

# Effects of Architectural Components on the Satisfaction Rate of Residents with Different Ages and Genders in Relation to Privacy (Case Study: a Residential Complex in Tabriz)

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**ABSTRACT:** The main objective of this paper is to assess the effects of architectural components on residential complex to achieve a desirable rate of privacy for the residents. Privacy is a process in which the transactions among individuals can be adjusted by means of providing a suitable relationship between people and their built environment. In addition, since the transaction between the behavior of residents and their built environment is undeniable, providing suitable personal spaces in the residential complex can efficiently improve the satisfaction rate of residents with respect to the privacy which seems to be very essential in urbanized regions with crowded populations. Following this, the present study was aimed to survey the effects of architectural components on personal spaces and boundaries of the residential complex, located in Tabriz. So, the research hypothesis was made to better understand the perception of personal spaces for different groups of residents. The results showed that the perception of personal spaces in residential complexes can be varied depending on different genders and various age groups of residents. Meanwhile, the fixed furniture in the corner of green space decreased the satisfaction rate for both females and males up to the middle age. In addition, the satisfaction rate of females with respect to the item of internal yard increased by increasing their age. Females were observed to be satisfied with the item of semi-open wall among communal spaces at all ages.

**Keywords:** Residential complex in Tabriz, Architectural components, Privacy, Gender.

## INTRODUCTION

One of the fundamental steps in architectural design process of buildings is to seek the transactions between the behavior of residents and their built environment, which can lead to the generation of better personal space and subsequently individuals' housing satisfaction as an urgent issue (Gifford et al., 2011, 440; Kupritz, 1998; Paulus et al., 1991). Development of architectural design components, influencing generated personal spaces, can contribute to permitting residents to feel content with their private lives in different types of housing. Since citizens in urban areas are encountered with a number of threats and dangers in their daily life, among various kinds of building classifications, the improvement of private life in the residential complex seems to be so essential and helpful for residents to overcome their daily stress and long-term strains

(Javanshir, 2016). Therefore, for providing a better life and security for individuals in residential complexes, it is required to arrange the personal spaces for creating a sense of private life.

Generally, it can be inferred that there is a link between the satisfaction rate of residents and their built environment including architectural components, which should be considered in the designing process. This matter, in turn, is helpful to achieve a desirable rate of privacy in the residential complex. Therefore, the following hypothesis is proposed.

**Research Hypothesis:** Perception of personal spaces in residential complexes can affect the satisfaction rate of residents in relation to privacy.

**Literature Review**

Privacy is a process in which the transactions among individuals can be monitored and adjusted by means of arranging and

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designing the relationship between people and their built environments appropriately (Kowaltowski et al., 2006; Soheili & Marandi, 2017). So, the development of a sense of security in physical spaces has drawn the attention of researchers to focus on the concept of privacy in architectural designs, where the feeling of privacy was considered as a significant characteristic of a home (Tognoli, 1987, 655; Sebba & Churchman, 1986; Sixsmith, 1986). Among individuals, it seems that there exists a difference between the satisfaction rate of male and female with respect to the privacy. Concerning this, Yildirim et al. (2007) indicated that more job satisfactions in open-plan offices were observed among male employees than female employees. Rustemli (1992) showed that male employees are less concerned to be surrounded by males or females, while more dissatisfaction was expressed by females, surrounded by males than other females. However, gender issues in architecture and design were found to be more sophisticated, since it is dependent on various factors (Ahrentzen et al., 1984; Lowry, 1993; McAndrew, 1993). Weinstein (1982) assessed students' desire for privacy in an elementary classroom. For boys, there was a correlation between booth use and some general behavior dimensions including sociability, distractibility, and aggressiveness, while, for girls, the booth utilization was increasingly dependent on privacy-seeking behavior at home. In another study, by Demirbas and Demirkan (2000), the privacy preferences in interior architecture design studio were analyzed for different genders. The results showed that the difference between preferences of solitude and isolation among genders was negligible, but males were prone to the intimacy with their friends, while females are much more willing to be near their families in a studio.

