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Spatial and Behavioral Variables That Affect "*Emotional Attachment*" of Users: A Multi-Dimensional Approach for Private Offices

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ABSTRACT

Attachment to workplaces is a new concept for which appropriate assessment approaches are required. The present study proposes a multi-dimensional model for the issue. The model is based on following variables: (i) technical, (ii) functional, (iii) spatial impact, (iv) emotional status of the studying person and (v) attachment. A questionnaire of 43 items was conducted to measure user satisfaction regarding performances. 170 academicians from Gazi University, Faculty of Engineering and Architecture replied. All subjects were full time academicians and owned a private room. Within the framework of the proposed model, firstly correlations between variables were analyzed. Secondly, causality analyses were performed to diagnose the effect of each performance variable on "emotional attachment". Findings diagnosed emotional status as the variable that had the most significant effect on emotional attachment. Spatial impact was the second and functional performance was the third and the last. No significant effect of technical performance was valid. Further analysis re-tested these effects to find out discrepancies in terms of personal factors; (i) age, (ii) status, (iii) department and (iv) gender. Findings identified the personal factors that were and were not in line with the aforementioned effects. The present study underlines the importance of functional and behavioral performances in the assessment of private offices and supports a holistic approach for such environments. In this context, it is not in line with several previous researches that focused on technical issues as a primary concern.

Keywords: attachment, workplace, private offices, gender, age, status, performance, user satisfaction

1. INTRODUCTION

Workplace research is an extensive field. Among numerous works, Vischer's approach [1,2] proposes a holistic attitude. In her *"building-in-use assessment"*, air quality, thermal comfort, spatial comfort, privacy, office noise control, building noise control and lighting comfort are considered as the integral parts of an overall approach. Besides these variables, the approach introduces *"emotional attachment"* although it does not use this concept in assessment. Emotional attachment by Vischer, covers the following issues;

- Territoriality: Closure, personalization and labeling behaviors,
- Home away from home: Decorating the office in a homely manner,
- Conflict: Define and defense behavior via shaping boundaries and
- Size & status of office: Furniture and layout preferences.

Although "attachment" characterizes workplaces, it has not been included in researches in combination with other variables. This can be stemming from the ambiguous position of the definition of the concept, its components and measurement tools which do not match well with the well-defined conventional assessments. Thus, an integration-based model is not yet present. It is obvious that assessment and emotional attachment variables are like the two sides of the same coin. If people do not feel attached to their workplaces they do not feel high satisfaction from their workplaces either, and vice versa.

"Do you feel at home?" is the main question of various attachment researches. In this study, emotional attachment was considered in terms of reflected user characteristics, sense of belonging, homeliness, ownership of users and providing peaceful time and conditions for users. This is an approach in line with Vischer though it reformulates her concepts in order to facilitate a holistic model. In other words, the present research integrates the attachment issue to the other issues that have been part of office research for decades.

2. THEORETICAL BACKGROUND

There has been a large variety of workplace research that uses mono-dimensional approach. Focusing on a single or a set of interrelated performances is a characteristic of these studies as methodologies vary.

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Reffat & Harkness [3], i.e., grouped lighting comfort, under the name of *"environmental comfort criteria"* for office buildings. They collected data via structured questionnaires and interviews with the experts who determined the weight of each criterion. An integration of evaluation and weighing criteria, thus a theoretical novelty, was their focus. In the end, they proposed a model of weighted criteria for design and post-occupancy evaluation of offices. A similar approach was introduced by Mahdavi & Unzeitig [4]. Their enlarged list of performances covered workplace and outdoor environment, layout and refurbishment, technical infrastructure, communication, thermal indoor climate, visual indoor climate and acoustic indoor climate. Data was collected via two methods; observations and snap-shot measurements for objective assessments and occupancy evaluations via interviews and questionnaires for subjective assessments. The approach integrated these two.

Like these two research examples, technical or technical + functional performances are usually considered as the independent variables which are assumed to affect the variables regarding productivity. However, Vischer's aforementioned approach underlines the need of a simultaneous consideration of *"emotional attachment"* too. It is obvious that, felt emotional attachment may diminish or amplify the satisfaction regarding functional and technical criteria. It is the same with productivity-based behavioral criteria that it facilitates effective work and organizational commitment.

The list of such mono-dimensional approaches can be enlarged. Sundstrom et al. [5] for example, focused on noise control in relation with productivity and workplace stress. O'Neill [6] tested a group of functional performances -adjustability, storage and enclosure- to see if they had impact on employee reaction and performance. Wells & Thelen [7] studied personalization as a function of personality and status whereas Stone & English [8] focused on workplace color in relation with task type, mood, satisfaction and performance. Although Kupritz [9,10,11] tested privacy through design features in relation with work activities and age differences, she used a mixture of technical -like adequate lighting-, functional -like larger office, adequate storing- and behavioral -like having a room to personalize- performances.

