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The factors determining the security perception in urban parks in different perceptual approaches

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Abstract. The sense of security in urban parks significantly determines the way visitors use them. This article presents the results of research on the factors influencing the sense of security in green areas, conducted using two methods: a survey questionnaire and a photo questionnaire. The respondents indicated which factors have an impact on the safety of staying in parks and also assessed the level of personal safety based on real park scenes. The correlation of the results determined whether there were discrepancies between general declarations and the actual sense of security. The results show that the respondents partially differ in indicating the factors influencing their safety depending on the research method used. The study confirms that the use of several methods is helpful for a more precise assessment of the sense of security of users of green areas, which is crucial for shaping safe urban parks. At the same time, the obtained results provide a basis for expanding the study, including other multiple comparisons, using different variables and/or other data collection methods.

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1. Introduction

Security is one of the crucial issues playing an increasingly important role in the use of urban green areas. Safe parks are attractive public spaces that bring many benefits to city dwellers – they are key to well-being, improve the psycho-physical health of city dwellers, provide leisure and enable social integration in a natural environment (Bedimo-Rung et al., 2005). However, urban parks, like other large public spaces available to many users, may be perceived as 'risky' (Eck et al., 2007). A wide range of their features, together with those such as surround features and social cohesion, is the source of crime and its variability (Taylor et al., 2019). Some parks may even have several hazardous areas where various problems related to undesirable behaviours occur, increasing the likelihood of conflicts, disorder, and incivility. Many threats result from the presence of physical barriers. The sense of security of urban park users is influenced by many specific factors - social and physical, personal or intersectional characteristics, and experiences. The recognition and elimination of potential threats are necessary to create safe green areas – places that are diverse and interesting, meet the needs of their users, and provide them with a positive image and experience (Lorenc et al., 2012). In the context of safe urban parks, the significant factors include those related to various aspects of visibility, maintenance and cleanliness, other park users, and the implementation of different forms of external protection (Maruthaveeran & van den Bosch, 2014; Mak & Jim, 2022; Polko & Kimic, 2022).

Visibility conditioned by the time of day and the presence of artificial lighting after dusk affects the availability of parks and the ability to move around them, and therefore it is one of the important factors with a positive impact on the perception of security (Calvillo Cortés & Falcón Morales, 2016; Mahrous et al., 2018; Masullo et al., 2022). The character of vegetation, such as its density (Andrews & Gatersleben, 2010; Qiu et al., 2013) or arrangement (Jorgensen et al., 2002), can also be an essential factor affecting personal safety (Maruthaveeran & van den Bosch, 2014; Sundevall & Jansson, 2020). The presence of hidden or hard-to-reach places resulting from vegetation density can also act as a deterrent to visiting parks (Burgess et al., 1988; Lis et al., 2019; Kimic & Polko, 2025). Negative feelings may be evoked by the generally poor condition of green areas, which proves that the parks are insufficiently maintained (Jorgensen et al., 2002; Braverman, 2008; Suchocka & Kimic, 2019). A low level of cleanliness in parks is often the reason for avoiding them (McCormack et al., 2010; Bai et al., 2013), and visible damage to equipment and graffiti on park facilities may intensify the negative assessment of these places (Bedimo-Rung et al., 2005; Campbell et al., 2021).

Various forms of external protection are also used employed in urban green areas to provide safety for their users. One of the common standard security precautions is fencing which minimizes danger. The night closure eliminates offenders, unwanted intruders and vandalism (Nordh & Østby, 2013; Shi et al., 2014). Video surveillance (Socha & Kogut, 2020) and police patrols are other popular strategies aimed at reducing crime and improving the sense of security (Zavadskas et al., 2019).

