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Effects of Covid-19 Pandemic on Neighborhood Perception and Satisfaction

Covid-19 Pandemisinin Mahalle Algısı ve Memnuniyeti Üzerine Etkisi

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Öz

Konut yakın çevreleri Covid-19 salgını sırasında şehirlerde ve insanların yaşamlarında önemli bir role sahip olmuştur. Sokağa çıkma yasakları, sosyal mesafe kuralları, karantina ve evde kal tedbirleri, insanların evlerinde ve mahallelerinde geçirdikleri süreyi artırmış ve bu alanlara yönelik algı ve davranışlarını değiştirmiştir. Bu çalışma, pandemi öncesi ve pandemi döneminde mahalleyle ilgili algı ve memnuniyetteki değişimi ölçmeyi amaçlamaktadır. Şubat 2020 ve Ağustos 2020'de Karşıyaka/İzmir mahalle sakinlerine "mahalle memnuniyeti" anketi uygulanmıştır. Sonuçlar, pandemi öncesine kıyasla pandemi döneminde mahalle sınırlarının daha geniş algılandığına işaret etmiştir. Aynı zamanda mahalle memnuniyetinin toplam 48 ölçütünden 9'una ilişkin değerlendirmeler pandemi öncesinde ve pandemi süresinde farklılaşmıştır. Pandeminin başlamasının ardından erişilebilirlik, fiziksel çevre kalitesi ve sosyal ilişkiler ile ilgili bazı parametreler daha olumlu değerlendirilmiştir. Ayrıca pandemi döneminde daha çok katılımcı mahalleden taşınmaya istekli olduğunu ifade ederek kent içi hareketliliğin artabileceğine işaret etmiştir. Elde edilen tüm bulgular bir arada değerlendirildiğinde, Covid-19 sürecine yönelik belirsizlik durumunun mahalle sakinlerinin mahalleye yönelik değerlendirmelerine de yansıdığı görülmüştür. Bu çalışma pandeminin mahalle algısı ve memnuniyeti üzerindeki etkisine yönelik ampirik bulgular sunması nedeniyle önemlidir.

Anahtar Kelimeler: Mahalle Memnuniyeti, Mahalle Algısı, Covid-19 Pandemisi

ABSTRACT

Neighborhoods had a prominent role in cities and people's lives during the Covid-19 pandemic. Lockdowns, social distance, self-isolation, and stay-at-home orders have increased the time people spend in their homes and neighborhoods and changed their perception and behavior towards these areas. This study aimed to measure the change in perception of and satisfaction with the neighborhood before and during the pandemic. A neighborhood perception and satisfaction survey was conducted among residents of Karşıyaka/Izmir in February 2020 and August 2020. Results showed that the mean value of perceived neighborhood borders extended during the pandemic. In addition, 9 of 48 parameters of participants' neighborhood satisfaction evaluations were different before and during the pandemic. Some aspects of accessibility, physical environmental quality, and social relations were evaluated better after the outbreak of the Covid-19 pandemic. In addition, residents revealed more tendency to move out of the neighborhood during the pandemic pointing to an expected increase in urban mobility. All these findings reflect the ambiguity and obscurity of the situation during the Covid-19 period from the perspective of the neighborhood residents. This study is significant because it provides empirical evidence on the impact of the Covid-19 pandemic on neighborhood perception and satisfaction.

Keywords: Neighborhood Satisfaction, Neighborhood Perception, Covid-19 Pandemic

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INTRODUCTION:

Physical quality of neighborhoods influences human behavior, well-being and happiness. The extent to which residents are satisfied with their neighborhood affect their life satisfaction directly and community satisfaction indirectly (Oktay, Rustemli & Marans, 2009; Talen, 1999). Therefore, several studies have investigated residents' evaluations of neighborhoods (Hur & Morrow Jones, 2008; Hur, Nasar & Chun, 2010). A case insensitive search for "Neighborhood satisfaction" via Google Ngram viewer shows that the share of references has significantly increased from 1960's to 1980's and is still a popular research subject (Figure 1).

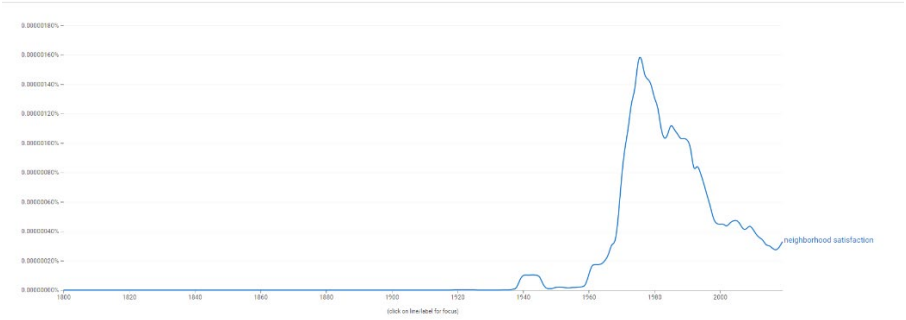


Figure 1. Google Ngram Viewer Search for the Keyword Neighborhood satisfaction"

The pandemic Covid-19 has profoundly affected the urban life. Beyond its visible short-term effects, the long-term permanent impacts and side effects of "new normal" and "new future" are immensely growing debates in urban design and environmental psychology (Bereitschaft & Scheller, 2020; Salama, 2020). In that respect, how neighborhood perception and satisfaction differ before and after the outbreak of the Covid-19 pandemic deserves attention. This study, which is a part of the first author's dissertation, aims to do that. First, the concept of neighborhood, the studies on neighborhood satisfaction, and its relation to Covid-19 pandemic will be reviewed. Then, the methodology used in this study to measure neighborhood satisfaction and people's perception on neighborhood boundaries will be discussed. Next, neighborhood boundaries and evaluations on neighborhood satisfaction before and after the first lockdown will be compared. Finally, the strengths and weaknesses of this study and potential future studies guided by this study will be highlighted.

1. Neighborhood definition and neighborhood satisfaction

Neighborhood refers to concepts beyond the administrative borders. There are various definitions of neighborhood. Despite that variation, Keller (1968) argues that all definitions refer to physical and social components (as cited Schwirian, 1983). Identifiable geographic area or an area with distinct physical or aesthetical characteristics are used as physical components (Barton, 2003; Dassopoulos & Monnat, 2011; Schwirian, 1983). Walking distance or everyday walking needs are also used as the keywords in definitions of neighborhoods (Smith, Gidlow, Davey & Foster, 2010). Social components are more diverse and involve keywords such as social characteristics (Glass, 1948), sense of belonging (Abdollahi, Sarrafi & Tavakolinia, 2010) and social network (Schoenberg, 1979) (as cited in Hosseini & Soltani, 2018).

Authorities define neighborhoods objectively with tangible borders. However, residents' perception of neighborhood does not overlap with these administrative borders. Residents define their neighborhood boundaries subjectively. Although residents' definition of physical boundaries of neighborhoods involve ambiguity (Minnery, Knight, Byrne, & Spencer, 2009), environmental psychology and urban sociology researchers suggest the use of resident-defined neighborhoods instead of administrative borders in studies of neighborhood (Coulton, Korbin, Chan, & Su, 2001). Given the fact that definitional precision (such as a small residential area or a greater area with social interaction) may influence how residents specify their neighborhood boundaries (Campbell Henly, Elliott, & Irwin, 2009), in this study, participants were asked to draw the borders of their neighborhood

with a specific definition derived from the literature (see methodology part for the definition) before evaluating their neighborhood satisfaction.

Neighborhood satisfaction refers to residents' overall evaluation of their neighborhoods. However, it is a contradictory discourse due to its fusion with related terms "residential satisfaction" and "quality of life". In comparison to residential area, neighborhood is a broader concept containing commercial, educational, recreational uses in addition to housing. Moreover, Schwirian (1983) asserts that social interaction is much higher in neighborhoods than in residential areas. In brief, compared to neighborhood satisfaction, residential satisfaction is a narrower concept and focused more on the dwelling. Quality of life; a broader and more objective concept than neighborhood satisfaction, is defined as overall well-being of societies and individuals (Woźniak & Tobiasz-Adamczyk, 2014). High quality of life does not always correspond to high neighborhood satisfaction or vice versa (Hur et al., 2010). Despite these conceptual differences between these three terms, (neighborhood satisfaction, residential satisfaction, quality of life) the indicators of these concepts often overlap. Neighborhood satisfaction is influenced by the personal characteristics of the evaluator. Older, higher income, homeowning, higher educated, or long-term residents tend to be more satisfied with their neighborhood (Hur & Nasar, 2014; Lu, 1999; Parkes, Kearns & Atkinson, 2002). Beyond the personal characteristics, the influence of physical environmental characteristics on neighborhood satisfaction has been frequently researched as well. Presence of and access to services, amount of green areas, aesthetics/architectural features of the neighborhood, physical upkeep etc. influence residents' neighborhood satisfaction (Dassopoulos & Monnat, 2011; Hur & Morrow-Jones, 2008; Hur & Nasar, 2014; Lee, Conway, Frank, Saelens, Cain & Sallis, 2017; Rioux & Werner, 2011).

