

Psychological Impact of Architectural Design: The city of Sarajevo and its comparison to European cities in social, psychological and biological aspect

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ABSTRACT

Architecture in Sarajevo has a deep impact on the psychological state of its residents due to a complex interaction between many cultural, historical and environmental factors. From an architecture standpoint, the collective fabric of architecture in Sarajevo includes Ottoman, Austro-Hungarian, modernist and contemporary styles which bring together collective memory and identity in the urban landscape and mark the outlines of war's influence with its physical remnants that evoke feelings ranging from pride to grief, this ultimately unravels inside the mental and social fabric of the community.

In order to gain insight into resident's collective mindset, a survey of 268 residents predominantly aged 13-35 was constructed in order to collect elements of how collective mindsets function on a psychological level through their perspectives of architecture. The survey uncovered a positive desire for communal living, improved green space, improved pedestrian only areas, mixed-use developments, the preservation of historical structures while acknowledging modernization, and receipt of individuality. A large proportion indicated life-long mental health challenges which further showcase the intersection of the built environment and psychological resilience.

Improving the urban quality of Sarajevo represents the future for a better city through culturally relevant, inclusive, and sustainable built environment strategies. Building upon curious research in Europe, creative potential lies in innovative mixed-use developments, green-focused planning, and utilizing historical architecture with contemporary architecture strategies to enhance community connection and support mental health to establish a spirited sense of place.

Keywords:

Architecture, psychological well-being, Sarajevo, cultural identity, sense of place, urban design, green spaces, community living, mental health, sustainable planning, human-centered design, European cities, urban resilience, modernization.

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I. INTRODUCTION

As the contemporary world progresses, the prominence of architecture continues to be focused on its aesthetics, based on style; composition; heritage; form and symbol; often with more emphasis placed on street appeal rather than the lived experience and the effects spaces have on cognitive health, function and overall well being. Our spaces shape our mood and health in unimaginable ways; a space may be visually appealing, however, if poorly orchestrated, it may ostracize our disposition, vitality and even long-term health; issues that can be avoided by a proper facade, threshold, and program.

The expansion of society and technology means lifestyles and needs evolve, and as a result, spaces are often left devoid of meaning and create placelessness. It leads us to the main question of can we build meaningful relationships with the spaces we exist in day to day and is that meaningful relationship a necessity for our mental and physical stimulation as humans?

To push the relevant conversation of human-centered design forward, we must begin by working directly with architects, urbanists and human beings in a meaningful relational manner such as discussions, surveys and psychological evaluation to better understand how they work, the triggers that influence emotions and their aspirations. This approach is fairly underdeveloped in Sarajevo, where scope for architecture's psychological effects are both large and relatively unexplored.

Sarajevo is a city enriched with history and sometimes overlooked in its architectural diversity: Ottoman; Austro-Hungarian; modernist and contemporary. They are all reflected in our reflexive collective memory and identity. However; war has left its scars on the city. Damaged buildings remind us of grief and loss, while

buildings that have survived are a reflection of possibilities. Opportunities for healing and renewal are seen when rebuilding is inspired by European cities, where the design of environment adds to a sense of well-being and inspired action driven sustainability.

This is research which explores the psychological outcomes of architecture in Sarajevo, while attending to the biological, architectural, medical, sociological and design factors. It will examine residential and urban spaces that need significant improvement, and compare them to similar spaces with successful exemplars in European society and will suggest actions, and interventions that can be measured when it is both aligned with scientific research and improves the well-being of the people who inhabit them.

Objectives:

- Identify unique architectural and urban characteristics in Sarajevo that influence mental and physical health.
- Compare those characteristics with examples of successful human-centric design strategies in European cities.
- Identify architectural/urban design actions that foster a disconnection, or provide functionality, and promote emotional well-being.
- Offer all suggested improvements for the city of Sarajevo that proposes psychological, social and cultural factors.

II. LITERATURE REVIEW

2.1. Psychology of Architecture in general

While it could be argued that psychology is the "individual experience of the physical environment" and architecture is the "built environment," architecture is sometimes understood using the knowledge of psychology. Thus, architectural psychology is a study of the relationship humans have with the spaces around them and the interaction between humans and their environments. This tool investigates the impact of tangible, intangible and affective layers built through cognition or behaviour on human experiences. People engage with space and architecture as their physical surroundings, which is related to their mental psychology. Specifically, the major book of architectural science series from 20th century that takes on neuroarchitecture is *Psychology of Architecture* (D.V. Canter, 1974).

