Exploring the Preferences for Micro-Apartments

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ABSTRACT
Due to changes in economics, environmental trends and demographic preferences housing preferences are shifting. Nowadays, a growing interest exists in micro-apartments. Micro-apartments give rise to new forms of living in and around the home. As a result, the design of micro-apartments is considered to be important since it can affect the well-being of the individual. The micro-apartment has to have flexible furniture and provide a comfortable living environment for the individual. This study focuses on the concepts of micro-living and micro-apartments, and explores the preferences of Turkish people for micro-apartments. Two three-dimensional (3D) computerized micro-apartment models with different designs are developed for the study. In order to understand the factors that affect the preferences for micro-living and micro-apartments, a questionnaire is conducted with 123 participants living in Ankara. The results indicated that the participants have positive attitudes towards micro-living, and gender, marital status and monthly income are found to be the most influential factors in preferring to live in a micro-apartment. In the assessment of the proposed two micro-apartments models, the model that was designed with a second floor was preferred for privacy reasons.

Keywords: Micro-apartments, Micro-living, Spatial Preferences, Attitudes

1. INTRODUCTION

Micro-living has become an emerging trend in many countries as a response towards more affordable living. Changing demographics and lifestyle, environmental trends and economical situations of people have played a role in fostering the micro-living trend (Gabbe, 2015; Lau and Wei, 2018; Potikyan, 2017; Urban Land Institute, 2014). Young professional singles and young couples with a high density of social and professional networks are being attracted to urban centers and are requiring small housing (Gazdag and Torlegård, 2018; Iglesias, 2014; Infranca, 2014; Urban Land Institute, 2014). However, a lack of space in urban centers is becoming a problem and causing housing to be unaffordable. In most case, living by oneself is unaffordable and people are forced to live with a house-mate, risking their own privacy and solitude. To maintain the housing price remain affordable and suitable for people, micro-apartments have become a way to create small living spaces with a lower price (Bilquish and Susanto, 2018).

Micro-apartments have given rise to new forms of living in and around the home. They are not only perceived as small living places, but also as a strategy for building affordable dwellings in densely populated urban centers (Bilquish and Susanto, 2018; Gabbe, 2015; Urban Land Institute, 2014). Although micro-apartments do not have a standard size, people are ready to sacrifice space mainly for location and affordability (Potikyan, 2017; Urban Land Institute, 2014). Living small means arranging oneself differently than other people and finding solutions to challenges that other people do not face (Beckman, 2018). Micro-apartments are well-known in the United States, Asia and Europe (Beckman, 2018; Bilquish and Susanto, 2018; Gabbe, 2015; Gazdag and Torlegård,

2018; Infranca, 2014; Lau and Wei, 2018; Shore, 2014; Urban Land Institute, 2014); however, this is a new concept in Turkey, as a result Turkish people may not be familiar with the concept and may not adopt a micro-living lifestyle. This study explores the factors in preferences for micro-living and micro-apartments of Turkish people living in Ankara with respect to their attitudes, demographical and economic differences.

2. MICRO-APARTMENTS

There is no standard definition for a micro-apartment since the size of the micro-apartment can vary between countries and cities. For example, in the United States, the size of micro-apartments varies according to cities; the size of micro-apartments in New York is between 25-27m^2, in Texas between 37-46 m^2, in Boston, the least size is 42m^2, in San Francisco, the minimum size is 20m^2 with 6.5m^2 for the bathroom (Urban Land Institute, 2014). In Stockholm, the standard micro-apartment is between 18-30m^2 with an average size of 25m^2 (Gazdag and Torlegård, 2018). In Sydney, they are sized between 24.5m^2 and 28m^2 (Clinton, 2019). In Hong Kong, micro-apartments are referred to any housing unit with saleable floor area below 40m^2 (Lau and Wei, 2018). In Indonesia, they are sized between 16-45m^2 (Bilquish and Susanto, 2018). However, Urban Land Institute (2014) defines a micro-apartment as "a purpose-built, typically urban, small studio or one-bedroom using efficient design to appear larger than it is and ranging in size from as little as 280 square feet up to as much as 450 square feet (which roughly equates to 20 percent to 30 percent smaller than conventional studios in a given market" (p. 6). A studio apartment is defined as a "small apartment consisting typically of a main room, kitchenette, and bathroom" (Merriam-Webster, 2017).