Voluminous number of studies focus on neighborhood satisfaction and they differ in terms of the individual characteristics of the participants or the neighborhood characteristics they focus on. Studies focus on parents (Cook, 1988; Gärling & Gärling, 1990), elders (Rioux & Werner, 2011) and disabled people (Coulombe et al., 2016). In terms of spatial characteristics, they focused on safety (Loo, 1986), place attachment (Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999), upkeep and crime (Hur & Nasar, 2014). However, so far, the influence of the pandemic on neighborhood satisfaction has barely been studied. Yang & Xiang (2021) investigated the change in residents' evaluations of neighborhood (social cohesion, neighborhood conditions, and physical activity) and mental health states during the pandemic. Results showed better evaluations of neighborhood during the pandemic thanks to health-promoting environmental features like less traffic, less crime and violence, and perception of more attractive sights in the neighborhood. Although Yang & Xiang's study can be considered as the most relevant research to this study, their study differentiates from this study in many dimensions. First, their findings relied on data during the pandemic. The absence of pre-pandemic data raises doubts about bias. Second, neighborhood satisfaction was measured via limited parameters without a comprehensive approach. Third, the study was held in the USA; whether their findings have an applied value for other cities is not known. Finally, they focus on evaluations of neighborhood and ignored how neighborhood boundaries is perceived and defined. The current study aims to fulfill these gaps.

2. Covid-19 pandemic and future of cities

The Covid-19 pandemic has affected everyone's life all around the world dramatically. New lifestyles with self-isolation, social distancing, stay-at-home measures arose strong debates on lockdown urbanism, post-pandemic architecture and planning (Bereitschaft & Scheller, 2020; Eltarabily & Elghezanwy, 2020; Jefferies, Cheng, & Coucill, 2020; Rice, 2020; Salama, 2020; Yang & Xiang, 2021; Zecca, Gaglione, Laing, Gargiulo, 2020). Salama (2020) discusses the challenges of the new normal in urbanism in various dimensions. He argued that compact densities prosper cultural, social, and environmental sustainability; nevertheless, social distancing and separation are essential to prevent spread of the virus. Travel restrictions destroy economies and increase unemployment, but at the same time decrease air, noise pollution, and increase active travel modes such as walking and cycling (Rice, 2020). Debates on how the pandemic will shape the cities reveal conflicting ideas; on one hand, the matter is staying safe, on the other coping with negative outcomes of the new normal such as

depression, loneliness, sleeping and eating disorders, obesity, lack of human-human and human-environment interaction. Salama (2020) asserts that the main concern of the experts is meeting complex challenges and balancing the conflicting values. He draws attention to increasing importance of home zones which can be defined as an area in walking distance around the home or neighborhood. He suggests that concepts and theories related to environmental psychology (such as neighborhood satisfaction) should be revised in post-Covid-19 conditions. Bereitschaft & Scheller (2020) also point out the necessity of research for residential preferences and urban neighborhood perception claiming that where people live will be the most profound question of the post-Covid-19 period. This study aims to provide empirical data on how neighborhood perception and satisfaction differ before and during the pandemic.

Once, neighborhood satisfaction was a debate among scholars with many dimensions; now, what satisfies the residents in new normal lifestyle is a broader question with lots of uncertainties. After the outbreak of the Covid-19 pandemic, the influence of new urban strategies and forms (with an emphasis on density, walkability, and access to green areas in the neighborhoods) on both physical and mental health are discussed in many studies (Bereitschaft & Scheller, 2020; Eltarabily & Elghezanwy, 2020; Jefferies et al. 2020; Zecca et al., 2020). However, how residents' perception of the neighborhood changed before and during the Covid-19 pandemic has never been studied with empirical data. This study fills that gap by utilizing data collected just before and during the pandemic.

METHODS:

This study is based on the first author's dissertation which aimed to investigate neighborhood satisfaction in various urban fabrics in two different case areas: one in France and the other in Turkey. This study focuses only on the Turkish case. In Turkey, the study was held in Izmir (third largest city in Turkey), Karşıyaka District which represents a densely urbanized area and covers an area of around 50 km^2 with almost 350 thousand inhabitants (census of 2020, TUIK, n.d.). Surrounded by Çiğli, Bayraklı, Bornova, and Menemen districts and the Aegean Sea (Izmir Gulf), Karşıyaka is one of the sub-centers of Izmir with its own educational, commercial, and cultural services.

First, urban fabrics in Karşıyaka were identified via an extensive morphological analysis (Figure 2) called Multiple Fabric Assessment (MFA). MFA has four-steps to classify the urban fabric. First, the street-based spatial partition (the unit of measurement) is defined. Second, urban morphometric indicators are calculated via geoprocessing. Third, significant spatial patterns are identified based on the spatial distribution of indicators. Lastly, these patterns are clustered. MFA analyses in Turkey used building footprint, building height, and street centerline information as base data which were derived from Izmir Metropolitan Municipality - Department of Geographical Information Systems Database. Fourteen urban morphometric parameters on three main dimensions, (Network Morphology, Built-up Morphology, Network-Building Relationship) were calculated based on this data (Table 1) (for further details on MFA analyses see Araldi & Fusco, 2019; Erin, 2022). In the study area (Karşıyaka), eight urban fabrics were identified (for detailed information see Erin, 2022).

Table 1. List of the Urban Morphometric Indicators

	Indicator Name	Definition
Network Morphology	Nodes 1 (cul-de-sac), Nodes 4, Nodes 35+	Average presence nodes of degree 1 / Average presence nodes of degree 4 / Average presence nodes of degree 3, 5+
	Street Length	Street segments length between two intersections
	Windingness	Euclidean distance / Network distance between two intersections
Built-up morphology	Coverage Ratio PB50meters	Built-up Area / PB50 Area
	Building prevalence (Footprint Surface, Elongation, Convexity, Height, Continuous Built-up Entity, Specialization)	Area of Building Types (B1, B2, B3, B4) / Total Built-up Surface

Network-Building Relationship	Average Open Space	Average width of open space (perpendicular sightlines) along the street
	Open Space Variability	Standard Deviation of Open Space
	Average Setback	Average width of open space (perpendicular sightlines) along the street
	Building Facades Misalignment	Standard Deviation Setback
	Corridor Effect	Length of Parallel Facades / Street Length
	Average Height-Width Ratio	Building Height / Open Space Width
	Average Building Height	Average building height along the street (in PB20)
	Height Misalignment	Standard Deviation Building Height
	Building Frequency	Number of buildings / Street Length