All these researches give place to one variable or a set of variables that is supposed to have impact on people's work performance. On the other hand, "overall satisfaction" has never been measured directly. Implicitly, it is assumed to be related with work performance, mood or work satisfaction of people. However, post-occupancy evaluation focuses on "habitability" of environments [12] thus encourages a consideration of satisfaction as a unique issue that can be measured directly. Are people happy with their physical environments or not? Are environments themselves supporting or impeding human activities? Do environments and people match? Do they need adaptation? All these questions are for improving acoustic comfort, thermal comfort and indoor air quality habitability of environments. Thus, an approach is necessary which will focus on an overall satisfaction of users without putting the work performance, mood or job satisfaction of people into the core.

The present study is such a holistic approach and assumes that people can be productive and effective only on condition that they are satisfied with their intimate environments technically, functionally and behaviorally, altogether as one. Thus it becomes obvious that, emotional attachment, which is an integral part of this overall approach, cannot be studied like the mono-dimensional researches did before. Instead, a multi-dimensional approach which puts human satisfaction into the core of the research is needed for workplace research. That is another way of optimizing the environmental conditions that supports productivity of people.

The study proposes a multi-dimensional assessment model for measuring overall user satisfaction and diagnosing the component variables that affect emotional attachment of users to their intimate environments. The approach classifies variables into five groups: (i) technical, (ii) functional, (iii) spatial impact, (iv) emotional status and (v) attachment. Temperature, noise, light and air quality are the items of technical variables as functional is measured through concepts of adequacy, utility and appropriateness. Spatial impact is an aesthetic / perceptional assessment due to impressions users get from their offices. Emotional status of the working person focuses on how subjects feel during their concentrated work in the space. And the emotional attachment issue is basically related with human-intimate environment relations defined in the last paragraph of Introduction part.

Like previous approaches, the present study uses a questionnaire to measure user satisfaction. As can be noticed, the first two performances of the research (technical and functional) repeat and adapt the existing approaches whereas the last three introduces a new way that is supposed to be a complementary part of an overall consideration of workplaces. On the other hand, the present approach does not use the four aforementioned principles of emotional attachment of Vischer due to the possible measurement techniques that do not correspond to the technical and functional components. Instead, it establishes its own emotional attachment approach that can facilitate comparisons, correlations and analyses of effects between all the items included in the research. By this way, a new definition and content for emotional attachment is being structured so that it can be studied in combination with the other criteria henceforth.

3. METHODOLOGY

3.1. Research Questions

related Pearson product-moment correlation coefficients. Diagnosed significant correlations encouraged the research to continue further analysis of *"affects"*.

Thus, the second part of the first research question was related with effects: Which variables had significant effect on emotional attachment? Although correlations give a general idea about relations in between variables, they do not predict causality. On what percentages the technical, functional, spatial impact / image and emotional status variables were affecting the emotional attachment of people? Regression analyses were performed on the computerized data.

The second research question was related with participant characteristics. Were the effects and their percentages, which were diagnosed in the previous step, the same for each participant group? In another saying, research aimed to diagnose whether there was homogeneity among the participant groups regarding emotional attachment and the variables that affect it. Were the effects similar or showing deviations from the global diagnosis? To answer this, each effect was analyzed in frame of user characteristics which were age, status, department and gender.

Briefly, these questions try to solve one main research problem: What is emotional attachment in relation to the proposed multi-dimensional model? In order to answer this question, two sub-questions were asked: (1) How much do the other variables be effective on emotional attachment? (2) Is this effect valid for all user groups? Therefore, all the variables that have been being used by former researches, their effects on emotional attachment and the differences of occurrence of these effects due to user group characteristics were tested. The first part focuses on emotional attachment in relation with other variables as the second part proposes the idea that certain human characteristics have differentiating role on emotional attachment.

3.2. Setting and Participants

The first part of the first research question of the present study was whether emotional attachment had positive / negative and significant correlations with the other variables of the research. Computerized data gave the The setting of the research is an Academicians' Block, situated in the in-city campus of Faculty of Engineering and Architecture of Gazi University in Ankara, Turkey. It is one of early works of architect Merih Karaaslan. Each floor consists of three single zones (one corridor + rooms). Two of the zones are long (having 18 offices on each) whereas the third one is shorter (having 6 offices). The fourth zone is allocated to seminar rooms and social activity rooms of departments. (Figure 1) Corridors have access to WCs, archive rooms, elevators and stairs. In the nine storey block, each floor is allocated to one department. This principle changes only for the Department of Architecture which has offices in 6^{th} and 7^{th} floors. At the time of the research was conducted (2004), ground level was allocated for administrative offices, mezzanine level was occupied by the Institute of Science and Technology, as the top level was allocated for catering units for academicians. Therefore, the offices on 2^{nd} to 8^{th} floors (totally 7 floors) and seven departments (Departments of Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Chemical Engineering, Architecture, City and Regional Planning, Industrial Engineering) were focused.