## MATERIALS AND METHODS

### Research setting

The chosen case study was a residential complex located in Tabriz. Since the residents with different genders and various age groups lived in this particular case study and there were suitable items of privacy including semi-open walls, different floor levels, balcony in corners, artificial light, windows, fixed furniture in the corner of green space, and internal yard, we decided to choose this specific case study. One four-floor residential complex was considered in this study, which was faced the south direction, and its own allocated parking and green spaces. All floors had similar plans with a slight difference in inner decoration, and the area of each floor was 597m<sup>2</sup> approximately, where it had six one-bedroom units. Most of the units were able to receive enough daylight and they had access to the building's windows, so residents enjoyed visiting the nearby streets and landscape. By contrast, a limited number of units were located away from windows. For this reason, some artificial lights in these units were used to compensate for the lack of enough light in some inside spots.

It is noteworthy that, the research methodology was quantitative in this study. In addition, two major types of surveys including descriptive and analytical were used to analyze the data.

### Participants

The residential complex was settled by a total number of 88 residents in which 69 (78.4%) of them participated in this investigation. Of the participants, 33 (48.8%) and 36 (52.2%) were male and female, respectively. The age of participants was in the range of 16-57, and the mean age was 36. Almost all participants were living at home with their families.

### Questionnaire

The main themes of questionnaire covered opportunities for the privacy in the residential complex. In some cases, the counteraction of some components was considered each other to provide raised questions with respect to the privacy and seek transactions between the behavior of residents and their built environment. These questions were also asked from different genders and various age groups of participants to know how satisfied they were with their personal spaces as a whole. So, the questionnaire included male and female with different ages to better survey the effects of architectural components on the satisfaction rate of participants in relation to privacy. Concerning this, participants were classified in four age groups in this survey, based on the suggestion of Yarlalagadda et al. (2015) (child age (3–12), young age (13–30), middle age (31–50) and senior age (51–70)). Since parents dealt with their children most of the time and they could describe the living conditions of their children better, some questions about the desirable rate of privacy for children were asked from their parents. To summarize the questionnaire, the satisfaction rate of residents with respect to the privacy for all items of architectural components was to be rated a five-point response scale (1= Not at all, 2= Only slightly, 3= To some extent, 4= To a great extent, 5= To a very great extent). It is noteworthy that each self-completed questionnaire was filled in 15 min approximately. However, some interviewers were asked to clarify some raised doubts and uncertainties. In addition, 7 architectural components were introduced to generate the questions in the questionnaire. These components were created by combining the indexes of privacy and satisfaction as shown in Fig. 1. At last, the questions were provided for the residents with different ages and genders to cover all aspects of architectural components. The indexes of privacy and satisfaction will be introduced in the next sections.

### Theoretical background of this research

It is not surprising that one of the leading tasks of privacy was found to assist in protecting residents' self-identity by generating personal boundaries (Westin, 1967, 166; Altman, 1975, 11). Therefore, it can serve a fundamental role in improving the quality of life in the built environment and different types of housing and building classifications as reported in a wide range of research works (Lawton & Bader, 1970; Brunetti, 1972, 1; Marshall, 1972; Smith, 1977; Parke & Sawin, 1979; Shumaker, 1980). However, a limited number of studies have been conducted by researchers on the effects of architectural components on the satisfaction rate of residents

to attain the feeling of privacy in residential complexes. For further investigation, the present study is an effort to consider a hypothesis in this survey research and assess the effects of architectural components on the private life and personal boundaries of residential complexes. In addition, some surveys were also performed on the satisfaction rate of different genders in relation to privacy. Furthermore, a comparison of privacy perception was conducted among various age groups of residents to better understand the desirable rate of privacy for different ages.

