

## Environmental Science and Sustainable Development

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# COVID impact on usage of public spaces in Brasilia, Brazil

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### Abstract

COVID 19 has proved to be a challenging time worldwide. For the last three years, academics have researched its impacts through different lenses and perspectives in many significant fields. In the urban academic realm, there has been a growing debate on the potential change in behavior towards public space usage during the pandemic. After compulsory confinement, public spaces became under the mainstream debate of the importance of public spaces for livelihood in times of crisis. Still, assessing its impacts on public space is still not widely done, neither quantitatively nor qualitatively. This research brings Brasilia as a study case to understand whether the pandemic has affected the usage of the iconic abundance of green spaces of the capital city on the first 18 months, before the introduction of vaccination. Brasilia as a garden-city, a concept brought by the modern urban design movement, has always faced criticism for its hygienist design and the ample provision of green spaces. The garden-city features was put to a test after COVID 19 through the analysis of five different types of public spaces using surveys and interviews with local residents of Plano Piloto (n=147). The results show that during the pandemic the usage of local neighborhood parks within walking distance has indeed increased. People tend to use these spaces for exercising but most importantly to socialize with friends and family.

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### Keywords

COVID-19; Public spaces; Brasilia; Pandemic.

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## 1. Introduction

After 2020, it is clear that life has changed due to the global COVID 19 pandemic. Cities are on the frontlines of this crisis, with economic activity being affected, high rates of infection and inadequate resources. Much has been discussed already on how the COVID-19 situation will shape the future of cities. It has highlighted the inequalities and fragilities of the way we live. As a component of urban fabric, public space has become crucial in helping maintain people's sanity during lockdowns. The importance of public space on the quality of life is irrefutable, after all it is where social interactions occur (Costa et al., 2020), the source of a community's collective life, and the foundation of its identity (Sepe, 2021).

Public spaces depend on public life and public life influences the vitality of public spaces (Bal, 2008). Whenever there is a decline in the usage, there is a decline in vitality of 'these centers of activity and communication' (Pasaogullari & Doratli, 2004, p. 226). Whenever there is a constant presence of people using it, public space is considered vibrant, and that extends to the perception of high quality of a particular city. The interaction is clear: life cannot happen without space and space loses its purpose without people. Daily life occurs in a physical setting but the provision of public spaces alone is not a guarantee that it will be fully used by its residents.

There are unlimited ways to evaluate the interaction of public life and public space. However, Gehl & Svarre (2013) suggest that although each city or context is exclusive, what happens depends on people's choices (Carmona et al.,

2010). The activities people choose to do in public spaces can be categorized in three main groups: ‘the necessary activities, the optional activities and the social activities’ (Gehl et al., 2006).

The interaction of public life and public space has changed as a result of the pandemic: some necessary and optional activities could be done without getting out of the house: work from home, shopping online, exercising with the help of mobile apps - all to limit physical contact to a minimum and stop the spread of the virus. Public life as we once knew it became digital. Nevertheless, the need to go outdoors was an overall longing for everyone, and the provision of public space became a global spotlight.

The modernist cities are in a favorable position when it comes to dealing with pandemics. The whole concept of garden city came from the hygienist utopia brought by Ebenezer Howard and, later, by Le Corbusier. “COVID-19 is not our first pandemic, nor is this the first time planning and design has focused on improving public health. Improving the sanitary conditions of cities motivated planners, architects and engineers to re-design cities before and more strongly in the late 19th century (Jordi Honey-Rosés et al., 2020). The idea of opening spaces to prevent diseases affected urban design: green belts, ventilation, large openings on the facades are some of the characteristics of these particular modernist cities. The wide provision of public spaces is one of many attributes, besides the segregation of functions and the car-oriented design.

Regarding public spaces, Jacobs (1992) and Holston (1989) were amongst the critics of the Brasilia configuration for having ‘infinite public space’, ‘empty spaces’, where it is difficult to promote encounters or, more broadly, where daily life should occur. The general perception of those infinite public spaces is the lack of expectation of public life. Like Tenorio rightly put it: “in Brasilia, we don’t normally expect to see a vibrant public life, therefore it is not a problem when we don’t find it” (Tenorio, 2012, p.209).