Private-enclosed offices of academicians are 3.5 x 4.5 m. in general. There are minor differences between rooms that stem from their locations in the floor plan. Places of windows and doors, sizes of fixed bookshelves slightly vary between rooms. Thus, rooms can be called stereotyped. On the other hand, institutional interference to personalization of offices is limited. The faculty equipped each room with fixed (open and closed bookshelves) and unfixed furniture (the work table). Additions to and changes of layout, furnishing and textures (wall + floor) were all up to users.

Figure 2 shows the frequency distributions of participants regarding the four characteristics on which the present study is based.

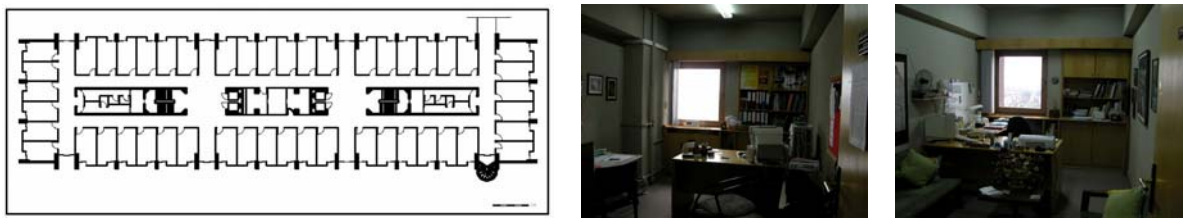

Figure 1. Typical floor plan and two room views of the Academicians' Block of Faculty of Engineering and Architecture, Gazi University [13]

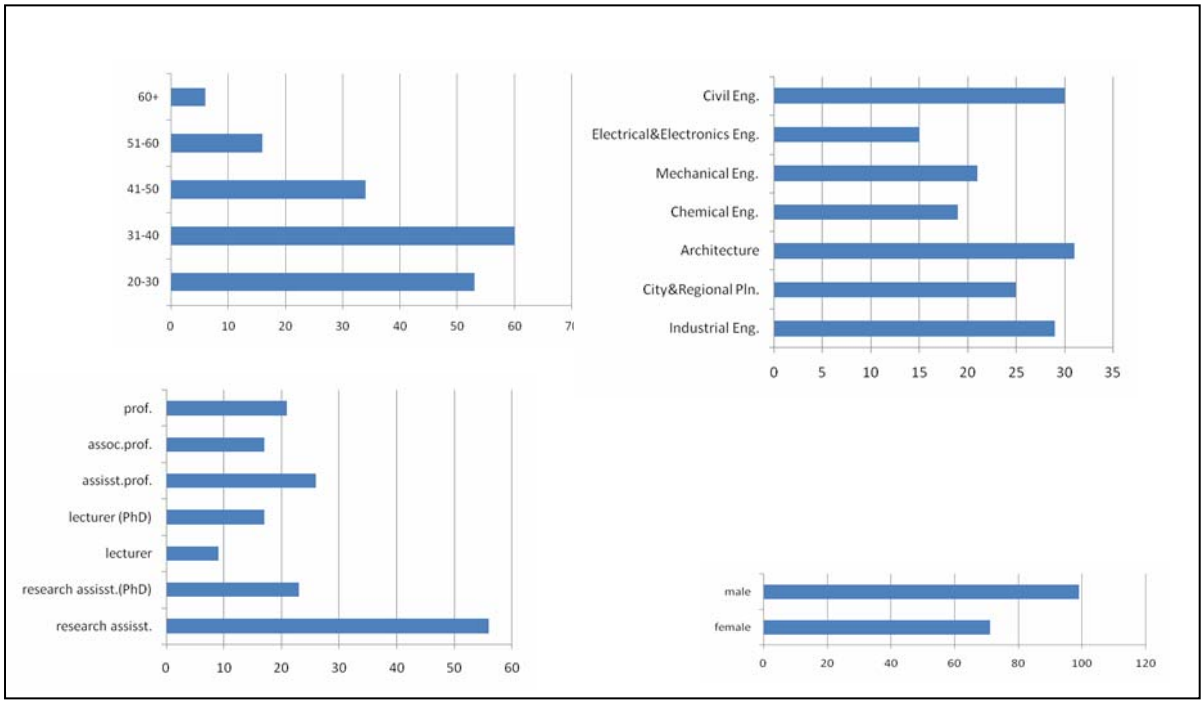

Figure 2. Frequency distributions regarding age cohorts, department, status and gender of participants [13]

3.3. Procedure and the Questionnaire

The research was conducted in May in 2004. Questionnaires were distributed by hand to all full-time academicians of the faculty. 170 questionnaires were completed anonymously and returned within one month time. 43 questions regarding performances and 4 questions regarding personal characteristics were asked. However, the present research is part of a more general post-occupancy research. Therefore, there were 40 other questions in the questionnaire that were related with personalization of offices, activities that people do in the offices, permanent and temporary changes that were made in the offices etc. They were left out in the analysis of this research. Questions regarding satisfaction felt from offices were asked on a 5-point Likert type scale with the responses 1=very positive to 5=very negative. Similarly spatial impact / image performance was asked on a 5-point semantical difference scale.