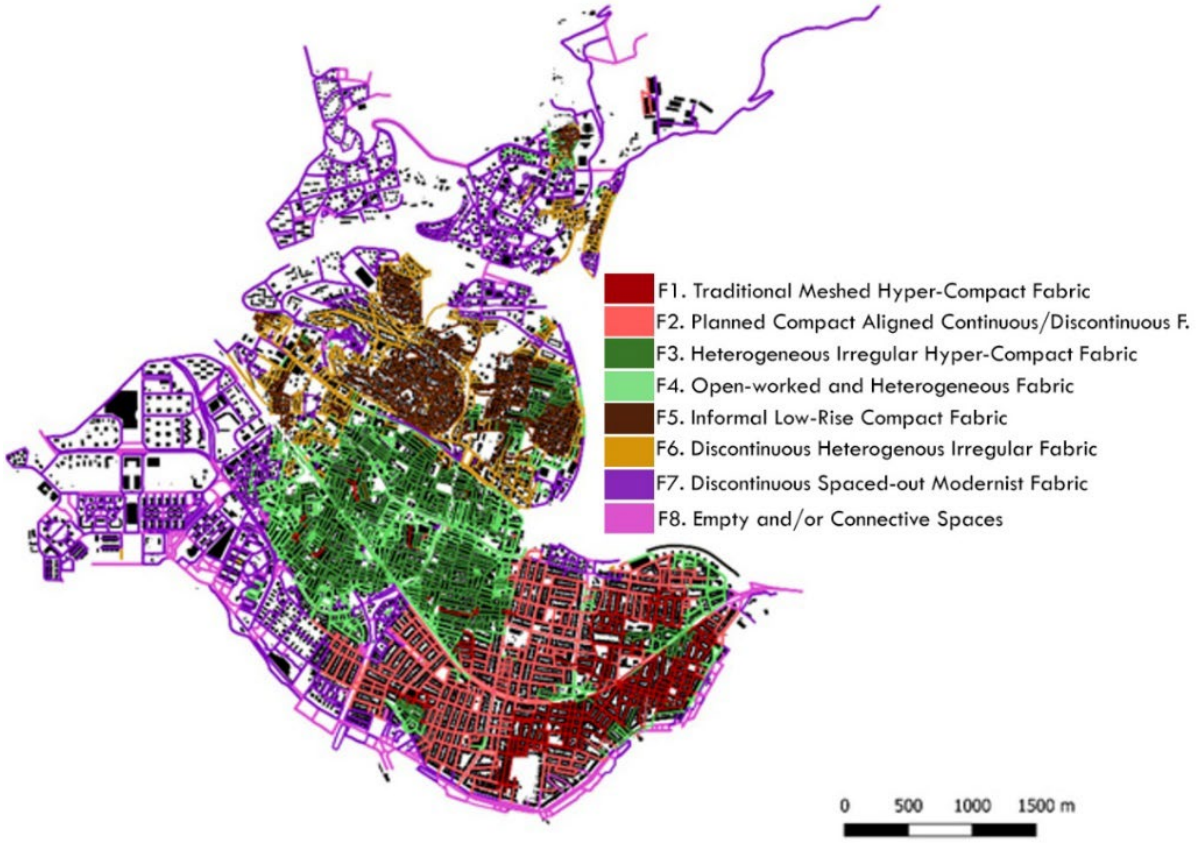


Figure 2. Urban Fabrics in Karşıyaka

Next a unique neighborhood satisfaction survey was designed to be applied in all urban fabrics where the budget of the project allowed 400 surveys to be conducted. The surveys were planned to be applied evenly in all fabrics. However, the Covid-19 pandemic has spread in Turkey in March 2020 during the field study, and it did not allow even application of the survey in all fabrics. Although 322 of 400 surveys were conducted before the pandemic, 78 were left to be conducted during the pandemic. As the Covid-19 pandemic has a high potential to influence the results, conducting the remaining 78 surveys in eight different urban morphologies would not allow appropriate statistical analysis. Therefore, the remaining 78 questionnaires were conducted in two urban fabrics, one of which is common with the one that was conducted before the Covid-19 pandemic. In other words, data on the neighborhood perception and satisfaction both before and after the lockdown period is only available for one type of urban fabric which is named as “the Planned Compact Aligned Continuous/Discontinuous Fabric” (F2 in Figure 2) in Karşıyaka, Izmir. Since the aim was to investigate neighborhood satisfaction and sample size was limited, the study area was narrowed down to few street segments close to each other to eliminate the variance in physical environmental qualities (Figure 3). In brief, red lines in Figure 3 represent the streets where the surveys were completed both

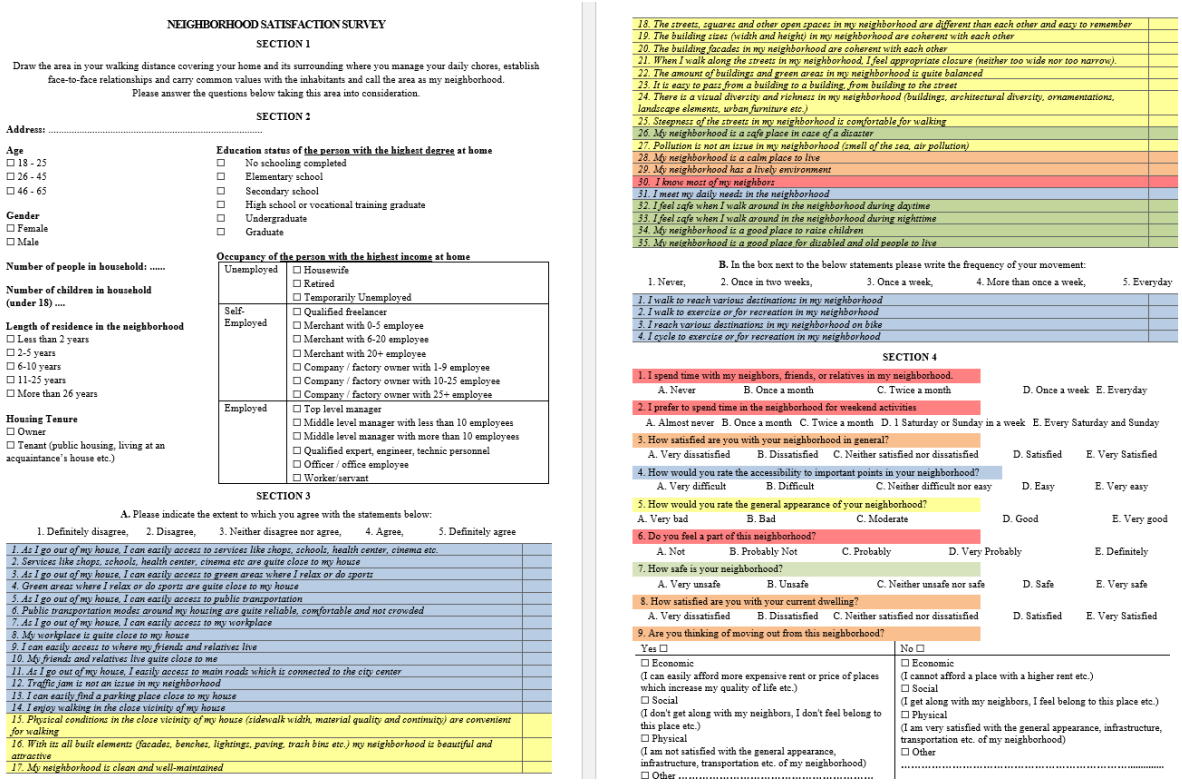
before and during the pandemic. This neighborhood is known as Bostanlı neighborhood and located nearby the old city center of Karşıyaka. The area was formed by a regular-grid street network which was planned in the mid-20th century. Although four to five story detached residential apartment buildings are dominant in the area, some streets involve mixed uses of residential and commercial. Various transportation modes are available in the area indicating high accessibility. Moreover, the area is rich in terms of recreational areas as it is close to waterfront pedestrian path. In February 2020; just before the outbreak of the Covid-19 pandemic; 27 neighborhood satisfaction surveys were completed in the area. After the first wave of the pandemic in August 2020, 38 surveys were conducted in the same area. Two conditions were defined to specify the households with whom the surveys will be held on the selected streets: (1) selecting no more than two households in the same building and (2) selecting no more than five buildings on the same street segment. In addition, when selecting the participants with whom the surveys will be held in the household the gender, age, and social economic status distribution were aimed to be balanced in each condition (before and during the Covid-19 pandemic).

Figure 3. Study Area

From a methodological perspective, most of the neighborhood satisfaction studies relied on subjective measurements such as surveys (Coulombe et al., 2016; Hur & Nasar, 2014; Rioux & Werner, 2011; Gärling & Gärling, 1990; Hur & Morrow-Jones, 2008). Similarly, in this study neighborhood satisfaction was measured via a survey. A comprehensive neighborhood satisfaction survey was designed based on the literature. The survey has four sections. The "first" section aims to understand how the participants perceive and define their neighborhood boundaries. The participants were shown the landmarks, major streets and transportation nodes on a map and asked to draw the border for

> "*The area in your walking distance covering your home and its surrounding where you manage your daily chores, establish face-to-face relationships and carry common values with the inhabitants and call the area as my neighborhood.*"

In other words, based on the literature, a specific definition of neighborhood was developed, and all participants were given the same definition to eliminate the participants' confusion about what the concept of neighborhood means. The "second" section collects data on participants' personal and social characteristics. The "third" section has two parts. First part asks participants to rate their agreement for 35 statements via a 5-point likert-scale. These statements aim to measure neighborhood satisfaction in five dimensions; (1) general satisfaction with the neighborhood, and satisfaction with issues related to (2) location/accessibility, (3) physical environmental quality, (4) social relations, (5) safety. Second part involves four statements to reveal participants' activities in and around the neighborhood. The "fourth" section involves multiple choice questions to understand participants' general evaluations on aforementioned dimensions and willingness to move, also contains questions on overall satisfaction of the neighborhood and the dwelling (Figure 4).



