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Why is Ortica beautiful? Experiential Walking as a Tool for studying Biodiversity Perception in Ortica Neighborhood in Milan

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In the context of escalating biodiversity loss and accelerating environmental degradation—where cities are increasingly recognized as key spaces for fostering reciprocal human–nature relationships—this paper explores experiential walking as a tool for examining biodiversity perception in urban environments. The research draws on data collected during an experiential walk conducted in April 2024 in Milan, focusing on two areas: Città Studi, home to the city's two main university campuses, and Ortica, a culturally and historically rich yet spatially fragmented district. Thirty students walked a west–east transect, crossing diverse urban landscapes and visiting various biodiverse public green spaces. Using questionnaires that included both closed- and open-ended questions, the study recorded participants' perceptions of biological diversity, its benefits, and the restorative qualities of green spaces. The data were statistically analyzed to identify patterns and factors influencing biodiversity perception. The findings underscore how experiential walking can enhance awareness of urban biodiversity, increase the recognition of the qualities of small natural areas, and foster a deeper connection with nature—ultimately encouraging greater public engagement in biodiversity conservation.

Introduction

In the context of escalating biodiversity loss and accelerated environmental degradation, cities have emerged as critical arenas for reinforcing nature and cultivating practices of care and stewardship grounded in reciprocal human–nature relationships (Oke *et al*., 2021). While research and policy have begun to acknowledge nature not merely as a systemic component that provides resources and benefits to humans, but as a dynamic entity whose rights and interests should be recognized on par with those of humans (Hernandez-Santin *et al.*, 2023). This shift aligns with integrative paradigms such as the One Health approach, defined as an integrated approach that recognizes the interconnectedness between human health, animal health, and environmental health. It emphasizes that the health of each component

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influences the others, highlighting the need for transdisciplinary actions to ensure systemic well-being (WHO, FAO, WOAH & UNEP, 2022). This perspective holds potential in the field of urban planning and design, as it supports the implementation of strategies that foster healthier urban environments. It highlights the importance of considering environmental qualities as active agents in maintaining public health, while also contributing to the achievement of the Sustainable Development Goals (SDGs) and enhancing urban livability (Lebov *et al.*, 2017; Bruno *et al.*, 2024). However, despite this conceptual evolution, the debate still lacks a clear account of how to assess humans' perception of biodiversity in urban environments and identify the factors and elements that shape it (Qiu *et al.*, 2013; Bele & Chakradeo, 2021).

This contribution aims to enhance the understanding of walking as a method for investigating the perception of biodiversity in urban environments. The research is based on data collected during a walk held in April 2024 in Milan, Italy, specifically in Città Studi - an area characterized by the presence of several university faculties – and in Ortica, a neighborhood on the eastern periphery of the city known for its rich cultural and historical identity. The urban fabric of Ortica[1] is highly fragmented, shaped by various transport infrastructures as well as temporary and permanent fenced areas. The initiative, titled "Why is Ortica Beautiful?"—a reference to the famous essay by Swiss urbanist and designer Lucius Burckhardt (1925-2003)[2]—was organized as part of the satellite events for the second edition of the Festival of the New European Bauhaus, promoted by the European Commission. Also, the walk had an educational purpose as it was integrated into the teaching activities of an urban planning and design course within the bachelor's program in architecture of Politecnico di Milano. Its objective was to guide a group of 30 students to walk along a west–east transect of the city, traversing urban areas characterized by diverse multispecies interactions, scales, and dynamics. The main research questions that guided the walk were: Q1) *What is the shape of biodiversity in this part of the city?* Q2) *To what extent is it recognized and appreciated by people?* Q3) *How can the practice of walking be used to map and experience biodiversity?*

The walk was led by three walk leaders and structured into three segments. The group of participants made three stops to visit highly biodiverse green areas encountered along the urban route: a botanical garden, a neighborhood green space, and a large public park (Figure 1). Qualitative and quantitative data were collected through an online questionnaire, which included both closed-ended questions using predefined answers and a Likert scale, as well as open-ended questions for participants to enter data.

