1.

This survey was administered to two private companies which use the mobile work-style and agreed to cooperate with the survey. (In the following, these companies are indicated as Company A and Company B.) Company A is a Japanese firm which does interior design, and Company B is a foreign-affiliated company engaged in work relating to real estate. In the following comparisons are made by indicating Company A and Company B, but these are not comparisons of the companies, but of occupational categories.

Furthermore, in order to analyze in detail the effects due to furniture/fixtures, structural equation modeling (SEM) (Tabei, 2011; Murohashi, 2007) was performed using the statistics processing software R, version 3.1.2. SEM (Kano, 2015; Takaya, 2010) is a statistical approach for understanding social and natural phenomena by introducing latent variables which cannot be directly observed, and then identifying the cause and effect relationship between the latent variables and observed variables. Its distinguishing feature is that factor analysis and regression analysis can be done at the same time.

Results

The number of questionnaire requests was 100 (50 male, 50 female) at Company A, and 300 (150 male, 150 female) at Company B. The number of questionnaire respondents was 52 (33 male, 19 female) at Company A, and 63 (44 male, 19 female) at Company B. The breakdown of respondent occupational categories is described below. The occupational categories of the respondents for company A were, primarily, designer, sales, and technology. At company A, designers and sales accounted for the majority. At Company B, the primary categories were sales and asset management, an occupation providing support for optimal strategic investment based on the latest information in markets that change moment to moment.

Questions were classified as follows: Question 1a (No assigned seats), Question 3 (Communication (1)), Question 4 (Communication (2)), Question 6 (Work requiring concentration), Question 10 (Layout), Question 11 (Design), Question 12 (Motivation) and Question 30
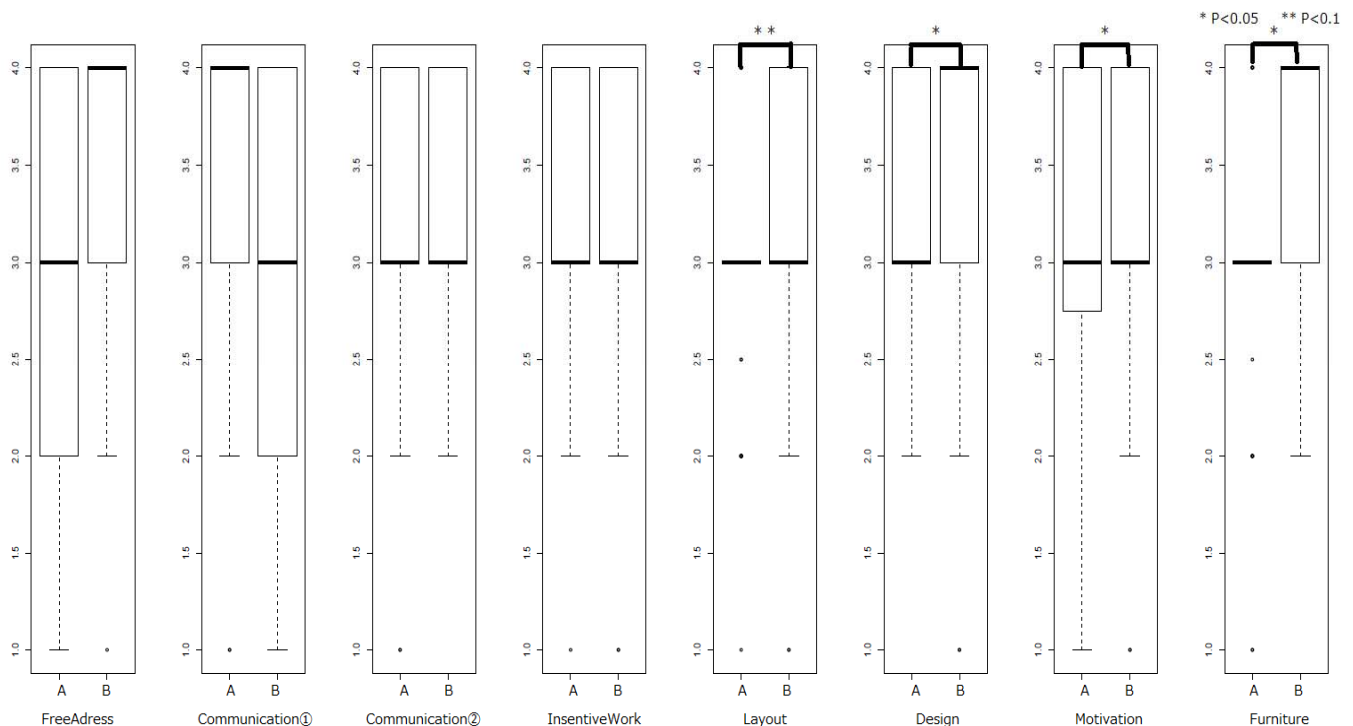