Urban parks are places for various types of visitors to spend time outdoors. The presence of other people, including the possibility to be visible and to see others, can be crucial to feeling safe. This also applies to their activity – signs of undesirable and destructive social behaviors are a deterrent factor (Nasar & Fisher, 1993; Herzog & Kutzli, 2002; Lorenc et al., 2013; Stefanizzi & Verdolini, 2019). Park users engaged in acceptable ways of using the space and participating in passive activities are usually assessed positively, while some forms of recreation may reduce the sense of security of others (Lindberg & Schipperijn, 2015). The presence of children in the playground has two dimensions – for some, it is a sign of a high level of safety in the park; for others, it may be a threat resulting from the excessive physical activity of the youngest or generational differences (Santos et al., 2016; Sundevall & Jansson, 2020; Davet, 2021). Security in green areas may also be related to the presence of water – generally, these elements are viewed positively by observers. Selected studies assessed water as a good predictor of high perceived safety (Schroeder & Anderson, 1984). Some negative aspects include the low quality of water, its pollution, dirt (Taylor et al., 2020), the access to a pond or lake (Shepley et al., 2019), and in selected studies, both varied topography and water elements are perceived as limiting security (Park, 2017; Shepley et al., 2019; Kimic & Polko, 2022).

Studies on the sense of security of urban park users employ various approaches and methods of obtaining information. However, most of them are used separately and focused on their specificity, and the results are not correlated with others. This gap, resulting from the limitations of the individual survey methods, may be significant for the obtained results. Each of these methods has certain disadvantages that may limit the effectiveness of both the data collection and distort its reliability and thus affect the importance of the preferences indicated (Gao et al., 2019; Kimic et al., 2025). The most popular is the survey questionnaire – a technique used for gathering statistical information about the attributes, attitudes, or actions of a population by a structured set of questions.

Administered by mail, in person, online, and over the telephone, questionnaire surveys provide broad coverage of populations. They enable the exploration of spatial and social variations in people's attributes, attitudes, and actions. The aim is to obtain accurate information suitable for statistical analysis by paying attention to how participants are selected, the extent to which questions relate to underlying concepts, and how often people answer each question (Preston, 2020). However, this technique requires large human resources to carry it out. Moreover, even if the survey is based on personal contact with the respondent, the limited time allocated to its implementation may affect the selection of the sample. Similarly, an online questionnaire may not reach some potential respondents due to their limited internet access (Andrade, 2020). These limitations may affect the reliability of the obtained results, even despite the use of special diligence and care in planning and carrying out such studies.

In studies on the feeling of safety in green areas, not only are text questions increasingly used, but also visual methods, because people's visual sense largely dominates landscape perception and preference. The use of visual elements such as diverse types of images is important, especially in the era when visualization becomes more prevalent for communication (Franconeri et al. 2021). Both on-site studies through the experience of the landscape, as well as off-site studies triggered by a representative scene through a medium such as photographs constituting a real representation of specific places and/or spatial situations, or visualizations (virtual reality) giving the possibility of modification of different landscape scenes, are carried out (Anjum et al., 1998; Bishop & Rohrmann, 2003; Fujisaki et al., 2007; Yi Xiang et al., 2021; Naghibi et al., 2022; Kimic et al., 2025). The photo questionnaire has been acknowledged as a valid and reliable method to represent the real and actual environment (Gau & Pratt, 2008; Hami & Emami, 2015). It is usually used in perception studies and landscape aesthetic quality assessments in which photographic representations are used as an implication with direct observations of landscapes (Daniel, 2001; Liu & Schroth, 2019). At the same time, the addition of photographs to the survey makes the presented information easier to understand and thus increases the perception process. The photo questionnaire is more intuitive, especially when complex or specific photographs are used. An online experience with that kind of survey is for participants more visually appealing, leading to better respondent participation and reduced drop-off rates, and significantly increases engagement with the study process. This is why this method might be regarded as an effective research instrument for the perception of security in urban parks. The conducted pilot studies show that the results obtained using the above-mentioned methods differ to some extent (Gao et al., 2019), which, in consequence, may be important for planning and designing safe urban parks.