For the purposes of supporting the communications about and contemplation of this relationship, it is important to incorporate psychological terms into the conversation in a specifically defined range of content and meaning. We must also pay attention to relatedness which is the pre-formed language culture that exists as psychological content in architecture in a distinct but sometimes different way from psychologists or non-architects. Architecture expresses itself through perception and engagement; this can be better defined and explained in *Dimensions of Architectural Knowledge*, (A. Abel, 2021).

2.2. The Correlation of Architecture and Emotions

In the book entitled *The Architecture of Happiness*, reflects upon the feelings, moods, and events that these environments conjure. Every component in the space, light, shadow, furniture, scent, etc. all work together to create a meaningful and balanced whole. The author wants to encourage both the local and the architect to consider the psychological ramifications of designed architecture. This involves more than superficial beauty each built forms influences people, their lives, health, and happiness - (A. Botton, 2006.). *Design for Emotion* represents simple techniques and memorized processes that can help an architect establish a humane connection through design (A. Walter, 2011).

On the flip side, a built environment has many implications on people, their attitudes and behaviors, and possibly in the negative ways (Mazumdar, 2000) through the processes of sensation, perception, and cognition. Sensation is a fairly predictable human sensory system response to a discrete stimuli. The boundary between perception and other mental activities is hard to define and no singular perception will give direct understanding of the outer world (Coren, Ward, & Enns, 1994). Perception can be thought of as the conscious possible experience of objects and their relatedness, while cognition reflects the knowing processes, encompassing perception and learning (G. Fischl).

In *From Object to Experience-The New Culture of Architectural Design*, the concept of heterotopias from, Michael Foucault, can be related to the line of action architects may find themselves pursuing in the evolution

of their projects. Heterotopias are described as worlds in worlds, reflecting and, at the same time, disturbing what is outside, thus it could be taken as the architect phenomenon of their own perception and spatial world order that true caves were to design through their living. The concept of heterotopia also has an inherent quality of precision and conversely, includes the in-depth consideration of ever spatial components considered in the design of spaces and its sensorial implications for our organism. It is also important to differentiate between place and space. Place has, name character, purpose, and metaphysical value. So as architects, it is very important to affect space and formulate a place. Imagine if people could occupy visible heterotopias wilfully, then, "upon entering a room for instance, we, in multisensory ways, take in the gist of the evolving perception, its positive or negative valences, long before we can step back and think about what we experienced. Each perception is in its own, 'evolving experience' and its embodied subtleties can now be 'watched' in real time by more sophisticated technology" (Mallgrave, 2018).

2.3. The Influence of Urbanism and City Living

Urban growth's effect on people, their environments, and their relationships with cities and towns is the subject of *Headspace: The Psychology of city living*. The author (P. Keedwell, 2017.) explores how the urban environment affects us, saying that our homes, and buildings create our lived experiences and happiness at every scale possible. Research science, surveys and studies extensively document how buildings affect our behaviours, moods and emotional health and there is significant merit to this concept of "headspace". Keedwell continues throughout the book to describe the projects of renowned architects contemporary to his writing that are brought into consideration with psychology literature which work together with us all as living beings.

Today's architecture is unable to help the connection with its inhabitants, because of the lack of emotion caused in much of the environments today which are built. Few architects today, seem to have their emotional perception attached to their design process, which may be the reason spaces are being produced that are basically bland. Also, emotional perception seems even less likely to become the physical manifestation of architecture expressions in the today's interventions. It is obvious (from any of the research of these spaces) that every space can induce and impact every inhabitant, regardless of their architectural impact, (as difficult as it is to quantify and measure emotion) we are able to step back into our memory through our instinct (that transports us back to that favorite place in the world) through the actual process of sensory reactions of who we are linked to places through experience generating and more importantly emotion. Most of the time, emotion is caused by the architecture in place and the "physical presence" of who is around us. The cliché statement, "we are products of our environment", is typically used to blame present situations on past mistakes or circumstances. Regardless, we are unable to achieve our passions and expectations, if we are (at some level) wanderers of the earth without correct atmospheres. Urgently and necessarily a different approach is needed.

In a book titled *The Appreciation of the Arts - New York*, explains "To live in an environment which has to be endured and ignored rather than enjoyed is to be diminished as a human being. The society which regards this confusion, and mediocrity contribute without the individual being aware (but real) to the frustration and depression which create stultified, sick or apathetic citizens" (S. Gauldie, 1969.)