Reliability tests gave high scores of coefficient alpha which was .91 for all performance related questions, .66 for technical, .85 for functional, .88 for spatial impact, .88 for emotional status and .78 for attachment. Thus, inter-subject reliabilities for responses were satisfying (>.60). Table 1 shows the list of 43 variables, mean and standard deviation values regarding the satisfaction felt from personal offices. Globally, behavioral performance "index value" (mean of all behavioral performance item means) is 2.68, whereas it is 3.21 for functional and 3.37 for technical performances. And the building's "total index value" is equal to 3.09. Thus, it is possible to say that, academicians are highly satisfied with their offices mostly due to behavioral performances.

Depending on the location of the focused block, the units that take place parallel to Celal Bayar Boulevard are exposed to heavy traffic noise whereas Gazi Primary School side units are exposed to direct sunlight and school noise. ANOVA tests were performed in order to find out if such location differences caused assessment differences of user satisfaction. Attachment to the workplace differed significantly [$F(2,126) = 4.89$, $p = .009$] whereas technical [$F(2,160) = .582$, $p = .56$], functional [$F(2,161) = 1.49$, $p = .23$], spatial impact [$F(2,113) = 1.31$, $p = .27$] and emotional status [$F(2,114) = .33$, $p = .72$] variables did not show any differentiation regarding satisfaction. This result indicates the independence of satisfaction values from the physical conditions stemming from room location. In other words, peoples' assessments did not differ according to exposition to sun or different noise levels. The only differing value, "attachment", indicates presence of other factors that might have effect on satisfaction which constitutes the 2nd part of this research. Further TUKEY tests diagnosed Celal Bayar Boulevard side having significantly more positive value (Mean = 2.38) than Gazi Primary School side (Mean = 2.96) for the satisfaction value regarding "emotional attachment". This shows the negative effect of sun and school noise compared to an ongoing (background) traffic noise.

Thus, it is possible to claim that people have a tendency to assess their work environments similarly despite the effects of diverse environmental factors that shape a

work unit. Diverse environmental conditions are not necessarily assessed differently. It may be due to the developed policies of human like "personalization" through which people tolerate and overcome the negative environmental factors.

Table 1. Means and standard deviations for performances, emotional status and attachment

Variables	*mean*	*SD*
Technical		
In-room temperature when it is cold outside	3.55	.79
In-room temperature in seasonal changes	3.41	.82
Temperature at the moment	3.07	.63
Noises that come from adjacent rooms	3.39	1.16
Noises that come from the corridor	3.83	1.09
Noises that come from upper /lower floors	2.29	1.13
Noises that come from open window	4.39	.97
Artificial lighting	2.68	.87
Glazing and reflections	3.16	.77
Dominant color	3.05	.82
Daylight	3.86	.79
Natural ventilation	3.35	.90
Smell	3.69	1.09
Humidity	2.87	.71
Indoor air quality with natural ventilation	3.90	.86
Functional		
Size of the room	3.19	.98
Sizes and numbers of closed shelves	3.19	1.01
Sizes and numbers of open shelves	3.38	1.00
Adequate place for personals	3.56	.68
Utility	3.23	.86
Appropriateness for work	2.69	.80

Variables	*mean*	*SD*
Spatial impact		
Gloomy-festive	3.22	1.16
Stressing-peaceful	2.67	1.03
Not well defined-well defined borders	2.08	1.00
Rough-elaborated	2.92	.98
Unattractive-attractive	2.95	.98
Ineffective-effective	2.84	1.01
Formal-informal	2.87	1.22
Ugly-beautiful	2.76	1.07
Old fashioned-modern	3.03	1.10
Antisocial-social	3.02	1.19
Emotional status		
Calm	2.02	.92
Comfortable	2.12	.99
Safe	2.03	.95
As if I am studying at home	3.30	1.48
In good mood	2.54	1.02
Productive	2.45	1.09
Independent and concentrated	2.45	1.20
Attachment		
It reflects my personal characteristics	2.77	1.23
It belongs to me	2.43	1.25
It is like my home	3.17	1.35
I spend 8 hours here with joy	2.72	1.21
It is important to have this room for me	2.18	1.19

4. FINDINGS

4.1. Emotional Attachment and its correlations with other variables

Table 2 shows the significant correlations between the emotional attachment performance and the other variables of the research. All correlations are positive (as one increases the other increase too or vice versa) and significant ($p<0.05$). According to the values (0 = no correlation and +1 = total positive correlation), participants' attachment to their offices is highly related with the satisfaction of their emotional status at the time of studying. The more academicians feel positive during their concentrated work, the more they feel attached to their offices. Thus, the more offices can give users support for their creative privacy, the more they arouse attachment feelings of their users. The same type of direct and strong effect is valid for spatial impact / image variable too.

