

Article

Models of Community-Friendly Recreational Public Space in Warsaw Suburbs. Methodological Approach

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Abstract: In recent years, after the rapid and chaotic suburbanization in the 1990s, public spaces were gradually appearing in the new suburbs of postsocialist Poland. It is worth verifying to what extent these spaces are used on a daily basis. This paper aims to present a method of measuring the utility value of recreational public spaces and to determine the relationship between the utility value of space and its publicness. It suggests models of publicness of the most community-friendly recreational public spaces in Warsaw suburbs. As the research shows, intended diversity has the greatest influence on the prosocial character of space. Proximity, on the other hand, does not influence utility value so much. Location at some distance from the main nodes of activity and the highest concentration of houses, but with safe pedestrian access, is of more importance and should be promoted as a condition of successful suburban recreational space. The main conclusion from the research is that the most community-friendly recreational spaces do not have to be fully public. The measurement tools used in analyzing socio-spatial relations contribute to the development of the academic methods of studying the quality of public space.

Keywords: recreational public space; Warsaw suburbs; utility value; publicness; community-friendly space

1. Introduction

1.1. Context and Aim of the Research

In Central and Eastern European (CEE) countries, the 1990s were the beginning of extensive suburbanization [1]. During the transformation, mass suburbanization was contributed to by the decentralization of power, real estate privatization, the conversion of agricultural land for urban uses on a large scale, the appearance of middle class as a new affluent social group, the new commercial and spatial demands of rapidly developing capitalist society, the activity of developers, the culture of privatism, etc. [1,2]. It is typical of CEE countries that suburbs are inhabited by both the old residents and the newcomers [3]. Suburbanization, happening in many ways similarly in all postsocialist countries [1], is not only a global process but also a locally grounded phenomenon and has its own national specificity. In Poland, suburbanization is quite chaotic, unplanned, and spontaneous as a result of extensive liberalization of spatial planning [4–6]. This results in a huge diversity of suburbs. Suburbia that arose in the previous political system were generally not planned and therefore, were not provided with recreational areas, except school sports fields and school playgrounds, but these were of rather low quality. This trend was continued in the 1990s, when suburbanites were driven exclusively by the desire to live in their own house with a garden, regardless of the availability of social services or leisure facilities [4,7]. At the beginning of the transformation, municipalities, as a local level of

self-government restored in Poland in 1990, rejected spatial planning as a relic of the previous political system. They also avoided reserving land for recreational spaces due to the necessity to pay high compensations for land purchased from private owners. As a consequence, new suburbs were deprived of recreational spaces, social facilities, roads, and good technical infrastructure. After Polish accession to the European Union in 2004, new possibilities of financing investments, also those contributing to building social capital, emerged. With time, the rapid development of the suburbs started to be accompanied by greater attention to satisfying nonresidential needs. New recreational spaces, available previously in the city, appeared also in the suburbs, and the few existing ones were upgraded and pedestrianized [8]. This is particularly evident on the outskirts of Warsaw, where changes are progressing relatively fast. As a result of all these processes, there are two types of public space in Polish suburbs: old and new [3]. The former type includes traditional meeting spaces: churches, cemeteries, bus stops, local stores, and the latter: green areas (parks, glades, forests), agrotourism farms (directing their offer mainly to wealthier urbanites), historic gardens and palace complexes, as well as large suburban shopping centers modeled on American shopping malls. There are also many new, well-equipped playgrounds, sports fields, and recreation areas.

The changing suburban reality necessitates some reflection not only on the rate and form of suburban development but also on the social effects of the transformation taking place. It is worth verifying to what extent newly-established or modernized suburban recreational spaces are used on a daily basis, and which of them has the biggest potential for building local social ties and making contemporary suburbs more sustainable. The aims of this article are twofold. It presents a method of measuring the utility value of recreational public spaces and determines the relationship between the utility value of space and its publicness. This paper identifies the most community-friendly recreational public spaces and describes how public they are. It is more methodological than theoretical since it provides tools and suggests methods of studying public space based on behavioral mapping, but it does not present extensive empirical material. A significant contribution to the theory of public space requires more comparative research in different types of living environments. However, the study presented in this paper allows general conclusions about the vitality of suburban recreational spaces to be drawn. Although the obtained results refer to the suburbs of Warsaw, they can also be applied to the suburbs of other CEE cities which are undergoing similar changes. Unlike the models representing Polish suburbs, the method and tools introduced here are universal. They only need to be slightly modified when applied to spaces of a different nature or within different cultural and political contexts.

1.2. Theoretical Framework

1.2.1. Publicness of Space

Publicness of space is an attribute of public, semipublic, and sometimes private spaces [9]. To conduct empirical studies, Benn and Gaus [10] pointed out the multidimensional nature of publicness and identified its three dimensions: access, agency, and interest. These initial dimensions have been introduced, refined, or extended by other scholars. In this paper, publicness is defined as a multidimensional and gradable feature that determines physical conditions for establishing interpersonal contacts. It shows how open and inclusive the space is to a diverse public [11]. It is explored mostly through its accessibility, design, freedom of use, and inclusiveness [10,12–14] – characteristics that result from ownership status, location, and the way the space is organized, equipped, and managed. The literature review [9,11,15–23] provides at least a few models (tools) for assessing the degree of publicness of a space, based on different publicness criteria (Table 1). For some models, the set of criteria includes both the physical attributes of space and the degree to which the space fulfils its social function.

Table 1. Selected models of the publicness assessment.

Model	Criteria of Publicness
"Tri-axial" model of Németh and Schmidt [11]	ownership, management, uses/users
"Cobweb" model of Van Melik, Van Aalst, and Van Weesep [15]	criteria of secured public space: surveillance, restraints on loitering, regulation; criteria of themed public space: events, funshopping, pavement cafés
"Spider" diagram of the Spaceshaper by The Commission for Architecture and the Built Environment (CABE) [16]	access, use, other people, maintenance, environment, design and appearance, community, you
"Star" model of Varna and Tiesdell [17]	ownership, control, civility, animation, physical configuration
'OMAI'* model of Langstraat and Van Melik [18]	ownership, management, accessibility, inclusiveness
Place diagram of Project for Public Spaces (PPS) [19]	sociability, access and linkages, comfort and image, uses and activities
Public space index (PSI) by Mehta [21]	inclusiveness, meaningful activities, safety, comfort, pleasurability
Public space experiential quality index (PSEQI) by Zamanifard et al. [22]	comfort, diversity and vitality, image and likeability, inclusiveness
The Publicness Evaluation Model (PEM) by Lopes et al. [23]	urban life, physical design, human connection, management

* OMAI—initial letters of the criteria of publicness.