2.4. Effect of color in architecture

Historically, color has had an essential part of how we perceive and ultimately engage with spaces. Color has been at the heart of composition and design, as evidenced in the works of many influential architects such as Le Corbusier and Luis Barragán. The ability to explore human behavior and emotion through colors is the study of color psychology. Every color has different meanings, implications and has different psychological effects; this is partly what makes color psychology and color theory such a complex study, not only is it culturally significant but also personal. The same can be said of *Color Psychology and color therapy; An empirical study of the influence of color on human life*. (F. Birren, 2016). Color psychology attempts to explore the human perception of color(s) as well as the ramifications of color combinations by using color theory—the application of the mixing and coordination of colors. In the early 20th century, Carl Jung, a Swiss psychiatrist, worked to study the psychological implications of colors. Carl Jung's work eventually developed into a color theory therapy that allowed his patients to express their emotions/thoughts and ideas through colors and visual images.

2.5. The city of Sarajevo in architectural aspect

Looking at the change in Sarajevo after the war, *The environmental aesthetics of Sarajevo: A city formed through memory* concerns how places are experienced by people in the urban environment after dealing with the aftermath of traumatic events and the emerging global landscape of the "Post-Ottoman Global City." One argument made within this article is that the culpable transformations of urban aesthetic and visual treating of cities like persisting concerns process, are intertwiningly formed and encounterable of haunting devastation. The project also contributes to broader theoretical conversations, regarding the transformations of the visual

logics and aesthetic nature of urban places after constructing and inhabiting visual cultures within post-war Sarajevo. It also speaks about urban memory, and its significant influence on the aesthetic encounters of these post-traumatic cities. In essence, the conclusion of the article is that architectural remnants have properties for continuity more than the value of unstable aspects. Therefore, this article appreciated the worth of incompleteness, and gave way to new insights that support playful experimentation that could break free from a static, threatening and boring condensed urban aesthetic. (E. Zejnilović, 2017.)

III. RESEARCH STUDY

3.1. Sampling

For the purpose to study the psychological impact of architecture in Sarajevo and compare it with other European cities, the first methodology that has been chosen for the research is sampling which is divided in two parts. The sample size was not immense, since the resources available for the research, including time and budget constraints, were not extensive. The sample size was sufficient to detect meaningful differences in psychological impacts between Sarajevo and the selected European cities.

a. Sarajevo sample

The first one is focused on Sarajevo, firstly using diversity to capture a range of perspectives. It is important to mention that factors as age, gender, socio-economic status and cultural background should not be ignored. Participants were from various neighborhoods within Sarajevo were included to show potential differences in architectural styles and living environments. The historical context was also included, as they were included and participants who have experienced different periods in Sarajevo's history, such as those who lived through the Bosnian War and those who have grown up in the post-war era. It can be said that this type of sampling technique was purposing and stratified.

b. European cities sample

On the other side, European cities sample is being treated different, since the information cannot be gathered as detailed as in Sarajevo. For this type of sampling features such as architectural diversity, geographical spread and population size were used. In that way cities from different regions of Europe are accounted for potential regional variations in architectural design and cultural influences.

3.2. Data collection

The data collection process for studying the psychological impact of architecture in Sarajevo and comparing it with European cities should incorporate a combination of quantitative and qualitative methods to provide a comprehensive understanding.

3.3. Literature review

I gained a profound understanding of what scholars have previously explored in terms of the psychological effects of architecture. This historical context became instrumental in framing the uniqueness of Sarajevo's architectural landscape and its potential influence on the residents. The literature review helped to identify gaps and limitations in the current understanding of the subject. Recognizing these gaps provides a motive for contributing new insights and addressing areas where knowledge is lacking.

Surveys

I developed a structured survey to gather quantitative data on participants' perceptions of the architectural environment. There were also included scales or other standardized measures to assess factors like stress levels, well-being, and satisfaction with the built environment. There were included few demographic questions to analyze how factors like age, gender, and socioeconomic status may influence responses.

3.4. Interviews

In process of researching, interview of an architect Amir Vuk Zec was used to gather in-depth qualitative insights into experiences with Sarajevo's architecture and problems that are connected to socio-economic and political status in Bosnia and Herzegovina, using Tibra for reference.

3.5. Architectural analysis and observation

I documented architectural styles, use of public spaces, and other relevant features that may influence psychological well-being in Sarajevo. I also noted behavioral patterns, such as social interactions, movement through spaces, and the utilization of public amenities.