Figure 1: Item results for each group

bringing together questions relating to furniture/fixtures such as lights, desks, and chairs from Question 20 to 29 (Lighting/Furniture/Fixtures).

The box-and-whisker plots showing median values for each of the two companies are given in Figure 1. As a result of conducting the Friedman test, a significant difference was obtained between the 2 companies in Figure 1. In addition, a comparison was done between each item for the two companies using a Wilcoxon Test, and as a result a significant difference was obtained for Layout, Design, Motivation and Lighting/Furniture/Fixtures.

1. Effects due to physical environment in the company

This section describes the effects of Layout, Design, and Lighting/Furniture/Fixtures, for which a significant difference was obtained in Figure 1, and satisfaction with the network environment and workplace environment with no assigned seating.

(1) Effects due to Layout/Design

Chairs placed in the office of Company A have various shapes, types, and designs. Company A is an interior/design company, and they get hints for their work by using a variety of chairs. In addition, there is a location called "Future Mapping" which functions as a circular theater and library. Presentations and conferences are often held here. Adjacent to that, there is a cafe/kitchen where staff can freely take coffee and snacks, and this functions as a communication space. In the free comments, many workers from Company A responded "I often use Future Mapping, because it's comfortable, and has the best design in the company."

At Company B, on the other hand, all workers have no assigned seats, and they are divided into 6 zones. Inside the company, there are various work points, such as: booth-type concentration spaces, spaces where private talk is strictly forbidden, individual telephone booths, spaces with murals, a cafe, conference rooms, etc. Among conference rooms, there are some for a small number of people with an open atmosphere, and some with outside blocking. Different rooms are used to suit the nature of the conference. There were many opinions on the layout/design such as: the interior and furniture have quality overall; the sense of design is extremely high and the atmosphere is good; I can concentrate; there

is no cooped up feeling; and it's a space with a spirit of play, and it's easy feel at ease.

(2) Effects due to Lighting/Furniture/Fixtures

First, results are described regarding effects due to lighting. In Question 21, the two companies were asked the reason for selecting the lighting of a location. The results are indicated in Table 2.

Table 2: Reason for selecting lighting of work location

Reason for selecting lighting of work location	Company A	Company B
Feel at ease	14%	14%
Pleasant	25%	12%
Can concentrate	14%	12%
Easy to view monitor screen	16%	21%

Figure 2 shows a path diagram for Company A and Figure 3 a path diagram for Company B drawn using SEM. Ellipses indicate latent variable, and rectangles indicate affected variables. Numerical values are path coefficients. Path coefficients are values which indicate the degree to latent values affect other variables. Table 3 shows each model goodness-of-fit for the 2 companies. The goodness-of-fit index is indicated as GFI, the adjusted goodness-of-fit index with AGFI, and the root mean square error of approximation with RMSEA. The goodness-of-fits GFI and AGFI are regarded as good at 0.9 or higher, and RMSEA at 0.05 or lower. RMSEA from 0.1 to 0.05 is the gray zone, but 0.08 or less is regarded as an appropriate approximation error, and thus the model is judged to have a satisfactory goodness of fit.

Table 3: Model goodness-of-fit values for each of the 2 companies

	Value for Company A	Value for Company B
Model Chisquare	13.0	21.2
DF	18	18
r (> Chisq)	0.79	0.27
Goodness-of-fit index	0.94	0.92
Adjusted Goodness-of-fit index	0.88	0.84
RMSEA index	0.0	0.053
Bentler CFI	1.0	0.90