Research based on comparative methods for the perception of safety is very limited (Šerý et al., 2024; Kimic et al., 2025), including the lack of correlations between the results obtained using the aforementioned two types of questionnaires. Thus, the objective of this study was to investigate which factors related to the visibility, maintenance and cleanliness, other park users, and external protection play an essential role in the evaluation of the personal security of the parks' users. Its implementation is to be guaranteed by the use of two perceptual approaches based on different research methods (textual and visual). Comparing general declarations about the factors shaping the sense of security through the assessment of specific scenes from urban parks allowed us to find a correlation and select those factors whose impact, thanks to the triangulation of methods, can be defined as necessary. The following two hypotheses were considered in this study:

Hypothesis 1. Users may assess factors shaping their sense of safety in urban parks differently depending on the type of questionnaire used.

Hypothesis 2. Only after triangulation of the study methods and techniques will it be possible to identify specific factors that shape the sense of security.

2. Research materials and methods

2.1. Research design

The study serves to document a new approach to interpreting results on the factors influencing the sense of security of urban park users, conducted using two methods: a survey questionnaire and a photo questionnaire. The study was conducted on a group of 394 randomly selected adult park users in Poland. The data for analysis were collected in the authors' earlier publications (Polko & Kimic, 2022; Kimic & Polko, 2022) between March and August 2020, online. Respondents were asked not to be guided by their experiences regarding the pandemic period when answering the questions. All study participants answered both parts of the questionnaire. In this preliminary study, the variables such as gender and age were not investigated.

In line with the primary objective and assumptions contained in the hypotheses presented in the Introduction section, the identification and categorization of factors shaping safety in urban parks was made based on the literature review and then used

in the first part of the study – the survey questionnaire. In the second part of the study, a photo questionnaire was used – 14 photos were selected showing real scenes from parks with a specific factor shaping the sense of security. The photos were taken in various parks located in Polish cities. The representative scenes have been selected from the database of over 200 photos of the authors themselves in order to illustrate various aspects, such as time of day and season, greenery condition, park infrastructure, cleanliness of the park and its maintenance, presence of other people, security systems, and presence of water elements.

Before starting the main study, a preliminary study was carried out to check whether the selected photographs show the selected factors. 12 people participated in the initial study. They were asked what aspect of the photos they were shown. They could choose from answers from a closed cafeteria, including factors indicated in the questionnaire. Depending on the photo, the compliance of the respondents' opinions with the assumption made when constructing the survey was from 74 to 96 per cent. As a result of the information obtained, two photos were replaced to better represent the opinions of the respondents.

At first, the results obtained from both methods were subjected separately to statistical analysis, and in the second stage of the study, they were correlated in order to indicate the factors selected as important for building the sense of security of the respondents using both study methods.

2.2. Questionnaire characteristics

In the first part, the textual questionnaire indicated 6 groups of factors, emphasized in the international literature as being associated with perceived security in urban parks thus most important (Loewen et al., 1993; Nasar & Fisher, 1993; Burgess, 1996; Yeoh & Yeow, 1997; Kuo et al., 1998; Crewe, 2001; Jorgensen & Anthopoulou, 2007; Maruthaveeran & Konijnendijk van den Bosch, 2014; Mak & Jim, 2018, 2022), such as (1) visibility (2) maintenance (3) cleanliness (4) external protection (5) other park users and their behaviors and (6) the presence of water. Details are presented in Table 1. The questionnaire asked the participants to rate each of the factors in terms of perceived security on the 5-point Likert scale (Likert, 1932), where 1 meant a very low, and 5 – a very high impact of the factor. Respondents were asked to indicate how, in their opinion, individual factors affect safety in an urban park.