3.6. Qualitative and quantitative data analysis

a. Comparative Analysis

I compared qualitative findings between Sarajevo and European cities to identify commonalities and differences.

b. Content Analysis

I applied content analysis to open-ended survey responses and qualitative data to categorize topic and to identify patterns of specific experiences or perceptions.

3.7. Limitations and future research

There is a slight dose of subjectivity in surveys, because some of the questions are potentially based on emotions of people, but it can be used, because the main theme is connected to the psychological state of users in Sarajevo. Observation is subjective in a way that personal beliefs and interpretations influence the way that something is perceived and reported.

IV. RESULTS

4.1. Quantitative Findings

268 people was surveyed by an online form, where every person could give their answer only once, so the authenticity could be improved for getting the results. Majority of respondents were female (62%) compared to men (38%) and the main population were people from 13-35, while the older population was not that interested in the survey. 69% of the respondents agreed that the living environment is important for the psychological state, and the findings also indicate that the users would feel happier in another city in Europe (45%), while many of them (32%) are neutral and not sure about it. 61% of respondents prefer living in a community, but that answer could be connected with the age that majority of respondents have, and also with a cultural and traditional aspect of the city. The most desirable type of housing in Sarajevo would be a house (59.7%), and the size of the room can affect the mood of a user (61%). Habitants also agreed that there is a lack of green areas/parks in Sarajevo (88.4%), and they almost fully agree that the person needs an open space just as much as a private one for a healthy life (95.1%). A significant number of respondents had experienced depression, panic attacks or anxiety in their life (73.9%). A significant number of participants expressed a desire for increased green spaces and more thoughtful urban design, emphasizing the importance of integrating nature into the architectural landscape. A notable percentage of respondents expressed concerns about some areas in Sarajevo, such as Alipasino polje, Dobrinja, Ilidza signaling potential areas for improvement.

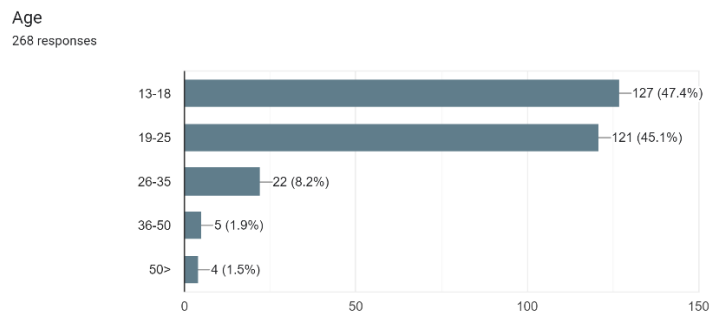


Figure 1: Age of respondents

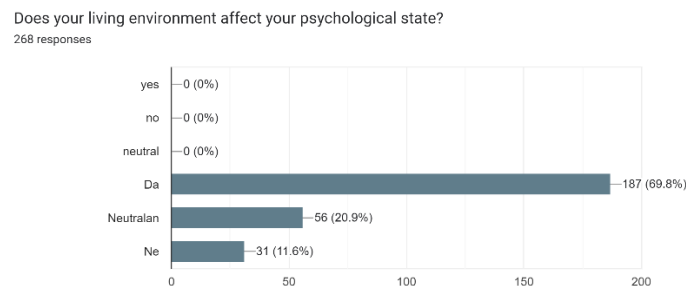


Figure 2: Impact of living environment on psychological state of respondents

Do you think you would feel happier if you lived in another city?
268 responses

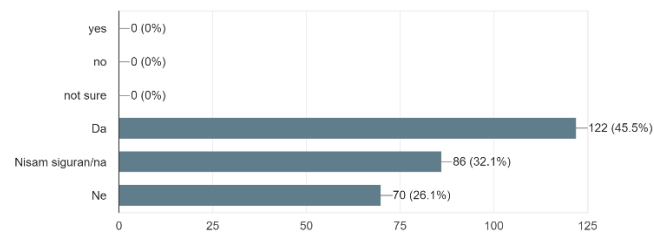


Figure 3: Perception of potential happiness when living in another city

Do you prefer living alone or in a community (roommate/family)?
268 responses

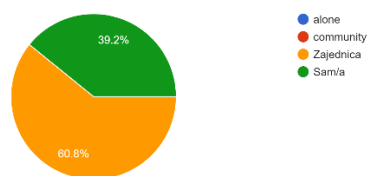


Figure 4: Living preference- alone vs. in a community

Choose the type of housing that you consider the most desirable for the quality of life?
268 responses