NEIGHBORHOOD SATISFACTION SURVEY

SECTION 1

Draw the area in your walking distance covering your home and its surrounding where you manage your daily chores, establish face-to-face relationships and carry common values with the inhabitants and call the area as my neighborhood.
Please answer the questions below taking this area into consideration.

SECTION 2

Address: .....

Age
☐ 18 - 25
☐ 26 - 45
☐ 46 - 65

Gender
☐ Female
☐ Male

Number of people in household: .....

Number of children in household (under 18) ....

Length of residence in the neighborhood
☐ Less than 2 years
☐ 2-5 years
☐ 6-10 years
☐ 11-25 years
☐ More than 26 years

Housing Tenure
☐ Owner
☐ Tenant (public housing, living at an acquaintance's house etc.)

Education status of the person with the highest degree at home
☐ No schooling completed
☐ Elementary school
☐ Secondary school
☐ High school or vocational training graduate
☐ Undergraduate
☐ Graduate

Occupancy of the person with the highest income at home

Unemployed	☐ Housewife ☐ Retired ☐ Temporarily Unemployed
Self-Employed	☐ Qualified freelancer ☐ Merchant with 0-5 employee ☐ Merchant with 6-20 employee ☐ Merchant with 20+ employee ☐ Company / factory owner with 1-9 employee ☐ Company / factory owner with 10-25 employee ☐ Company / factory owner with 25+ employee
Employed	☐ Top level manager ☐ Middle level manager with less than 10 employees ☐ Middle level manager with more than 10 employees ☐ Qualified expert, engineer, technic personnel ☐ Officer / office employee ☐ Worker/servant

SECTION 3

A. Please indicate the extent to which you agree with the statements below:

1. Definitely disagree, 2. Disagree, 3. Neither disagree nor agree, 4. Agree, 5. Definitely agree

1. As I go out of my house, I can easily access to services like shops, schools, health center, cinema etc.	
2. Services like shops, schools, health center, cinema etc are quite close to my house	
3. As I go out of my house, I can easily access to green areas where I relax or do sports	
4. Green areas where I relax or do sports are quite close to my house	
5. As I go out of my house, I can easily access to public transportation	
6. Public transportation modes around my housing are quite reliable, comfortable and not crowded	
7. As I go out of my house, I can easily access to my workplace	
8. My workplace is quite close to my house	
9. I can easily access to where my friends and relatives live	
10. My friends and relatives live quite close to me	
11. As I go out of my house, I easily access to main roads which is connected to the city center	
12. Traffic jam is not an issue in my neighborhood	
13. I can easily find a parking place close to my house	
14. I enjoy walking in the close vicinity of my house	
15. Physical conditions in the close vicinity of my house (sidewalk width, material quality and continuity) are convenient for walking	
16. With its all built elements (facades, benches, lightings, paving, trash bins etc.) my neighborhood is beautiful and attractive	
17. My neighborhood is clean and well-maintained	
18. The streets, squares and other open spaces in my neighborhood are different than each other and easy to remember	
19. The building sizes (width and height) in my neighborhood are coherent with each other	
20. The building facades in my neighborhood are coherent with each other	
21. When I walk along the streets in my neighborhood, I feel appropriate closure (neither too wide nor too narrow).	
22. The amount of buildings and green areas in my neighborhood is quite balanced	
23. It is easy to pass from a building to a building, from building to the street	
24. There is a visual diversity and richness in my neighborhood (buildings, architectural diversity, ornamentations, landscape elements, urban furniture etc.)	
25. Steepness of the streets in my neighborhood is comfortable for walking	
26. My neighborhood is a safe place in case of a disaster	
27. Pollution is not an issue in my neighborhood (smell of the sea, air pollution)	
28. My neighborhood is a calm place to live	
29. My neighborhood has a lively environment	
30. I know most of my neighbors	
31. I meet my daily needs in the neighborhood	
32. I feel safe when I walk around in the neighborhood during daytime	
33. I feel safe when I walk around in the neighborhood during nighttime	
34. My neighborhood is a good place to raise children	
35. My neighborhood is a good place for disabled and old people to live	

B. In the box next to the below statements please write the frequency of your movement:

1. Never, 2. Once in two weeks, 3. Once a week, 4. More than once a week, 5. Everyday

1. I walk to reach various destinations in my neighborhood	
2. I walk to exercise or for recreation in my neighborhood	
3. I reach various destinations in my neighborhood on bike	
4. I cycle to exercise or for recreation in my neighborhood	

SECTION 4

1. I spend time with my neighbors, friends, or relatives in my neighborhood.
A. Never B. Once a month C. Twice a month D. Once a week E. Everyday

2. I prefer to spend time in the neighborhood for weekend activities
A. Almost never B. Once a month C. Twice a month D. 1 Saturday or Sunday in a week E. Every Saturday and Sunday

3. How satisfied are you with your neighborhood in general?
A. Very dissatisfied B. Dissatisfied C. Neither satisfied nor dissatisfied D. Satisfied E. Very Satisfied

4. How would you rate the accessibility to important points in your neighborhood?
A. Very difficult B. Difficult C. Neither difficult nor easy D. Easy E. Very easy

5. How would you rate the general appearance of your neighborhood?
A. Very bad B. Bad C. Moderate D. Good E. Very good

6. Do you feel a part of this neighborhood?
A. Not B. Probably Not C. Probably D. Very Probably E. Definitely

7. How safe is your neighborhood?
A. Very unsafe B. Unsafe C. Neither unsafe nor safe D. Safe E. Very safe

8. How satisfied are you with your current dwelling?
A. Very dissatisfied B. Dissatisfied C. Neither satisfied nor dissatisfied D. Satisfied E. Very Satisfied

9. Are you thinking of moving out from this neighborhood?

Yes ☐	No ☐
☐ Economic (I can easily afford more expensive rent or price of places which increase my quality of life etc.) ☐ Social (I don't get along with my neighbors, I don't feel belong to this place etc.) ☐ Physical (I am not satisfied with the general appearance, infrastructure, transportation etc. of my neighborhood) ☐ Other	☐ Economic (I cannot afford a place with a higher rent etc.) ☐ Social (I get along with my neighbors, I feel belong to this place etc.) ☐ Physical (I am very satisfied with the general appearance, infrastructure, transportation etc. of my neighborhood) ☐ Other .....

(Blue lines: parameters related to accessibility, Yellow lines: parameters related to physical environmental quality, Red lines: parameters related to social relations, Green lines: parameters related to safety, Orange lines: parameters related to general satisfaction.)

Figure 4. Neighborhood Satisfaction Survey Form

In brief, the survey involves parameters to evaluate location and accessibility (20 questions in blue), physical environmental quality (13 parameters in yellow), social relations (4 parameters in red); safety (6 parameters in green); and satisfaction in general (5 parameters in orange) (Figure 4). All these parameters were derived from the previous studies (Araldi & Fusco, 2019; Cetintahra & Cubukcu, 2015; Cubukcu, Hepguzel, Onder & Tumer, 2015; Dassopoulos & Monnat, 2011; Hur et al., 2010; Hur & Morrow-Jones, 2008; Hur & Nasar, 2014; Lee et al., 2017; Najafi & Kamal, 2012; Nasar, 1983; Rioux & Werner, 2011; Semken and Piburn, 2004; Stamps III, 2011; Vaske & Kobrin, 2001; Williams & Roggenbuck, 1989).

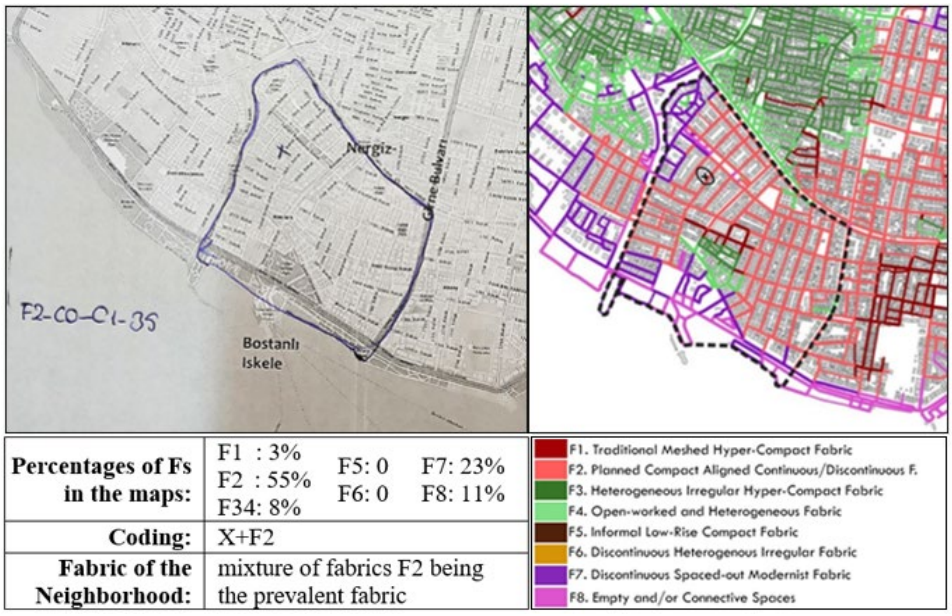
The participants' neighborhood boundary maps were evaluated in two steps. First the participants' maps were digitalized in QGis 3.16.3 and total areas drawn by each participant were calculated in ArcMap 3.16 to analyze whether neighborhood boundaries extend or shrink during the Covid-19 pandemic.