A micro-apartment is a developed version of a studio apartment that minimizes space while maximizing efficiency. The design strategy of micro-apartments is to provide the necessary space for the resident and eliminate any excess space that might be considered as luxury. Micro-apartments are smaller than conventional studio apartments with floor plans that are optimally used to make them as efficient as possible for their size and provide affordable living in urban areas (Gabbe, 2015). Potikyan (2017) showed that only 40% of the living space was frequently used and the micro-apartment could be seen as a minimalist concept that provided the necessary living space. Micro-apartments are appealing to young professional singles typically under 30 years of age, young couples, stay over commuters and the workforce that come to the city for a limited number of years or months in the tech and new media industries (Clinton, 2019; Iglesias, 2014; Lau and Wei, 2018; Urban Land Institute, 2014). These specific groups are willing to live in a minimal way because they focus on work and leisure, and often utilize the public and social spaces within the city to a higher extent than other groups. The micro-apartment is seen as a place to sleep and store goods, while other activities are accommodated outside. Likewise, the Urban Land Institute (2014) stated that the residents of the micro-apartment usually use a large number of facilities and various community spaces outside their micro-apartment. In addition, the major reasons for living in micro-apartments can be stated as having cheaper rents and utility costs, residents of micro-apartments can save about 20-30% of the rent when compared to a conventional studio or one-bedroom apartment and the ability to live alone (Urban Land Institute, 2014).

Although micro-apartments vary in size, configuration and layout, they integrate various living spaces based on day and night time zones, and maximize the limited floor area through smart design solutions of multi-functional and space saving built-in furniture and storage systems (Clinton, 2019; Gazdag and Torlegård, 2018; Potikyan, 2017; Urban Land Institute, 2014). The design of a micro-apartment is important since it must incorporate the furniture and appliances of a conventional apartment and provide a comfortable living environment that prevents psychological stress and the feeling of confinement. Built-in furniture widens the living space and efficiently organizes belongings, in addition, it provides a smooth transition between different spaces and

offers plenty of storage space compared to freestanding furniture by using the dead space (Potikyan, 2017).

Multi-functional and flexible furniture allows spaces to be designed differently from the past. For example, a single space can be used as a bedroom and living room by a Murphy bed, which is a "bed that may be folded or swung into a closet" (Merriam-Webster, 2017). A queen-sized bed can be easily converted into a sitting, dining or desk area, bench seating can be placed in window nooks, television stand can be integrated with a bookcase that allows more storage area, wall-mounted tables can be wall-mounted mirrors that can be converted to dining tables and working desks when folded down. Since micro-apartments are small spaces, mirrors help to reflect existing light and create the illusion of a larger room. Coffee or console tables can be converted to dining tables or desks, kitchen modules can be hideaway. Storage areas can be provided by built-in seating, built-in wardrobes and vertical shelving. Transformable, built-in furniture and storage systems encourage livability, flexibility, small footprint and serve as a partition thus helping residents to live in small spaces (Potikyan, 2017; Urban Land Institute, 2014). In addition, the size of the kitchen and bathroom facilities can be reduced by omitting features or furniture that may not be necessary, for example a kitchen with two hotplates instead of four and a bathroom without a vanity cabinet (Urban Land Institute, 2014).