A detailed review and attempt at systematizing various dimensions of publicness of space were proposed by Varna and Tiesdell [17]. They listed the following five basic dimensions referred to by a majority of other scholars: (1) ownership; (2) control; (3) citizenship (level of responsible freedom); (4) physical configuration (relationship between a place with its surroundings); (5) animation (manner of design and arrangement of space so that it offers various possibilities of social interaction). Following the model proposed by Varna and Tiesdell, this paper suggests three basic dimensions of publicness: (1) Diversity (partly overlapping with animation), (2) Management (ownership and the resulting form of control), and (3) Accessibility (physical configuration and freedom to access). Taking into account these three criteria and a gradable nature of publicness, a fully public space is described as a space: (1) provided with a wide range of supports for diversified potential uses and users; (2) owned, managed, and maintained by a public body mandated to act in the public interest and obliged to ensure free use of space; (3) well connected and located within the movement system, without time-restrictions in access.

The above description suggests that publicness can be measured. Since the scores assigned to each criterion represent a continuum of different levels of publicness, public space that meets the criterion to the highest possible extent has the highest score. Unfortunately, public spaces with the highest scores for all criteria of publicness are rare [9,24,25]. Publicness is often characterized as existing somewhere along a continuum from completely private ownership at one end to completely public ownership at the other [11]. In a contemporary world, however, the ownership status of a public space seems to be less important than the possibility to share the space with other users and the freedom of use [20,26,27]. Different degrees of publicness result also from different restrictions on accessibility, which can be viewed from the physical, visual, but also the symbolic perspective [28]. Spaces in which only a very specific type of public is welcome, and the activities of the users are restricted to those of consumption are also considered public [29]. The same level of diversification of possible situations applies to the design of space. There are different types of physical design dedicated, formally, to public space. This category includes spaces planned for social integration but also tranquil places, where users can spend time together without verbal contact with each other [30]. Both types of space are public, although the degree of publicness is different. To conclude, different levels of publicness result from increasingly blurred boundaries between "public" and "private" in urbanized space [31].

Unlike other studies (e.g., [13,14,21,23]), this research excludes the vitality of space from the concept of publicness which focuses only on intended function and physical configuration of the space as indicators of the conditions for integration and human connection. It refers to the Carmona's [26] concept of "function" as one of the dimensions of publicness. Function dimension does not merely focus on planned but also on spontaneous use. For the purposes of the analysis, two overlapping dimensions

of public space—physical and social—have been separated from each other in order to make it easier to study socio-spatial relations. It was assumed that the prosocial character of space does not depend on physical attributes only. It is influenced also by several other variables, such as socio-demographic characteristics and lifestyle; therefore, the way the space fulfils its social function should be separated from its spatial dimension. Consequently, all three dimensions of publicness proposed in this article relate to the physical conditions of space intended to contribute to its social function.

1.2.2. Utility Value of Space

While publicness reflects what was intended for the space, the utility value shows its real usage. We can refer it to the Gibson's theory of perception and a concept of affordances—the perceived properties of the physical environment that support the individual's actions [32,33]. For certain types of behavior, we search for affordances, i.e., functional properties of environments offering individual user certain possibilities; hence, some spaces become important and behaviorally useful for the user, while others do not. Affordances are conditioned by the publicness of space, especially by the level of spontaneity it offers. The more affordances related to a given space, the greater its utility value.

The utility value of space, identified with its prosocial character or activity, is the degree to which the space fulfils its social function. According to Montgomery [34], “activity of space” includes two related concepts: vitality and diversity. Vitality refers to the number of people using the space across different times of the day and night, the uptake of facilities, the number of cultural or other events over the year, and generally the presence of an active life in the space. We can analyze it through street liveliness, essential and optional activities outdoors, duration of stay [35], and the number of people engaged in social activity [35,36].

There are numerous studies on the prosocial character of space [34–39]. The efficiency of the space usage has so far been estimated based on subjective perception, including gauging the quality and performance of public space only on the basis of user experiences and inputs gathered through surveys [22,40], but also measurable criteria related to the number, type, and intensity of behaviors [41,42]. Assuming that the measurement of the prosocial character of space should refer to the category of behavior, we can assess the utility value of space by social behaviors. According to Gehl [43], social behaviors are all the actions that depend on the presence of others in public space. Social behaviors are the result of necessary behaviors (e.g., transit) or optional behaviors. They encompass a broad spectrum of activities: from passive ones, such as observing people, to greetings, spontaneous talks, children's play, young people spending time together, and group activities planned to a lesser or greater degree, such as street events, parades, demonstrations [35]. Spontaneous integration in groups, which can be illustrated by people meeting other users with whom they did not come to a given space, is of particular importance when it comes to public space. This is why multi-person groups that do not consist exclusively of members of the same family and do not result from participation in organized activities are the most preferred for public space. Organized activities mean that interactions between people are not spontaneous, although they result in higher rates of public participation in physical activity [44]. Connecting with other people, whether familiar or strangers (talking and listening), is a type of behavior that is particularly important from the social perspective [45], although the presence of lone users is also far-reaching—their stay in a public space is often a transition between being alone and being with others at a relatively demanding and highly involved level (e.g., in organized groups) [43]. Public space, open and welcoming to everyone, enables people to mix, which contributes to building a society that draws on its class diversity, multicultural character, and heterogeneity [28].

2. Materials and Methods

2.1. Study Area

The study area included western and south-western part of Warsaw's suburban zone, where the most intensive suburbanization processes in Poland take place. Although this area is not representative

of the majority of Polish metropolitan regions (Warsaw Metropolitan Region is the biggest and the fastest-growing urban region in Poland, with the highest share of the affluent metropolitan class), the situation in the suburban areas of other large cities is similar in certain respects. While the types of suburbs are similar, the social structure of suburbanites and the approach of individual municipalities to planning and creating mature public spaces may be slightly different. These factors affect the amount of suburban public spaces and the intensity of their use. Contextual differences and their impact on the utility value of public space may be an inspiring subject for further research.