### Privacy

In the designing process, it is important to consider some private spaces in residential buildings, where residents feel safe during a day in. Alexander et al. (1977) assessed two specific patterns including ceiling height variety to consider the concept of privacy in architectural designs. They concluded that low ceilings can be sufficiently qualified for providing the concepts of territoriality, and privacy in apartments. Meanwhile, the ground floor of apartments should be built higher than the level of street to allow residents to oversee street life and enjoy living in a private space. Similar results, reported by Kowaltowski et al. (2006), revealed that the concept of privacy in workspaces can be developed by putting forward introducing barriers, nooks, level changes and lighting definitions, which should be considered each other to improve the quality of design process. Regarding semi-open spaces in architectural designs, Parsaee et al. (2014) showed that when the interior and exterior spaces are connected using a semi-open space, it can lead to a desirable sense of privacy in the building. A study by Yildirim et al. (2007) indicated that unwanted and negative aspects of open-plan offices including lower levels of visual and acoustical privacy can be compensated near a window compared to those far from a window. Furthermore, employees, sitting in partitions with higher height and near a window, are more satisfied with their working atmosphere, where enough daylight has been provided. By considering these researches, some selected indexes, affecting the feeling of privacy in the built environment, are presented in Table 1. So, four indexes including nooks, ceiling height, semi-open space, and lighting were considered in the present study to achieve a desirable

rate of privacy for residents as indicated in Fig. 1, where two architectural components were drawn from each of this index. The use of suitable materials at the construction process can make buildings a suitable place to live in (Saberian et al. 2017; Kazemi et al. 2019a; Jahandari et al. 2019; Madandoust et al. 2019; Kazemi et al. 2019b). However, what's interesting about the theme of privacy in architecture is the number of creative ways in which it can be explored, with everything from building materials and surrounding nature pliable to help create a sense of privacy and separation (Crowder, 2018; Heath & Bennett, 2000). By considering this, it seems that the indexes of nook and ceiling height can be helpful to restrict the space to achieve a sense of privacy in the residential complex. Meanwhile, the index of semi-open space can appropriately provide a semi-separated space to attain the feeling of privacy in residential complexes. Furthermore, the artificial light in the private spaces can be considered as one of the important indexes in the residential complex. Generally, it seems that the chosen indexes including nooks, ceiling height, semi-open space, and lighting play a fundamental role in achieving a desirable rate of privacy.

### Satisfaction

Some selected indexes of residential satisfaction have been assessed by researchers. Ilesanmi (2010) evaluated the level of residents' satisfaction in public housing. To response this, he assessed some indexes including the landscape, building density, security and safety. The results showed that the physical characteristics of residences are very important for achieving a desirable rate of residents' satisfaction. Another study, by Kennedy et al. (2015), indicated that natural light and views to natural surroundings affect the level of residents' satisfaction in multi-story apartment dwellings. Similar results were also reported by Azimi and Esmaeilzadeh (2017) where the access to enough sunlight was found to be significant for attaining adequate satisfaction in housing complexes. The selected indexes of residents' satisfaction, considered by researchers, are presented in Table 2. Therefore, four indexes including landscape, lighting, building density, and security were considered in the present study to assess the levels of residents' satisfaction as shown in Fig. 1.

Table 1. Effective indexes of privacy, considered by researchers.

Researchers	Indexes			
	Nook	Ceil height	Semi-open space	Lighting
Alexander et al. (1977)	-	✓	-	-
Kowaltowski et al. (2006)	✓	✓	-	✓
Yildirim et al. (2007)	-	-	-	✓
Parsaee et al. (2014)	-	-	✓	-



Table 2. Effective indexes of satisfaction, considered by researchers.

Researchers	Indexes			
	Landscape	Lighting	Building density	Security
Ilesanmi (2010)	✓	-	✓	✓
Kennedy et al. (2015)	✓	✓	-	-
Azimi and Esmacilzadeh (2017)	-	✓	-	-