The questionnaire items corresponding to the observed variables shown in Figures 2 and 3 are, respectively, Light: 20b, Desk1: 23a, Desk2: 23b, Chair1: 241, Chair2: 24b, Understanding of the chair adjustment: 25, Network: 29 General satisfaction: 30.
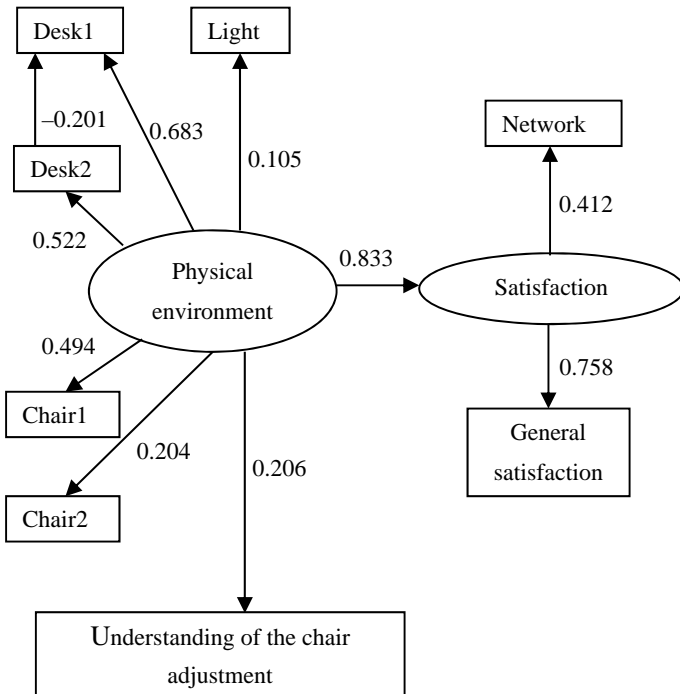

Figure 2: Path diagram for Company A

The observed variables Light, Desk1, Desk2, Chair1, Chair2, and "Understanding of the chair adjustment" are indices relating to the physical office environment, and thus "Physical environment" is taken to be the latent variable. Also, the observed variables Network and "General satisfaction" are indices relating to satisfaction, and thus Satisfaction is taken to be the latent variable. This time, the focus was placed on furniture as the physical environment. Based on the idea that the observed variables are based on some hidden factors, an attempt was made to discriminate the effects of those factors using correlation, and thus the path coefficient has the same meaning as the correlation coefficient. Latent variables not treated here, such as sounds (e.g., noise, reverberation of voices), temperature/humidity, air currents, room size and so on become model error of the SEM, and this is reflected in the goodness-of-fit indices together with statistical error.

(3) Satisfaction with network environment

In Question 29, subjects were asked about satisfaction with the network environment in their current office.
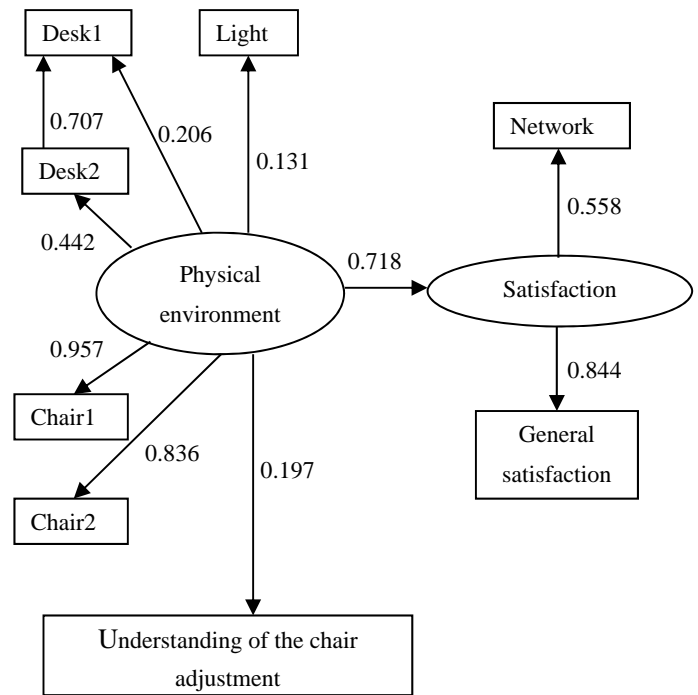

Figure 3: Path diagram for Company B

Figure 4 shows satisfaction in the network environment of Company A. The response rate of each item for satisfaction is about 25% each, and satisfaction with the network environment is split. In the free comments, there were opinions desiring improvement in the network environment, such as: "When I use a PC for a long time with the wireless LAN, the connection sometimes goes off, and I'd like them to improve that" and "Since switching to no assigned seats, I feel like my e-mail reception has been delayed and the network environment has worsened."

