

Exploring user needs in urban plazas: an empirical mixed-method analysis

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Abstract. This research aims to investigate the relationship between humans and the physical area of their activity by identifying the needs of urban plaza users. The study used two research methods – IDI and CAWI survey. A total of 17 needs that are satisfied in urban plazas were identified. Analysis of the frequency of their satisfaction indicates that urban plazas are mainly recreational and leisure spaces. However, it is worth noting that the average ratings of how frequently individual needs were fulfilled differed insignificantly, indicating that urban plazas are highly multifunctional. At the same time, the frequency with which social needs were satisfied was rated relatively low. The survey results also suggest that the satisfied needs in urban plazas vary by gender and personality. The research points to generational changes that affect the fulfillment of differentiated needs depending on user age. A change in the “center of gravity” of the satisfied needs of young people relative to older users of urban plazas is observed.

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1. Introduction

There is a strong belief expressed in the literature about the interconnectedness of space and its users. Many authors point to the close connection between humans and the activities they carry out and space as the environment of their life in which they carry out these activities (Barker, 1968; Bechtel, 1997; Bechtel & Churchman, 2003; Gifford, 2007; Jurkovič, 2014). Urban spaces, due to their multifunctionality, are indicated as places for satisfying the full range of human needs (Cardoso et al., 2022). The literature also distinguishes the critical role that plazas play in people's lives during their daily urban existence (Carr et al., 1992; Beck, 2009; Gehl, 2009, 2013). It is also pointed out that there is a feedback loop between humans and their activity spaces (Wallis, 1977). The literature raises the important role of man's relationship with the surrounding urban environment in understanding human activity, sustainable urban design, and management of urban spaces (Naveh, 2000). This relationship is based on the possibilities inherent in humans and space (Gibson, 1977, 2014; Wallis, 1977).

Human needs allow such a relationship to exist (Gibson, 1977; Wallis, 1977). They cause people to locate their activities to specific urban spaces according to the activity's purpose. The combination of self-identified needs and the functionality of a particular space gives a person a reason to appear in a specific place (Carr et al., 1992). The activities of the human individual are directed at satisfying various types of needs, some of which can be satisfied outside the home, such as in open public spaces (Carr et al., 1992). Many researchers emphasize that the relationship between users and their activity space is based on diversity (Low, 2010; Jurkovič, 2014; Boros et al., 2016). This refers to the diversity of needs possessed, individual capabilities, and the functionality offered by different types of urban public open spaces. This article focuses on plazas as important urban spaces that have received much attention in geographic research, especially in a social context (Whyte, 1980; Gehl, 2009; Harun et al., 2014; García-Doménech, 2015; Bierwiazzonek, 2016, 2018; Seamon, 2018).

This article aims to identify the needs met by users of urban plazas. To achieve the above goal, the following research questions are answered: (Q1): What specific user needs are fulfilled by urban plazas? (Q2): How frequently are these identified needs addressed in urban plazas, especially in the context of the user's age? (Q3): What framework can be employed to categorize the needs met by urban plazas?

The above research questions will help verify two research hypotheses (H1): Today's urban plazas are multifunctional and simultaneously meet the multiple needs of their users, (H2): The needs met in urban plazas vary according to user age.

2. Literature review

Human needs have been a subject of consideration among psychologists for many years (Dover, 2016). The best-known ways of classifying them are those proposed by Maslow (Maslow, 1943, 1954, 1962) and Alderfer (1969). According to Maslow, human needs have a hierarchical arrangement that is similar among all people. The hierarchy of needs theory assumes their layering, which is often presented as a pyramid. At its base is the layer of physiological needs, and further up in the order there are groups of needs: security, belonging and love, esteem, cognitive, aesthetic, and self-actualization (Maslow, 1943, 1954, 1962). Alderfer (1969) in his ERG model divided human needs into three groups: existence (E), referring to the material conditions of life of the human individual; relationships (R), referring to the needs for contact and integration with other people; and growth (G) consisting of enrichment of the human personality.

In the context of geographic research, consideration of human needs began to be addressed in more significant numbers in the literature after the so-called "humanist turn" in geography (Golledge & Stimson, 1987; Golledge, 1997; Lewis & Walmsley, 1997), as well as with the development of the concept of placemaking, among others (Madden, 2011; Wyckoff, 2014). Placing the human being at the center of attention in studying their relationship with the surrounding space makes it possible to pay attention to their needs, among other things. Works referring to human needs in public spaces deserve special mention. One of them is the publication of Poerbo (2001) in which the author divides needs into five main categories: psychological (security and stimulation), emotional (needs for identity and interaction with others), perceptual (needs for orientation in space), physical (needs for comfort) and aesthetic (needs referring to the physical properties of space). On the other hand, Carr, Francis, Rivlin & Stone (1992) classify human needs in public space into those related to comfort (resting, eating, drinking, sitting, shelter, being in the sun), active involvement in the spatial-social situation (observing others, interpersonal interaction, participating in cultural events, participating in games, physical activity),

relaxation (seeking respite in a particular space) and discovery (new places, observing the behavior of others, elements of development and exhibitions). Some observations on the needs of users of urban spaces can also be observed from grassroots projects (created by citizens for citizens) implemented as part of civic budgets, which can accurately reflect the needs of local communities (Bernaciak et al., 2018; Kołat et al., 2022).