During the walk, participants answered questions about three main topics: i) the recognized benefits of urban biodiversity, ii) the evaluation of participants' perception of biodiversity present along the path, and iii) the restorative capacity of green areas and the typologies of activities that the participant would feel comfortable doing there. Data collected through questionnaires were then analyzed

1. To further explore the historical and socioeconomic characteristics of the Ortica neighborhood, see: Salmoiraghi, M. (1991), *Cent'anni all'Ortica: storia fotografica*, Cinisello Balsamo: Arti grafiche P. Lupi.

2. The essay "*Why is Landscape beautiful?*", dated 1979, is published in Ritter, M. & Schmitz, M. (eds, 2015), *Lucius Burckhardt. Why is Landscape beautiful?* Basel: Birkhauser.

through a statistical analysis for finding relationships and hierarchy in participants' answers.

The paper is structured into these main sections. Section 2 introduces experiential walking as an approach that can inform and guide urban design and planning, with an emphasis on sensing multispecies dynamics and identifying socio-ecological traits. Section 3 outlines the research methodology, focusing on data collection and the analysis of relationships and hierarchies within participants' responses. Section 4 describes the urban transect along which the walk took place, with particular attention to green spaces, urban morphologies, building typologies, and functions of the built environment. Section 5 presents the results, analyzing variations in participants' responses across different segments of the walk. Section 6 provides a discussion of the findings. Finally, Section 7 addresses the limitations of the study and offers concluding remarks.

Experiential walking as a Multispecies Practice

In the last decades, experiential walking has gained increasing attention in the debate as an approach that guides and informs urban planning and design. Defined as an immersive process of (re-)discovering and learning the environment through the embodied sensory experience that structures personal and collective life, experiential walking frames the ways through which we sensorially and reflectively interact with places (Wunderlich, 2008, Piga *et al.*, 2021a, Rainisio *et al.*, 2024). Beyond senses, the affective experience of walking unfolds as a situated, temporal, and relational process, shaped by micro-variations in context and movement. As recent research has shown, affective responses may shift significantly even within short distances or timeframes, highlighting the dynamic interplay between the person and the environment (Gatersleben & Andrews, 2013; Bornioli *et al.*, 2018; Piga *et al.*, 2023). These evolving emotional patterns highlight the temporal nature of urban experience, where even momentary transitions, such as changes in light, noise, smell, proximity to others, or the presence of biodiversity-related cues like birdsong or rustling leaves, may trigger new meanings and affective reaction, underscoring the relevance of studying and mapping the in-motion experiences as a foundation for more responsive and human-centered urban design (Piga, 2017; Piga *et al.*, 2020; Piga *et al.*, 2021b). In particular, the recognition of these affective dynamics reinforces the potential of biophilic design approaches that aim to integrate nature within urban environments that aim to integrate nature within urban environments in ways that actively engage perception, emotion, and bodily experience (Jackson, 2003; Kellert *et al.*, 2008; Lindal & Hartig, 2015; Fumagalli *et al.*, 2020; Boffi *et al.*, 2021). This resonates with Thibaud's (2013) notion of affective atmospheres emerging through motion, and with Ingold's (2011) idea of walking as a mode of embodied learning that fuses perception and movement in situ. Such interaction reflects a *purposive sensibility*, indicative of a pre-reflective form of knowledge held while walking—a distinctive mode of attentional learning through which we come to experience and understand urbanism, as McFarlane (2011) also highlights. Several authors highlighted the presence of a reciprocal

relationship between the walking practice and the sense of (or for) place because walking as an "aesthetic and critical spatial practice" contributes to moderate and shape our sense of place and the narratives that surround it (Careri, 2002; Decandia & Lutzoni, 2016). Indeed, as Giovannoni (2017) argues, walking constitutes a multifaceted experience that encompasses sensory, socio-relational, and imaginary dimensions—each contributing to the way we interpret and give meaning to the urban environment.