(4) Satisfaction with work-style of no assigned seats

In Question 1a, subjects were asked about the work-style of no assigned seats in connection with the mobile work-style. The results are shown in Figures 5 and 6.

In Question 1b, subjects were asked about the impression of working with no assigned seats. The results are shown in Table 5.
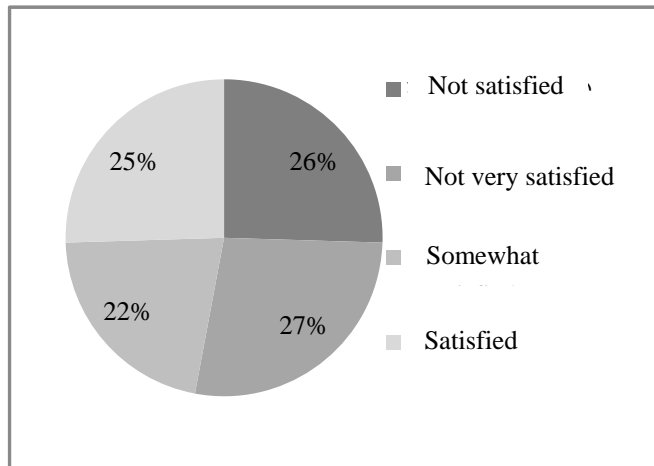
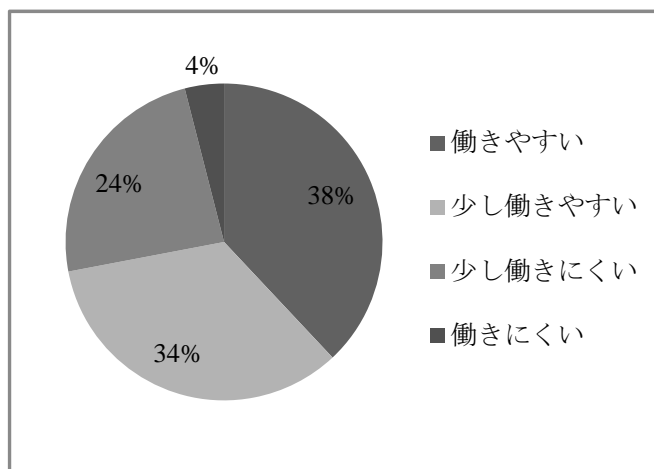Figure 4: Satisfaction with network environment (Company A)

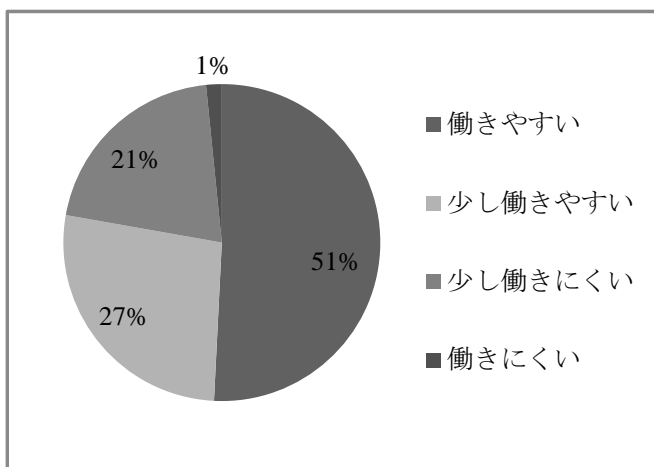Figure 5: Work-style of no assigned seats (Company A)

Figure 6: Work-style of no assigned seats (Company B)

2. Interest in ergonomics

Next, the current status of workers' interest in ergonomics was ascertained. The following describes results relating to workers' interest in ergonomics based on the state of utilization of chair adjustment functions.