In addition to the above, the literature also mentions social (Cattell et al., 2008; Duzenli et al., 2010), cultural, informational (Maga-Jagielnicka & Bagiński, 2012), political (Madanipour, 2013; Wronkowski & Lorek, 2022), economic or play and recreational needs (Mehta, 2014). There is a position in the literature that human needs and the opportunities to satisfy them form a reciprocal relationship between a person and space (Wallis, 1977; Noor & Kamar, 2022). As Gehl (2009, 2013) points out, once needs are satisfied, a person may stay longer in a particular place because of its quality, satisfying completely different needs than those with which they appeared in the space.

Numerous definitions of urban public open spaces illustrate the relationship between a person with specific needs and the space where those needs can be met. Dymnicka (2009) notes that the essence of public open space is freedom of expression and the expression of various behaviors. In the *Charter for Public Spaces*, (Note 1) definitions emphasize that these are spaces designed to meet the needs of local and supra-local communities. Lorens (2010), on the other hand, indicates that these are fragments of urban space intended to realize direct contact between participants in social life and the different social needs of the communities using it. Madanipour (2013) also emphasizes the role of public spaces in meeting social and political needs. The definition provided by Bierwiazzonek (2016) also highlights aesthetic considerations and a sense of security.

Urban plazas, the focus of this paper, are among the most significant public spaces in cities worldwide. In the literature, these types of spaces are often referred to as critical elements of the town that crystallize its plan, acting as peculiar nodal points where various events intertwine (Wejchert, 1984; Chmielewski, 2001) and providing opportunities for a variety of activities (Whyte, 1980; Carr et al., 1992; Carmona et al., 2008; Gehl, 2009; Jałowiecki, 2011). This diversity allows spaces and users to “connect” with each other. Carr, Francis, Rivlin & Stone (1992) emphasize that people look to public spaces to reflect and respond to their many needs. Publicly accessible places in cities, through their

functionality, location, structure, or the users who use them, provide opportunities to realize the needs that arise. In turn, the space is treated in the literature as a means of satisfying needs (Maga-Jagielnicka & Bagiński, 2012). At the same time Bierwiazzonek, Lewicka & Nawrocki (2012) state that the more a given space is conducive to realizing various needs, the more activity is observed in particular spaces. Therefore, empirical knowledge of the needs realized in particular types of urban public open spaces seems essential for understanding the social functioning of these spaces and their appropriate design (Carr et al., 1992; Francis, 2003; Keleg et al., 2015; Namar et al., 2021).

3. Materials and methods

To realize the purpose of the study and answer the research questions, two methods were used – individual in-depth interviews (IDIs) and a survey questionnaire (CAWI). The empirical study was conducted between April and June 2021 and was preceded by a thorough literature study. The research proceedings were divided into four main stages: (1) review of the literature relating to the needs met in urban public open spaces, (2) collection of primary data using IDIs, (3) qualitative analysis of the collected data to identify the needs met in the space of urban plazas, (4) quantitative assessment of the frequency of meeting the identified needs in urban plazas in Poznań (CAWI). During the research, the author attached particular importance to ethical issues. Any data that could be considered sensitive was anonymized. The study was conducted when Poland was in an epidemic state caused by the SARS-CoV-2 virus. Therefore, the Ministry of Health's guidelines for staying in public spaces were followed during the observations. In addition, the COVID-19 epidemic prompted the decision to conduct individual in-depth interviews using remote communication techniques (Microsoft Teams tool) after recruiting participants in advance.

3.1. Data collection and analysis

The spatial scope of the study was the city of Poznań. It is a large city by Polish standards, the capital of Wielkopolska voivodeship with a population of over 500,000. It was selected for the study due to the diversity of its urban squares, some of which, formerly the centers of suburban localities, were incorporated into the city as it grew. The study included a total of 15 city squares, the general

characteristics of which are presented in Appendix 1. Poznań was also chosen because of the author's expertise on this city, especially regarding its history and social and spatial structure.

First of all, a review of the literature on human needs in urban space was carried out. This was followed by structured IDIs, conducted according to a previously prepared interview scenario (Frankfort-Nachmias & Nachmias, 2007; Babbie, 2020). The number of questions, how they were phrased, and their order were the same for all respondents. The needs met in Poznań's urban plazas spaces were addressed during the interviews. A total of ten interviews were conducted with participants varying in age and gender. All study participants are Poznań residents who use the city's urban plazas. Each IDI participant was informed

of the purpose and planned conduct of the study. Study participants knew that all data would be anonymized and that they could withdraw from the study at any time. Consent was obtained from each participant to participate in the study and to record the interview. IDI participants were paid for their participation in the study. The research procedure was guided by theoretical saturation and the law of diminishing returns – when subsequent interviews did not provide new knowledge, this research stage was terminated (Kvale & Brinkmann, 2018). The collected qualitative material was analyzed with the help of NVivo 12 software using open (data-driven) coding. The study made it possible to isolate the needs met in urban plazas by their users. The final stage of the research was to collect quantitative data on the identified needs using the CAWI method