Second, the morphological classes in each participant's map were examined via Arcmap 3.16. The urban morphology data was overlayed with the participant's neighborhood boundary map to calculate

the ratio of different morphological classes in each map. Based on that calculation, each map was assigned to the morphological characteristics via the following coding:

- When one urban fabric constituted more than 66% of the total area, then, the neighborhood was coded as that urban fabric.
- When two fabrics covered between 33% and 66% of the total area, then, the neighborhood was coded as these two urban fabrics.
- When only one fabric covered more than 33% of the total area and all other urban fabrics were represented with less than %33 of the total area, then, the neighborhood was coded as mixture of fabrics with one prevalent fabric.
- When all urban fabrics covered less than 33% of the total area, the neighborhood was coded as mixed fabrics.

In brief, although all participants live in the same urban fabric (F2), they may consider other urban fabrics within their neighborhood and represent that thought in their drawings. Figure 5 shows an example of one participant's neighborhood boundary map. The neighborhood boundary the participant drew involves five different urban fabrics; F1, F2, F3-4, F7 and F8. Considering the ratios covered by each urban fabric, the neighborhood map was assigned to "mixture of fabrics F2 being the prevalent fabric" morphological class.



Percentages of Fs in the maps:	F1 : 3% F2 : 55% F34: 8% F5: 0 F6: 0 F7: 23% F8: 11%
Coding:	X+F2
Fabric of the Neighborhood:	mixture of fabrics F2 being the prevalent fabric

Figure 5. Drawing and Interpreting Neighborhood Maps

RESULTS:

The results showed that the perceived neighborhood boundaries extended during the Covid-19 pandemic (higher mean values for "during" condition compared to "before" condition in Table 2). Although, this difference did not achieve a statistical significance ($p>0.05$), higher variation between minimum and maximum values during the pandemic (in comparison to "before" condition) may provide empirical evidence on participants' confusion on determining the neighborhood boundaries. Higher variation in perceived neighborhood area during the pandemic may indicate that for some residents the neighborhood boundaries shrank, whereas for the majority of citizens this area extended after the lockdown as they began to spend most of their time around their house and travel less to work or to other areas (

Table **2**). Perhaps, they discovered places they had never been to before in the immediate vicinity of their residences during the pandemic. As supporting evidence to this argument, during the pandemic, the overlayed maps extended more towards north and east (Figure 6).

Table 2. Area of the Participants' Neighborhood Boundary Maps

	N	Min	Max	Mean	Std. Deviation
Before	27	618.42m^2	1887.73m^2	1023.66m^2	344.45
During	38	505.46m^2	2358.95m^2	1196.42m^2	449.65
Total	65	505.46m^2	2358.95m^2	1124.66m^2	415.25
T-Test			t(63)= -1.674; p=0.099		

Maps before the Pandemic **Maps during the Pandemic**

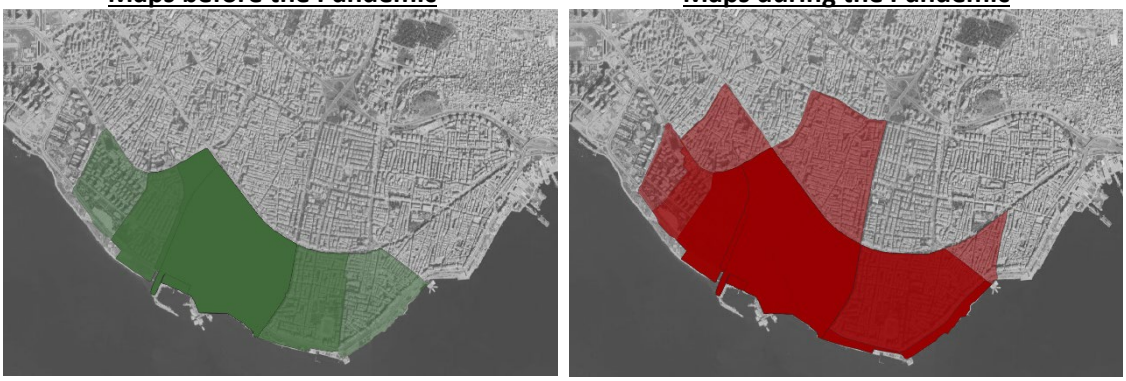


Figure 6. Overlayed Neighborhood Maps of the Participants

Next, the content of neighborhood areas before and during the Covid-19 pandemic were compared. Results showed that the "mixture of urban fabrics where F2 is the prevalent urban fabric" was the dominant urban morphological class in participants' drawings. However, in comparison to the condition before the pandemic, during the pandemic, the percentage of participants who added "Discontinuous Spaced-out Modernist Fabric" (F7 in Figure 2) into their neighborhood boundary increased from 4% to 16% (Table 3). The fabric F7 is a modernist fabric and contains high-rise buildings in large plots. Large open spaces, low coverage ratio and less commercial area are the main characteristics of this urban fabric. The extension of neighborhood boundaries of the participants towards F7 is reasonable considering the fact that F7 is an urban fabric that meets the isolation and separation requirements of the pandemic.

Table 3. Morphological Classes of the Participants' Maps Before and During the Pandemic

Coding Based on Urban Fabrics	Before the Pandemic(n=27)	During the Pandemic(n=38)
Mixture of F2 and F7	1 (3.7%)	6 (15.79%)
Mixture of fabrics F2 being the prevalent fabric	26 (96.3%)	32 (84.21%)

After the investigation of perceived neighborhood boundaries, residents' evaluations of neighborhood satisfaction were compared before and during the Covid-19 pandemic based on the survey data. When the demographic characteristics of the participants in two conditions (participants who took the survey before or during the pandemic) were compared; results showed that gender and housing tenure distribution were statistically similar in both conditions (Table 4). Gender distribution was balanced, and the number of house-owners were more than the tenants in both conditions. As the remaining parameters (age, household size, number of children, length of residence and SES) involve more than two levels, inferential statistical analyses were not applicable considering the small sample size. Yet, it is obvious that the participants' age, number of children and SES were similar before and during the pandemic. Majority had no child and were from middle or high SES groups who were older than 25 years. On the other hand, household size and length of residence differed slightly between the two conditions. Before the pandemic, single person households were not represented in the sample. However, during the pandemic, percentage of single person households increased from 0% to 21%.

Similarly, before the pandemic, majority of the participants revealed that they lived more than 10 years in the neighborhood (about 85%), whereas during the pandemic only about half of that (42%) revealed that they lived more than 10 years in the neighborhood.