Intriguingly, the pandemic has brought new life to those ‘empty spaces’ of Brasilia. The hypothesis brought on this research is that after COVID-19, public spaces are being used like never before in Brasilia. Five different types of precincts were selected as case studies to measure this change according to the three different categories of activities (necessary, optional and social) related to the daily lives of the residents in the Plano Piloto area. These were chosen to explore the diverse range of modernist spaces that are involved in daily life of residents. They all have the potential to provide social distancing, are fully used by different types of people, can host different types of activities and testify to the functional characteristic of public space provided by the modernist urban planning tradition. The diversity of the selected public spaces demonstrates the different levels of usage as not all spaces were meant to have the same level of vitality.

## 1.1. Relevance

The relevance of the present research comes from the current situation the entire world is experiencing. The impacts of COVID-19 are being researched in different fields such as health, economics, psychology, and politics. In regards to health, there is no better time to study the impacts of public spaces on health than now. The context is exceptional: since the spread of SARS COVID-19 was widely known, the first wave left the cities with a different image: streets and public spaces were left empty. Every person in the world could observe that the synergy between people on the streets have become ‘unfamiliar and distant’ (Jordi Honey-Rosés, 2020).

In the urban academic realm, there has been a growing debate on the potential change in behavior towards public space usage during the COVID-19 pandemic. Weinberg and Alexander (2021) have found that public spaces are being repurposed during the pandemic. Cook and Thorsen (2021) found that public life became more vibrant in public spaces during lockdowns providing ‘social infrastructure’ to local residents. A global research carried by Gehl (O’Connor, 2020) with more than 2000 respondents in 68 countries from all continents found that 65% of them have used public space daily during the pandemic. It also found that the main reason for doing so relates to physical and mental health activities. There is still much to be answered and no better timing to research the impacts of COVID-19 than now, since COVID is still, unfortunately, an ongoing issue. It is critical to study and measure the changes in usage of public spaces during this pandemic, as a way to inform future planning and public policies in a post-COVID world (Jordi Honey-Rosés, 2020). Additionally, those impacts have not yet been researched in a modernist city, which provides an opportunity to evaluate the design principles derived from a hygienist concept.

## 1.2 Research Objective

The current research aims to get an insight on what has changed for the residents of Brasilia in terms of usage of public space and ultimately make a South American contribution to the global mainstream debate of the importance of public spaces in times of crisis. Moreover, it aims to test the hypothesis that public spaces are being used more than ever during the pandemic.

The research aims to evaluate the main question: to what extent has COVID-19 affected the usage of public spaces by local residents of Brasilia?

## 1.3 Limitations

Since the research was conducted online due to travelling restriction during the first wave of the pandemic, on-site observations were not possible. This limitation prevented the collection of on-site data on usage of the chosen precincts, relying only on the feedback given by the respondents complemented by interviews. The number of respondents (N=147) were not representative of the population of the neighbourhood (over 225.000 people), and yet, the spatial configuration of Plano Piloto is so unique that does not represent the entire city of Brasilia. In that sense, the typology of public spaces are confined exclusively in the Plano Piloto area.