Table 1. Characteristics of survey participants

| | | N | % |
|----------------------------|--------------------------------------|-----|-------|
| Gender | Female | 175 | 54.69 |
| | Male | 145 | 45.31 |
| Age | 18–29 | 44 | 13.75 |
| | 30–39 | 74 | 23.13 |
| | 40–49 | 57 | 17.81 |
| | 50–59 | 40 | 12.5 |
| | 60–69 | 54 | 16.88 |
| | 70+ | 51 | 15.94 |
| Personality type | choleric | 50 | 15.63 |
| | sanguine | 124 | 38.75 |
| | melancholic | 95 | 29.69 |
| | phlegmatic | 51 | 15.94 |
| Completed education | vocational | 27 | 8.44 |
| | high school or post-secondary | 111 | 34.69 |
| | higher bachelor's degree/engineering | 39 | 12.19 |
| Nature | higher masters degree | 143 | 44.69 |
| | 1 – definitely introvert | 24 | 7.5 |
| | 2 | 69 | 21.56 |
| | 3 | 100 | 31.25 |
| | 4 | 77 | 24.06 |
| Origin | 5 – definitely extrovert | 50 | 15.63 |
| | From Poznań | 228 | 71.25 |
| | From outside of Poznań | 92 | 28.75 |

Source: Own elaboration based on conducted CAWI (n=320)

among Poznań residents. A total of 384 people participated in the survey (320 of whom declared that they use the city's plazas), who were selected in a way that maximally reflected the population of Poznań in terms of age, gender and education (Table 1).

The obtained sample was similar to the characteristics of the population of Poznań in terms of the above criteria, but was not representative. The questions in the questionnaire were closed and related generally to the city squares in Poznań (except for the question about the three most frequently visited city squares). Thus, the answers obtained referred to Poznań city squares in general, not to individual squares. Otherwise, the questionnaire would have had a large volume, which could have affected far fewer responses. The data presented are therefore generalized for urban squares in Poznań in general.

With the help of the survey, it was possible to assess the frequency with which users of the city's plazas met their needs. Using statistical analysis, correlations and regularities of attributed ratings were sought about the metrics. Intergroup differences were identified using the Student's t-test for independent samples in SPSS software. Moreover, for the purpose of classifying the identified needs, a statistical analysis was also carried out based on the mean values of the responses using the standard deviation. The results were presented in standard tables, heat maps, and quotes from individual in-depth interviews.

Table 2. Characteristics of in-depth interview participants

| Respondent number | Age | Gender |
|-------------------|-----|--------|
| IDI01 | 48 | Female |
| IDI02 | 74 | Female |
| IDI03 | 22 | Male |
| IDI04 | 32 | Female |
| IDI05 | 53 | Male |
| IDI06 | 45 | Female |
| IDI07 | 65 | Male |
| IDI08 | 35 | Male |
| IDI09 | 39 | Male |
| IDI10 | 21 | Female |

Source: Own elaboration

3.2. Limitations

Given the limited scope of the research conducted, the need for further research in this area is indicated. First of all, it should be noted that the study concerned only urban plazas in their spatial scope. From an exploratory perspective, conducting research also in other urban public open spaces seems valuable. It can be assumed that they are conducive to satisfying various needs. Assigning satisfied needs to different types of urban public open spaces can help shape urban areas such as neighborhoods or quarters to ensure comfortable use and satisfaction of urban living needs near where people live or work. This can reduce the need for inconvenient travel throughout the city to meet needs and promote the idea of the 15-minute city (Moreno et al., 2021; Zhang et al., 2023).

The time scope of the study was also limited. The survey was conducted during the warm months. Conducting a similar survey during the other seasons may show differences in the needs met in urban plazas and other types of urban open public spaces. In addition, the survey was conducted during the COVID-19 pandemic, which could also have affected the results. Repeating the study after the end of the pandemic could provide valuable material for comparative analysis. It would be interesting to further explore the realized needs of humans according to the time of day, week and year. Gaining knowledge in this area can also be translated into a practical aspect and will allow those in charge (e.g., from city offices) to better plan various types of events in particular spaces (Smith, 2017; Glover, 2019) or, more broadly, the development of entire cities based on human needs (Caprotti et al., 2017; Caprotti, 2018; Cardoso et al., 2022). It would also be interesting to repeat a similar study in 10 or 20 years to determine better the dynamics of met needs in urban plazas concerning specific age groups.

The present research can also be extended to discover the relationship between the needs met and the furnishings of space, as there is a link between human needs and the design of urban spaces (Noor & Kamar, 2022). The literature indicates that successful public spaces respond to the needs of their users (Francis, 2003). This approach could influence the development of research on human responses to the environment and further discover how the furnishing of spaces serves the needs of urban residents (Cardoso et al., 2022; Osborne & Jones, 2022).

4. Needs in an urban plaza

Participants in individual in-depth interviews indicated that the selection of their activity space is based primarily on the needs they have to satisfy at a given moment. Identifying a single need or several needs is followed by matching the space to them based on previous experiences on the one hand and on obtaining current information on the other. The confrontation of the need with the possibilities offered by the space of which the person is aware results in selecting a space that will allow the need to be met most effectively.