The selection of the suburbs was based on the typology by Mantey and Sudra [46]. The typology was built on five criteria: (1) spatial scale (face-block neighborhood, residential neighborhood, institutional neighborhood); (2) the time when the neighborhood was erected (suburb developed largely before World War II; suburb developed largely after World War II, but before 1990; suburb developed largely after 1990; former rural village modernized after 1990); (3) spatial interaction with the nearest town/city (satellite towns, settlements, or villages undergoing suburbanization; peripheral accretion; linear development along main public road; leap-frogging development); (4) the prevailing type of investment (neighborhood planned by one developer, housing cooperative, or tightly regulated by a municipality; many developer's micro-investments; individual housing; mix of developer's micro-investments and individual housing); (5) street layout (street grid, layout based on main public road, layout based on cul-de-sac or perpendicular development axis, cul-de-sac network). Taking into account these criteria, sixteen types of the suburbs were indicated, eight of which favored the creation of public spaces: a gated community based on a cul-de-sac network, distant from nearest settlements (T6); a garden city with individual housing along the railway line, fully planned and developed before World War II (T7); a satellite village densely populated, developed largely after World War II, but before 1990, based on a street grid (T8); a satellite settlement planned and developed by one investor after 1990 as a contemporary garden city (T10); a satellite village undergoing suburbanization after 1990, a mix of developer's micro-investments, and individual housing, based on street grid (T11); a separate administrative unit that represents peripheral accretion, dominated by individual housing erected mainly after 1990, based on street grid (T12); a peripheral accretion of the satellite town, a mix of developer's micro-investments, and individual housing erected mainly after 1990, based on a cul-de-sac network (T13); a satellite village in the form of leap-frogging development, an individual housing erected mainly after 1990, based on a cul-de-sac network (T14). The typology of suburbs puts a special emphasis on the possibility of creating public spaces in both groups of suburbs: old—emerged before transformation and new—most often irrational sprawl-like spatial layouts. The typology of suburbs organizes the diversity of settlement units on the outskirts of Warsaw. It may be applied also in other postsocialist countries, but not in different social, historical, political, and economic contexts.

When it comes to the study area, twelve suburbs representing eight above-mentioned types of suburbs were investigated. Their spatial scale, housing density, and street layout (conditions that should foster the creation of recreational public spaces) are illustrated in Figure 1. The suburbs studied do not constitute a representative sample of all suburbs outside of Warsaw. They rather represent all kinds of situations Warsaw suburbs deal with when it comes to recreation. In order to present the full range of possible situations, a few types of suburbs (T6, T7, T12, T14) were doubled, because despite similar conditions, some suburbs of one type are equipped with attractive recreational spaces, while others are deprived of them or equipped with spaces of insufficient quality.



(a)



(b)



(c)



(d)



(e)



(f)



(g)



(h)

Figure 1. Cont.

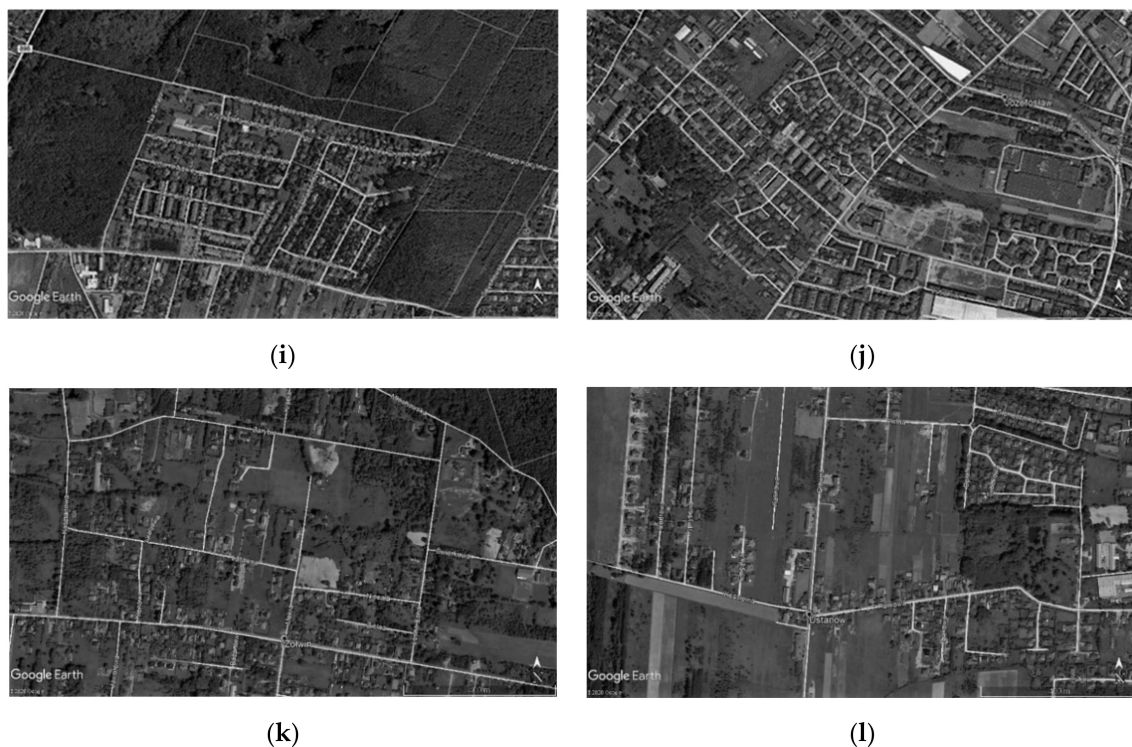


Figure 1. Suburbs covered by the study (symbols of types according to Mantey and Sudra [46]): (a) open estate of Nadarzyńska Spółdzielnia Mieszkaniowa (a housing cooperative) in Nadarzyn (T6); (b) open estate “Słoneczne” in Kanie (T6); (c) Komorów (T7); (d) Zalesie Górne (T7); (e) Raszyn (T8); (f) Stare Babice (T11); (g) Książenice (T10); (h) Kwirynów (T12); (i) Latchorzew (T12); (j) Józefosław (T13); (k) Żółwin (T14); (l) Ustanów (T14).