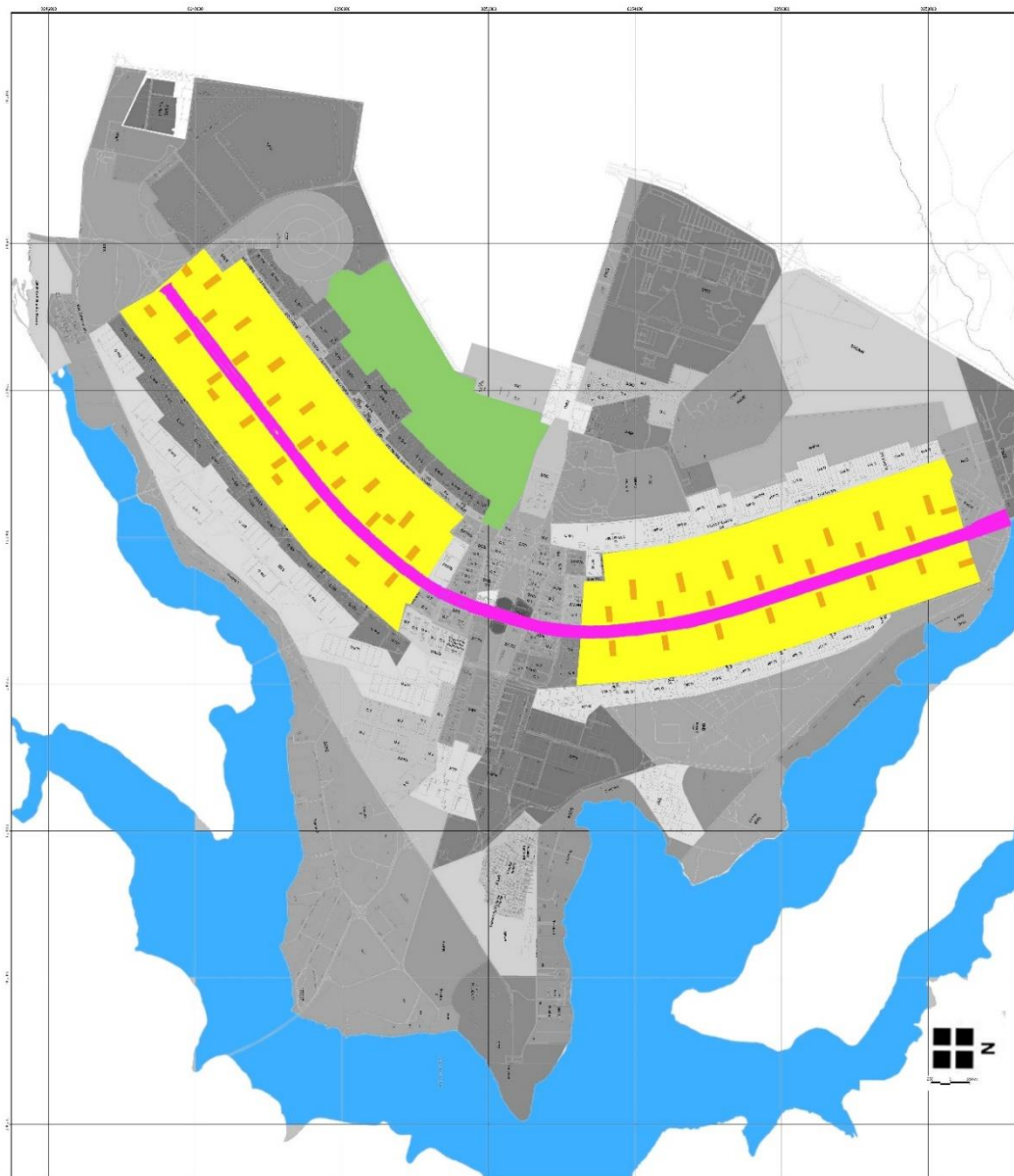


Figure 1: Plano Piloto and its five types of public spaces: Superquadras (yellow), Entreaquadras (orange), 'Eixão do Lazer' (pink), Paranoa Lake (blue) and City Park (green). (Source of the base map: SEDUH/GDF, 2021)

## 2. Public Space

### 2.1 Physical dimension

Public space within the urban context is the starting point of this research. Although some people believe defining public space is rather obvious, a precise definition is a complex challenge. Each person defines it according to their own lens. The definition varies amongst authors and researchers. Carmona (2010) in his literature review-based paper proposes his own typology of urban spaces with 20 categories after analyzing many proposals. Those typologies helped in choosing the five precincts subject of this research:

- **Public Open Space:** Typically green and available to all. It is located surrounded by residential areas and caters to a diversity of cultural, leisure and contemplative uses for its local adjacent residents. It is normally equipped with sitting benches, playgrounds, gardens, sports courts, hosting different users at different times of the day. See figure 2.
- **Left Over Space:** Space that has no specific functions other than to separate residential areas or to connect them to others. It has a wide continuous green surface space filled with lawn and fewer random trees with few or no equipment. It has well defined edges and it is perceived often as a deserted area. See figure 3.
- **Movement space:** Space that has as main function to serve vehicular traffic, and therefore it has little pedestrian movement. However, it transforms to a linear park when it is closed to cars during weekends making room for a diversity of activities for local residents. See figure 4.
- **Civic space:** It is often a point of reference for a number of events that affect public life, having a collective interest. For that, it contains multiple areas that cater to combined uses and different needs such as large greenery surface, water features, barbecue facilities, amphitheaters, sports courts, playgrounds, etc. It is accessible by different modes of transportation and easily recognizable by the residents. See figure 6.
- **Natural urban space:** As an important natural element within the urban landscape such as lakes, rivers, seashore, and canals, it has a wideness characteristic and has an ecological importance. It is associated as a resting and socializing space that could also host recreational activities. See figure 5.