Notably, respondents emphasized in interviews that they perceive urban plazas together with their immediate surroundings, which are most often the surrounding buildings. This means that the perceived opportunities to meet identified needs directly in urban plazas are extended by the functionalities offered by the surrounding buildings and close neighborhoods. Thus, the urban design objects are mainly valuable in meeting needs, and the immediate vicinity of these places provides additional functional qualities. Interviewees stressed that the large areas of urban plazas combined with well-designed urban furniture increasingly showed the possibility for modification according to needs. Locating city plazas in downtown developments promotes their multifunctionality due to the numerous service establishments in such areas.

Through analysis of the material collected through individual in-depth interviews, 17 needs were identified that were satisfied in the urban plaza. These needs are the following (in alphabetical order): belonging to a group, communication with others, communing with culture, communing with nature, creating (creating something), externalizing one's personality and expressing emotions, gaining knowledge and information, gastronomic, interacting with others, movement, playing, recreation and sports, rest, safety, self-realization/self-development, shopping, visual/aesthetic.

4.1. Meeting needs in urban plazas

The identified needs were assessed by participants in a survey conducted using the CAWI technique. Respondents answered the question, "What needs do you satisfy and how often do you satisfy them in the urban plaza space?" by rating them on a five-point scale, where individual responses meant: 1 – I do not satisfy it, 2 – I rarely satisfy it, 3 – I sometimes satisfy it, 4 – I often satisfy it, 5 – I

very often satisfy it. Based on the ratings given, it was possible to calculate the average frequency of indications attributed to a given need, which suggests the frequency with which it is satisfied by users of the city's plazas.

The highest average frequencies of indications were assigned to the needs of rest (3.87) and movement (3.69). In addition to the highest average frequency of indications, these two needs stand out regarding the highest percentage of responses, "4 – often", and the lowest percentage of responses, "1 – I do not satisfy it". Visual/aesthetic needs (3.54), communing with nature (3.52), communicating with others (3.46), communing with culture (3.41), safety (3.39), gastronomic (3.34), play (3.27), and recreation and sports (3.26) were indicated as the following most frequently satisfied needs. The predominant rating assigned to the above needs was "4 – often."

On the other hand, the little satisfied needs in the urban plaza space are the needs to create/create something (2.79), externalize one's personality and express emotions (2.96), interact with others (2.99), belong to a group (3.00), shop (3.02), self-realization/self-development (3.05) and gain knowledge and information (3.12). For this group of needs, the dominant response declared by respondents was "3 – sometimes." The needs listed above are also characterized by the highest percentages of "I do not satisfy it" responses. Two are characterized by far the highest number of such responses – externalizing one's personality and expressing emotions (46; 14.4%) and creating/creating something (47; 14.7%).

Analysing the average frequency of indications, the number of the most frequently indicated answer, and their percentage of the total number of indications, two primary groups of needs were distinguished by declared frequency of satisfaction. The first is the needs that are frequently satisfied in the space of urban plazas. These are indications whose average rating was relatively high, with a high share of "4 – often" responses. The second group consists of needs fulfilled with average frequency, among which the dominant response was "3 – sometimes". Only one need in this group – acquiring knowledge and information – received less than 10% of "not satisfied" responses.

The average frequency of indications for meeting needs in urban plazas varies by gender. On average, women indicated they were slightly more likely to be satisfied in this type of space. Only in the case of interaction with others was the rating among both genders identical (2.99), and in the context of the needs of belonging to a group (F: 3.04; M:

Table 3. Typology of needs satisfied in the space of urban plazas by their users

| Need | Mean frequency of indications | Most common answer (number of indications; percentage share) | "I do not satisfy it" (number of indications; percentage share) |
|--|-------------------------------|--|---|
| Rest | 3.87 | often (164; 51.2%) | 9 (2.8%) |
| Movement | 3.69 | often (143; 44.7%) | 8 (2.5%) |
| Visual/aesthetic | 3.54 | often (137; 42.8%) | 12 (3.8%) |
| Communing with nature | 3.52 | often (124; 38.8%) | 14 (4.4%) |
| Communication with other people | 3.46 | often (137; 42.8%) | 14 (4.4%) |
| Cultural exposure | 3.41 | often (118; 36.9%) | 15 (4.7%) |
| Safety | 3.39 | often (115; 35.9%) | 22 (6.9%) |
| Gastronomic | 3.34 | often (112; 35.0%) | 21 (6.6%) |
| Play | 3.27 | often (119; 37.2%) | 25 (7.8%) |
| Recreation and sports | 3.26 | often (121; 37.8%) | 27 (8.4%) |
| Gaining knowledge and information | 3.12 | sometimes (126; 39.4%) | 29 (9.1%) |
| Self-realization/self-development | 3.05 | sometimes (113; 35.3%) | 38 (11.9%) |
| Shopping | 3.02 | sometimes (113; 35.3%) | 33 (10.3%) |
| Group affiliations | 3 | sometimes (136; 42.5%) | 36 (11.3%) |
| Interaction with others | 2.99 | sometimes (125; 39.1%) | 35 (10.9%) |
| Externalize your personality and express your emotions | 2.96 | sometimes (114; 35.6%) | 46 (14.4%) |
| Creation (creating something) | 2.79 | sometimes (108; 33.8%) | 47 (14.7%) |

Source: Own elaboration based on conducted CAWI (n=320)

2.96), communing with culture (F: 3.45; M: 3.37) and recreation and sports (F: 3.29; M: 2.23) were very similar. In other cases, the differences between women's and men's indications averaged 5%. In the case of needs for freedom of choice (6.28% difference in the average frequency of indications between women and men), communication with others (7%), visual and aesthetic (7.38%), and self-realization and self-development (8.81%) were the largest.