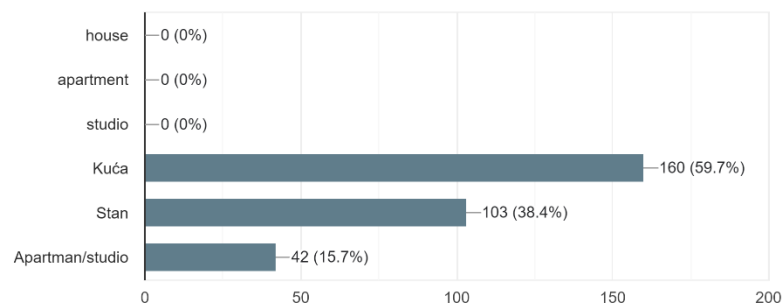


Figure 5: Preferred housing type for best quality of life

Name a neighborhood in Sarajevo that makes you feel unsafe/unwanted
268 responses

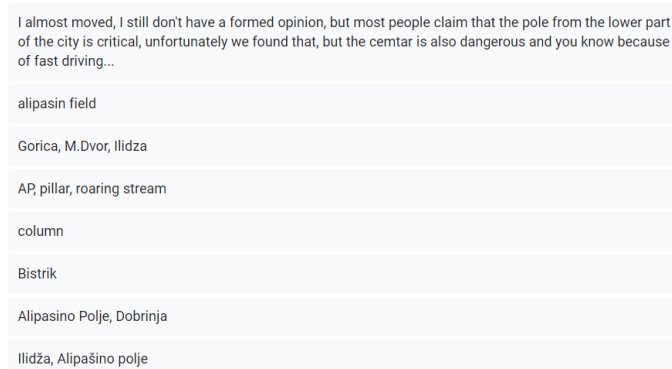


Figure 6: Neighborhoods in Sarajevo perceived as unsafe or unwelcoming

Have you ever experienced depression, panic attacks or anxiety?

268 responses

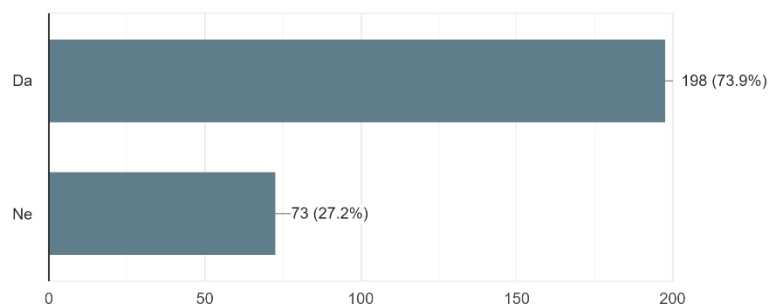


Figure 7: Experience of depression, panic attacks or anxiety among respondents

Can the size of a room affect your mood?

268 responses

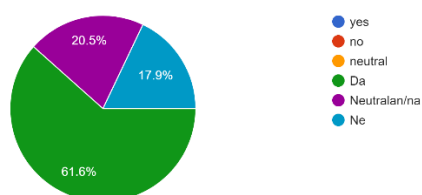


Figure 8: Influence of room size on a mood

Is there a lack of green areas/parks etc. in Sarajevo?

268 responses

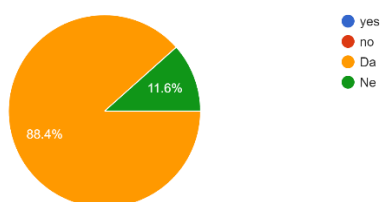


Figure 9: Perceived lack of green areas and parks in Sarajevo

Do you think that a person needs an open space just as much as a private one for a healthy life?

268 responses

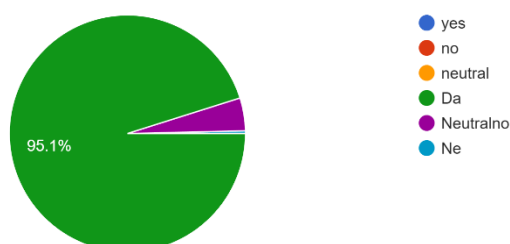


Figure 10: Importance of open public space in relation to private space for a healthy life

4.2. Qualitative findings

Thematic Analysis of Residential Narratives: Residents often expressed a strong sense of attachment to historical residential elements, citing these as contributors to their overall well-being. Participants in Sarajevo emphasized the cultural significance of residential spaces, associating cultural identity more closely with specific architectural features within residential areas.