Alongside recent perspectives that emphasize the affective and perceptual dimensions of walking in urban contexts, it is also important to acknowledge earlier theoretical contributions that have laid the conceptual foundations of the experiential approach. The critical perspectives underpinning experiential walking draw on a range of philosophical and theoretical contributions that foreground the body, space, experience (and their interrelations) as key dimensions on which 20th century critical discourse reflects on — ranging from Yi-Fu Tuan's conception of experience as a synthesis of feeling and thought, corresponding to the subjective and objective realms respectively, to Merleau-Ponty's (1962) phenomenological account of experience and the body–space relationship, characterized by continuity and sensory immersion. Other important contributions relate to Augoyard's (1979) or De Certeau's (1980) different, although complementary, interpretations of walking as a form of enunciation, framed by the analogy with verbal language, as well as to Burckhardt's (Ritter & Schmitz, 2015) science of walking which emphasizes the perceptive sequences through which we experience landscape.

According to Yi-Fu Tuan (1977), the concept of experience matches with the one of learning, because "to experience is to learn; it means acting on the given and creating out of the given. The given cannot be known by itself. What can be known is a reality that is a construct of experience, a creation of feeling and thought" (Tuan, 1977: 9). For Merleau-Ponty (1962), space is not a neutral or abstract container, but something that is *lived through* — a field of possibilities that is actively constituted through our bodily presence and movement. Accordingly, the body does not merely occupy space, but it generates spatial relations and serves as the origin point from which the space becomes *meaningful*. An interesting aspect of Merleau-Ponty's conception is his interpretation of the body as *corps vécu* (lived body) – experienced from within rather than perceived as an external object. It is a body in motion, dynamically engaged with the world, continuously navigating, perceiving, and acting within space in a relational and embodied manner. Echoing this perspective, Donna Haraway (1988) emphasizes that embodiment is the very condition through which knowledge is produced—always situated, partial, and shaped by the physical, social, and political positioning of the knowing subject. From her feminist perspective, the body becomes a site of meaning, power, and epistemic authority. More focused on landscape and the ways of experiencing its subjective nature is the reflection of the Swiss designer and planner Lucius Burckhardt. Our perception of landscape is shaped more by cultural and psychological factors than by inherent qualities of the environment, this is why walking becomes a method to engage with and understand the environment. The title of one of his well-known essays, "Why is Landscape Beautiful?", reflects the idea that the beauty perceived in landscapes is not inherent, but constructed and shaped by factors such as personal experience,

cultural narratives, and societal norms (Ritter & Schmitz, 2015).

In relation to the diverse interpretations of experiential walking outlined above—and in light of the urgent challenges posed by environmental degradation and biodiversity loss (Oke *et al*., 2021)—experiential walking has recently been employed as a method for capturing the socio-ecological traits (Andersson *et al.*, 2021) as well as the multispecies dynamics that characterize contemporary cities. By referring to Vergunst and Ingold (2008), Just (2024) highlighted walking as a way to research the "more-than-human social relations", as a method to highlight tensions and frictions between humans and nature. Following Haraway's work, walking can be interpreted as a practice that helps us to «learn to stay with the trouble of living and dying in response-ability on a damaged Earth». In Chthulucene —the word coined by Haraway to refer to a time-space in which humans live in symbiotic entanglement with other species and the Earth, recognizing interdependence, complexity and non-hierarchical relationships— each person is called to engage in unexpected collaborations and combinations with the other species and to perform «ongoing multispecies stories and practices of becoming-with in times that remain at stake, in precarious times, in which the world is not finished and the sky has not fallen—yet» (Haraway, 2016: 55).