In the second part, the photo questionnaire showed 14 photos of different real scenes in urban parks in Poland. The respondents were asked to rate each of them in terms of their perceived security on the

Table 1. Groups of factors indicated in the questionnaire

groups of factors	specific factors
visibility	dark night
	artificial lighting
	possibility to be visible and to see others
	presence of hidden or hard to reach places
	greenery without leaves
maintenance	condition of greenery
cleanliness	graffiti on park facilities
external protection	police patrols
	video surveillance
	fencing, night closure
other park users	passive users children in the playground
presence of water	water elements (ponds, lakes, brooks)

Source: Own author's data

continuation Fig.1 on the next page

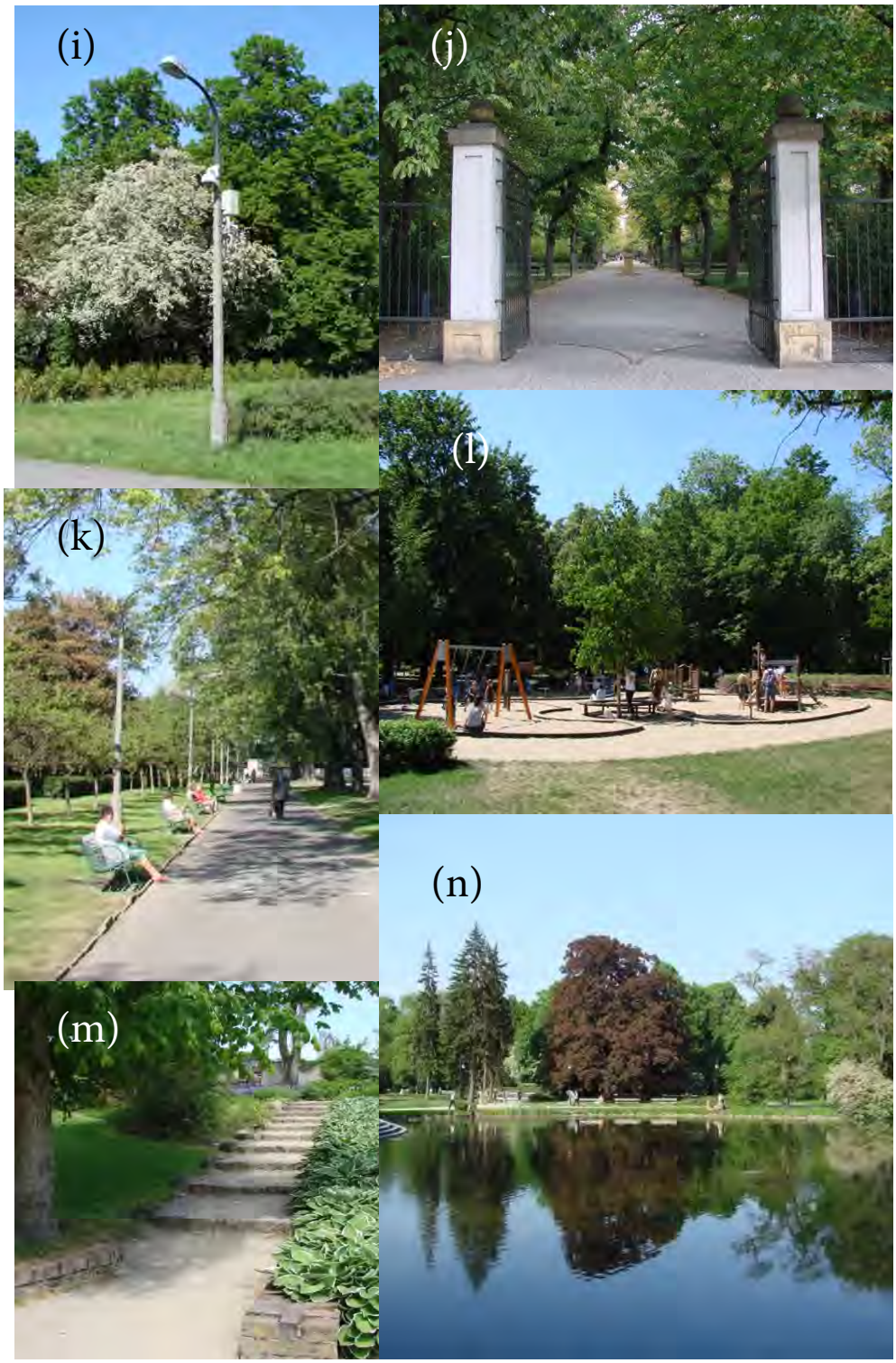

Fig. 1. Photos of parks presented to the respondents in order to learn about their sense of security: (a) a park during a dark night without artificial lighting; (b) a park with artificial lighting after dark; (c) a park where users have the possibility to be visible and to see others; (d) a park with hidden or hard to reach places; (e) a park with greenery without leaves; (f) a park with greenery in good condition; (g) graffiti on park facilities (h) a park patrolled by police; (i) a park with video surveillance; (j) a park with fencing; (k) passive users in a park; (l) children in the playground in the park; (m) a park with varied topography; (n) park with a pond

Source: All photos are the property of the authors of the article and have been taken by them personally

5-point Likert scale, where 1 meant a very low level, and 5 meant a very high level of perceived security in the indicated park. All the used research photos are presented in Figure 1.

The part of the questionnaire containing the photos was a separate part – questions about the sense of security were not connected with questions about the importance of factors. Respondents first answered the question of how the indicated factors affect the shaping of safety in urban parks and then assessed how safe they would feel in the parks presented in the photos.

3. Research results

The programme PS Imago Pro 6.0 was used to analyze the collected data. The reliability of the ratings of factors was tested with the Cronbach's Reliability Test and yielded a relatively high Cronbach's Alpha = 0.816. All the factors were combined into a scale to assess them.

3.1. The first part – the survey questionnaire