During the field research, thirty-nine recreational spaces were identified in the twelve suburbs studied. The recreational function referred to the broadest possible definition of recreation, which included leisure activities undertaken voluntarily, for pleasure, self-expression, self-formation, renewal, and multiplication of psychophysical forces [47]. The presence of at least three benches in close proximity to each other (up to 30 m) was the primary criterion for selecting specific spaces to be studied (such spaces offer at least the possibility of passive leisure and establishing eye contact between users). Spaces used by residents spontaneously and spaces with informal seating only (not intended to fulfil social function), as well as spaces of flow (streets, cycling paths) and exclusively commercial spaces, were excluded from the research. The broadest possible definition of recreation explains why recreational spaces were so diversified in terms of intended users, equipment, and location. The selection of such diversified spaces required a field inventory. Among the public spaces studied, there were: eight sports fields (also those with playgrounds); eight separate playgrounds, outdoor gyms, or skate parks; seven multifunctional recreational areas; five squares with greenery and seating; four areas adjacent to churches or roadside shrines (Areas around churches and roadside shrines become “alive” particularly in May and June because this is when, according to Polish tradition, people (mostly older persons) gather at shrines and chapels for common prayer, while in churches and around them, children rehearse for the First Communion ceremony or the first anniversary of this event. The vitality of these spaces declines considerably in the other months.); three parks; two market squares with seating; one dog playground, and one recreational center comprising a publicly accessible space with seating as well as private recreational facilities with paid access. The above-mentioned recreational spaces constitute the full range of spaces that can be found not only in postsocialist Europe, but also in other world regions.

2.2. Measuring the Publicness of Recreational Public Spaces

The research was based on comparative analysis not on case studies. Such approach enforces the adoption of a simplified rather than a detailed analysis scheme based on a few physical features that can be specified in all recreational spaces. It explains why spatial design characteristics of all spaces studied were not described in detail.

The degree of publicness was measured by using a matrix model. Its dimensions and indicators were based on previously developed tools: the “cobweb” model [15]; the “tri-axial” model [11]; the “star” model [17]; the “OMAI” model [18]; the “spider” diagram of CABE’s Spaceshaper [16]; the “place diagram” of PPS [19]; the “six-axial” model dedicated to gathering places [9] (the “six-axial” model for assessing the publicness of gathering places consists of the same dimensions, but the study of gathering places requires different indicators within each dimension.). The matrix model, unlike some of those mentioned above, is dedicated to recreational spaces only. It also excluded from the concept of publicness the way the space operates in terms of social integration and human relations, as previously explained. It was based on three dimensions: (1) Diversity (D), (2) Management (M), and (3) Accessibility (A) and six indicators: D(IU) intended users (planned heterogeneity of the users in terms of their age or specific recreational preferences); D(DU) diversity of uses (number of intended functions and activities); M(ME) managing entity (involvement of public and other than public sectors in the process of designing and operating the space); M(C) form of control (regulations or other forms of supervision that prevent certain behaviors and thus restrict the freedom of using the space); A(TLA) time limits in access (possibility of using a given space at any time of the day and night); A(L) location (placement of a given space in relation to the main routes, nodes of activity, or larger compact housing areas). Each indicator has its own four-point scale. All six scales are presented in Table 2. The result of the assessment is presented on a matrix, which enables a comparison between different public spaces (the number of grey squares represent the score). The more squares in grey, the higher the publicness rating for a given indicator (Figure 2).

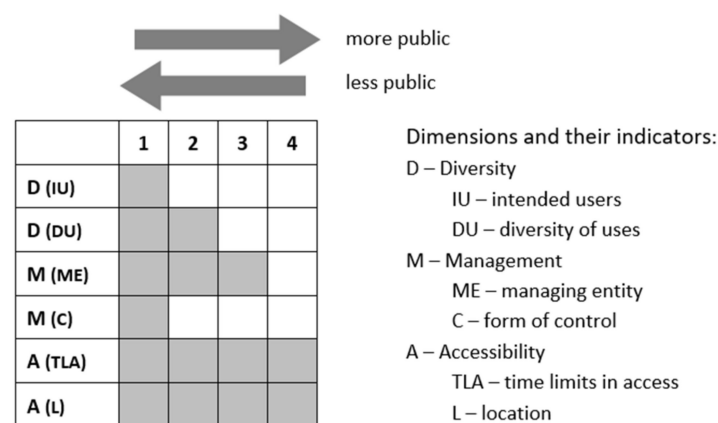


Figure 2. Matrix model for assessing the degree of publicness of suburban recreational public spaces.

Table 2. Indicators of publicness of suburban recreational public spaces.

Dimensions	Indicators	Scale			
		1 Low Level of Publicness	2	3	4 High Level of Publicness
Diversity (D)	IU Intended users ^a	users with strictly defined needs (e.g., religious) or specific recreational preferences (e.g., professional skateboarding)	mainly children, but also their carers	different age groups (older children and youth, working adults, seniors) except for small children	everyone, regardless of age and recreation preferences
	DU Diversity of uses	equipment for one type of intended activity; no space to take up spontaneous behavior; no secluded corners	equipment for one type of intended activity; the space for spontaneous behavior, or the presence of secluded corners	equipment for two or more types of intended activities that significantly differentiate users in terms of age or recreational preferences; no space to take up spontaneous behavior; no secluded corners	equipment for two or more types of intended activities that significantly differentiate users in terms of age or recreational preferences; space for spontaneous behavior, or the presence of secluded corners
Management (M)	ME Managing entity	1) fragments of the space leased to private sector, or 2) space belonging to the church that operates like a private owner	space formally belonging to the municipality, but appropriated (used and maintained) by a narrow group of users	space managed and maintained by public service providers (nongovernmental organizations, cultural institutions, schools, railways)	space managed and maintained by the municipality
	C Form of control	space supervised by the owner, manager, or security guard	visible regulations of using the space that entitle you to reprimand someone who breaks the rules or ask them to leave the space	1) only fragments of the space covered by the regulations of use (those equipped with recreational facilities or private subspaces), or 2) blurred/destroyed boards with regulations of using the space, or 3) no regulations, but visible information about monitoring	1) no control, or 2) hidden monitoring cameras
Accessibility (A)	TLA Time limits in access	available to the public at selected times of the day; at least half of the space gives priority to organized, previously scheduled groups	available to the public at selected times of the day	available all day, but closed at night or after dark	unlimited access at any time of the day or night
	L Location ^b	space at some distance from residential building and nodes of activity ^c , located somewhere “off-the-beaten-track”	1) space at some distance from nodes of activity ^c (at least 500 m), deprived of safe pedestrian access, or 2) space at the edge of the suburb	space at some distance from nodes of activity ^c and not in the highest concentration of houses, but, with safe pedestrian access	space nearby a node of activity ^c with safe pedestrian access

^a This indicator takes into account the needs of people belonging to different age groups, including mothers with children, elderly, and disabled people, but also unique needs or forms of recreation that effectively discourage people who do not engage in specific practices or activities from using a given space. Other dimensions of heterogeneity, such as ethnic and cultural affiliation as well as social status, do not require space to be specially adapted to the needs of users. ^b The points of scale for this indicator have been adapted to the suburban reality. ^c A node of activity is a place with at least one public object frequented by people every day (e.g., school, train station), accompanied by at least two shops/catering establishments in close proximity (up to 200 m), or a place localized at the main crossing of the suburb, accompanied by at least two shops/catering establishments.