Table 4: Impression of working with no assigned seats

	Company A	Company B
Nice because I can choose a seat to suit my mood and the nature of my work	65%	71%
Nice because there are changes each day	42%	59%
Searching for a seat is bothersome	35%	59%
Searching for superiors and colleagues is bothersome	33%	35%

(1) State of utilization of chair adjustment functions

In Question 27, subjects were asked about frequently used chair adjustment functions. Figure 7 shows the results. In Figure. 7, when the chi-square test was performed at each point between the 2 companies, a significant difference was obtained between the two for: seat surface depth position, repulsion strength of backrest, and elbow height. In addition, it is evident that extremely few workers at either company adjust the lumbar support position. Lumbar support is the part which supports the body's lower back section. Furthermore, at Company A, more than 70% of workers had lower back pain, and although the rate wasn't as high as Company A, more than 40% of workers at Company B had the same problem. Even though many workers have lower back pain, the number who adjusted the lumbar support position is extremely small. To Question 28 regarding the reason for not adjusting, there were workers who responded: "It's troublesome to do each chair adjustment" or "It's in the range I can tolerate, so there I times when I don't adjust."

Discussion

1. In-company physical environment

(1) Layout/Design

Based on Result (1), opinions of workers at the 2 companies exhibit high satisfaction with layout/design. It is thought that workers at both companies responded by comparing with the office before relocation. There has been an improvement after relocation from the layout/design before relocation, so it is likely the

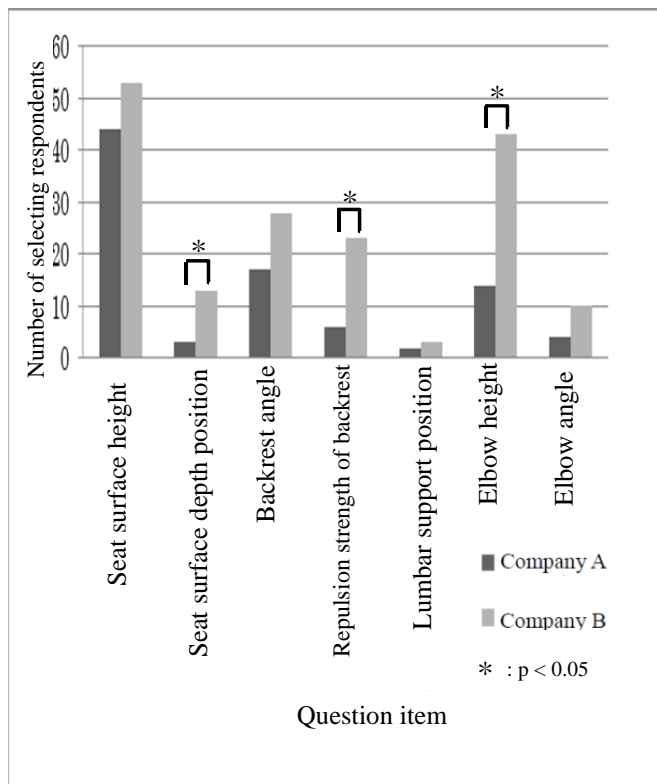layout/design has improved worker satisfaction.

Figure. 7: Frequently used chair adjustment functions

(2) Lighting

Based on Result (2), it is thought that effects due to proper lighting improve peace-of-mind (e.g., "Feel at ease" or "Pleasant"), and also have effects in improving work efficiency (e.g., "Can concentrate" and "Easy to view monitor screen").

(3) Furniture/Fixtures

Here the discussion is based on Figures 2 and 3. First, notice the effect of "Physical Environment" on "Satisfaction." For Company A, this is 0.718, and for Company B, it is 0.833. Both companies exhibit values over 0.7, so it is evident that "Physical environment" has a major impact on "Satisfaction." Next, notice the effect of "Physical environment" on "Desk." For Desk 1, Company A is 0.206, and for Company B it is 0.683. For Desk 2, Company A is 0.442, and Company B is 0.522. For both Desk 1 and Desk 2, the values at Company B are over 0.5. That is, it is evident that at Company B, the "Physical environment" has a comparatively large effect on "Desk." Furthermore, notice the effect of "Physical environment" on "Chairs." For Chair 1, Company A is

0.957, and Company B is 0.494. For Chair 2, Company A is 0.836, and Company B is 0.204. At both companies, there are many types of chairs, and they can be freely selected. The reason values are high at Company A is because workers at Company A use chairs which suit themselves, and conversely, at Company B, the values reflect that workers do not use chairs which suit themselves. In other words, at Company A, it is evident that "Physical environment" has an extremely large effect on chairs. Thus, at Company A, the "Physical environment" which had the greatest impact on Satisfaction is chairs, and at Company B, the "Physical environment" which had the greatest impact on "Satisfaction" was clearly desks. It was found that these sorts of furniture/fixtures have an effect on mobile work type offices. However, it was found that differences appear in their weighting due to the situation at each company and office.