The results of the first part of the textual questionnaire containing the mean perceived security ratings for the examined factors shaping the sense of security are presented in Table 2.

None of the indicated factors received a rating above 4.50 in terms of the impact on shaping the sense of security. 4 out of 14 factors turned out to be very important (rating above 4.00). These are factors related to visibility (the possibility of being visible and seeing others and artificial lighting) and to park supervision (video surveillance and police patrols). Factors rated above 3.50 can be considered important. These include, from the visibility group, dark nights and the presence of hidden or hard-to-reach places; from the maintenance group: the condition of the greenery; and from the external protection group: fencing, and night closure. This shows that the dominant groups of factors which, according to the respondents, have the most significant impact on shaping their sense of safety in the park are related to visibility (both with the amount of light, time of day, etc., as well as space management) and the presence of organized forms of protection.

3.2. Second part – photo questionnaire

In the second part of the survey, the respondents answered the question of how safe they would feel in the parks shown in the photos (Figure 1). The

Table 2. Mean perceived security ratings for factors shaping the sense of security based on the results from the textual questionnaire

Factor	Mean perceived security ratings	Standard deviation
dark light	3.91	1.345
artificial lighting	**4.19**	1.020
possibility to be visible and to see others	**4.33**	0.955
presence of hidden or hard-to-reach places	3.76	1.348
greenery without leaves	3.00	1.302
condition of greenery	3.59	1.305
graffiti on park facilities	2.95	1.394
police patrols	**4.17**	1.106
video surveillance	**4.18**	1.105
fencing, night closure	3.67	1.351
passive users	2.56	1.384
children in the playground	2.64	1.402
varied topography	3.24	1.388
water elements (ponds, lakes, brooks)	3.05	1.317

Source: Own author's data

Table 3. Mean perceived security ratings for factors shaping the sense of security based on the results from the photo questionnaire

Photo	Mean perceived security ratings
a	4.36
b	1.71
c	**4.59**
d	**4.50**
e	4.25
f	3.95
g	3.10
h	4.29
i	3.40
j	3.99
k	**4.42**
l	2.96
m	4.28
n	3.07

Source: Own author's data

summary of the mean perceived security ratings for the photographs in question is presented in Table 3.