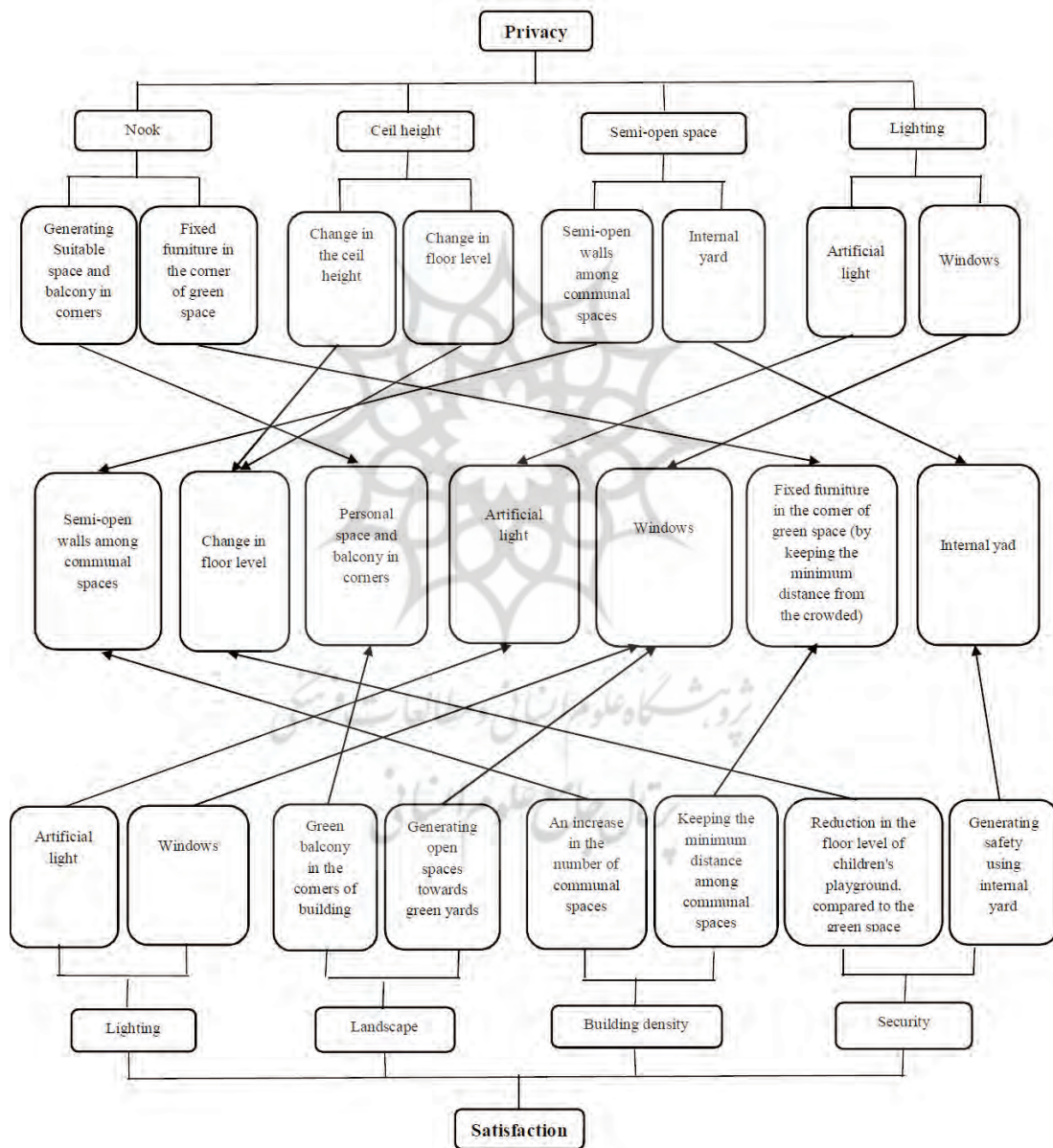


Fig. 1. Architectural components, drawn from indexes of privacy and satisfaction, in this study.

## RESULTS AND DISCUSSIONS

By combining the items of privacy and satisfaction, 7 architectural components were considered in the residential complex as shown in Fig. 1. The effects of these selected architectural components including semi-open walls, changed floor level, personal space and balcony in corners, artificial light, windows, fixed furniture in the corner of green space and internal yard were analyzed independently to achieve a desirable rate of privacy for different genders and various age groups of participants. It is noteworthy that Pearson correlation coefficient ( $\rho$ ) was also obtained to show the association between each architectural component and the satisfaction rate of residents. This coefficient is a value between -1 and 1, where the value of 0 shows that there is no association between the variables. When  $\rho$  is closer to 1 means that there exists a good correlation between two variables, while there is a negative association between two variables for  $\rho$  closer to -1. In this study, the values of  $\rho$  for all architectural components were no less than 0.798, which shows that there is a good correlation between two variables of architectural component and the satisfaction rate of residents.