The analysis of the collected data also highlighted the variation in the average frequency of responses on the frequency of realized needs in urban plazas by personality traits. Respondents declared the degree of their nature on a five-point scale with two maxims: definitely introverted nature (1) and definitely extroverted nature (5). On average, those with a decidedly introverted nature declared a lower frequency of realized needs than respondents who declared themselves to have a decidedly extroverted nature. The difference between the extreme responses reaches the highest values in the case of gastronomic needs (1.28 point difference; 52% higher value for strongly extroverted people compared to introverts), creating (1.27 points; 67.91%), interacting with others (1.25; 58.59%) and externalizing one's personality and expressing

emotions (1.24; 59.62%). Despite the variation in absolute values, the Student's t-test showed no significant correlations of responses. This indicates the important role of personality in meeting needs that mostly require social contact. The minor differences between the average responses on the frequency of realized needs of extreme introverts and extroverts are observed in the needs for rest (0.48; 13.56%) and movement (0.53; 15.92%), as well as communing with nature (0.66; 21.43%), which do not necessarily involve intensive or any social contacts. Needs that are satisfied moderately less often by introverts than by extroverts are also a broad group. The variation of assessments depending on the declared personality reveals the important role of a person's internal capabilities in choosing the activity space for satisfying the identified needs. As the interviewees emphasized, urban plazas are places for satisfying multiple needs due to their spatial specificity – size and multiplicity of objects and functions. For this reason, introverts tend to seek low-social-engagement, individual activities to meet their needs. Conversely, extroverts look for entirely different activities, which are generally much more other-oriented. It is worth noting, however, that both introverts and extroverts can share urban plazas without mutual conflict.

It is also worth noting the average frequencies of respondents' indications by the six age groups adopted in the survey. People over 60 years of age (two age groups: "60–69" and "70 and over") overwhelmingly declared the rarest satisfaction of needs in the space of urban plazas in Poznań (15 of the 17 lowest scores). Other age groups declare only in the case of self-realization/self-development needs (the lowest average score in the 30–39 age group) and visual/aesthetic needs (the lowest average score in the 40–49 age group) lower average frequency. This indicates significant discrepancies between the needs of people over 60 and the possibilities of fulfilling these needs in the space of city plazas. Such discrepancies may be due to changes in the spatial structure of urban plazas that have been taking place in recent years due to, for example, the revitalization process and the reduced motor skills of people over 60.

On the other hand, people under 40 declared significantly more frequent satisfaction of such

needs as externalizing one's personality and expressing emotions, playing, creation, gastronomic, and shopping than those over 60. Thus, a shift in the center of gravity of satisfied needs from group needs (e.g., communicating with others, interacting with others, belonging to a group) to needs that are more individualized and turned toward the user's inner self (visual/aesthetic, creating, self-development) is observed. This may be related to the different lifestyles of younger and older people and the spatial/social conditions in which they grew up (are growing up).

There should also be three needs that most age groups highly rate. These are the needs for rest (6/6 age groups), movement (5/6), and visual/aesthetic (4/6). These three needs are a kind of bridge between the different age groups and promote similar activities among them. Therefore, we can speak of a certain universality, and the listed needs can be the basis for creating spaces that include all age groups in activities in urban plazas. The

Table 4. Heat map showing average frequencies of indications of satisfaction of a given need by age group of respondents. Bold – the three highest values in a given age group; bold italic font – the three lowest values in an age group

| Need | Age group | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|
| | 18–29 (n=44) | 30–39 (n=74) | 40–49 (n=57) | 50–59 (n=40) | 60–69 (n=54) | 70+ (n=51) |
| Safety | 3.2 | 3.28 | 3.67 | 3.63 | 3.19 | 3.45 |
| Gaining knowledge and information | 3.11 | 3.01 | 3.44 | 3.35 | 2.85 | 3 |
| Gastronomic | 3.39 | 3.55 | 3.39 | 3.4 | 3.13 | 3.14 |
| Communing with other people | 3.45 | 3.53 | 3.51 | 3.65 | 3.24 | 3.37 |
| Interaction with others | 3.09 | 2.96 | 3.16 | 3.35 | 2.74 | 2.75 |
| Group affiliations | 3.07 | 3.16 | 3.02 | 3.2 | 2.78 | 2.78 |
| Cultural exposure | 3.3 | 3.38 | 3.53 | 3.68 | 3.19 | 3.45 |
| Communing with nature | 3.61 | 3.46 | 3.65 | 3.65 | 3.43 | 3.39 |
| Rest | 3.82 | 3.96 | 3.93 | 4.03 | 3.74 | 3.73 |
| Movement | 3.59 | 3.8 | 3.7 | 3.8 | 3.65 | 3.57 |
| Recreation and Sports | 3.23 | 3.38 | 3.4 | 3.6 | 3 | 2.98 |
| Self-realization/self-development | 3.05 | 2.86 | 3.25 | 3.33 | 2.94 | 3 |
| Creation (creating something) | 3.02 | 2.77 | 2.81 | 2.9 | 2.59 | 2.71 |
| Externalize your personality and express emotions | 3.25 | 2.92 | 3.11 | 3.13 | 2.69 | 2.78 |
| Visual/aesthetic | 3.66 | 3.57 | 3.4 | 3.55 | 3.48 | 3.59 |
| Play | 3.45 | 3.5 | 3.4 | 3.5 | 2.91 | 2.84 |
| Shopping | 3.23 | 3.09 | 3.04 | 2.93 | 2.83 | 3.02 |