Table 4. Participants' Characteristics

Characteristics of Participants	Before the Pandemic(n=27)	During the Pandemic(n=38)*	Chi-Square Test
Gender			
(1) Female	15 (55.6%)	20 (52.6%)	X^2 (1, N = 65) = 0.54, p= 0.816
(2) Male	12 (44.4%)	18 (47.4%)	
Age			
(1) 18-25	5 (18.5%)	1 (2.6%)	
(2) 26-45	9 (33.3%)	17 (44.7%)	N/A
(3) 46-65	13 (48.1%)	20 (52.6%)	
Number of people in household			
(1) 1 person	0	8 (21.1%)	
(2) 2 people	5 (18.5%)	12 (31.6%)	N/A
(3) more than 2 people	22 (81.5%)	18 (47.4%)	
Number of children in household (under 18)			
0 (no child)	21 (77.8%)	29 (76.3%)	
1 (1 child)	4 (14.8%)	5 (13.2%)	N/A
2 (more than 1 child)	2 (7.4%)	4 (10.5%)	
Length of Residence of the Participants			
(1) Less than 2 years	0	7 (18.4%)	
(2) 2-5 years	1 (3.7%)	6 (15.8%)	
(3) 6-10 years	3 (11.1%)	9 (23.7%)	N/A
(4) 11-25 years	14 (51.9%)	8 (21.1%)	
(5) More than 26 years	9 (33.3%)	8 (21.1%)	
Housing Tenure			
1 (Owner)	19 (70.4%)	21 (55.3%)	X^2 (1, N = 65) = 1.522, p= 0.217
2 (Tenant)	8 (29.6%)	17 (44.7%)	
Socio-Economic Status (SES) (derived from data on education and occupation)			
(1) Low	0	2 (5.3%)	
(2) Middle	22 (81.5%)	23 (60.5%)	N/A
(3) High	5 (18.5%)	13 (34.2%)	

Considering the difference in household size and length of residence in two groups, it was necessary to investigate whether neighborhood satisfaction differs by these two parameters. Among 48 measures of neighborhood satisfaction, for five parameters (two on accessibility, one on social relations, and one on general satisfaction) participants living with others tended to be more positive as compared to those living alone. Similarly, for seven parameters, evaluations differed between participants living less or more than 10 years in the neighborhood. For two parameters (on accessibility), participants living less than 10 years in the neighborhood gave higher scores. For other five parameters (two on accessibility, two on social relations, and one on safety), participants living less than 10 years in the neighborhood gave lower scores. In other words, the influence of demographic characteristics on neighborhood satisfaction is ambiguous and thus deserves consideration in comparisons of neighborhood satisfaction before and during pandemic situations.

When neighborhood satisfaction evaluations before and during the Covid-19 pandemic were compared; it is seen that for 9 of the 48 measures, the mean evaluations differed between the two conditions. For the general evaluations, mean values of four parameters were similar in both conditions (Table 5). Both group of participants (who took the survey before and during the pandemic) revealed that they were satisfied with their neighborhood and dwelling in general, and they believed that their neighborhood was calm and lively.

Table 5. Neighborhood Satisfaction in General Before and During the Pandemic

Satisfaction in General	t-Test	Before		During	
		Mean	Std.D.	Mean	Std.D.
How satisfied are you with your neighborhood in general	t(63)=-1.657; p=0.103	4.26	0.447	4.47	0.557
How satisfied are you with your current dwelling	t(63)=-0.146; p=0.885	4.30	0.465	4.32	0.574
My neighborhood is a calm place to live	t(63)=0.282; p=0.779	4.22	0.698	4.16	1.027
My neighborhood has a lively environment	t(63)=-1.635; p=0.107	3.78	0.847	4.16	0.973

Concerning accessibility, in both conditions, participants revealed satisfaction for 14 of the 16 parameters. However, they criticized their neighborhood for traffic congestion and lack of parking space. For 3 of the 16 parameters of accessibility, participants' evaluations differed before and during the pandemic. Quality of the public transportation, walkability in the close vicinity of the house, meeting the daily needs in the neighborhood were evaluated significantly better during the pandemic (Table 6).

Table 6. Satisfaction with Accessibility Before and During the Pandemic

Accessibility	t-Test	Before		During	
		Mean	Std.D.	Mean	Std.D.
How would you rate the accessibility to important points in your neighborhood	t(63)=0.482; p=0.632	4.22	0.424	4.16	0.594
As I go out of my house, I can easily access to services like shops, schools, health center, cinema etc.	t(63)=-1.188; p=0.239	4.48	0.580	4.68	0.739
Services like shops, schools, health center, cinema etc. are quite close to my house	t(63)=-1.831; p=0.072	4.41	0.636	4.68	0.574
As I go out of my house, I can easily access to green areas where I relax or do sports	t(63)=0.43; p=0.668	4.59	0.501	4.50	1.033
Green areas where I relax or do sports are quite close to my house	t(63)=-1.464; p=0.148	4.52	0.580	4.74	0.601
As I go out of my house, I can easily access to public transportation	t(63)=-0.162; p=0.872	4.52	0.580	4.55	0.978
Public transportation modes around my housing are quite reliable, comfortable, and not crowded	t(63)=-3.031; p=0.004	3.56	1.155	4.37	0.998
As I go out of my house, I can easily access to my workplace	t(34)=1.423; p=0.164	4.25	0.622	3.79	1.021
My workplace is quite close to my house	t(34)=1.463; p=0.153	4.00	0.953	3.38	1.313
I can easily access to where my friends and relatives live	t(63)=0.4; p=0.69	4.22	0.641	4.13	1.044
My friends and relatives live quite close to me	t(63)=0.514; p=0.609	3.93	0.829	3.79	1.189
As I go out of my house, I easily access to main roads which is connected to the city center	t(63)=1.96; p=0.054	4.70	0.465	4.39	0.718
Traffic jam is not an issue in my neighborhood	t(63)=-0.015; p=0.988	2.89	1.368	2.89	1.705
I can easily find a parking place close to my house	t(63)=-0.903; p=0.37	2.33	1.271	2.68	1.710
I enjoy walking in the close vicinity of my house	t(63)=-2.764; p=0.007	4.04	0.759	4.58	0.793
I meet my daily needs in the neighborhood	t(63)=-2.3; p=0.025	4.22	0.698	4.58	0.552

In the evaluations of physical environmental quality, participants revealed satisfaction for 12 of 13 parameters both before and during the pandemic. Only pollution was moderately rated. Participants' evaluations statistically differed for 3 of 13 parameters. During the pandemic, participants evaluated the beauty and the attractiveness of the neighborhood as well as the sense of closure more positively (Table 7).

Table 7. Satisfaction with Physical Environmental Quality Before and During the Pandemic

Physical Environmental Quality	t-Test	Before		During	
		Mean	Std.D.	Mean	Std.D.
How would you rate the general appearance of your neighborhood	t(63)=-0.404; p=0.688	4.07	0.474	4.13	0.623
Physical conditions in the close vicinity of my house are convenient for walking	t(63)=-0.11; p=0.912	4.19	0.681	4.21	1.044
With its all built elements my neighborhood is beautiful and attractive	t(63)=-3.746; p=0.000	3.85	0.770	4.55	0.724

My neighborhood is clean and well-maintained	t(63)=0.413; p=0.681	4.07	0.781	3.97	1.078
The streets, squares and other open spaces in my neighborhood are different than each other and easy to remember	t(63)=0.252; p=0.802	4.37	0.688	4.32	0.962
The building sizes (width and height) in my neighborhood are coherent with each other	t(63)=-2.187; p=0.032	3.93	0.730	4.37	0.852
The building facades in my neighborhood are coherent with each other	t(63)=-1.935; p=0.058	3.74	0.712	4.16	0.945
When I walk along the streets in my neighborhood, I feel appropriate closure (neither too wide nor too narrow).	t(63)=-4.12; p=0.000	3.26	0.944	4.32	1.068
The amount of built and green areas in my neighborhood is quite balanced	t(63)=0.555; p=0.581	4.07	0.73	3.95	1.012
It is easy to pass from a building to a building, from building to the street	t(63)=0.863; p=0.391	4.33	0.62	4.16	0.916
There is a visual diversity and richness in my neighborhood	t(63)=-1.166; p=0.248	3.85	0.77	4.11	0.924
Steepness of the streets in my neighborhood is comfortable for walking	t(63)=0.039; p=0.969	4.48	0.7	4.47	0.862
Pollution is not an issue in my neighborhood	t(63)=-1.077; p=0.286	3.15	0.718	3.47	1.447

In the evaluations of safety, participants revealed high satisfaction for all measures but “safety in case of disasters” in both conditions. “Safety in case of disasters” was rated moderately both before and during the pandemic. Among six parameters of safety, participants’ evaluations statistically differed only for “being a good place for disabled and old people.” Participants revealed less satisfaction with the qualifications of the neighborhood for disabled and old people during the pandemic (Table 8).

Table 8. Satisfaction with Safety Before and During the Pandemic

Safety	t-Test	Before		During	
		Mean	Std.D.	Mean	Std.D.
How safe is your neighborhood	t(63)=0.596; p=0.553	4.22	0.424	4.13	0.704
My neighborhood is a safe place in case of a disaster	t(63)=0.005; p=0.996	3.37	1.115	3.37	1.618
I feel safe when I walk around in the neighborhood during daytime	t(63)=-0.755; p=0.453	4.56	0.577	4.68	0.739
I feel safe when I walk around in the neighborhood during nighttime	t(63)=-0.744; p=0.46	4.41	0.636	4.55	0.86
My neighborhood is a good place to raise children	t(63)=-0.082; p=0.935	4.41	0.636	4.42	0.683
My neighborhood is a good place for disabled and old people to live	t(63)=2.223; p=0.03	4.52	0.58	3.89	1.371

In the evaluations of social relations, participants’ responses varied. On the one hand, feeling a part of the neighborhood and knowing the neighbors received high or moderately high scores. On the other hand, spending time with people in the neighborhood and preferring to spend time in the neighborhood for weekend activities received moderately low scores. Among four parameters of social relations, only one of them differed significantly between two conditions. The participants who evaluated their neighborhood during the pandemic revealed that they tended to know their neighbors statistically more compared to the those who participated in the survey before the pandemic (Table 9).