In addition to flexible built-in furniture and storage systems, micro-apartments are designed and constructed with high ceilings, large operable windows, which give the impression that they are bigger than a conventional apartment, and Juliet balconies with sliding glass doors and guard rails for daylight and ventilation (Urban Land Institute, 2014). High ceilings create the illusion of spaciousness and provides additional storage spaces. In the United States, one of the most noticed strategies in designing micro-apartments is increasing the vertical dimension to provide an extra room for a second-floor bedroom space, leaving the main floor area for the kitchen, bathroom and living area (Disbrow, 2010; see Figure 1. This provides additional privacy and extra storage areas under the stairs by integrating drawers into the risers and under the sleeping area. Various studies have shown that ceiling height, window size, light, color and amount of furniture affect spatial perception (Bokharaei and Nasar, 2016; Imamoğlu, 1973; Kaye and Murray, 1982; Oberfeld, Hecht and Gamer, 2010; Ünal and Akın, 2017; von Castell, Hecht and Oberfeld, 2017; 2018; von Castell, Oberfeld and Hecht, 2014).

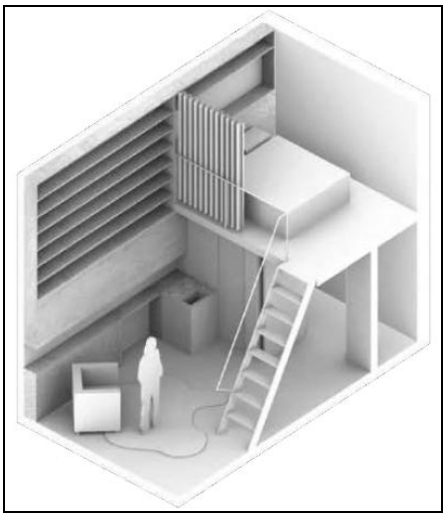

Figure 1. A vertically oriented micro-apartment prototype (Disbrow, 2010)

3. METHODOLOGY

In Turkey, living in small spaces, in other words micro-living, is a new concept that has developed within the past few years. With the development of this idea, there has been an increase in the construction of small houses and accordingly, the Turkish Ministry of Environment and Urban Planning has set out design criteria that include prescriptive minimum interior apartment sizes. However, most Turkish people are unfamiliar with micro-living and micro-apartment, as a result they may not lean towards the concepts. This study aims to explore the attitudes of Turkish people towards the concepts of micro-living and micro-apartment. In addition, it explores the preferences in micro-apartments with respect to demographical and economic differences. The following hypotheses are formulated:

1. Gender differences affect the preference for a micro-apartment. Male participants prefer micro-apartments more than female participants.
2. The marital status of an individual affects the preference for a micro-apartment. Singles prefer micro-apartments more than couples.
3. The monthly income of an individual affects the preference for a micro-apartment. Participants with low income level prefer micro-apartments more than participants with high income level.
4. Privacy is important in micro-apartments. Model 2 that has a second floor is preferred more than Model 1.

3.1. Participants

The sample group consisted of 123 residents (61 males and 62 females) randomly chosen from people living in Ankara (Soub, 2017), whose age range was from 18 to 55 years with a mean age of 27.60 years (SD=7.40). Seventy-three participants were single (59.3%) and the remaining were married.

3.2. Description of the 3D Micro-Apartment Models

Two computerized 3D micro-apartment models (Model 1 and Model 2) were designed that consisted living room, kitchen, bedroom and bathroom areas with a floor area of $57m^2$ and $66m^2$, respectively (Soub, 2017). According to the building policy of the Turkish Ministry of Environment and Urban Planning a dwelling is prescribed a minimum size of $28.5m^2$ (T.C. Çevre ve Şehircilik Bakanlığı, 2017). However, when designing the first micro-apartment model (Model 1), the prescribed minimum size was doubled not to intimidate the participants with the minimum size. Both models were in achromatic scale and were presented to the participants as plan and interior views.

In Model 1, the kitchen, living and the sleeping areas are integrated (see Figures 2, 3 and 4). The kitchen area, which is built in the corner with an L-shape counter, sink, appliances and preparation counter, provides sufficient storage areas and a space for the dining table. The bathroom is a separate room containing the essential components of sink, toilet and shower. A Murphy bed is used that can be folded at day time; however, no extra storage area is incorporated within the bed design. The design of this apartment adopted a queen-size bed that could be suitable for a small bedroom of $18m^2$.