2.3. Measuring the Utility Value of Recreational Public Spaces

For assessing the utility value of recreational spaces, the behavioral mapping method was adopted. The method is based on observations conducted in “behavior settings” defined by Barker (1976) as ecological units of analysis, each composed of people, physical components, and behavior, where physical environment and behavior are indissolubly connected in time and space. Behavioral mapping relies on observing users, counting people in groups, and classifying their activities. It imposes the subdividing of an environment or area behaviorally, in other words, disaggregating designed outdoor environments into their functional parts (e.g., pathway, water play setting, gathering place, vegetable garden, and so on) [48]. While most of the studies based on this method cover one large public space divided into several behavior settings, the measurement of utility value of many varied recreational spaces, as proposed in this paper, requires some simplifications of the method so that all spaces can be observed according to the same scheme. It explains also why the behavioral map as a product of observation [49] has been abandoned.

First, a matrix model for assessing the utility value of space was developed. It was based on the following dimensions: (1) Vitality (V), (2) Integration (I), and (3) Activity (A) and six indicators: V(NP) number of people who have appeared in a given space, V(IU) intensity of use (extent to which objects and facilities are used), I(HU) heterogeneity of users (heterogeneity of users in terms of gender, age, and recreational preferences), I(IG) integration in groups (proportion of single users, two-person groups, and multiperson groups, from which the most desirable are multiperson nonfamily groups), A(TB) type of behavior (necessary behavior, passive leisure, or physical activity), and A(TC) type of contact (proportion of particular types of contact: from accidental eye contact to verbal contact between different groups of users). Similar to the publicness, each indicator of the utility value had its own four-point scale. The development of the scales was preceded by long-lasting pilot field observations conducted in varied suburban recreational spaces other than those studied. The final score system is presented in Table 3. Cut-offs used for particular points of scales reflected the reality prevailing in the suburbs, but they could be modified to suit also other types of settlement units (cities, towns, villages).

Table 3. Indicators of utility value of suburban recreational public spaces.

Dimensions	Indicators	Scale			
		1 Low Utility Value	2	3	4 High Utility Value
Vitality (V)	NP Number of people who appeared in a given space	on average up to 5 people on a working day	on average 6–20 people on a working day	on average 21–40 people on a working day	on average more than 40 people on a working day
	IU Intensity of use	low intensity of use; there are visits when nobody appears in a given space; intensive use results from a very specific situation	place in use during every visit but never with high intensity (most of the benches, facilities, and spaces are not used)	place used intensively during one visit (most of the benches, facilities, and spaces are used); there are visits when no users are present	place in use during every visit; most of the benches, facilities, and spaces are used during at least one visit
Integration (I)	HU Heterogeneity of users ^a	representatives of one gender or one age group predominate ($\geq 80\%$)	users represent at least two age groups; no group predominates ($\leq 80\%$); representatives of at least one age group are missing	users represent different age groups; no group predominates ($\leq 80\%$); there is no visit during which all groups would meet	users represent different age groups, including senior citizens; representatives of all age groups meet at least during one visit
	IG Integration in groups	predominance of lone users ($\geq 50\%$)	predominance of people forming two-person groups or slightly larger family groups ($\geq 50\%$)	predominance of people forming multiperson groups representing more than one family ($\geq 50\%$), among which organized groups predominate ($\geq 80\%$), i.e., groups under the care of a teacher, event leader, or animator	predominance of people forming multiperson groups representing more than one family ($\geq 50\%$), among which nonorganized groups predominate ($\geq 80\%$), or the proportion of multiperson nonorganized groups and family groups is similar (40%–50%)
Activity (A)	TB Type of behavior	predominance of necessary behaviors (transit, shopping, waiting for a train) ($\geq 70\%$) or users who stand ($\geq 50\%$)	recreational behaviors almost exclusively; transit accounts for not more than 5%	all kinds of behaviors, including transit above 5%; one kind of recreational behavior predominates: physical activity or passive leisure ($\geq 80\%$)	all kinds of behaviors, both passive leisure and physical activity account for less than 80%
	TC Type of contact	predominance of accidental or short-lasting contacts or persons who do not seek contact with others	intragroup contacts dominate; if there is more than one group, groups ignore one another, or it is impossible to establish eye contact with all groups	besides contacts within groups, most groups maintain longer-lasting eye contact with one another (mutual observation); eye contact can result from the movement of the groups; groups tend not to mix	besides contacts within groups, some groups establish verbal contact with each other; some groups move and mix; it happens that most users visually form one group

^a The heterogeneity of users indicator was limited to age and gender because in Poland these dimensions differentiate users of suburban public spaces the most. Polish suburbs are rather homogeneous in terms of ethnicity. Although on the outskirts of Warsaw there are a few concentrations of Asians (e.g., Raszyn), such settlements are still in the minority. The most numerous dispersed minority group in Poland, though visually difficult to recognize, are Ukrainians. Many of those who come to Poland for work settle on the outskirts of big cities. Another dimension of heterogeneity that is not included in the study is the affluence of public space users. It is difficult to judge people's material status based solely on observations. The degree of the adaptation of public space to the needs of people with disabilities was also omitted, since all open recreational spaces studied are physically accessible for wheelchair users. This factor may significantly limit the heterogeneity of users in the case of internal spaces (buildings). Taking all these circumstances into account, it was decided to consider only those factors that differentiate the users of suburban open recreational spaces the most and that are easy to assess visually. This does not mean, however, that there are no other potential dimensions of social diversity. They do exist, but they were not included in the study presented in this paper.