### Semi-open walls among communal spaces

A sample of semi-open walls in the green space of residential

complex is shown in Fig. 2. Fig. 3 indicates the satisfaction rate of residents from different genders and various age groups with respect to the item of semi-open walls among communal spaces. Females were very satisfied with this item at all ages. In this residential complex, more than 80% males worked uninterruptedly for 24 hours and then they rested for 48 hours. Therefore, they had the chance of using the semi-open spaces in the residential complex during the day if they wanted. These results showed that less satisfaction was expressed by males, surrounded by semi-open walls, and even there was no willingness for males at older ages (50-70) to attend this space for the feeling of privacy in the residential complex. In fact, the types of tasks, performed by male and female, affect their preferences in daily routine as reported by Belakehal et al. (2004). Most of the males in the residential complex spent their time at work in semi-open spaces, so they would like to be in open spaces instead of semi-open spaces, when they were in the residential complex. These results demonstrated that males much prefer to attend open spaces, but not semi-open spaces to achieve a desirable rate of privacy, while the reverse was observed for females. Similar to this, Yildirim et al. (2007) revealed that more job satisfaction with working in open-plan offices was expressed by male employees than female employees.



Fig. 2. A semi-open space in the green space of residential complex.

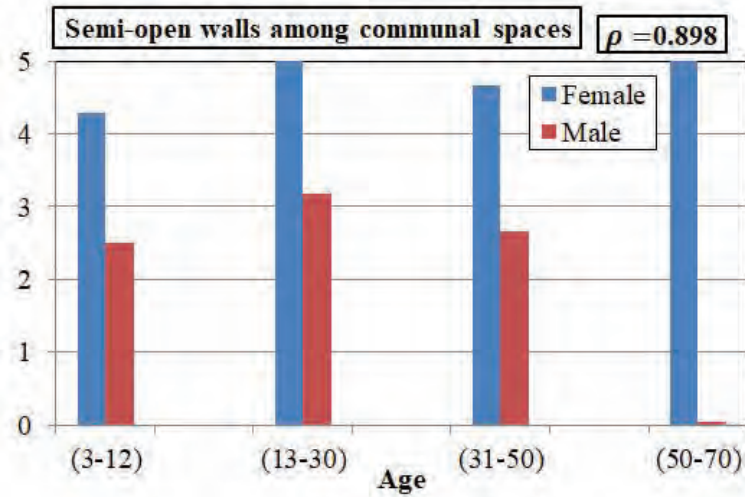


Fig. 3. Satisfaction rate of residents with respect to privacy for the item of semi-open space among communal spaces, Scale: 1 Not at all, 2 Only slightly, 3 To some extent, 4 To a great extent, 5 To a very great extent.

**Change in floor level**

Fig. 4 indicates a change in floor level of residential complex. The satisfaction rate of residents concerning the item of floor level is shown in Fig. 5. According to the results, females expressed a great extent of satisfaction with changing in floor level, up to the middle age. In addition, the satisfaction rate of males with respect to this item decreased by increasing the age. Generally, it can be inferred that the item of low ceilings can efficiently provide the feeling of privacy for females than

males particularly at child, young, and middle ages. Therefore, it seems that female children are increasingly dependent on privacy-seeking behavior at the residential complex as reported by Weinstein (1982). Although males and females were very satisfied with this item at child ages, there was no willingness for both of them at older ages (50-70) to spend their time in changed floor levels. The reason is that most of residents at senior ages suffered from some diseases such as leg pain. So, they would like to be in places with constant height.



Fig. 4. Change in floor level of residential complex.