Walking can thus be seen as an approach which helps identify ways of building bridges between disciplines that can help us challenge anthropocentric perspectives and develop sensitivity and attentiveness towards more-than-human relations and multispecies dynamics, through approaches which combine ethnographic practices, multispecies studies, animal geography, and biodiversity-sensitive design. This methodological shift also requires a change in the role and positioning of the expert/researcher, which is no longer the (only) one possessing the expertise and knowledge needed to investigate comprehensively natural processes and dynamics, but rather the expert/researcher emerges as a subject which acts as a mediator between humans, non-human species and the environment. In the field of spatial planning and design, this means that the prerogative of researcher becomes the one of guiding the recognition of biodiversity as a non-human stake and right-holder in policy and design processes, as an active subject that planners and designers can co-design with, going beyond its interpretation as a dimension whose values simply relate to the benefits, services, and resources it provides to human societies (Hernandez-Santin *et al.*, 2023).

In this framework, the idea of this contribution is to experiment with experiential walking as a multispecies practice which helps to enrich your perspective on and strengthen the interaction with more-than-human ecologies, as an approach that can improve our capacity to perceive biodiversity in urban environments and recognize it as an active stake and right-holder which we should engage with in planning and design processes. In this vein, experiential walking becomes an approach through which we get to know seasonal rhythms or patterns of inhabitation, maintenance, and care, which impact the ways we see, smell, and hear urban environments as shared vital milieus shaped by human-nature coexistence (Just, 2024).

Methodology

The methodology adopted relies on a data collection process through an online questionnaire administered to participants during the two hour-long experiential walk on an urban transect. Participants in the walk were recruited as part of the Satellite events organized for the second edition of the Festival of the New European Bauhaus which took place in April 2024, promoted by the European Commission. Thirty people, primarily university students from architecture and urban planning courses, agreed to participate. Three facilitators guided the participants along the west-east transect of the city, traversing urban areas where diverse multispecies interactions, scales, and dynamics unfold (Figure 1). The group of participants made three stops to experience highly biodiverse green areas encountered along the urban route: a botanical garden, a neighborhood garden, and a large public park. Qualitative and quantitative data were collected through an online questionnaire, which included both closed-ended questions using predefined answers and Likert scale, as well as open-ended questions. Before the beginning of the walk, as an icebreaking activity, participants were asked to submit three to five keywords related to urban biodiversity through the WOOCLAP app that were used to build a word cloud which was presented and discussed at the end of the walk. During the walk, participants answered questions about four main topics: i) the recognized benefits of urban biodiversity, ii) the ability to recognize different plant and animal species, iii) the evaluation of participant's perception of biodiversity present along the path, iv) the perceived restoration of the green area, that is its capability of restoring mental fatigue (Kaplan, 1995; Felsten, 2009), and v) the typologies of activities that the participant would feel comfortable to do there. The questionnaires were structured as alternating sets of questions to assess the possible influence of exposure to natural environments on their responses and potential changes in participants' opinions throughout the route (Figure 2). For this purpose, a first questionnaire (Q1) was administered at the beginning of the route in an urban setting (Celoria Street) and mirrored (Q6) at the end of the route in a more natural environment (Lambretta Park). Similarly, a second questionnaire (Q2) was mirrored by another questionnaire (Q4), both conducted in urban settings, while Questionnaire 3 (Botanical Garden) was mirrored by Questionnaire 5 (San Faustino Garden). In total, three questionnaires were administered in urban, built environments and three in natural, "green" environments. At each stop point, facilitators asked participants to carefully observe the surrounding environment and access a dedicated questionnaire through their mobile scanning a QR code.