The procedure of scoring based on behavioral mapping was carried out in May, June, and September 2018, on days with a temperature of 20–25 °C. Since the vitality of spaces belonging to different types can change depending on the day of the week and time of the day, it was assumed that the most comparable conditions for all types of recreational spaces are on working days, except Fridays afternoons, which often have a weekend-rhythm. At weekends, some spaces become empty while others are visited by people who are not residents of particular suburbs. The observations were conducted in the afternoon, so that residents working during the day could also use recreational spaces. There were two or three fifteen minute visits in each space, each visit at least two hours apart. The number of visits depended on the fact of whether a given recreational space was accessible all day long (three visits, the first one after 3 pm) or only in the afternoon (two visits, the first one after 5 pm). The observations were not carried out after dark. If nobody appeared during two or three visits, the observation was repeated on another day (maximum three attempts), making sure that the weather conditions were similar. When conducting observations, persons in groups were counted and behaviors classified into the following categories: (1) necessary behaviors and (2) recreational behaviors divided into passive leisure and physical activity, which were subsequently summed up and their proportions determined (cut-offs of these proportions are presented in Table 3). Necessary behaviors included: transit (passing, running, and cycling), shopping, using banks or cash machines, working, waiting for a bus. Passive leisure was represented by those who stand, sit, or lie but also by small children in prams. Physical activities were: child/youth play; active childcare; walking alone, with a pram, or with a dog; individual physical activity; physical activity in a group. There were also counted single users, two-person groups, or slightly larger than two-person groups whose members belong to one family, and nonfamily groups of more than two persons. The predominant type of contact was also rated according to the descriptions presented in Table 3. Finally, the observer assigned appropriate scores to all six indicators and illustrated measurement results on thirty-nine matrixes, similar to the assessment of the publicness of space (Figure 3).

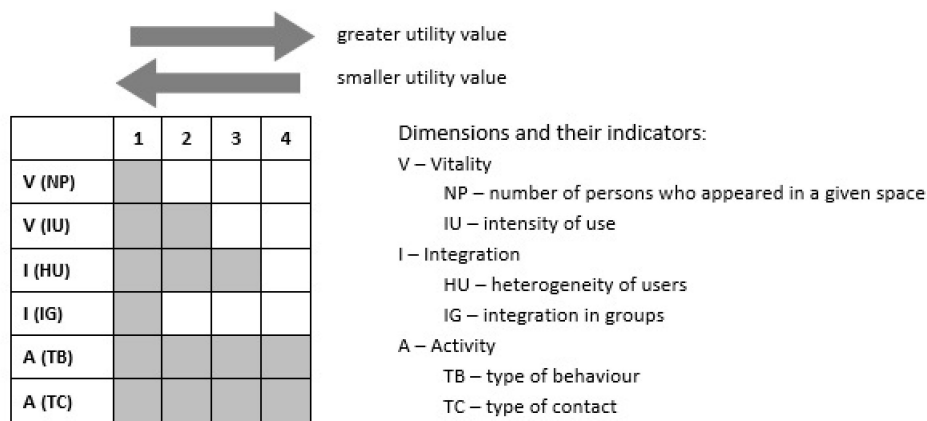


Figure 3. Matrix model for assessing the utility value of suburban recreational public spaces.

2.4. Developing Models of Recreational Public Space Dedicated to Suburbs

In order to develop a model of utility value and a model of publicness of the most community-friendly recreational spaces, the thirty-nine spaces were sorted according to their total utility value (the total utility value is the sum of the scores obtained for all indicators), and then spaces above the 75th percentile were selected as the most community-friendly (twelve out of thirty-nine spaces). For the most community-friendly spaces, the dominants for six publicness and six utility value indicators were determined and two models developed. Additionally, the dominant publicness was determined also for each of the six groups of spaces with the highest scores for individual utility value indicators (score 4 on a four-point scale). As a result, six partial models for the six groups of spaces mentioned above were created.

3. Results

The total utility value of space could range from 6 to 24. The obtained results were in the range of 10 to 23. None of the recreational spaces studied reached the maximum total score. The scores of the twelve spaces that were in 75th percentile of the total utility value (the most community-friendly spaces according to the methodology) amounted to 18 or more. This group included: three multifunctional recreational spaces; three playgrounds; two parks; two paying fields; one market square; one area around the church (observed during the rehearse for the First Communion ceremony). The utility value model of the most community-friendly suburban recreational space (two matrices because of two dominants for the type of behavior A(TB) indicator) shows that too few people pass through such spaces, and establishing new contacts between users is insufficient (Figure 4). The problem of a lower level of integration lies in the lack of willingness to interact with other people or generally low intensity of use of suburban public spaces. Suburban social life is often replaced by meetings in private gardens [50] or club spaces that attract users with a specific profile of interest [9,51]. This may inherently reduce the vitality of suburban public spaces compared to their urban counterparts (the comparison of the utility value of suburban and urban public spaces was not the subject of the research, but it suggests directions for further studies).

	1	2	3	4
V (NP)				
V (IU)				
I (HU)				
I (IG)				
A (TB)				
A (TC)				

	1	2	3	4
V (NP)				
V (IU)				
I (HU)				
I (IG)				
A (TB)				
A (TC)				

Figure 4. Two sets of dominant scores of utility value indicators for the most community-friendly recreational public spaces—a group of twelve spaces, which are above the 75th percentile of the total utility value (the total utility value of a given space is a sum of scores obtained for individual utility value indicators). There are two models since the type of behavior A(TB) indicator obtained two dominants (2 and 4).

The comparison of six partial models of publicness shows that all six groups are dominated by spaces managed and maintained by the municipality, located near the node of activity, and controlled by visible regulations (Figure 5). The biggest differences concern diversity of uses (see descriptions of the scales in Table 2). In the case of the spaces that are the most frequently visited by people (V(NP) = 4), the number of intended functions and activities as well as the presence of a subspace for spontaneous behavior or secluded corners seems to be not so important. The presence of secluded corners or a subspace for spontaneous behavior is of little importance also in the case of spaces most intensively used (V(IU) = 4), but it is significant in the case of spaces of the highest heterogeneity of users (I(HU) = 4) and spaces where all kinds of behavior occur: transit, passive leisure, and physical activity (A(TB) = 4). In the case of the spaces with the highest level of integration in groups (I(IG) = 4), the possibility of spontaneous behavior is insignificant, which results from the large proportion of fully planned and equipped sports fields in this group. Spaces that are the most conducive to establishing contacts between various groups of users (A(TC) = 4) are usually intended only for one specific kind of activity. These spaces attract users with particular recreational preferences and do not offer a subspace for spontaneous behavior.