Emotional Connection to Residential Spaces

Both quantitative and qualitative data is showing the emotional connection residents in Sarajevo have with specific residential architectural elements.

4.3. Literature findings: Historical Influence on Architecture

a. Ottoman Era:

The Ottoman Era is still present in Sarajevo, both in the form of buildings (mosques, bazaars, and genuine Bosnian houses) as well as in the courtyards and interiors that exhibit the same aesthetic. Generally, this time period preserves a sense of calm, and a reflection of Islamic memory that might evoke a sense of loss for an individual. It is also likely that there is some kind of psychological connection to this built environment because there is imaginary continuity in the traditions and the story of history that is forged into the city's point of view.

b. Austro-Hungarian Era:

The Austro-Hungarian period represents a period of change in building styles, incorporating neoclassicism alongside its Secessionist design. There is a level of elegance that the Austro-Hungarian period brings and the large boulevards along with their lofty facades bring an orderliness to the city. Here there is also an impact from the neurology of buildings bringing a sense of politeness, history, and continuity. Permanent residents are likely to reflect on their own connection to a structured building experience, a responsive interest appealing to both aesthetics and a building's historical notation.

c. The Post War Period:

The post-war period in the architecture of Sarajevo is represented with modernist architecture and through the reconstruction of the city after it was subjected to total shutdown. Certainly, the war has left some scars on the city but many have seen how resilient the city has been. There are multi-faceted implications with the architecture, with the symbols of surviving together with the advancement of obliteration. Residents could feel vulnerable reflecting on the omitted history and sometimes the weight of the legacy itself. As an individual, how might they grapple with solidarity, and the sense of worry about remembering?

V. DISCUSSION AND CONCLUSION

In summary, the influence of architecture in Sarajevo on the psychological state of its population is controlled by a combination of culture, history, and environmental factors. I hope the information from the survey of 268 individuals from an online form gives an insight into how the built environment affects the mental state of the city dwellers. The demographic structure of the respondents, most of which are female, and are mostly in the age group of 13-35, gives a representation of the interests and worries of this part of the population, though it should be noted that the older generation showed less interest in the survey. The information collected by younger generation members offers a perspective relating to their experiences and expectations regarding the architecture of Sarajevo. In conclusion, the survey offers insight into a complex relationship between architecture and the role it plays in the living environment in regards to the well-being of its residents. This is important in relation to future planning and development of urban strategies, potentially providing frameworks which consider cultural sensitivity, communal engagement, and further green spaces in the built environment to support the well-being and satisfaction of all residents. Interestingly, the responses indicate that respondents would like to reside in another city in Europe, suggesting that there is maybe some detachment of formal architecture in the contemporary context of Sarajevo, and its corresponding role to the preferences of the populace. Additionally, 32 % of respondents were neutral regarding the prospect of relocating, indicating some uncertainty or complication in a wish to relocate. The preference for communal living corresponds with the proportion of respondents and potentially reflects a culture and tradition of the city, this preference may also potentially impact the choice in architecture and future city planning strategies to offer the potential for a communal purpose in architectural design and shared spaces. While not architecturally linked, there is recognition of mental health experiences, with 73.9 % of respondents relating that they have experienced mental health conditions. The fact that the living environment has an enormous potential impact on residents needs to be find a future way to reflect in the context of mental health productive helping systems. The desire for better green spaces and design is aligned and common, with potential areas identified for bettering the places like alipasino polje, dobrianja and Ilidza. These responses could indicate a potential way forward in future planning and urban development, on the basis of ensuring future urban planning is culturally sensitive, community and green sensitive, to permit better all round living conditions in Sarajevo. If the city wants to

improve/stimulate conditions of living for Sarajevo and better promote a happy space for citizens, it might consider the attributes of some European cities. Prioritize green spaces and design carefully would form better connections to external spaces in communal situations. It could offer mixed-use developments for the whole neighborhood to afford some vibrancy to the neighborhoods rather than a sterile issue. It could promote pedestrian access, and opportunities for people outside in a community sense. It would require thinking about preservation and modernity, like most European models that maintain something historical whilst also embracing modernity/ contemporaneity. Promote mental health support systems visually when relating to the reported experiences of depression and anxiety. In conclusion, if the city considered cultural sensitivity, engagement of the community, and sustainable urban planning in its activities it could look like a city that could offer happy environments for its people, rather than concurrently designed tourism and social enterprises.

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