On the other hand, the weakest correlation of emotional attachment is with technical performance. This raises the idea that, as long as people feel that they work in optimum conditions (calm, comfortable, safe, as if at home, in good mood, productive, independent and concentrated) and satisfied aesthetically they do not feel perplexed about the technical conditions. As mentioned before, participants were free to personalize their offices. It is possible that they can overcome negative technical conditions through i.e. keeping the window shut during their work.

Table 2. Correlation coefficients between emotional attachment and other variables

Correlations	*Technical performance*	*Functional performance*	*Spatial impact*	*Emotional status*
Emotional attachment	,333 (n=127)	,476 (n=125)	,519 (n=113)	,562 (n=112)

All correlations are significant at p<.001 value

Briefly, technical and functional performances have less relation with attachment than spatial impact / image and emotional status. Although technical performance and its effects on working people have been subject to several researches for long time, its being the factor having the weakest correlation with emotional attachment is a very new finding. This finding repeats itself for the units that take place in diverse sides as well. For the units that are on the Celal Bayar Boulevard side, the correlation of attachment variable is the weakest with technical (p=.375, sig = .022) and functional (p = .439, sig = .007) variables as is stronger with spatial impact ((p = .580, sig = .001) and emotional status (p = .705, sig = .000) variables. Only a minor difference is diagnosed for the same kind of analysis regarding Gazi Primary School side. The correlation of attachment at this side is the weakest with technical (p = .319, sig = .007) and strongest with emotional status (p = .484, sig = .000), functional variable (p = .507, sig = .000) and spatial impact (p = .564, sig = .000). Despite the minor differences of order, the position of technical variable does not change. It keeps its position as being the variable that has the weakest correlation with attachment issue.

It should be kept in mind that the research was conducted in a specific and institutionally free context. It's validity for other kinds of private offices need further inquiry.

4.2. How technical, functional and behavioral variables effect emotional attachment, diagnosing the causality

As the previous stage of the research indicated, positive emotional status and aesthetic stimuli were the variables that had been the strongest variables correlated with the emotional attachment whereas the technical comfort criteria had been the weakest. This only shows relations but does not prove causality that the other variables have on attachment. In addition, the weight of each performance is not definite either. In order to diagnose causality and weights, regression analyses were performed.

First step analyses supported the significance of values indicating that at least one of the four variables had impact on attachment [$F(4,91) = 23.43$, $p = .000$]. Table 3 diagnoses spatial impact / image, emotional status and functional performance as the variables that have significant effect on attachment ($p < .05$). On the contrary, technical performance has no significant effect ($p > .05$). As standardized coefficients and sigma values in Table 3 indicate, emotional status has the strongest effect (42%) on emotional attachment, followed by spatial impact (33%) and functional (21%) performances. Thus, the sequence of effects becomes as the following:

"EMOTIONAL STATUS > SPATIAL IMPACT / IMAGE > FUNCTIONAL PERFORMANCE"

Further analysis indicated the validity of this sequence for the units that take place in diverse sides of the block. As a minor difference, the total effect of four variables is significant (sig = .004) though only the values for impact and emotional status are near to significance (sig = .071 and .055) in the Celal Bayar Boulevard side. Total effect is relatively more significant (sig = .000) and the values for functional, spatial impact and emotional status are significant (sig = .000, .015 and .000) at Gazi Primary School side. It is possible to claim that the location of units in the floor plan, and thus presence of specific physical conditions, do not affect the sequence of variables that determine emotional attachment. Technical performance is the variable that has no impact on emotional attachment in any physical condition. It should be kept in mind that, the only physical condition is the diversity of locations in this research; therefore it is likely that findings may show variance for other setting types.

Table 3. Regression analyses

	Unstandardized Coefficients		*Standardized Coefficients*	*t*	*Sig.*
	B	Std. Error	Beta		
Technical performance	-4,342	,070	-,054	-,621	,536
Functional performance	,233	,088	,214	2,645	,010
Spatial impact / image	,205	,055	,326	3,701	,000
Emotional status	,332	,067	,420	4,964	,000

4.3. Personal factors and emotional attachment

After diagnosing correlations and causalities between variables the human factors that determine attachment were focused. The last part of the research tested whether there were significant differences within age, status, department and gender groups of participants in terms of the effects that other variables had on emotional attachment. The research firstly diagnosed the human factors that cause discrepancy in terms of emotional attachment and the aforementioned sequence of effects.

Were satisfaction levels of participants regarding emotional attachment showing any significant difference according to age, status, department and gender groups? Table 4 shows related One-way ANOVA test results. Sigma values in Table 4 indicate significant discrepancy for departments and gender groups ($p < .05$) whereas no discrepancy for age and status groups. In another saying, peoples' satisfaction of emotional attachment varies according to departments, thus professional background and practice, and gender of office owners. According to Figure 3, female academicians have more emotional attachment to their units (Mean = 2.37, SD = .77) than their male colleagues (Mean = 2.86, SD = .89) as academicians who are electronical engineers (Mean = 2.24, SD = .55) and industrial engineers (Mean = 2.35, SD = .96) are more attached to their units compared to civil engineers (Mean = 3.26, SD = .89).