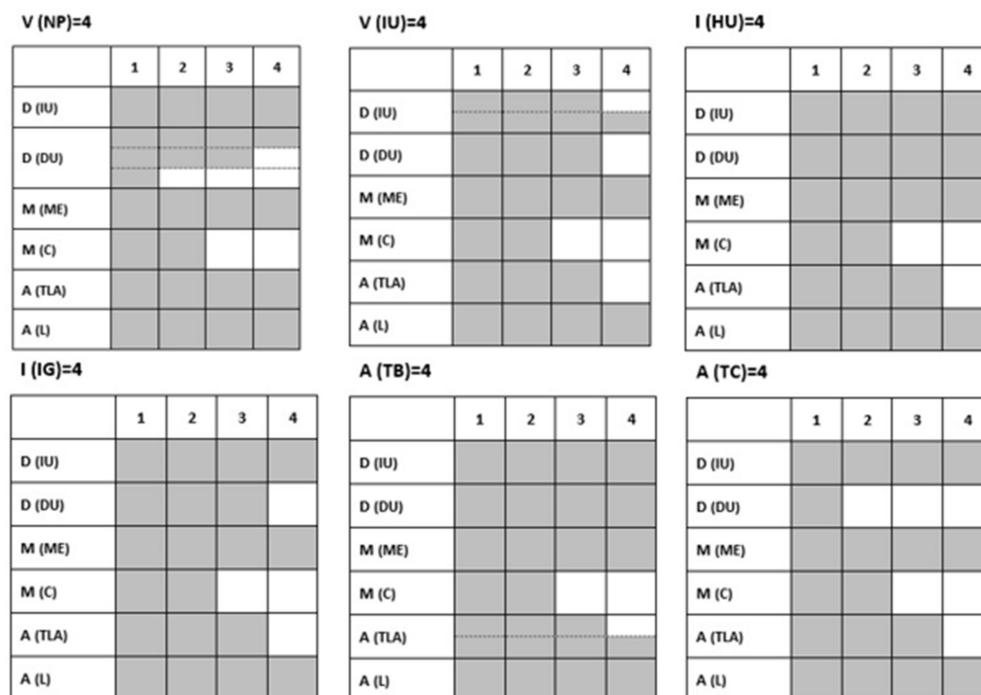


Figure 5. Models of publicness of suburban recreational public spaces. Each model represents dominant scores of publicness for a group of public spaces that obtained the highest score (4) for one out of six utility value indicators. If a given space has several maximum values, it belongs to several groups simultaneously. In the case of two or three dominants, instead of creating several models, the squares were divided by a dashed line into the appropriate number of equal parts, and each part was colored grey or white depending on the values of the dominants.

The analysis of the model of publicness of the most community-friendly recreational spaces (two matrices, Figure 6) show that the number of spaces enabling spontaneous behavior or offering secluded corners, and the number of spaces deprived of such possibilities are equal. What distinguishes this model from the six aforementioned partial models is peripheral location. The most community-friendly recreational spaces in Warsaw suburbs are located mainly at some distance from the nodes of activity and not in the highest concentration of houses.

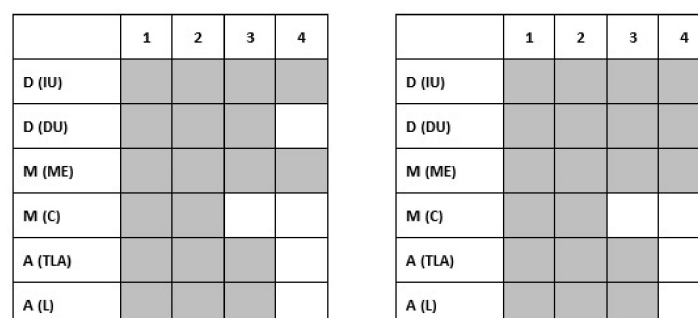


Figure 6. Two sets of dominant scores of publicness indicators for the most community-friendly recreational public spaces—a group of twelve spaces, which are above the 75th percentile of the total utility value (the total utility value of a given space is a sum of scores obtained for individual utility value indicators). There are two models since the diversity of uses D(DU) indicator obtained two dominants (3 and 4).

4. Conclusions

This paper presented a method of measuring the utility value of recreational public spaces which is partly determined by their publicness. It extended the literature on the evaluative methods used for measuring qualities of public space. Through a comparative study of thirty-nine recreational public spaces in Warsaw suburbs, this research validated matrix models for assessing publicness and utility value of space as a modification of existing tools for public space analysis (both models allow for relative not absolute assessment). It also revealed relations between both properties. The research was based on behavioral mapping, which is typically used to study a single, though internally diversified space; hence, the modifications proposed in this paper towards analyzing more spaces simultaneously make a considerable contribution to the development of this method. The concept of publicness limited to physical conditions only and the concept of utility value of space as a manifestation of its vitality are also an improvement of existing methodologies. The multidimensional nature of publicness proposed in this article differs from current approaches, because it separates physical conditions of space from its operational aspect. This facilitates investigating socio-spatial relations. Both models aggregate features over simplified indicators, which is necessary when extremely different recreational spaces, such as sports fields, parks, areas around churches, and market squares, are compared. The indicators of both measurement tools, and in particular the scales for assessing the utility value of space, have been adapted to Polish suburbs, but generally, they can be applied also to the research of other postsocialist countries. Observations carried out under comparable conditions and a scoring system assisted by simple graphical representations allowed the formulation of several conclusions regarding suburbs.

Among three dimensions of publicness, diversity has the greatest influence on the utility value of recreational space. It corroborates other reports and studies, in which the design for various activities, both active and passive, dedicated to different age groups, is emphasized [52,53]. Proximity, although decisive to the usage of the space, should be considered alongside directedness and connectedness [52]. The location at some distance from the main nodes of activity and the highest concentration of houses, but with a safe pedestrian access, is of more importance and should be promoted as a condition of successful suburban recreational space. Additionally, the peripheral location close to nature is in line with residents' preferences [8]. Longer distances may be problematic for seniors and people with disabilities, but in new suburbs, the proportion of this group of residents is smaller than among city dwellers [8]. Furthermore, elderly people often prefer to spend their free time in private gardens; therefore, the peripheral location of recreational spaces is recommended mainly for suburbs, but not for cities.