Figure 2 (left): Aerial view of a Superquadra with its inner green areas. The vast empty green area in between Superquadras is an Entrequadra. (Photo credit: Joana Franca, 2018)



Figure 3 (right): Entrequadra 309/310 North. Between two Superquadras, this area is perceived as an empty area. Under the red polygon, there is a church, one of the common uses for this space. The highlighted area has 1.7 hectares approximately. (Base images extracted from Google Earth, 2021.)



Figure 4 (left): Aerial view from Residential highway Axis, also known as 'Eixão'. (Photo credit: Joana Franca, 2020)

Figure 5 (bottom): Birdview from Lago Paranoa and JK bridge. (Photo credit: Bento Viana, 2018)



Figure 6: Birdview from City Park and its inner lakes. (Photo credit: Heitor Menezes, 2016)

## 2.1. Social dimension: Usage of public space

From an environmental psychology approach, Canter (1977) emphasizes the reciprocal relation between space and human behavior. It is difficult to disassociate the social component from the physical one in trying to define public space. He states, “behavior is related to a particular setting and thus constrained by it” (p.44). Additionally, our behavior is determined by our subjective interpretation of our individual experiences (p.22), it is related to what we do, as activities, and what we feel, as perception (p.40). Different from other spaces that often relate to a certain type of activities, public spaces seem to have a capacity to host several activities.

Kaplan & Kaplan (1989, p.6) relate people to a natural environment, which includes parks and green areas. Although it is about a specific spectrum, we can amplify their findings to all types of public spaces. According to them, human species are ‘strongly oriented to visual and spatial information’. Moreover, spatial organization gives substantial information about what one can do in a particular setting.

There are many ways to categorize what one can do in a public space. Activities can vary from place to place and from time to time, ‘undergoing continuous change’ (Gehl & Svarre, 2013, p.19). New activities can appear depending on external factors such as changes in legislation, new technological products or a big event, for instance. Due to limitations, the passive engagement, sensorial behavior, stationary activities were intentionally left out since it requires on-site observations (watching, hearing, speaking, standing, sitting). The categories used in this research are derived from Gehl et. al (2006, pp. 9-12). They are divided in:

- **Necessary activities** are related to everyday tasks and do not depend much on the spatial conditions (e.g. working, shopping, walking to school, taking the garbage out);
- **Optional activities** depend more on willingness and external conditions (e.g. strolling, jogging, reading a book). The optional activities have a higher importance because they relate to peoples’ preferences. If a public space offers better spatial quality, chances are that people will choose to use it more often;
- **Social activities** can occur in either or both of the abovementioned, and depend on interaction with others (e.g. children playing, playing soccer).

### 3.0 Methodology

The strategy for this research is a combination of both quantitative and qualitative methods. A case study is necessary to explore and describe the unique physical dimension of public spaces in *Plano Piloto* neighborhood. Regarding accessibility and proximity, public spaces in Brasilia can be divided in three types considering the distance from the residential areas: local areas (immediate access, less than 5 minutes walking), adjacent open areas (from 5 to 15 minutes walking access), and further public spaces (over 15 minutes walking).

The selection of the five precincts were based not only on the levels of proximity mentioned earlier, but also to cover the different typologies of public spaces. The level of recognition by local residents was also a reason for the choosing the abovementioned precincts. Multiple case studies can help understand why some places are more susceptible to public life than others are.

Secondly, an online survey with close-ended questions provided insight to the change in behavior in relation to the chosen public spaces considering the time dimension. The usage of public space was measured by frequency divided in three main groups of activities in each precinct: the necessary activities, the optional activities and the social activities’, proposed by Gehl (Gehl et. al., 2006). The survey contains the same questions divided in two parts: before and during the pandemic, to evaluate change, yielding a total of 26 variables analyzed. The target population was *Plano Piloto*’s residents (N=147) who live in the area, at least, for 2 years in the interest of evaluating change in usage before and during the pandemic, considering that it has officially started in Brasilia in March 2020.