(4) Network environment

As indicated by Result (3), there were opinions desiring improvement in the network environment. A network is essential for mobile work. Therefore, it can be expected that satisfaction will rise if the network environment is improved further. On the other hand, an issue for the future is the fact that it is not easy to develop a network environment. The reason why is because a network environment cannot be developed by the workers themselves, and even assuming the company develops it, this involves a considerable cost.

(5) Free address environment

As indicated by Result (4), more than 70% of workers at both companies can be regarded as indicating a positive impression regarding work-styles with no assigned seats. It appears that regardless of the worker's age, sex, and occupational category, they were positive about being able to select a seat to suit their mood and the content of their work at the time. However, adoption of a system with no assigned seats is troublesome, and some workers feel stress with this work-style. People who feel stress are often seen among designers and sales staff. Designers want to secure a place to finish their drawings, and concentrate on their work, and they expressed the opinion that they were unable to find a seat, causing delays in their work. When sales staff return from outside the company, there may be no seat, or it may take time to find a seat, or there may be employees who leave the

company with their seat still occupied. It is likely these factors are linked with stress while searching for a seat.

2. Chair adjustment

From Figure 7, there was found to be a problem that, although workers should adjust the lumbar support position to the extent they have lower back pain, at present this adjustment is almost never used at either of the two companies.

Acknowledgements

Table 1: Survey questionnaire

<This section asks about working with no assigned seats>
1a. Please give your overall evaluation of the work-style with no assigned seats compared fixed seats. Circle the applicable item.
    Hard to work   Somewhat hard to work   Somewhat easy to work   Easy to work
1b. Please indicate the reason. Circle the applicable items (multiple items can be chosen).
A. I can select a seat that suits my mood and the nature of my work at the time
B. It's easy to communicate with the necessary people (superiors, coworkers, other departments)
C. I can get away from my superiors and coworkers, so I can make progress with my work
D. It's nice to have changes from day to day
E. Due to the move toward paperless work accompanying the elimination of assigned seats, progress was made in information sharing and tidiness/organization
F. Due to the move toward paperless work accompanying the elimination of assigned seats, it's not possible to use paper documents, and I don't make progress with my work
G. It's bothersome to always clean up the desk and put everything away in a locker or bag
H. It's bothersome to find an open seat
I. It's hard to find superiors and coworkers
J. Using fixtures when you don't know who has sat down on them creates problems from the standpoint of hygiene, and it's unpleasant
If other, please describe (   )

2. From the following answers, circle those you feel are highly important as requirements when selecting a non-assigned seat (multiple items can be chosen).
A. Seat near window   B. Far from entrance and traffic lines (passageways)   C. Near to entrance and traffic lines   D. Close to conference room   E. Close to locker   F. Close to multi-function printer area
G. Close to library   H. Close to food/drink (cafe or coffee machine)
I. Air-conditioning (temperature on the low side)   J. Air-conditioning (temperature on the high side)
K. Bright lighting   L. Subdued, somewhat dark lighting
M. Seat where it is easy to communicate with people   N. Quiet seat   O. Independent, individual seat
P. Close to seat of superior   Q. Far from seat of superior   R. Close to team or involved people
S. Far from team or involved people   T. Presence of display or other equipment
U. Presence of an easy-to-use desk or chair
If other, please describe (   )

<This sections asks about ease of communication in the office>
3. Is communication smooth with superiors and coworkers in the department or project you belong to? Circle the applicable item.
Not smooth   Not very smooth   Somewhat smooth   Smooth
Where is the location where you communicate a lot? (   )
4. Is communication with other departments smooth? Circle the applicable item.
Not smooth   Not very smooth   Somewhat smooth   Smooth
Where is the location where you communicate a lot? (   )
5a. Are conferences and meetings smooth (appropriate frequency, easy to secure a location, etc.)? Circle the