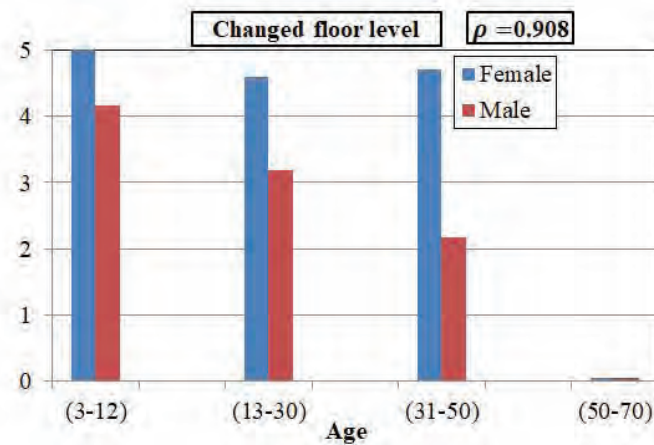


Fig. 5. Satisfaction rate of residents with respect to privacy for the item of floor level, Scale: as in Fig. 3.

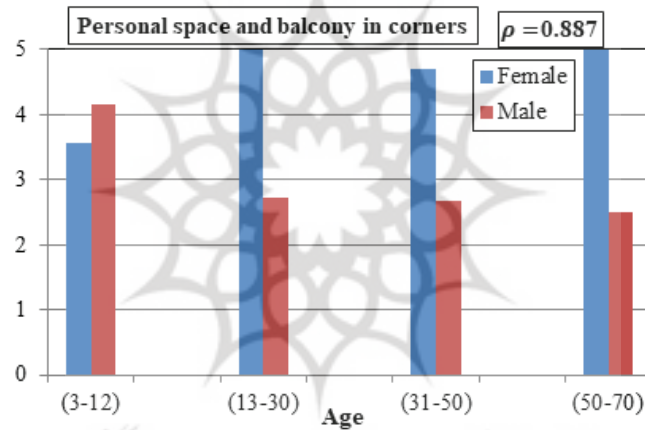


Fig. 6. Satisfaction rate of residents with respect to privacy for the item of personal space in corners, Scale: as in Fig. 3.

#### Personal space and balcony in corners

Fig. 6 indicates the satisfaction rate of residents with respect to the privacy for the item of personal space in corners. Based on the results, children showed a good rate of satisfaction with the item of personal space in corners. At other ages, females expressed a great extent of satisfaction with this item, while there was only a limited willingness for males to attend these spaces of the residential complex. Therefore, it seems that the feeling of privacy can be developed for females better than males by putting forward the personal spaces in corners.

#### Artificial light

To achieve a desirable rate of the privacy, it was not required to provide very bright spaces in the residential complex. By

considering this, only a limited amount of brightness was generated by the designer using the artificial light in the private spaces of the residential complex. Therefore, in some cases, the artificial lights were provided for the private spaces with the fixed furniture to achieve the feeling of privacy. The satisfaction rate of residents concerning the architectural component of artificial light is shown in Fig. 7. Children expressed a great extent of satisfaction with this architectural component. At other ages, there was only a limited willingness for males, exposed to the artificial light in residential complex. For the females up to the middle age, the satisfaction rate with respect to this item decreased, while there was a great extent of satisfaction for them at older ages (50-70). Therefore, at these ages, it seems that the feeling of privacy can be developed for



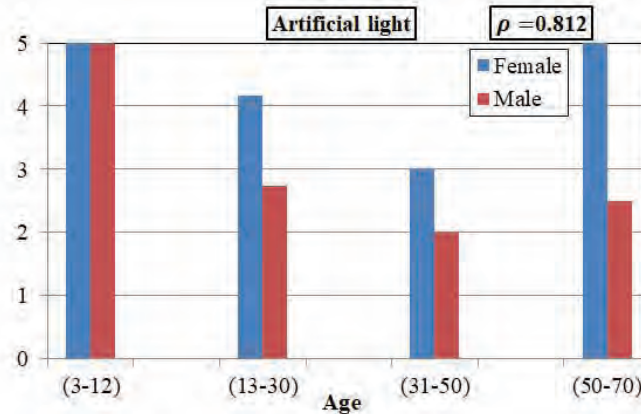


Fig. 7. Satisfaction rate of residents with respect to privacy for the item of artificial light, Scale: as in Fig. 3.

females better than males by putting forward the artificial light in the residential complex.