### 4. Research findings

Many scholars are writing about the relation between Covid and public spaces and this thesis wants to contribute to this debate. As I write this in the fall of 2021, 18 months after the outbreak of COVID-19, we are still learning from the potential and importance of public space, as a ‘socially produced space’ (Van Melk, Filion, & Doucet, 2021, p. 16). It can certainly not be dissociated from people within the city. Although we might be facing a ‘recovery’ or a ‘reopening phase’ all over the world, the virus is still a threat, and obviously requires more than park provision. We could not be at a better laboratory. As Jacobs (1992, p.6) said, “Cities are an immense laboratory of trial and error”. Interesting choice of the word laboratory for a city where a virus is literally spreading. The city has indeed become a laboratory to test the best practices to avoid spreading the virus amongst its inhabitants.

The pandemic has changed the way the inhabitants see and use public space: “the search for essential outdoor and climatic human needs has become more valuable” (GEHL, 2020, p. 11). In Gehl’s exemplary study in four different Danish cities it was found that “people have adapted existing offering of public spaces to fit their physical activities needs (recreation, play, exercise) even in places that don’t have exercise equipment” (GEHL, 2020, p. 19). This also applies to the case of Brasília, where public spaces closer to residences have few amenities available.

The present research demonstrated the impacts of COVID-19 on the usage of public spaces in Brasilia. The physical dimension of public spaces in Plano Piloto, unchanged over time due to its heritage-listed condition, set the context where the social dimension of public life occurred. The COVID 19 is a mediating variable, an external shock that affected this ongoing relationship. Even though the data showed that some residents stopped using public spaces

reflecting contagion concerns, there was an overall increase in frequency from those who remained using them. In that sense, the empiric observation was tested and confirmed that public spaces are being used more than ever during the pandemic. Moreover, it demonstrated the differences in use between different types of public spaces and how use changed before and during the pandemic. Researching the five precincts gave insight on how the usage differs according to the physical characteristics of a public space. The importance of local neighborhood areas within walking distance was the main outcome, supporting the outcomes of Gehl's research in Denmark (GEHL, 2020). Local or neighborhood parks were more intensively used than the ones that are located in the city center, correlating proximity and increase of usage during the pandemic.

#### **4.1 Usage before the pandemic**

When residents were approached to reflect on their usage of public space during corona, it brought a retrospective perspective of what it was like before the COVID interrupted our lives. This baseline was necessary to set grounds to a comparison analysis. The subquestion 'How was the usage of each different type of public space before the pandemic regarding necessary, optional and social activities' has shown that there was a significant usage of public spaces already in Brasilia. The number of respondents and their frequency of usage showed that the five precincts were more intensively than often thought. The usage was especially high on the further precincts: 46% of the respondents said they always used Paranoa Lake and 42% used the City Park always. Those places were mostly reached by private vehicles by 69% and 67% of the respondents, respectively. As per types of activities, the closest precincts were mostly likely to be chosen for necessary activities (35% in Superquadras and 33% in Entrequadras), whereas the Paranoa Lake was mostly used for relaxing, an optional activity. Eixao and City Park were precincts chosen mainly for exercising (47% and 35%, respectively). Comparing weekday usage with weekend usage, the latter was more intense on Eixao, Paranoa Lake and City Park (77%, 65% and 58%, respectively), confirming those public spaces as common weekend destinations. From all the precincts research, City Park had the more intense night usage.

That outcome contradicts some criticism of the modern tradition itself. Holston once said that in "Brasilia 'there are no people in the streets', the city 'lacks crowds' and 'lacks the bustle of street life'". The absence of an urban crowd has earned Brasilia the reputation of a city that "lacks human warmth" (Holston, 1989). Of course, the vitality will always be a difficult attribute when someone refers to Brasilia in comparison to a traditional city. Even so, the city has its own dynamics. Pinto in his research concluded that the "residents attributed a special meaning to Brasilia's public spaces, a place status that is attached to a way of living. (...), this (place) can constitute a reference to affection, that some can call quality of life, expressing a relation to a place, a spatial reference to one's life." (Pinto, 2011, p.103).