Source: Own elaboration based on conducted CAWI (n=320)

lowest frequency of respondents' indications about individual needs is also worth noting. In this context, we can distinguish two needs that were unanimously or almost unanimously rated lowest by survey respondents in each age range. These are the creation needs (6/6 age groups), externalizing one's personality, and expressing emotions (4/6). The declared low frequency of satisfaction of needs by most of the age groups participating in the survey may also provide some indication of the design of urban plaza spaces. The results show that, in general, in the eyes of the survey participants, urban plazas are transit spaces for relaxation, and their space and immediate surroundings have considerable aesthetic value.

The results of the variation in the respondents' declared frequency of indications relating to the satisfaction of needs in the city's plazas by age group are shown in the following table as a heat map (Knafllic, 2015). Each age group's average frequency of indications was visualized separately for each need (horizontal analysis). This made it possible to visualize the average frequency of indications for each need by age group.

4.2. Typology of needs met in urban plazas

The data obtained through individual in-depth interviews suggest that the identified needs can be divided into two main categories: obligatory and optional. Obligatory needs refer to the main goals with which a person comes to an urban plaza. They are treated as crucial, essential and most important, and their satisfaction often conditions the realization of other needs (Gehl, 2013). Optional needs, however, are realized after or during the satisfaction of obligatory needs. To some extent, the proposed division follows the hierarchy of needs proposed by Maslow (1943, 1954, 1962). However, it is much more fluid due to the possibility of simultaneous realization of several needs of both optional and obligatory nature. These needs can be divided into four subcategories: (1) basic and (2) recreational, (3) social and (4) developmental. Each identified need can be classified as obligatory or optional, depending on the context.

Urban plazas are spaces where needs categorized as basic are realized. They relate to necessary activities and are considered the most basic. Their satisfaction often conditions the realization of other needs. Therefore, the needs for safety, movement, acquiring knowledge and information, and shopping are included in this category. They can be referred

to as the needs of existence (E) identified by C. Alderfer (1969).

[...] so when there were these market plazas and I had, for example, to transfer between a bus and another to work and had to wait 15 minutes, in the meantime I bought myself some small groceries just at the markets, vegetable market.

Female, 45

The largest category of identified needs is recreational and leisure needs. They are usually associated with people's optional activities. The need for rest is the most commonly met among this needs category, which is defined by its gastronomic, recreational or sports nature. The restful nature of urban plazas was clearly emphasized in the in-depth interviews. Interviewees indicated that city plazas are spaces for fulfilling the needs of rest and recreation and sports. Respondents emphasized that they are spaces where the need for play is often also realized. This refers to both play among children and between adults and children. This need also refers to various types of events and meetings with friends. Urban plazas are places conducive to respite and regeneration during daily urban existence. Due to the numerous restaurants and cafes in the area, city plazas are chosen to fulfill gastronomic needs.

We go to the plaza for enjoyment. It is supposed to be a place of relaxation, rest. So that a person would move from the busyness of everyday life to such a rest. To have that deep breath.

Male, 31

This is such an oasis of peace. This is what a person goes for, to sit for a while, to think. To feel a little different from this everyday rush.

Male, 65

Due to their open nature, urban plazas are often equated with spaces that fulfill social needs. This needs category mainly refers to social activities carried out during leisure time, which involve active and passive interpersonal contacts. Included in this category was the need to communicate with others (3.46), confirming the critical role of urban plazas in forming interpersonal relationships. Significantly lower ratings were assigned by respondents to the need to interact with other space users (2.99). This highlights the disparity between activities among loved ones and activities with unknown people. Low scores were assigned to the need to externalize one's personality and express emotions (2.96) and to belong to a group (3.0), confirming the above

conclusion. This may be due to the relatively infrequent (compared to daily use) functioning of city plazas as a space for expressing one's thoughts, e.g., by participating in protests, strikes and gatherings, where strangers united by a common goal are primarily present. During the in-depth interviews, interviewees very often referred to city plazas as a space for political expression and a place of demonstration. Thus, the above needs are essential for users of urban plazas but are not realized as often as the other needs satisfied during daily activities.

A meeting place where I actually hang out with my husband or friends. Somewhere there is a landmark and these are our meeting places.

Female, 48

On the one hand, I would look at it and so in general describe it as such a place of space development mainly culturally, but also at some celebration events. (...) For example, Freedom Square is more of a cultural type, like a stage, some such cultural events. Mickiewicz Square rather such city life more for these protests, strike, celebrations, because we have this big monument there.