Further analyses revealed *"it belongs to me"* item of emotional attachment showing significant discrepancy for age [$F(4,139) = 3.73$, $p = .006$], status [$F(7,137) = 2.153$, $p = .042$], department [$F(6,138) = 4.119$, $p = .010$] and gender [$F(1,143) = 12.57$, $p = .001$], as *"it reflects my personal characteristics"* item showing variability for only department [$F(6,135) = 3.70$, $p = .002$] and gender [$F(1,140) = 16.75$, $p = .000$] issues. Discrepancy was not supported for any of the remaining items of emotional attachment. Thus, it is possible to state that variability between participant groups regarding emotional attachment items is present but weak.

Table 4. Significant differences in terms of age, status, department and gender groups regarding emotional attachment

AGE COHORTS	*Sum of Square*	*df*	*Mean Square*	*F*	*Sig.*
Between Groups	88,029	4	22,007	1,172	,327
Within Groups	2310,440	123	18,784		
STATUS GROUPS					
Between Groups	154,323	7	22,046	1,153	,335
Within Groups	2314,003	121	19,124		
DEPARTMENTS					
Between Groups	310,716	6	51,786	2,928	,011
Within Groups	2157,610	122	17,685		
GENDER					
Between Groups	180,188	1	180,188	10,001	,002
Within Groups	2288,138	127	18,017		

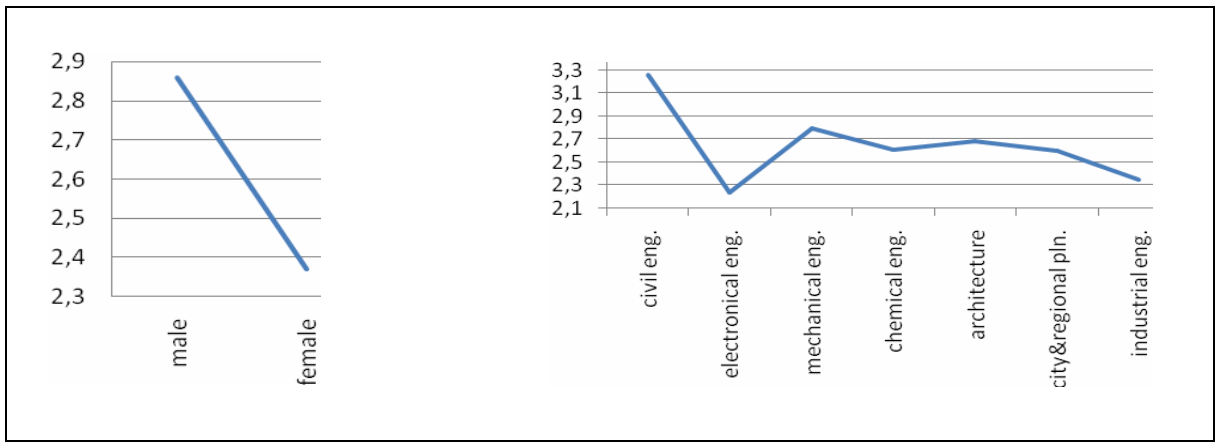

Figure 3. Significant differences between gender and professional groups regarding emotional attachment

The second step was diagnosing the effect that functional, spatial impact / image and emotional status factors had on emotional attachment for each participant group. Regression analyses were performed.