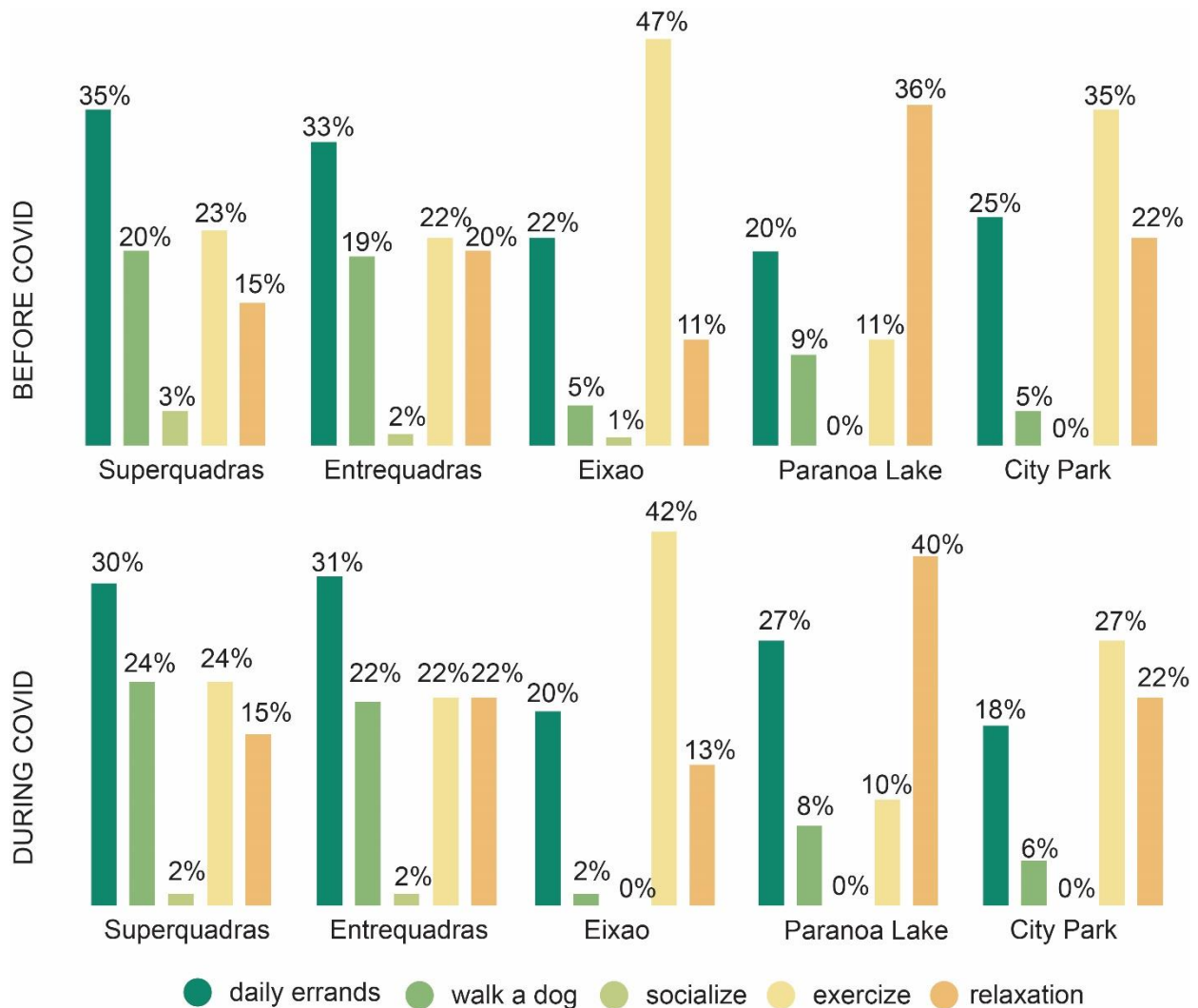


Figure 7: Difference between the type of usage of the 5 different types of public spaces in absolute percentage from the survey. It is possible to make comparisons between types of public spaces, types of activities and time, considering the pandemic. (Source: The Author, 2021)

## 4.2. Usage during the pandemic

Activities can vary from time to time, ‘undergoing continuous change’ (Gehl & Svarre, 2013, p.19). The COVID 19 pandemic was an external factor that brought new ways of living and new ways to use public space in Brasilia.