Table 9. Satisfaction with Social Relations Before and During the Pandemic

Social Relations	t-Test	Mean	Std.D.	Mean	Std.D.
Do you feel a part of this neighborhood	t(63)=0.572; p=0.57	4.22	0.506	4.13	0.704
I know most of my neighbors	t(63)=-2.215; p=0.03	3.59	0.747	4.13	1.095
I spend time with my neighbors, friends or relatives in my neighborhood	t(63)=0.993; p=0.325	2.89	1.649	2.55	1.083
I prefer to spend time in the neighborhood for weekend activities	t(63)=-0.461; p=0.646	2.85	1.433	3.03	1.551

In brief, these results suggest that people tend to evaluate their neighborhood differently before and during the pandemic. Moreover, when the activities in the neighborhood was compared between the two conditions, participants revealed satisfaction for two of the four parameters. They criticized their neighborhood for being unsuitable for biking to reach destinations or to exercise in both conditions.

Despite these low ratings, participants' evaluations significantly differ for the appropriateness of their neighborhood for reaching destinations on bike. They rated bikeability in the neighborhood as better during the pandemic in comparison to that before the pandemic (Table 10).

Table 10. Activities Involved Before and During the Pandemic

Accessibility	t-Test	Before		During	
		Mean	Std.D.	Mean	Std.D.
I walk to reach various destinations in my neighborhood	t(63)=1.196; p=0.236	4.74	0.447	4.55	0.724
I walk to exercise or for recreation in my neighborhood	t(63)=-0.534; p=0.595	4.33	0.832	4.45	0.860
I reach various destinations in my neighborhood on bike	t(63)=-2.492; p=0.015	1.19	0.681	1.84	1.242
I cycle to exercise or for recreation in my neighborhood	t(63)=-1.228; p=0.224	1.48	1.087	1.84	1.220

Finally, when residents were asked about their willingness to move out of the neighborhood; 5 of the 65 participants showed a tendency to leave their neighborhood. The participants who were willing to move were all males, generally in the oldest age group having no child (younger than 18) and living in the neighborhood for six to ten years (the number of household and SES group were varied among these 5 participants). Although this ratio may seem negligible, it is important to highlight that all these participants who were willing to move out were the ones who were interviewed during the pandemic. In other words, among 38 residents who participated in the study during the pandemic, five of them revealed a tendency to move out. From zero percent to fifteen percent change in people's tendency to move out may point to the influence of pandemic on potential increase of urban mobility. This finding may also seem conflicting with the results above: participants tended to give higher scores to various measures of neighborhood, yet they were more willing to change their neighborhood. Perhaps these findings are not conflicting, they are simply reflecting the confusion and obscurity created by the Covid-19 pandemic. In addition, among these five participants, only one of them pointed to social issues as reason to move out, the remaining four pointed to physical environmental conditions as reasons to move out (**Hata! Başvuru kaynağı bulunamadı.**). This finding also indicates that people's evaluations of physical environment differed during the Covid-19 pandemic.

Table 11. Number of Participants Willing or Not to Move Out and the Reasons for the Answer

Are you thinking of moving out from this neighborhood?	Before	During	Tot
Yes	0	5	5
No	27	33	60
Reasons for moving out	**Before**	**During**	**Tot**
Economic	0	0	0
Social	0	1	1
Physical	0	4	4

The results showed that the pandemic changed residents' evaluations of neighborhood and when they have a chance some residents are willing to move to a different neighborhood with the hope of a better life. Yet the finding on the differences of neighborhood satisfaction and willingness to move out should be considered in relation to demographic characteristics. For nine parameters, the scores differed before and during the pandemic. Among those nine parameters, five of them (meeting daily needs, knowing the neighbors, quality of public transportation, reaching various destinations on bike, and qualifications of the neighborhood for disabled) also differed between different household sizes and length of residences. Moreover, four of the five participants who were willing to move out were the ones who were living in the neighborhood less than 10 years. Considering the fact that the ratio of participants with different household sizes and length of residences differed in two conditions (before and during the pandemic), the difference in evaluations of neighborhood satisfaction may stem from the difference of participants' demographic characteristics rather than the influence of the pandemic.

In order to see if the results differ when the length of residence and the number of the people in the household were similar in both conditions (before and during the pandemic), the analyses were repeated after eliminating the participants living in the area less than two years and single person households from the sample. For this reduced sample size, the number of parameters which were

significantly different before and during pandemic conditions reduced from nine to five (Table 12). For five parameters (convenience of the public transportation, beauty and attractiveness of the neighborhood, coherence of building facades, appropriate closure of the streets and knowing most of the neighbors) results still showed a significant increase in satisfaction "during the pandemic condition" as compared to the "before pandemic" situation.

Table 12. Neighborhood Satisfaction Evaluation of the Selected Sample

Satisfaction in General	t-Test	Before (N=27)		During (N=24)	
		Mean	Mean	Std.D.	Std.D.
How satisfied are you with your neighborhood in general	t(49)=-0.807;p=0.424	4.26	0.447	4.38	0.576
How satisfied are you with your current dwelling	t(49)=0.03;p=0.976	4.3	0.465	4.29	0.624
My neighborhood is a calm place to live	t(49)=-0.318;p=0.752	4.22	0.698	4.29	0.859
My neighborhood has a lively environment	t(49)=-1.497;p=0.141	3.78	0.847	4.17	1.007
Accessibility					
How would you rate the accessibility to important points in your neighborhood	t(49)=0.665;p=0.509	4.22	0.424	4.12	0.612
As I go out of my house, I can easily access to services like shops, schools, health center, cinema etc.	t(49)=-0.905;p=0.37	4.48	0.58	4.67	0.868
Services like shops, schools, health center, cinema etc. are quite close to my house	t(49)=-1.96;p=0.056	4.41	0.636	4.75	0.608
As I go out of my house, I can easily access to green areas where I relax or do sports	t(49)=0.216;p=0.83	4.59	0.501	4.54	1.103
Green areas where I relax or do sports are quite close to my house	t(49)=-1.668;p=0.102	4.52	0.58	4.79	0.588
As I go out of my house, I can easily access to public transportation	t(49)=-0.101;p=0.92	4.52	0.58	4.54	1.021
Public transportation modes around my housing are quite reliable, comfortable, and not crowded	t(49)=-3.187;p=0.003	3.56	1.155	4.5	0.933
As I go out of my house, I can easily access to my workplace	t(24)=1.513;p=0.143	4.25	0.622	3.79	0.893
My workplace is quite close to my house	t(24)=1.146;p=0.263	4	0.953	3.5	1.225
I can easily access to where my friends and relatives live	t(49)=0.545;p=0.589	4.22	0.641	4.08	1.139
My friends and relatives live quite close to me	t(49)=0.169;p=0.866	3.93	0.829	3.88	1.296
As I go out of my house, I easily access to main roads which is connected to the city center	t(49)=1.46;p=0.151	4.7	0.465	4.46	0.721
Traffic jam is not an issue in my neighborhood	t(49)=-0.065;p=0.949	2.89	1.368	2.92	1.692
I can easily find a parking place close to my house	t(49)=-1.252;p=0.217	2.33	1.271	2.88	1.801
I enjoy walking in the close vicinity of my house	t(49)=-1.779;p=0.081	4.04	0.759	4.46	0.932
I meet my daily needs in the neighborhood	t(49)=-1.755;p=0.085	4.22	0.698	4.54	0.588
Physical Environmental Quality					
How would you rate the general appearance of your neighborhood	t(49)=-0.313;p=0.756	4.07	0.474	4.12	0.68
Physical conditions in the close vicinity of my house are convenient for walking	t(49)=-0.841;p=0.404	4.19	0.681	4.38	0.924
With its all built elements my neighborhood is beautiful and attractive	t(49)=-3.073;p=0.003	3.85	0.77	4.54	0.833
My neighborhood is clean and well-maintained	t(49)=0.729;p=0.47	4.07	0.781	3.88	1.154
The streets, squares and other open spaces in my neighborhood are different than each other and easy to remember	t(49)=0.482;p=0.632	4.37	0.688	4.25	1.073
The building sizes (width and height) in my neighborhood are coherent with each other	t(49)=-1.714;p=0.093	3.93	0.73	4.33	0.963
The building facades in my neighborhood are coherent with each other	t(49)=-2.027;p=0.048	3.74	0.712	4.21	0.932
When I walk along the streets in my neighborhood, I feel appropriate closure (neither too wide nor too narrow).	t(49)=-3.848;p=0	3.26	0.944	4.33	1.049
The amount of built and green areas in my neighborhood is quite balanced	t(49)=-0.039;p=0.969	4.07	0.73	4.08	0.974
It is easy to pass from a building to a building, from building to the street	t(49)=1.007;p=0.319	4.33	0.62	4.12	0.85