a. Effects and age cohorts: Participants were grouped in five age groups. Since the groups of *"51-60"* (N=16) and *"60 +"* (N=6) did not have appropriate number of people for tests, they were not taken into account in the analysis. For the age group of *"20-30"*, the effect of four variables (technical, functional, spatial impact / image, emotional status) was significant [$F(4,30) = 9.69$, $p = .000$] as only functional ($\beta = .36$, $p = .015$) and emotional status ($\beta = .35$, $p = .032$) variables had significant effect on emotional attachment of the group. For the age group of *"31-40"*, the total effect was significant [$F(4,33) = 11.39$, $p = .000$] as only spatial impact ($\beta = .60$, $p = .000$) variable had significant value. For the age group of *"41-50"*, total effect was less significant [$F(4,9) = 4.35$, $p = .031$] and only emotional status ($\beta = .513$, $p = .051$) was near to have a significant effect on emotional attachment. Therefore, effects of four variables showed variety according to age groups. For the youngest age group, emotional attachment was affected from functionality of the rooms and people's emotional status during their work, whereas spatial impact / image was effective for the elder group and emotional status was again effective for the oldest group.
b. Effects and status groups: Participants were grouped in eight status groups. Due to insufficient numbers, they were regrouped into three sections that were professors, lecturers and research assistants. Although the effect of four variables was significant [$F(4,26) = 4.90$, $p = .004$] for *"professors"*, only spatial impact /image ($\beta = .424$, $p = .014$) and emotional status ($\beta = .451$, $p = .010$) had effect on attachment. For the *"lecturers"* group, significance for total variables was higher [$F(4,8) = 10.32$, $p = .003$] but only spatial impact / image variable had significant effect ($\beta = .960$, $p = .009$) on emotional attachment. For the *"research assistants"* group, significance for all variables reached its highest value [$F(4,47) = 12.47$, $p = .000$] as the effect of functional ($\beta = .312$, $p = .010$) and emotional status ($\beta = .422$, $p = .001$) variables had highly significant effect on emotional attachment to offices. Therefore, effects of four variables on emotional attachment varied according to statuses of room owners. As status gets higher, the effect of functional variable on emotional attachment falls. Spatial impact / image variable has effect on attachment for the two high statuses as emotional status variable is effective on attachment for professors and assistants.
c. Effects and departments: There were seven departments thus seven different professional groups. In order to make a meaningful comparison, departments were regrouped as *"design professions"* -architecture and city & regional planning- and *"non-design professions"* -remaining departments-. For *"non-design professions"*, the effect of four variables on attachment was significant [$F(4, 69) = 19.81$, $p = .000$] and functional ($\beta = .216$, $p = .019$), spatial impact / image ($\beta = .286$, $p = .006$) and emotional status ($\beta = .458$, $p = .000$) variables had effective role in determining emotional attachment. For *"design professions"*, the effect of total variables was less significant [$F(4,17) = 5.51$, $p = .005$] as only the effect of spatial impact /image variable was significant ($\beta = .491$, $p = .016$). Therefore, for "design professions", spatial impact / image variable determines emotional attachment whereas three variables act together for *"non- design professions"*.
d. Effects and gender: Effects of four variables on attachment is more significant for *"males"* [$F(4,57) = 21.75$, $p = .000$] than *"females"* [$F(4,29) = 4.34$, $p = .007$]. For males, functional ($\beta = .283$, $p = .003$), spatial impact / image ($\beta = .273$, $p = .012$) and emotional status ($\beta = .501$, $p = .000$) variables act together in determining the emotional attachment whereas none of the variables had significant role for females. Therefore, the three variables introduced in this research seems to be appropriate for diagnosing effects for males' attachment but not broad enough to cover some other kind of variables that may have effect on females.

Table 5. Significant effects of the three research variables that determine attachment value of participant groups

	Participant groups	*Functional criteria*	*Spatial impact / image criteria*	*Emotional status criteria*
Age	20-30	.015	-	.032
	31-40	-	.000	-
	41-50	-	-	-
Status	Professors	-	.014	.010
	Lecturers	-	.009	-
	Research assistants	.010	-	.001
Profession	Non-design	.019	.006	.000
	Design	-	.016	-
Gender	Male	.003	.012	.000
	Female	-	-	-

Table 5 gives a summary of effects of three variables that affect emotional attachment of participant groups. sub-groups of academicians. On the other hand, emotional status criteria gave more significant effect values than the other two variables for professors, research assistants, non-design professions and males. Thus, the sequence of effects is not valid for all sub-groups.

5. DISCUSSION

The present study aimed to draw a new framework for workplace assessment. *A variety of variables* that would correspond to an overall user satisfaction was targeted. Therefore, a multi-dimensional approach was proposed. The five variables (technical, functional, spatial impact / image, emotional status and emotional attachment) were considered as integral parts of the approach. Items of technical and functional variables were adapted from previous researches as the items of spatial impact / image, emotional status and attachment variables were original to the present study. The basic variable that shapes the overall satisfaction (emotional attachment) was chosen as the dependent variable and the effects that other variables had on the dependent variable were analyzed. Further analyses were performed in order to see whether the effects were showing discrepancy according to participant characteristics of age, status, department and gender.

Findings of the present study support the idea that emotional status of the working person is the variable that has the most significant effect on emotional attachment of people to their personal / private offices. In another saying, being able to work in the office in a good mood is more effective than the satisfaction felt from spatial impact / image and functional criteria. This is a finding that has to be evaluated in frame of academic environments. Validity for all types of offices should be re-tested. The technical criterion was excluded from the variables list since it did not give significant values of causality despite its positive correlation with emotional attachment.

Weak correlation and no causality of technical performance criteria that the present research diagnosed, requires a new consideration of the previous researches that focus on such variables regarding their role in people's productivity and satisfaction. Leather et.al. [14], i.e., focused on the effect of ambient noise on psychosocial job stress and found out that ambient noise had no direct effect on job satisfaction, well-being and organizational commitment although low levels of ambient noise were negatively effective. In another research, mechanical and natural ventilation systems were compared by Muhic & Butala [15] regarding their effect on absenteeism behavior of workers and mechanical ventilation's negative effect was diagnosed. Such researches consider technical performance criteria in relation with one behavioral aspect of users, mostly regarding productivity. The present research differs from such considerations with its configuration and According to the table, spatial impact / image is the most active criterion that causes discrepancy among the content of its variables. In the present research, productivity of users was not a focal point. Instead, a more general satisfaction, a broader understanding of well-being of users thus an emotional dimension was focused. Therefore, it is possible to claim, although technical criteria have positive or negative direct effects on productivity-related performances of users, it has no significant effect on the emotional attachment felt for workplaces. This dimension, the emotional attachment, is a new concept that previous researches had not used before. What effects and does not affect this dimension will make its meaning clearer.