“When I went for a walk here, in the band 700, between the blocks there are some gardens, trees, I noticed people making picnics, they put a chair away from each other, a towel, and they have a snack, under the trees, that got my attention”. R10 (female, 53 years old)

The research subquestion ‘How was the usage of each different type of public space during the pandemic regarding necessary, optional and social activities’ brought the outcomes regarding change in time on this usage.

The results show that even though there might be people who ceased to use the public space after the start of the pandemic, the ones who continued to use the public space are using it more frequently. The number of respondent who answered they use ‘always’ the Superquadra open spaces increased 10% in comparison to the usage before the pandemic. On the other hand, the ones who use it ‘rarely’ increased significantly by over 30% on the further precincts (31% at Eixão, 31% in Paranoa Lake and 37% at City Park). That confirms the suspicion that proximity plays a major role during the pandemic, when local public spaces have been more used than ever. In the context of Brasilia, the way you reach those spaces has not changed much: walking is still the preferred mode to reach the closest areas whereas cars to reach the further ones.

In regards to types of activities, there was an overall decrease in socializing, which is predicted in a pandemic scenario. One can say that socializing was mainly happening inside our houses, through digital platforms and social media. The research found that at Eixão, Paranoa Lake and City Park there were no respondents who said they have used those



spaces for social activities during the pandemic. Walking a dog and relaxing had a slight increase both in Superquadra and Entrequadras areas. Exercising increased only in Superquadra areas, stating that people would choose closest public spaces not only for necessary activities but also to keep fit during the pandemic. When it comes to weekend preferences, the results were relatively the same, confirming that the further public spaces continues to be the weekend preferred destinations even during the pandemic.



Figure 8: Why do you use the public space? Before the pandemic (Left) during the pandemic (Right). (Source: The author, 2021.)

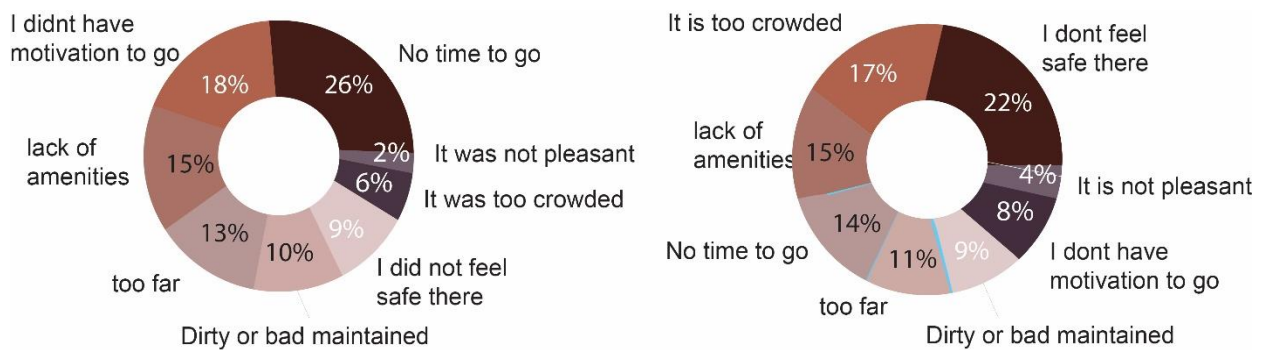


Figure 9: Why don't you use the public space more often? Before the pandemic (left) during the pandemic (right). (Source: The author, 2021)

Prompting for the reasons for not using the public space more often, respondents were asked to think about the public space they use the least. Interestingly, the motivations have changed significantly due to the pandemic. The top two reasons for not using public spaces before the corona crisis were lack of time and lack of motivation to go. During the pandemic, one can imagine that time was plentiful and motivation to go out after being stranded at home for a long period was not valid any longer. During the pandemic, the reasons for not going to public space more often shifted to perception of safety and crowds. The safety measures may have played a good part in it. Since the question had an open space for respondents to add other reasons, most of them added the distancing and fear of contamination as reasons for not using public space. Gehl's study showed that 'some local places are becoming full and it is harder for people not to cluster in large groups and keep distance' (GEHL, 2020, p. 30).

Another finding related to night usage found that in one hand, the number of residents who stated they used the City Park during nighttime have decreased during the pandemic on the other it has increased in Entrequadra areas, also confirming the importance of proximity in changes in usage behavior.