The respondents indicated that they would feel the safest (4.59) in a park with well-kept greenery. This factor was more important than the presence of a police patrol (4.50). The third safest park (4.42) is the one where passive users can be found. The presence of other users who do not behave aggressively, do not engage in competitive sports and do not ride bikes or scooters, builds the belief in the respondents that it is a safe place. Parks that offer visibility and the opportunity to interact with others can also be considered as such; they are closed at night, fenced, and filled with children playing in playgrounds, accompanied by small water features. According to the respondents, the least safe parks after dark are those without artificial lighting and with hidden or hard-to-reach places.

3.3. Correlation

As can be seen from the data compilation, the respondents identify factors differently that may affect their safety in urban parks in a 'theoretical' way when answering questions in the survey questionnaire and when assessing real scenes in the photo questionnaire. Comparing respondents' answers from the questionnaires, it should be emphasized that in both of them, the presence of the police patrols was repeated as most significant for safety in parks, while the remaining significant 3 factors in the survey questionnaire and 2 in the photo questionnaire were different (Table 4).

The differences mentioned above are the basis for determining the second part of the study: the correlation between the answers given in the first and second parts of the survey. The correlation was performed as follows:

Factor: dark night visible in the photo a;

- Factor: artificial lighting visible in photo b;
- Factor: possibility to be visible and to see others visible in photo c;
- Factor: the presence of hidden or hard-to-reach places visible in photo d;
- Factor: greenery without leaves visible in photo e;
- Factor: condition of greenery visible in photo f;
- Factor: graffiti visible in photo g;
- Factor: police patrol visible in photo h;
- Factor: video surveillance visible in photo i;
- Factor: fencing, night closure visible in photo j;
- Factor: passive users visible in photo k;

Table 4. Position and types of significant factors shaping the sense of security in urban parks from two types of questionnaires

Position	Survey questionnaire (ratings)	Photo questionnaire (ratings)
1	possibility to be visible and to see others (4.33)	condition of greenery (4.59)
2	artificial lighting (4.19)	police patrols (4.50)
3	video surveillance (4.18)	passive users (4.42)
4	police patrols (4.17)	-

Source: Own author's data

- Factor: children in the playground visible in photo l;
- Factor: varied topography visible in photo m;
- Factor: water (ponds, lakes, brooks) visible in photo n.

Spearman's rank correlation coefficient (RHO) was used to check the correlation between the assessment of the significance of the factor and the sense of security in the park depicting it. It was assumed that the correlation is weak from 0.0 to 0.2, low from 0.2 to 0.4, moderate from 0.4 to 0.6, high from 0.6 to 0.8, and very high from 0.8 to 0.9. Values from 0.9 to 1.0 represent the virtually full correlation. It was assumed that the correlation is statistically significant at $p < 0.05$.

The higher the correlation coefficient, the greater the dependence, which in the case of the presented data can be interpreted as a concordance in the theoretical assessment of the importance of factors shaping the sense of security in urban parks and the feeling in the park representing the indicated factor. On the other hand, the lack of correlation or its low value may mean that there is a discrepancy between the theoretical assessment and personal perception. Table 5 presents the results of the correlation for the factor-photo pairs.

The highest correlation indicators were observed for the presence of a police patrol in the park. Its value allows us to classify the correlation as low. The second pair of correlated factors was related to the presence of artificial lighting in the park after dark. The values of the factors allow for classifying the correlation as low, too. Similarly, in the case of the correlation of factors relating to the presence of other passive users in the park, its fencing and the possibility of closing it, the possibility of being visible and to see others, and to monitor the park using video surveillance, we can also speak of weak and low correlations. In all these cases, the correlation is positive, and therefore, the presence of a given studied factor builds a sense of security. On the other hand, in the case of factors relating to the presence of graffiti in the park and the sense of security in a dark, unlit park after dark, we have a negative correlation (which affects the sense of security, reducing it) at a low level.

There is no statistically significant correlation in both tests in the case of factors such as the presence of varied topography, children in the playground, water elements (ponds, lakes, brooks), the presence of hidden or hard-to-reach places, the condition of greenery and the presence of greenery without leaves.