Figure 2. Floor plan of Model 1 (57 m^2)

Figure 3. Model 1 - a view from the living room looking towards the kitchen and entrance

Figure 4. Model 1 - a view from the entrance looking towards living room

In Model 2, the actual floor area of the micro-apartment is increased and more effective facilities are provided. In addition, the micro-living design technique of the United States

is implemented by increasing the vertical dimensions to provide an extra room for a second-floor bedroom space, leaving the main floor area for the kitchen, bathroom and living area (Disbrow, 2010). With the second floor, the floor area of the micro-apartment is increased to 66m^2. Although the building policy of the Ministry of Environment and Urbanization prescribed a size of 9m^2 for the bedroom, the area was doubled when designing the second micro-apartment (see Figure 5).

The elevated design concept allows the bedroom to be located on the second floor above the kitchen. The bedroom is accessed by a stair from the living area. The space between the soffit of the staircase and the floor can be used efficiently for storage. This concept maximizes the effective area of the apartment, provides privacy and allows a spacious design where more space is provided for the living area (see Figure 6). The kitchen and the bathroom areas are the same as Model 1. The kitchen provides sufficient storage areas and a space for the dining table. In addition, the kitchen and the living room are open-plan type where there are no walls separating the two areas (see Figure 7).

Figure 5. Floor plan of Model 2 (66 m^2)

Figure 6. Model 2 - a view from the stairs looking towards the bedroom

Figure 7. Model 2 - a view towards the apartment

3.3. Procedure

The study was conducted in two phases. In the first phase, a questionnaire was administered to the participants that consisted of three sections. The first part of the questionnaire consisted of the participants' demographic and personal information. In the second part of the questionnaire, the participants rated the concept of micro-living on a 5-point Likert scale. The questions were related to whether the participant would move to a smaller apartment or adopt a micro-living lifestyle if all the essential facilities were provided and would it be more economically convenient and comfortable. In addition, the participants indicated whether their marital status, family size, and income level would affect their decisions in preferring to live in a micro-apartment. Furthermore, the participants evaluated the different aspects of micro-living design techniques, such as the integration of the living and kitchen areas as one space, an open bedroom area and the inclusion of more storage areas.

In the second phase, the participants evaluated two computerized 3D micro-apartment models according to the following criteria:

1. The effectiveness of the micro-apartment design with respect to the living room, kitchen, bedroom, bathroom and storage spaces,
2. Perceived comfort and privacy,
3. An overall preference with respect to gender, marital status, income level and economically convenience.

4. RESULTS

With respect to the first part of the questionnaire, the monthly income of the participants varied. The vast majority of the participants (53.7%) had a monthly income below 2000TL, 31 participants (25.2%) indicated that their income was between 2001-4000TL, 17 participants (13.8%) indicated that their income was between 4001-6000TL and only 9 participants had a monthly income of more than 6000TL. Moreover, 68 participants (55.3%) indicated that they lived in Çankaya, the central region of Ankara. Eighteen participants (14.6%) lived in the northern region of Çankaya (Altındağ and Keçiören) and 37 participants (30.1%) lived in the western region of Çankaya (Yenimahalle, Etimesgut and Sincan).

The participants provided information about their households including the number of rooms in their houses, the floor area of the house, and the number of people living in their houses (see Tables 1, 2 and 3, respectively). The majority of the participants currently live in three-bedroom apartments that mainly has a total area that ranges between 101 and 200m^2.

Table 1. Number of rooms in the participant's house

No. of rooms	Frequency	Percent
1+1	2	1.6
2+1	21	17.1
3+1	76	61.8
4+1 and more	24	19.5
Total	123	100.0

Table 2. Total area of the participant's house

Area (m^2)	Frequency	Percent
Less than $100m^2$	29	23.6
101 – $200m^2$	70	56.9
201 – $300m^2$	19	15.4
More than $300m^2$	5	4.1
Total	123	100.0

Table 3. Number of people living in the house

No. of people	Frequency	Percent
1	7	5.7
2	20	16.3
3	32	26
4	43	35
More than 4	21	17
Total	123	100.0

In the second part of the questionnaire, the participants evaluated the micro-living concept on a 5-point Likert scale. There was an equal of number of participants agreeing to move to a smaller apartment and participants refusing to move. Individual differences that consist of gender, marital status and monthly income were correlated with the willingness of the participants to move to smaller apartments, given that the essential facilities are provided. By using Spearman's rho correlation, significant relationships were found between gender, marital status and monthly income ($p<0.049$, $p<0.000$, $p<0.001$, respectively; see Table 4).