Male, 22

Urban plazas are also spaces that, to some extent, are dedicated to self-realization and self-development needs. Development needs are usually related to developing one's passions and interests. The need to create is also included in this group. This type of need can be identified with the group of developmental needs (G) proposed by Alderfer (1969). To some extent, this category can relate to recreational/leisure needs. Depending on the context, for example, the need for recreation and sports can also be classified as developmental by users of urban plazas.

When the weather is so nice, you have a completely different mood then, and why should I sit at home and read a book to myself somewhere in a closed room – I can sit in such a Mickiewicz Square along these alleys, where the fountain spouts here, and I sit and read a book. And not only do I read because I like it, because it's my passion, but also in such a beautiful environment.

Female, 74

The identified needs to be broken down into four subcategories are shown in the Table 5:

At the same time, based on the average values obtained by each need (see Table 1) and using the standard deviation for calculations, four categories were distinguished: needs with low-, medium-,

Table 5. Categorization of the needs met in the space of urban plazas by their users

| Need | Category |
|--|---------------|
| Shopping | Base |
| Movement | Base |
| Safety | Base |
| Rest | Recreational |
| Visual/aesthetic | Recreational |
| Communing with nature | Recreational |
| Cultural exposure | Recreational |
| Gastronomic | Recreational |
| Play | Recreational |
| Recreation and Sports | Recreational |
| Communing with other people | Social |
| Group affiliations | Social |
| Interaction with others | Social |
| Externalize your personality and express your emotions | Social |
| Gaining knowledge and information | Developmental |
| Creation (creating something) | Developmental |
| Self-realization/self-development | Developmental |

Source: Own elaboration based on conducted CAWI (n=320)

high- and very-high-frequency satisfaction. The first group included the following needs: creation, externalizing your personality and expressing your emotions, interaction with others, and group affiliations. The groups of high and very high frequency of satisfaction in urban plazas included movement (high) and rest (very high), respectively. The remaining needs (10 in total) were assigned to the medium frequency of satisfaction category.

5. Discussion and conclusions

An analysis of the frequency of meeting needs in urban plazas indicates that they are primarily recreational and leisure spaces. This indicates their essential role in this regard, especially in city centers. Together with parks and little squares, they can provide places of rest during daily urban existence (Ryan & Borden, 2006). The study rated social needs – belonging to a group, interacting with others, externalizing one's personality, and expressing emotions – relatively low. These needs relate to activities often carried out with strangers. The corollary to this is that significantly higher frequency of satisfaction scores were attributed to the need to communicate with others, which refers primarily to contact with acquaintances. Despite their social character, urban plazas are spaces of contact mainly with close people (Bierwiazzonek, 2016). In this regard, one can speak of their social importance from two perspectives. First, it is to satisfy users' needs with friends and conduct activities with them. On the other hand, it is also the conduct of activities by multiple social groups simultaneously, which form the background of the activities undertaken together using the same space and taking advantage of the opportunities it offers. In this respect, the "community" of urban plazas should be seen.

The average frequencies of indications regarding the satisfaction of needs suggest that survey participants could not distinguish the dominant needs satisfied in the urban plaza space. Admittedly, the highest value is for the need for rest (3.87) and is 0.18 points higher than the need for movement, next in the list, but the differences between the following needs are much more minor. The slight differences between the following needs in the order do not allow us to conclude that these needs are dominant over others in terms of the frequency with which they are met in the space of urban plazas. It is also worth noting the relatively small spread between the highest and lowest ratings of the

frequency of satisfaction of needs in urban plazas (a difference of 1.08 points with 17 needs, giving an average distance between them of 0.06 points). The average frequencies of respondents' indications show that urban plazas are spaces where it is possible to satisfy various needs with similar frequency, which is related to their multi-functionality, as indicated by Harun, Zakariya, Mansor & Zakaria (2014) and Živković, Lalović, Milojević & Nikezić (2019).

Two needs have the highest percentage of "I do not satisfy it" responses about urban plaza spaces. Low scores were assigned to the need to externalize one's personality and express emotions (2.96) and to belong to a group (3.0). This may be due to the relatively infrequent (compared to daily use) functioning of urban plazas as spaces for expressing one's thoughts, e.g., by participating in protests, strikes and gatherings (Wronkowski & Lorek, 2022), where strangers united by a common goal are predominantly present (Parkinson, 2012). During individual in-depth interviews, interviewees often referred to urban plazas as a space for political expression and demonstration. Thus, the above needs are essential to users of urban plazas but are not realized as often as the other needs satisfied during daily activities.