Table 5. Summary of the correlation results for pairs: factor-photo showing the correlated factor

Variables to be correlated (factor with the photo illustrated the factor)	RHO Spearman
dark night/photo a	**-0.115***
artificial lighting/photo b	**0.262****
possibility to be visible and to see others/photo c	**0.109***
presence of hidden or hard-to-reach places/photo d	Not significant
greenery without leaves/photo e	Not significant
condition of greenery/photo f	Not significant
graffiti/photo g	**-0.187****
police patrol/photo h	**0.329****
video surveillance/photo i	**0.150****
fencing, night closure/photo j	**0.101***
passive users/photo k	**0.127***
children in the playground/photo l	Not significant
varied topography/photo m	Not significant
water (ponds, lakes, brooks)/photo n	Not significant

Explanation: * Correlation statistically significant at the level of 0.05 (two-sided)
** Correlation statistically significant at the level of 0.01 (two-sided)
Source: Own author's data

4. Discussion

The main objective of the presented study was to identify what factors have the most significant impact on the sense of security of urban park users, regardless of the type of questionnaire used. The secondary goal related to the main objective was to examine how different methods (two types of questionnaires) used in the study affect the results and whether it is justified to use triangulation of methods in order to obtain the most reliable results in the area of detection of key factors for shaping the sense of security of users of urban parks.

The results show that respondents assessed various factors, which determine their security perception in urban parks, differently in both parts of the study. In the case of the survey questionnaire, the most affecting factors were: possibility to be visible and to see others (4.33), artificial lighting (4.19), video surveillance (4.18) and presence of the police patrols (4.17), while in case of the photo questionnaire, respondents indicated: condition of greenery (4.59), police patrols (4.50) and the presence of passive users (4.42)(Table 4). This result confirms hypothesis no. 1, that users may assess factors shaping their sense of safety in urban parks differently depending on the type of questionnaire used. The importance of these factors is widely discussed in the literature on the subject, and the results of the research confirm their positive impact on the increase in safety in public spaces, including urban parks. People rely on the presence of others as cues that might increase or decrease their fear of all types of public spaces (Jorgensen et al., 2013). The possibility of being visible to others in urban parks generally increases the sense of user safety (Skär, 2010; Lindgren & Nielsen, 2012), as well as observing other people, except for those violating the basic principles of using such areas (Maruthaveeran & van den Bosch, 2014; Lis & Iwankowski, 2021). Artificial lighting is a popular solution for crime prevention in all types of public spaces (Crewe, 2001; Welsh & Farrington, 2008; Lorenc et al., 2013; Fotios et al., 2015), especially in urban parks (Shenassa et al., 2006; Maruthaveeran & van den Bosch, 2015). Both video surveillance and police patrols are positively assessed by the majority of park users (Welsh & Farrington, 2008, 2009; Kimic & Polko, 2022; Polko & Kimic, 2021). The discussed studies are therefore in line with this trend and strengthen it. The results of the second part of the survey (photo questionnaire) also coincide with most studies conducted in this area, where the importance of a good condition of greenery is emphasised not only for the improvement of health and well-being (Sefcik et al., 2019), but especially for the sense of security in urban parks (Jorgensen et al., 2002; Jansson et al., 2013).

After applying the correlation of the factor with the photo, it turned out that the significance of factors from the groups: (1) external protection (factor: police patrols, fencing, night closure and video surveillance), (2) visibility (artificial lighting and dark nights), (3) cleanliness (graffiti) and (4) other park users (passive users) was confirmed, with the strongest correlation occurring for factors from the groups: visibility and external protection. It should be noted, however, that the correlation did not occur in the case of the condition of greenery factor, although when answering the question about the sense of security in the well-kept park visible in the photo, the respondents indicated it as the safest of all the presented ones.