Table 4. Spearman's rho correlations between the willingness to move to smaller apartments and individual differences

Individual differences	Willingness to move to smaller apartment	
	Correlation Coefficient	Sig. (2-tailed)
Gender	-0.161*	0.049
Marital status	-0.317 **	0.000
Monthly income	-0.264 **	0.001

*. Correlation is significant at the 0.05 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

According to the results, gender was reversely correlated with the willingness to move to micro-apartments. A weak negative relationship indicated that male participants lean

more to the concept of micro-apartments than female participants. Moreover, a negative moderate relationship was found between the marital status and the willingness to move to micro-apartments; participants who were single preferred the micro-apartment concept. In addition, a weak negative relationship was found between the monthly income and the willingness to move to micro-apartments; participants with low income preferred the micro-apartment concept.

In analyzing the factors that influence the decision to consider micro-living, the participants indicated with high rates of agreement that the economically convenience (cost) of the micro-apartment, marital status, family size, and monthly income influenced the preference for micro-apartments. Eighty-four participants (68.3%) considered living in micro-apartment due to its cost. The majority of the participants indicated that marital status, family size and monthly income (90%, 81.3% and 86.2%, respectively) would have an impact on their decision in preferring a micro-apartment.

Furthermore, the majority of the participants (72.4%) perceived micro-apartments cheaper than normal apartments, whereas 10.6% of the participants did not have an idea. Nonetheless, 70 participants (57%) indicated that living in a small space would be uncomfortable, whereas 44 participants (35.8%) did not agree with this idea. With respect to the micro-living ideas, more than half of the participants (52%) accepted the idea of integrating the kitchen and the living room; likewise, the majority of the participants (83.7%) indicated that the living space should incorporate more storage spaces. However, the majority of the participants (80.5%) did not accept the idea of having an open bedroom that is viewable from the rest of the house.

In the assessment of the designed 3D micro-apartment models, the majority of the participants preferred the design of Model 2 according to living comfort, effectiveness of the design, privacy, effective storage space, kitchen area, living area, bedroom area and overall (see Table 5). In the overall assessment of the reasons for preferring a micro-living concept, the participants indicated that the main reason was economically convenience and secondly it was found appropriate for the marital status.

Table 5. Assessment of the developed micro-apartment models

Reason	Model	Frequency	Percent
Model preferred according to living comfort	Model 1	16	13.0
	Model 2	**107**	**87.0**
Model preferred according to design effectiveness	Model 1	23	18.7
	Model 2	**100**	**81.3**
Model preferred according to privacy	Model 1	20	16.3
	Model 2	**103**	**83.7**
Model preferred according to effective storage space	Model 1	25	20.3
	Model 2	**98**	**79.7**
Model preferred according to Kitchen area	Model 1	44	35.8
	Model 2	**79**	**64.2**
Model preferred according to living area	Model 1	32	26.0
	Model 2	**91**	**74.0**
Model preferred according to Bedroom area	Model 1	17	13.8
	Model 2	**106**	**86.2**
Overall preferred model	Model 1	16	13.0
	Model 2	**107**	**87.0**