#### Windows

To achieve a desirable rate of the privacy in the residential complex, windows with bigger size were faced with private balconies and internal yards, while those with smaller sizes were faced with communal spaces. Double glazed windows were used to prevent entering noises into the buildings and subsequently provide more feeling of privacy for the residents. Windows with reflex glasses were used in the building of residential complex thereby being prevented to view internal spaces of the building. Fig. 8 shows lighting through a window in the residential complex. The satisfaction rate of residents

with respect to privacy for the item of lighting through a window is indicated in Fig. 9. According to the results, children showed a great extent of satisfaction with the item of windows. This manner was also reported for females at other ages. For the males up to the middle age, the satisfaction rate with respect to the item of lighting through window decreased, while there was a great extent of satisfaction for them at older ages (50-70). Generally, it can be inferred that most of children and females spend their time inside of residential complex, where they do not have access to enough light. So, it would be very enjoyable for them to be exposed to natural light. This can also be true for retired males to achieve a desirable rate of privacy near to the windows as reported by Yildirim et al. (2007). Fixed furniture in the corner of green space

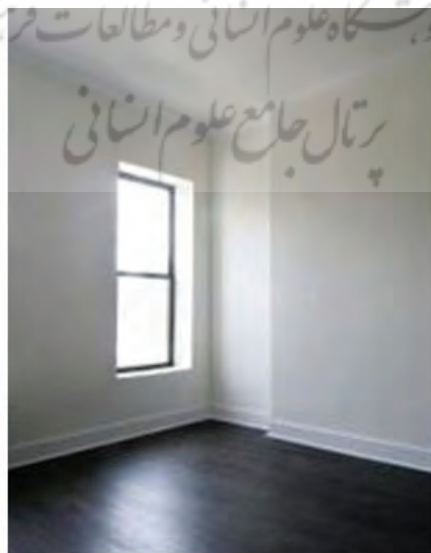


Fig. 8. Lighting through window.



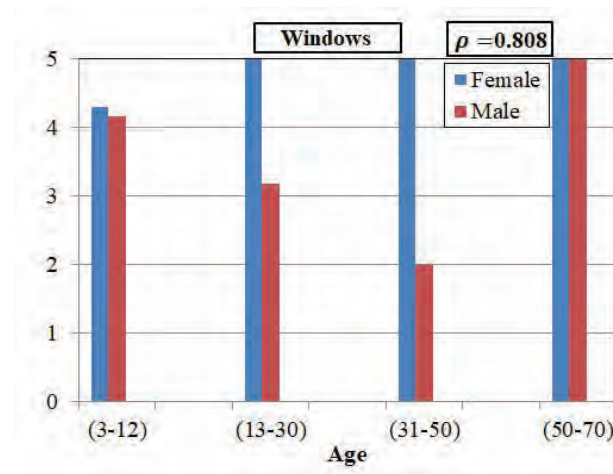


Fig. 9. Satisfaction rate of residents with respect to privacy for the item of lighting through window, Scale: as in Fig. 3.

A fixed seat in the corner of green space is shown in Fig. 10. Fig. 11 indicates the satisfaction rate of residents from different genders and various age groups regarding the architectural component of fixed furniture in the corner of green space. Children showed a great extent of satisfaction with this architectural component. For both females and males up to the middle age, the satisfaction rate with respect to the fixed furniture in the corner of green space decreased, while there was a great extent of satisfaction for them at older ages (50-70). By exploring older adults' perceptions of their daily lives, it can be inferred that residents at senior ages are willing to spend their time in quiet places, located far from noisy spaces, thereby being provided the feeling of privacy. That's why there

was a great satisfaction for both male and female to sit on the furniture in the corner of green space.

#### Internal yard

The satisfaction rate of residents for the architectural component of internal yard is shown in Fig. 12. Males expressed a great extent of satisfaction with this architectural component at young and senior ages. Furthermore, the satisfaction rate of females with respect to the item of the internal yard increased by increasing their age. It may be due to the fact that mature women spend time more in internal yard, while children are willing to spend their time in the playground of green space, but not in the internal yard. So, it seems that children in the



Fig. 10. A fixed seat in the corner of green space.