The need for a wider space was the main motivation for using public space during the pandemic: it has increased 6% in comparison to before the pandemic. The main reason for not using more often the public space was the perception they were too crowded, which had an increase of 11% in comparison to before the pandemic. This last finding can also add to the empiric perception that public spaces in Plano Piloto were being more used than before the pandemic.

The relation between residents and public space changed due to a global pandemic. People started to build new relations, relations where the base is the fear of contamination. Even with a horrible motivation to use, local residents in Brasilia seeked to overcome this difficulty and found in the wide public spaces a safe escape.

"I believe that the pandemic revolutionized the way 'brasilienses' see their city" R1 (female, 44)

Moreover, it has shown that there were some activities people prefer to do in public spaces during a pandemic. Exercising and relaxing were the main ones, and are probably the ones that would persevere in a post covid scenario



Figure 9: Superquadra 'new normal': celebrating birthdays on public spaces. (Photo credit: Virginia Manfrinato, 2021)



Figure 10: 'Eixão do Lazer', a highway closed for car traffic on Sundays during the pandemic, in August 2020. (Photo credit: Acacio Pinheiro/Agencia Brasilia)



## 5. Conclusion

Despite the differences in dealing with the spread with stay at home, compulsory usage of facial mask, lockdowns measures, we have observed that even though there was an initial closure of public spaces (that varies differently between countries and types of public spaces), and then more and more public spaces were getting used, with pressure growing on large urban parks. The small local parks seemed to be undergoing a resurgence (Van der Berg, 2020).

The pandemic has shown how public spaces are more than just nice amenities; they are vital community hubs. Through a multi-method impact assessment for Knight Foundation, Gehl documented how public spaces fostered more equitable access and community resilience (Weinberg & Alexander, 2021).

The research has confirmed the empiric observation that, even though people were avoiding encounters due to the pandemic, they used more frequently the surrounding public spaces than before the pandemic. The proximity factor was one of the key attributes that impacted this change in behaviour. The trend was not only observed in Brasilia, but in a global scale, where public spaces played a major role during the pandemic. Brasilia is a city that its residents have wide access to green areas and public spaces within walking distance, which is a feature that was embedded in its creation in 1960, in the midst of the modern movement trend. The perception of residents during the pandemic changed in a way that they realize the privilege of living in a city with wide provision of spaces.

“When you are forbidden to go out, we recognize the importance of having public spaces”. R5 (male, 35)

There is a window of opportunity to be taken from this pandemic by identifying options in managing public spaces during a crisis. The complexity of urban issues shows that public life experiences can vary greatly between different groups and that can highlight inequalities from levels other than spatial. A pandemic brought attention on how fast this change can disrupt lives and the urge of having a fast response. The management of public spaces must be realized through intersectional approaches that focus not only in designing policies but also in individual and collective action. Discussion a vision for public spaces can rise new possibilities and ideas in the planning and policy realms for the existing and potential open areas. Short-term approaches is possible, as many initiatives around the globe can show. In addition, long-term perspectives are also desirable and urgent. Our cities should be resilient to the next shock whether is unexpected or not. COVID-19 is still a reality, but other pandemics can emerge. What happened with the pandemic is an extraordinary opportunity to learn from other cities and people about change in behaviors, mobility patterns, community business and environmental approaches to strategically improve not only the city planning itself but also our citizens wellbeing.

## 7. Recommendations

A further step in academic research would be getting a broader horizon on the subject of public spaces in South America, where there is little literature in this context. An interesting comparison between other modernist cities could bring more in depth knowledge on how the modernist principles affect the usage of public spaces by its residents in a crisis.

Furthermore, since this research was focused on residents of Plano Piloto, a broader view could start in comparing this data with similar neighborhoods. Noroeste and Sudoeste are neighborhoods that have a similar spatial configuration as seen Plano Piloto. This comparison could bring similarities or differences considering the same types of public spaces. Since both

these neighborhoods have demographic similarities, another way to improve the comparison would be to compare neighborhood parks from surrounding districts, also known as ‘satellite cities’. As those areas have a completely different spatial configuration, further research could test the proximity to public spaces variable to see how it affects



Figure 11. Waiting for vaccination. Photo: Roberta Saita, September 2021

usage behavior. Moreover, a future investigation can compare whether there was a significant change in usage in a post covid scenario. We can then draw more conclusions on whether COVID-19 has indeed transformed the way people use public space.

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