The study results of the frequency of satisfied needs in the space of urban plazas by different age groups can be treated similarly to the age pyramid. They illustrate specific dynamics of satisfied needs, and each age group has different characteristics. With the emergence of the youngest group of users (18–29 years), urban plazas began to be spaces of increased satisfaction of some needs (creation, externalization of one's personality and expression of emotions, visual/aesthetic), limiting the satisfaction of other needs realized much more often by older people (such as communing with culture, movement, and recreation and sports). The realized needs vary according to the age groups that use their point to the need to design urban plaza spaces with the needs of children, the elderly, people with disabilities and other social subgroups in mind (Marcus & Francis, 1997; Burton & Mitchell, 2006; Tonnelat, 2010; Southworth et al., 2012). Moreover, some evaluation and change in the urban design of urban plazas are needed to ensure their continuity of use both in the context of the diverse needs of different social groups (Moore et al., 2022) and their seasons (Costamagna et al., 2019). Moreover, the results obtained make identifying two distinct needs groups possible. The first group consists of needs whose average frequency of indications can be described as high. These are the needs for rest and movement. The CAWI results indicate that these are

the needs most often satisfied in urban plazas for most age groups. Needs were also identified whose average frequency of indications was rated lowest by most respondents by age group. These are the need to create and externalize one's personality and the need to express emotions. In the context of the rather significant variation of needs between age groups, the above needs seem intergenerational and unite all users regardless of age. In particular, the needs most often realized should be the basis for creating spaces that include all age groups (Landman, 2020; Jian et al., 2021). The above results revealed the problem of designing urban plazas and public open spaces. The design of such spaces is based on historical, or at most current, user needs. This approach results in short-term shelf life for designs and rapid potential obsolescence of the ability of public spaces to meet user needs.

Notes

1. A document created during the 3rd Congress of Polish Urbanism in 2009 indicating threats to public spaces and outlining desired directions for change.

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Appendix

Characteristics of plazas in Poznań

| Plaza name | Brief description | Photo of the plaza |
|-----------------------|---|---|
| Adam Asnyk Plaza | A plaza with an area of about 4200 m ² , located among compact, historic downtown buildings in the Jeżyce district. Developed mainly as a playground and resting place for adults. |  |
| Anders Plaza | Space with an area of about 2,300 m ² , located in the business part of the city center at the characteristic promenade (Półwiejska Street). Its development mainly includes lining its surface with paving stones and a few plantings of trees and shrubs. |  |
| Adam Mickiewicz Plaza | Plaza with an area of about 2000 m ² , located in the center of the city in the immediate vicinity of the park of the same name and buildings of the Adam Mickiewicz University in Poznan. The plaza is empty, paved with cobblestones. Overlooking the plaza is the monument to the Victims of June 1956. |  |
| Bernardynski Plaza | One of the trade plazas in Poznan with an area of about 3300 m ² . Many stalls and sales stands are located in its space. In its immediate vicinity are old downtown buildings, a church and a streetcar stop. |  |
| Cyryl Ratajski Plaza | The plaza has a traffic character with an area of about 8,000 m ² . A street runs around the plaza, and a streetcar line runs through the center of the plaza, with a stop in the central part of the plaza. The rest of the surface includes sidewalks and plantings of medium and tall greenery. The plaza is surrounded by tall, historic downtown buildings. |  |
| Dzialowy Plaza | A triangular space at the intersection of two roads with an area of about 650 m ² . The vast majority of the space is a parking lot. Near the plaza is located a basilica, a church and a cemetery. |  |

| | | |
|------------------------------|--|---|
| Kolegiacki Plaza | The plaza was created on the site of the former collegiate church of St. Mary Magdalene. Its area is 5,000 m ² . The current development of the plaza includes large empty spaces, tree planting in the northeastern part and fountains in its southern part. |  |
| Kazimierz Nowakowski Plaza | A green plaza with several alleys with an area of about 8600 m ² . It has a playground in its northern part, and is bounded on the south and west by busy streets and a large traffic circle. |  |
| Maria Skłodowska-Curie Plaza | A fenced yard full of medium and tall greenery. Its area is about 5,200 m ² . It is located among historic downtown buildings, which in recent years have been supplemented with modern multi-family buildings, and the former market plaza of one of the small villages near Poznań. |  |
| Orawski Plaza | A green space of about 2,800 m ² , located among single-family housing. It is a fairly unorganized space, landscaped mainly with grass and surrounded by tall trees. |  |
| Spiski Plaza | A space quite similar to Orawski Plaza in terms of location (400 meters to the east) and development (with a higher proportion of tall greenery). Its area is 6,200 m ² . |  |
| Wielkopolski Plaza | Shopping plaza in Poznan. In its space (counting about 8,300 m ²) are located numerous commercial stands. A streetcar line runs through the plaza and a bus stop is located there. |  |

| | | |
|---------------------------|---|--|
| <p>Wiosny Ludow Plaza</p> | <p>Plaza in the very center of the city, located near the Old Market Plaza. Its area is about 4,700 m². The development of the plaza is partly a parking lot and partly an area of unmanaged greenery with a path running through the center of the plaza.</p> |  |
| <p>Freedom Plaza</p> | <p>Located to the west of the medieval part of the city, a space of 17,500 m². It is empty in the central part, and low and medium plantings have been provided along its edges. A fountain with an interesting form in its western part is characteristic of this plaza. A streetcar line runs along its southern border.</p> |  |
| <p>Old Market</p> | <p>The main city plaza in Poznan, delineated around 1253 as the central place of the city. It has an area of nearly 19,000 square meters. In its central part is the former city hall and museum. The Old Market Plaza is surrounded by medieval buildings with numerous streets diverging from it.</p> |  |