<This section asks about your personal attributes.>
Circle the applicable response for each of following items A–K.
A. Age: Less than 20, 20–29, 30–39, 40–49, 50–59, 60 or older
B. Sex: Male, Female, Other
C. Number of years working at current company: Less than 1 year, 1–5 years, 5–10 years, 10–15 years, 15–20 years, 20 years or more
D. Occupational category: Sales, Marketing, Development, Research, Technology, Consultant, Designer, PM, CM, General affairs, Accounting, Financial affairs, Legal affairs, Human resources, Reception, Secretary, Other — please be specific (   )
E. Height: Less than 150 cm, 150–159 cm, 160–169 cm, 170–179 cm, 180–189 cm, 190 cm or more
F. Weight: Less than 40 kg, 40–49 kg, 50–59 kg, 60–69 kg, 70–79 kg, 80–89 kg, 90 kg or more
G. Eye color (color you feel is closest): Black, Brown, Gray, Blue, Green, Other (   )
H. Visual acuity: Normal, Near-sighted, Far-sighted, Astigmatism, Far-sighted due to aging
I. Lower back pain: Yes, No
J. Shoulder stiffness: Yes, No
K. Room temperature preference: Tend to feel cold quite a bit, Tend somewhat to feel cold, Tend somewhat to feel hot, Tend to feel hot quite a bit

applicable item.
Not smooth   Not very smooth   Somewhat smooth   Smooth
Where is the place where you conduct meetings a lot? (   )

5b. Circle the applicable items regarding conferences or meetings at your current office without assigned seating (multiple items can be chosen)
A. Informal meetings have increased because it is possible to talk on the spot
B. Formal conferences in conference rooms have decreased because it is possible to talk on the spot
C. It's reached the point where conferences and meetings are visualized (progress situation can be ascertained, it's possible to hear a variety of opinions, etc.)
D. Conversations proceed with just the people at the location, so it's become difficult to participate in decision-making
E. Minutes cannot be taken and it's become easier for the details and conclusion to be perfunctory
F. Meetings start on the spot, so it is hard to concentrate on personal work
G. Frequency of using closed conferences has decreased
H. I can make progress with work because I no longer have to take the trouble of going to a conference room
If other, please describe (   )

<This sections asks about ease of doing work requirement concentration.>
6. In the current office environment, can you concentrate on your work? Circle the applicable item.
Cannot concentrate   Cannot concentrate very well   Can concentrate somewhat   Can concentrate
Where is the location you frequently use for work requiring concentration? (   )
7. Do you ever feel the voices around you to be annoying? Circle the applicable item.
No   Not much   Sometimes   Yes
8. Do you ever change your seat because the surrounding area is noisy? Circle the applicable item.
No   Not much   Sometimes   Yes

<This section asks about paperless work>
9. Is paperless work in your current office environment working well? Circle the applicable item (multiple items can be chosen).
A. It's become easier to share information   B. I've gotten into the habit of tidying up every day
C. I like that I can use the full area of the desk
D. Information isn't listed on a single sheet, so it's hard to get an overview of the whole situation
E. Mistakes in writing and misunderstandings have increased
F. It is troublesome to digitize paper data from the outside
If other, please describe (   )

17. This question is for those who indicated they feel bodily fatigue in response to Question 16.
Circle applicable items relating to the specific part of the body where you feel fatigue (multiple items can be chosen).
A. Head (in the sense of headache) B. Eyes C. Ears D. Neck E. Shoulders F. Back G. Lower back
H. Wrists I. Fingers J. Upper arms K. Thighs L. Knees M. Ankles
If other, please describe (   )
18. In the current office, are you able to do your work efficiently? Circle the applicable item.
Efficiency is poor   Efficiency is somewhat poor   Efficiency is somewhat good   Efficiency is good
19. With mobile work (offices with no assigned seats, and new work-styles where work can be done anywhere, anytime, in locations other than the office including the home) are you able to do your work efficiently? Circle the applicable item.
Efficiency is poor   Efficiency is somewhat poor   Efficiency is somewhat good   Efficiency is good

<This section asks about the physical office environment, such as lighting, air-conditioning, furniture, and fixtures, etc.>
20a. This question asks about brightness of the current office as a whole.   Circle the applicable item.
Feel it is dark   Feel it is somewhat dark   Somewhat bright   Extremely bright
20b. This question asks about brightness in the area of non-assigned seats that you frequently use. Circle the applicable item.
Feel it is dark   Feel it is somewhat dark   Somewhat bright   Extremely bright
Where is that place? (   )
21. This question asks about your reasons for selecting "brightness or lighting color" for that location (multiple items can be chosen).
A. Feel at ease B. Pleasant C. Can concentrate D. Easy to view monitor screen
E. Conversation is lively F. Make progress with work G. Brightens my mood H. Warm
I. There is a sense of tension J. Never been particularly aware of lighting
If other, please describe (   )