As the present study diagnosed, emotional attachment is closely related with the emotional status of the working person. Findings indicated that people's positive responses regarding calmness, comfort, safety, feeling as if at home, in good mood, productive, independent and concentrated had impact on their emotional attachment to their workplaces. Thus, emotional attachment to workplace becomes a concept closely related with the psychological status, well-being of people during work activity. The second significant criterion was spatial impact / image variable. Therefore, emotional attachment is a concept which is closely related with how the spaces are perceived, how they are decorated thus defined with their aesthetic content. The last and least significant criterion was the functional one. Accordingly, sizes, adequacies, utility and appropriateness of spaces and facilities that take place in the rooms had effect on the emotional attachment that people feel for their workplaces.

All these findings draw a framework for emotional attachment in workplaces: Emotional attachment to a workplace is a positive psychological status that can be approached through (from the most significant to the least) (i) positive effects of emotional status during activities related with work, (ii) positive aesthetic concerns that the office has and (iii) satisfying sizes, adequacies, utility and appropriateness regarding spatial concerns. In addition to these spatial ingredients, age, status, department and gender of working people shape emotional attachment too. Although such characteristics of people change the value of effects of other variables on emotional attachment, emotional status of the working person remains as the primary factor that determines attachment.

The novelty of the present study is its multi-dimensional framework for a concept that has been known but not studied explicitly before. It is obvious that the causality that is diagnosed in this research can not be generalized for all types of offices. Thus, new researches that extend the definition of emotional attachment and exemplify attachment items on a wide variety of settings are needed. Although personal differences did not show salient characteristics for an academic environment, different institutional structures and various positions and statuses of people can still

have the potential to cause differences in the effects and effect values that the other variables have on emotional attachment. Therefore, further research should be based components of attachment; attachment to physical settings and to their characteristics emerges as a new problem area that should be developed in specific to workspaces.

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REFERENCES

[1] Vischer, J.C., Environmental Quality in Offices, **Van Nostrand Reinhold**, USA (1989)

[2] Vischer, J.C., Workspace Strategies: Environment as a Tool for Work, **Van Nostrand Reinhold**, USA (1996)

[3] Reffat R.B. ve Harkness E.L., "Environmental Comfort Criteria: Weighing and Integration", **Journal of Performance of Constructed Facilities**, 104-108 (2001)

[4] Mahdavi, A. ve Unzeiting, U., "Occupancy Implications of Spatial, Indoor-environmental and Organizational Features of Office Spaces", **Building and Environment**, 40: 113-123 (2005)

[5] Sundstrom et al., "Office Noise, Satisfaction and Performance", **Environment and Behavior**, 26: 195-222 (1994)

[6] O' Neill, M.J., "Workspace Adjustability, Storage and Enclosure as Predictors of Employee Reactions and Performance", **Environment and Behavior**, 26 (4) 504-526 (1994).

on a more elaborated consideration of *"attachment"* concept that has to take a distinct position in research literature. Apart form the social and psychological

[7] Wells M. & Thelen L., "What Does Your Workplace Say About You?", **Environment and Behavior**, 34 (3) 300-321 (2002).

[8] Stone N.J. & English A.J., "Task Type Posters and Workspace Color on Mood, Satisfaction and Performance", **Journal of Environmental Psychology**, 18: 175-185 (1998)

[9] Kupritz, V., 2001, "Aging Worker Perceptions about Design and Privacy Needs for Work", **Journal of Architecture and Planning Research**, 18 (1): 13-22 (2001)

[10] Kupritz, V., "The effects of Physical Design on Routine Work Activities", **Journal of Architectural Planning and Research**, 20 (2): 110-121 (2003)

[11] Kupritz, V., "Accommodating Privacy to Facilitate New Ways of Working", **Journal of Architectural Planning and Research**, 20 (2): 123-135 (2003)

[12] Preiser, W.F.E., Rabinowitz, H.Z., White, E.T., Post-Occupancy Evaluation, Van Nostrand **Reinhold Company, New York** (1988)

[13] İnce, F.S., Post-Occupancy Evaluation of Closed Offices: Example of GUFEA Academic Staff Building, Gazi University, Institute of Science and Technology, **unpublished Master's Degree Thesis** (2006)

[14] Leather, P., Beale, D. ve Sullivan L., "Noise, Psychosocial Stress and Their Interaction in the Workplace", **Journal of Environmental Psychology**, 23: 213-222 (2002)

[15] Muhic, S. ve Butala V., "The Influence of Indoor Environment in Office Buildings on Their Occupants: Expected - Unexpected", **Building and Environment**, 39: 289-296 (2004)