The traditional approach to opinions on the perception of safety in public spaces, especially urban green spaces, is usually based on collecting data using a single method, or elements of different methods contained in one questionnaire are used to complement them rather than compare the results (Gyllin & Grahn, 2015; Mahrous et al., 2018; Gao et al., 2019; Xiang et al., 2021). The research covers the most common environmental characteristics of urban green areas (physical elements and/or their features) in the context of user safety such as the spatial quality of greenery (Hami & Emami, 2015), visual quality of the greenery and other elements (Daniel, 2001; Muderrisoglu & Demir, 2004; Talal et al., 2021), visual and physical accessibility (Lis et al., 2019). At the same time, pilot studies comparing the data obtained from different methods show that the accuracy and equivalence of different approaches require cross-testing to obtain reliable results (Gyllin & Grahn, 2015; Gao et al., 2019). However, there are few comparative studies of this kind in the context of the safety of urban green areas (Gao et al., 2019). The results presented in this article show that the correlation in the assessments of the sense of security occurs only in the case of some factors from such groups as visibility and external protection, although the responses from the photo questionnaire and survey questionnaire, analyzed separately, gave a much wider spectrum of impact. Thus, the hypothesis No. 2, that only after triangulation of the study methods and techniques will it be possible to identify specific factors that shape the sense of security, was confirmed.

The use of photos in research may bring up some limitations in terms of their representativeness (Rose, 2007) when they are used to crowd-source

safety perceptions of the urban environment. The three-dimensional elements of urban green areas presented on a two-dimensional image on a screen are separated from other variables that are perceived subconsciously in the natural environment by senses such as hearing or smell (Quercia et al., 2015). However, linking photos with the survey (questions) extends and enriches the set of data and their detail (Kimic et al., 2025), thus increasing the value of questionnaire research on the perception of safety in green areas, although it focuses only on the visual features of the environment. Therefore, the approach presented in this article, combining the two methods used, should be seen as valid.

The insights emerging from the use of both methods, as a more complex approach than popularly used, increase knowledge and offer opportunities to better understand urban parks and how they are perceived by their users. They indicate differences that are difficult to grasp with only one method. In order to better understand the security perception of urban park users, not only the implementation of different methods but also their triangulation and correlation of obtained results may contribute to a deeper identification of the specific expectations of urban park users. More detailed results can be used in practice to formulate design principles (Kimic et al., 2025) helpful for the creation of safer, more attractive, and inclusive urban parks that better respect the needs and expectations of their users.

The presented approach still leaves room for future research to add other properties of space to it. It is important in the context of the lack of quantitative models and tools available for urban planners and designers to measure and rate urban environments objectively (Shach-Pinsly, 2019). At the same time, the presented study has a preliminary status, thus has some limitations. The relations between demographic variables and the obtained results have not been included in this stage of research. Considering that the perception of safety is highly personal, other variables such as age, gender, or even sample size may also differentiate the results (Traunmueller, Marshall & Capra, 2015). Thus, further detailed research should include this aspect. In this context, the future extension of the study through the use of regression analyses as the next stage could also deepen and detail the establishment of the role of variables such as gender and age on the causality of safety perception among park users.

5. Conclusions

Various factors affect the sense of safety of urban park users: external protection, visibility, including park lighting, the general condition of the park (maintenance of greenery, cleanliness) or the presence of other people. Their importance, however, has a different value, hence the need to identify the most important factors from the point of view of shaping the sense of security. When conducting in-depth research in this area, it should be taken into account that in the case of green areas, users' sense of safety is assessed through the perception of specific scenes and their components. Therefore, the use of only a survey questionnaire in research may be treated as a limitation. Additionally, the influence of various factors may be assessed differently depending on the method used, which was confirmed by the correlation of the results obtained using a survey questionnaire and a visual questionnaire. This indicates the need to use various methods to identify the real significance of individual factors influencing the sense of security of urban park users. Such an innovative and comprehensive approach based on comparison of the results from different methods still can be developed but is important for designing research in the area of the perception of safety for green areas. The implementation of the knowledge obtained as a result of the presented study will allow for the shaping of safer urban parks.

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