5. DISCUSSION AND CONCLUSION

The micro-living concept is one of the most effective solutions that is implemented worldwide in order to solve many emerging issues, such as the increase in population and the limited residential spaces, the increase in the demand for studio and one-bedroom apartments, the increase in renting costs that form a financial burden on the people compared to their income (Urban Land Institute, 2014). Living small means arranging oneself differently than other people and finding solutions to challenges that other people do not face (Beckman, 2018). Micro-apartments have been effectively implemented in many countries around the world and have proven their success in resolving the abovementioned issues (Beckman, 2018; Bilquish and Susanto, 2018; Gabbe, 2015; Gazdag and Torlegård, 2018; Infranca, 2014; Lau and Wei, 2018; Shore, 2014; Urban Land Institute, 2014). Although the space of a micro-apartment is limited, smart design solutions such as multi-functional, space saving built-in furniture and storage systems, and the integration of various living areas maximize the limited floor area and provide a comfortable living environment (Clinton, 2019; Gazdag and Torlegård, 2018; Potikyan, 2017; Urban Land Institute, 2014).

According to the Urban Land Institute (2014) report micro-apartments are appealing to young professional singles typically under 30 years of age and slightly more male than female. Likewise, previous studies indicated that the economical situations of people play a role in the preference for micro-apartments (Bilquish and Susanto, 2018; Gabbe, 2015; Lau and Wei, 2018; Potikyan, 2017). In this study, the mean age of the participants was below 30 years and the majority was single. It was hypothesized that male participants and singles prefer micro-apartments more than female participants and couples. In line with the report, a significant relationship was found between gender differences and preference for a micro-apartment, and between marital status and preference for a micro-apartment. The reason for male participants preferring micro-apartments more than female participants may be explained by the cultural background. In the Turkish culture, male emerging adults are encouraged to be more free, more independent and more aggressive in society and to spend more time outside, whereas female emerging adults are expected to spend more time at home, take more responsibility at home, are expected to behave obediently to the traditional mother role, and are encouraged to become more dependent (Atak and Taştan, 2012; Eryılmaz and Atak, 2009). As stated in the report, micro-apartments are appealing to singles since they live in a minimal way because they focus on work and leisure, and often utilize the public and social spaces within the city to a higher extent than other groups. The micro-apartment is small and consists of a compact design that is suitable for the user with minimal belongings. It was hypothesized that the monthly income of an individual affects the preference for a micro-apartment. Likewise, a significant relationship was found between monthly income and preference for a micro-apartment. Participants with low income level prefer micro-apartments more than participants with high income level since micro-apartment are more affordable than conventional apartments (Bilquish and Susanto, 2018; Clinton, 2019; Gabbe, 2015; Lau and Wei, 2018; Potikyan, 2017).

Although the participants lean towards the idea of an integrated kitchen area and living area, they do not accept the idea of an integrated bedroom and living area. Privacy is an important aspect in micro-apartments. It was hypothesized that Model 2 that has a second floor is preferred more than Model 1. The participants confirmed this hypothesis and indicated that privacy is a major concern for the bedroom and the bed area should be separated from the rest of the living area. This is in line with Clinton's (2019) study where the participants' concern was the absence of physically separated bedroom or some form of spatial design that separated the bed area from the remainder of the living area.

Micro-living is an emerging concept in Turkey and within the past few years there has been an increase in the construction of small houses. However, most Turkish people are not familiar with micro-apartments as a result they may not adopt a micro-living lifestyle.

The present study explored the attitudes towards micro-living and the factors affecting preferences for micro-living and micro-apartments with respect to demographic and economic differences. Two computerized 3D micro-apartment models were developed and the interior views were presented to the Turkish people living in Ankara. The results indicated that the participants have positive attitudes towards micro-living, and gender, marital status and monthly income are found to be the most influential factors in preferring to live in a micro-apartment. In the assessment of the proposed two micro-apartments models, the model that was designed with a second floor was preferred more for privacy reasons. This study can shed light on the design of micro-apartments in Turkey with respect to the residents' preferences. The design of flexible built-in furniture and storage systems can be optimized in order to achieve the same living experience in a normal-sized apartment. For further studies in addition to demographic and economic differences, cultural differences can be considered to understand privacy and spatial preferences. Different micro-apartment designs from different cities can be compared with respect to architectural features such as materials, color, light, openings and design layout. Also, a survey can be conducted with the actual users of micro-apartments to understand if the design actually corresponds to the needs of its users.

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