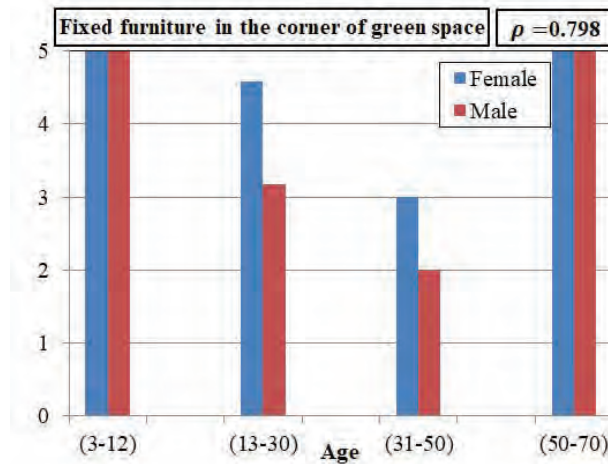


Fig. 11. Satisfaction rate of residents with respect to privacy for the item of fixed furniture in the corner of green space, Scale: as in Fig. 3.

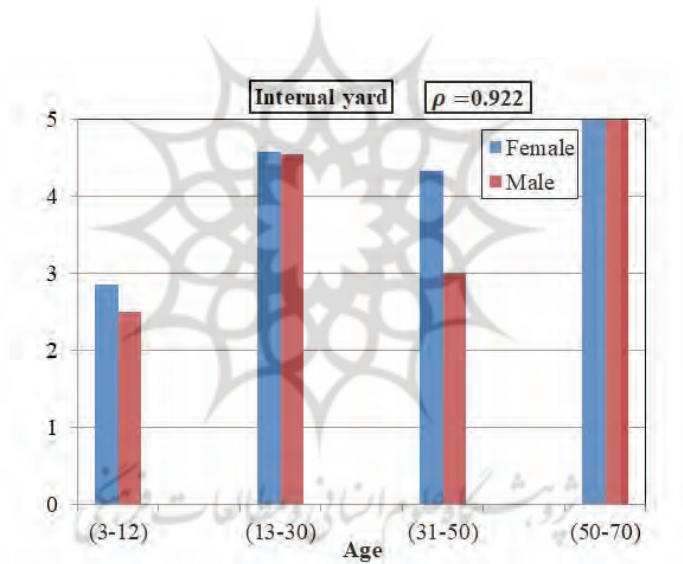


Fig. 12. Satisfaction rate of residents with respect to privacy for the item of internal yard, Scale: as in Fig. 3.

internal yard cannot experience a great sense of freedom and privacy.

### CONCLUSION

In this study, the effects of architectural components on private life of residents in a residential complex were evaluated. The following conclusions can be drawn from this investigation:

Females achieved a desirable rate of satisfaction with the item of semi-open walls among communal spaces at all ages, while less satisfaction was observed by males, surrounded by these walls.

A change in floor level led to a desirable rate of privacy for all

age groups of female, except to the senior age. Meanwhile, the satisfaction rate of males with respect to this item decreased by increasing their age.

Children were prone to attending the personal spaces, generated in corners, to attain a desirable rate of privacy. At other ages, females expressed a great extent of satisfaction with this item, while there was only a limited willingness for males to attend these spaces of residential complex.

According to the results, children showed a great extent of satisfaction with the items of artificial light and windows. At other ages, there was only a limited willingness for males, exposed to the artificial light in the residential complex. Similar to this, for the males up to the middle age, the satisfaction rate

with respect to the item of lighting through window decreased. According to the observations, it is recommended that only a limited amount of brightness should be provided using the artificial light in the private spaces of the residential complex to achieve the feeling of privacy.

The type and size of the window and its glasses play a key role in the generation of privacy in the residential complex and it can be stated that double glazed windows with reflex glasses and smaller size provide the feeling of privacy for the residents more.

The fixed furniture in the corner of green space decreased the satisfaction rate for both females and males up to the middle age, while the reverse was observed for residents at older ages.

The architectural component of internal yard efficiently affected the level of males' satisfaction at young and senior ages. Meanwhile, the satisfaction rate of females with respect to the item of the internal yard increased by increasing their age.

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