There is a visual diversity and richness in my neighborhood	t(49)=-1.759;p=0.085	3.85	0.77	4.25	0.847
Steepness of the streets in my neighborhood is comfortable for walking	t(49)=0.793;p=0.432	4.48	0.7	4.29	0.999
Pollution is not an issue in my neighborhood	t(49)=0.59;p=0.558	3.15	0.718	2.96	1.488
Safety					
How safe is your neighborhood	t(49)=0.091;p=0.928	4.22	0.424	4.21	0.658
My neighborhood is a safe place in case of a disaster	t(49)=-0.56;p=0.578	3.37	1.115	3.58	1.586
I feel safe when I walk around in the neighborhood during daytime	t(49)=-0.338;p=0.737	4.56	0.577	4.62	0.875
I feel safe when I walk around in the neighborhood during nighttime	t(49)=-0.989;p=0.328	4.41	0.636	4.62	0.924
My neighborhood is a good place to raise children	t(49)=-0.74;p=0.463	4.41	0.636	4.54	0.658
My neighborhood is a good place for disabled and old people to live	t(49)=1.527;p=0.133	4.52	0.58	4.12	1.191
Social Relations					
Do you feel a part of this neighborhood	t(49)=0.085;p=0.933	4.22	0.506	4.21	0.658
I know most of my neighbors	t(49)=-2.617;p=0.012	3.59	0.747	4.21	0.932
I spend time with my neighbors, friends or relatives in my neighborhood	t(49)=0.881;p=0.382	2.89	1.649	2.54	1.062
I prefer to spend time in the neighborhood for weekend activities	t(49)=-0.251;p=0.803	2.85	1.433	2.96	1.601
Accessibility - Activity					
I walk to reach various destinations in my neighborhood	t(49)=0.666;p=0.509	4.74	0.447	4.62	0.77
I walk to exercise or for recreation in my neighborhood	t(49)=-0.675;p=0.503	4.33	0.832	4.5	0.933
I reach various destinations in my neighborhood on bike	t(49)=-1.442;p=0.156	1.19	0.681	1.54	1.062
I cycle to exercise or for recreation in my neighborhood	t(49)=-0.199;p=0.843	1.48	1.087	1.54	1.062

In brief, more research is on call before generalizing the results. Yet, this finding may also indicate that the influence of the pandemic on neighborhood satisfaction was pronounced more for people who are living alone and who just moved to the neighborhood.

CONCLUSION:

This study aimed to compare neighborhood perception and satisfaction before and during the Covid-19 pandemic. In terms of perception, the variation and mean value of perceived neighborhood borders have increased during the pandemic. The participants of the survey during the pandemic tended to include the modern urban fabrics characterized by large open spaces to their neighborhood boundaries. During the pandemic, people tend to walk around more in open areas and less in crowded places and covered areas such as shopping malls. The change in walking routes and distances around houses may have caused a change in the perception of the neighborhood area. In other words, inclusion of this urban fabric within the neighborhood boundaries is expected because this urban fabric is dominated by open areas and is in walking distance to participants' houses. Participants tend to include these areas in their neighborhood maps during the pandemic as they spend more time in these isolated areas near their residences and discover these new areas during the pandemic.

The results also showed that evaluations for 9 of 48 neighborhood satisfaction parameters significantly changed after the first wave of the pandemic. Although the influence of participants' characteristics can be seen in five of nine parameters and this diminishes the influence of the pandemic on neighborhood satisfaction; according to the unbiased results, there is a significant change in perception of physical environment quality in a positive way. Yang & Xiang (2021) found similar results on perception of aesthetics in neighborhoods with high SES residents. He relates this outcome to less traffic, crime, and violence in the new conditions. This study used a different methodology from Yang & Xiang (2021) by investigating satisfaction based on two different dataset (one is before and the other is during the pandemic) and provide empirical evidence for Yang & Xiang's (2021) claim on the positive change in perceived physical environment characteristics in middle-high SES group neighborhoods. Yet, there is no evidence to support the argument relating to less traffic and crime as reasons of positive evaluation. Those arguments still remain speculative. Future studies may investigate why high

SES groups tend to evaluate their neighborhood as better during the pandemic. As the study area has a better physical environment quality (involve more open areas, is close to waterfront pedestrian path etc.) compared to most of the neighborhoods in Izmir, the tendency to have more positive perception on physical environment quality during the pandemic seems reasonable. However, this study should be repeated in various SES and morphological areas before generalizing this argument.

Although residents tended to evaluate their neighborhood as better during the pandemic (in comparison to before pandemic), they nonetheless revealed willingness to move out from the neighborhood. This conflicting finding must be handled cautiously as it may point to the confusion and obscurity of the pandemic on the residents of the neighborhood. More research is on call to study the longitudinal effects. Moreover, since this finding indirectly indicates that urban mobility will increase, subsequent studies should question the effect of the Covid-19 pandemic on urban mobility using a different methodology. This question should be evaluated as a new perspective and a new research question generated by this study.

Neighborhoods became the most important components of the cities in the Covid-19 pandemic. This study is significant because it investigates people's perception on these areas as also suggested by Salama (2020). The strength of this study is to have a dataset from pre-Covid-19 and post-first-wave periods instead of a retroactive dataset. Majority of studies dealing with the influence of the Covid-19 pandemic on people's behavior and perception of environment relies on the data during the pandemic and fail to make comparisons between pre- and post-pandemic-outbreak periods. The main weakness of the research relates to small sample size. This small sample size limits comprehensive inferences and generalizations. More generalizable arguments can be developed with the increase of such empirical studies in different cities and cultures. This study is important in introducing a valid methodology for such empirical studies. In order to develop this study via future studies, the survey can be conducted in all fabrics of Karşıyaka like it has been conveyed before the pandemic (with 322 surveys) and the comparison can be done accordingly. Also, the same study can be repeated to see the change in three different periods pre-Covid-19, post-first-wave and present. In addition, overall life satisfaction of the participants can be added to the survey questions to achieve more accurate results.

This study contributes to urban design and environmental psychology literature by bringing comprehensive urban morphology analysis and neighborhood satisfaction measurements together. Also, it paves the way to monitor residents' satisfaction and with their environment before, during and after the pandemic in the future studies. Practitioners and academicians focusing on real-estate development may also benefit from this study as it provides hints about how residents' priorities changed after the Covid-19 pandemic. Moreover, findings on urban mobility tendency change during the pandemic may also be used by real-estate agencies, as the balance between supply and demand determines real-estate prices and this study showed that although the supply remained the same the demand changed during the Covid-19 pandemic. A better extension of this study should investigate which neighborhood characteristics are demanded more in the post-Covid-19 period based on actual urban mobility data. Moreover, this study can serve as an example to repeat previous research in new conditions to observe the change in preferences and behavior of the residents in the post-Covid-19 period.

Compliance with Ethical Standard

Conflict of Interests: The authors declare that for this article they have no actual, potential or perceived conflict of interests.

Ethics Committee Approval: This study was supported in 2018 within the scope of Dokuz Eylül University Scientific Research Project (BAP) which can be used as the Ethics Committee Approval requirement. The survey used in this study was accepted after being examined by BAP. Also, the surveys were conducted only to volunteers via a professional survey research firm as the funding for surveys were accepted by DEU BAP. The professional research firm works within the scope of the

Personal Data Protection Authority (Kişisel Verileri Koruma Kurumu-KVKK) and the surveys were conducted without obtaining the personal information of the participants. In brief;

Three files that can be counted as a substitute for the ethics committee document are attached as supplementary files. 1) BAP application form, 2) The document showing the start and end dates of the BAP project, 3) The contract issued by Dokuz Eylül University Scientific Research Projects Administration regarding the supply of services related to the surveys. In this contract, the survey questions and the procedure to be followed in the conduct of the surveys were explained in detail and it was approved by Dokuz Eylul University Scientific Research Project Department on 10.12.2019.

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