22a. Is the temperature appropriate in the current office as a whole?
Not appropriate   Not very appropriate   Somewhat appropriate   Appropriate

22b. Is the temperature appropriate in the area of non-assigned seats you frequently use?
Not appropriate   Not very appropriate   Somewhat appropriate   Appropriate
Where is that place? (   )
23a. How is the ease-of-use of desks in the current office as a whole? Circle the applicable item.
Poor   Somewhat poor   Somewhat good   Good

23b. How is the ease-of-use of desks among the non-assigned seats you frequently use? Circle the applicable item.
Poor   Somewhat poor   Somewhat good   Good

<This section asks about layout and design of the office as a whole.>
10. Is the current office layout (function and arrangement) suitable for carrying out work? Circle the applicable item.
Not suitable   Not very suitable   Somewhat suitable   Suitable

11. Is the current office design (floor color/material, wall color/design, overall design concept, etc.) suitable for carrying out your work? Circle the applicable item.
Not suitable   Not very suitable   Somewhat suitable   Suitable

<This section asks about the office environment, motivation, creativity, fatigue, efficiency, concentration, and stress>
12. Does the current office environment contribute to improving motivation? Circle the applicable item.
Does not contribute   Does not contribute much   Contributes somewhat   Contributes

13. Does the current office environment contribute to carrying out creative work? Circle the applicable item.
Does not contribute   Does not contribute much   Contributes somewhat   Contributes

14. In the current office, do your feel stress or psychological fatigue during work? Circle the applicable item.
Do not feel   Do not feel much   Feel somewhat   Feel

15. This question is for those who indicated they feel stress in response to Question 14.
Circle items you regard as reasons for feeling stress or psychological fatigue (multiple items can be chosen).
A. Human relationships B. Nature of work C. Amount of work D. Surrounding noise
E. Being seen by surrounding people F. Everything can be seen and heard G. Searching for a seat
H. Cleaning up desktop I. Length of working hours J. Working time slot K. Work-style itself
If other, please describe (   )

16. Do you feel bodily fatigue in the current office? Circle the applicable item.
Do not feel   Do not feel much   Feel somewhat   Feel

Where is that place? (   )
24a. How is the ease-of-use of the chairs in the current office as a whole? Circle the applicable item.
Poor   Somewhat poor   Somewhat good   Good
24b. How is the ease-of-use of the chairs among the non-assigned seats you frequently use? Circle the applicable item.
Poor   Somewhat poor   Somewhat good   Good
Where is that place? (   )

25. Do you know the method of adjusting chairs provided in the office? Circle the applicable item.
Don't know   Don't know very well   Know somewhat   Know

26. Each time you select a free address seat, do you adjust the chair provided there? Circle the applicable item.
No   Not very often   Occasionally   Yes

27. This question is for those who responded "Occasionally" or "Yes" regarding chair adjustment in Question 26.
Circle the applicable items regarding the adjustment function of the chairs you frequently use (multiple items can be chosen).
A. Seat surface height B. Seat surface depth position C. Backrest angle D. Backrest repulsion strength
E. Lumbar support position (part that supports lower back) F. Elbow height G. Elbow angle

28. This question is for those who responded "No" or "Not very often" regarding chair adjustment in Question 26.
Circle the applicable items regarding the reasons for not adjusting, or not adjusting very often (multiple items can be chosen).
A. Bothersome B. Don't feel the need C. Within a tolerable range D. Meaningless even if I do adjust
E. Not physically adjustable F. Don't know the adjustment method
If other, please describe (   )

29. Are you satisfied with the equipment, network environment, and ICT environment in your current office?
Not satisfied   Not very satisfied   Somewhat satisfied   Satisfied

30. Based on your responses to the above questions 22–29, are you satisfied overall with the current office environment? Circle the applicable item.
Not satisfied   Not very satisfied   Somewhat satisfied   Satisfied

If you have any other comments regarding your current office environment, please describe them here.
This completes the questions.
Thank you for your cooperation.

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