The intended diversity of users and uses engenders vital recreational spaces; however, the linkage between design and practice is not so obvious. It should be remembered that the diversity of uses is equally composed of activities planned for different age groups, as well as the possibility to hide in a secluded corner or undertake spontaneous behaviors, which by their nature open new ways of using a given space without requiring additional equipment. The social value of such "loose spaces" is emphasized by experts of public space [54]. In order to improve the vitality of space, instead of creating fully planned and equipped spaces (Figure 7), planners should enrich new recreational spaces, especially those adjacent to natural areas, with secluded corners or a subspace that gives the opportunity to adapt it to the users' own needs (Figure 8). However, the implementation of this recommendation requires larger recreational spaces.



Figure 7. Recreational space in Raszyn that does not enable spontaneous behavior.



Figure 8. Recreational space in Komorów enabling spontaneous behavior (e.g., a barbecue).

Locating recreational spaces near nodes of activity results in more people appearing in them, including seniors. However, appearing in a given space does not have to imply using it. Some recreational spaces located near major intersections or public buildings, but of little economic vitality or equipped only with benches, perform primarily transit function, which significantly reduces their utility value (Figure 9). Additional functions, and thus additional equipment that encourages people to stay in such spaces, could make them more appealing to the residents.



Figure 9. A market square in Stare Babice dominated by a parking lot and empty benches.

For many researchers, the extent to which the space is controlled indicates how public it is [11,17,55]. Nowadays, monitoring, fencing, and rules of use are standard in most recreational spaces, except for natural and spontaneously arisen ones. This practice also applies to spaces managed by the municipality (Figure 10). Control, just like ownership, loses its significance as a dimension of publicness, especially in the suburbs, where public spaces are less frequently visited; hence, visible forms of control provide users with a sense of safety and ensure that the equipment of the space remains in a good condition [8].



Figure 10. Boards with regulations of use in a recreational space in Komorów.

The conclusions drawn from the analysis of publicness of the most community-friendly recreational spaces can be applied not only to the outskirts of Warsaw, but generally to the suburbs of postsocialist Europe since mechanisms of suburbanization are similar in this part of Europe. In turn, the utility value of the most prosocial recreational spaces may significantly differ depending on the scale of social heterogeneity of different metropolitan regions; hence, extending conclusions regarding the utility value of recreational spaces beyond a specific cultural context may be faulty.

5. Discussion

The proposed tools (matrixes) have obvious limitations, but they may be further developed and modified. The scales of individual indicators should be adapted to different cultural contexts, different settlements units (cities, suburbs, rural villages), or different types of public space. By adjusting the tools for the study of Polish suburbs, the scope of heterogeneity was limited to a few basic dimensions. In the case of cities or more complex cultural contexts, the heterogeneity of users indicator as proposed

in this paper may be insufficient. Social diversity is multidimensional and multicausal. It reflects, among others, various reasons for settling in the suburbs: representatives of the middle class are inspired by the suburban landscape and environment, while pensioners and low-income families move there for the area's significantly lower costs of living. This leads either to social heterogeneity or to spatial segregation of different social classes in individual suburbs. When studying urban public spaces, especially American ones, the scale for assessing the heterogeneity of users should be extended to include racial, ethnic, or sexual minorities. As illustrated by the research of Stodolska et al. [56], representatives of these minorities sometimes feel excluded from using certain amenities, such as swimming pools in a park, when nonminority security guards monitor them. This example proves how important it is to adapt measurement tools to the spatial and social context, and this context needs to be described when a summary model of the utility value of a space is created. Although the method is universal, the measurement scales may be treated as its weakness and an obstacle in comparative studies.

When it comes to the publicness assessment, in the case of spaces representing a single type (e.g., parks, playgrounds, or public buildings only), it is recommended to extend the matrix by adding another dimension for assessing the design dedicated to this type of space exclusively. For example, in the case of public buildings, a new dimension could measure the level of adaptation to the needs of disabled people.

It should be remembered that the questions regarding "who", "what", "where", "with whom" and "for how long" are best answered by methodical observations, whereas understanding "why" is best performed by user input [57]; therefore, it is recommended to use surveys alongside behavioral mapping in order to obtain a robust method of studying public space. The method of assessing the utility value of space should be a base in a process of evaluating public spaces in a systematic and rigorous manner after they have been occupied for some time (postoccupancy evaluation) with the aim to learn how to improve the future design and location of recreational spaces. Such systematic evaluation seems to be of special importance in a time when public funding and resources are limited. Analyzed together with publicness, the utility value of a space suggests the design and management of future public spaces but also helps with renewing existing ones so that they remain relevant in serving multiple publics (groups of users). Assuming that economic vitality can increase social vitality, it is also worth analyzing the surroundings of individual recreational spaces in more detail in order to better understand what encourages people to use public spaces.

This paper contributes not only to the methods of studying public spaces but also to the academic discussion about their substitutes. The research confirmed the importance of semipublic spaces managed by other than public entities, spaces accessible for most of the day only to a specific group of users, and spaces that "become alive" occasionally in establishing social relationships among residents. Areas around churches, club spaces, and private spaces occasionally used for picnics or local events (the last two categories of space have not been included in the study, because they are not intended for public use) are the categories of gathering space that gain popularity in the suburbs [9,51], but their social potential is not sufficiently used. In the absence of fully public recreational spaces, such substitutes are important elements of suburban social life. Private or not fully public entities that manage and maintain the space, as well as narrow groups of people who appropriate some spaces (e.g., areas around roadside shrines), are more likely to profile and select users, but on the other hand, users of the same interests or representatives of the same social or demographic group are more likely to establish verbal contact, which significantly increases the social value of a space. This means that suburbs should create opportunities for establishing interpersonal contact also in spaces that attract specific groups of people. Relationships established in this way are likely to be continued in fully public spaces.

The growing number of suburban recreation spaces, although accessible and well equipped, does not necessarily mean a revival of social life. Vitality, integration, and the type of behavior and contact are not fully determined by the location of the space and the way it is planned and managed.

Fully public spaces do not always obtain the highest utility values. This means that utility value depends not only on perceived properties of the physical environment that support an individual's actions (affordances), but also on other nonspatial factors. Some of the factors are related to lifestyle, while others to the sphere of needs [8].

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