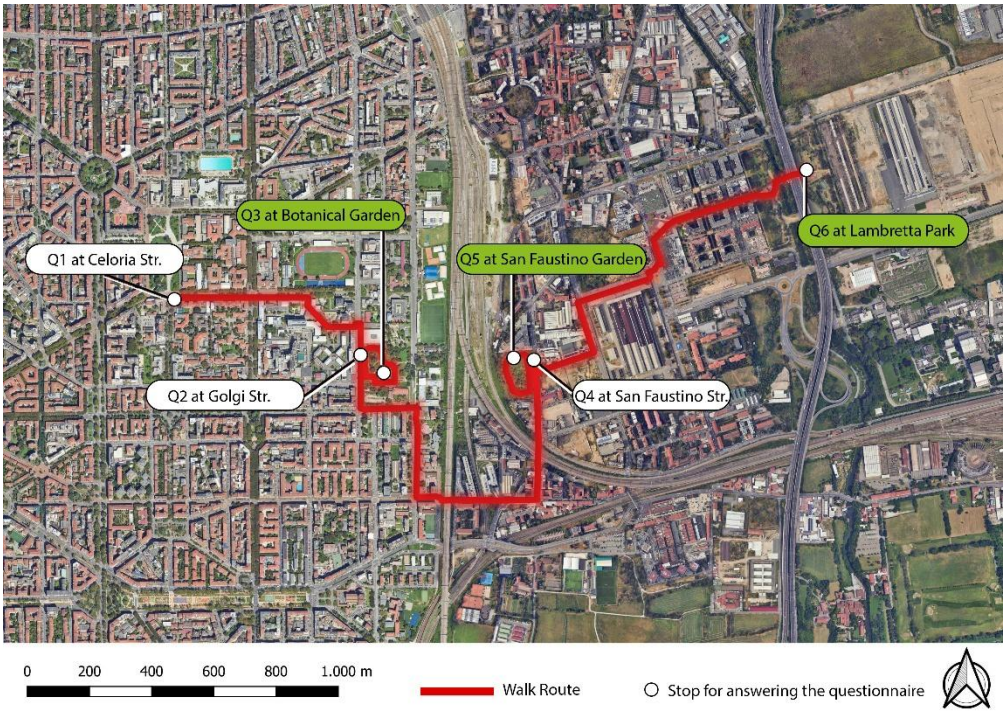

Figure 1. *Sequence of Questionnaire Locations (white dots; green labels indicate questionnaires administered in green areas gardens and parks), White Labels refer to those administered in the Built Environment along the Experiential Walk Route (in red), which follows the East-west Urban Transect from Leonardo da Vinci Square to Lambretta Park*
Source: elaboration by the authors

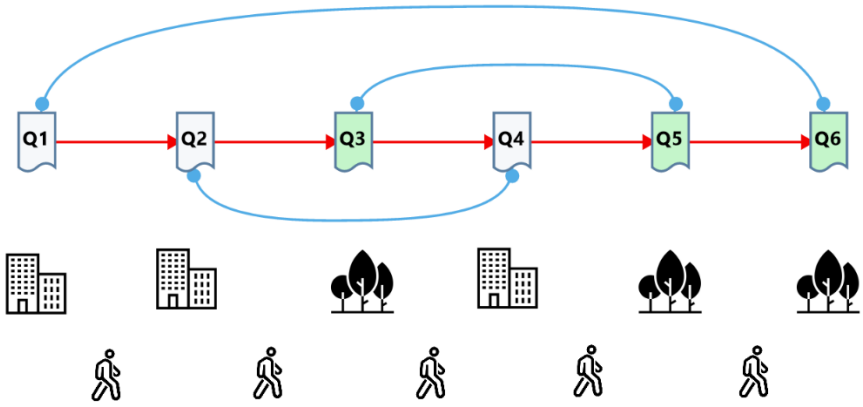

Figure 2. *Questionnaires Sequence along the Route. The First Point Relates to the Built Environment, while the last one is an Urban Park. The other Questionnaires alternate between the Two Different Contexts. Questions are replicated in Pairs of Questionnaires: Q1-Q6; Q2-Q4; Q3-Q-Q5*
Source: elaboration by the authors

Data collected through questionnaires were then analyzed to find relationships and hierarchy in participants' answers. The first analysis is the comparison of the

Likert scale questions to assess how the rating increased, decreased or remained the same in the two different areas. In the two green areas of the Botanical Garden and the San Faustino Garden participants (Figure 3 and 4) were asked to select activities that better suited the places (i.e., Creative activities, Contemplative activities, Interaction with nature, Social interactions, Fitness, Break, I don't know). The six activity categories were identified by taking as reference a recent study that employed a similar methodological approach (Boffi *et al.*, 2022). The comparison of the categories' distribution offers a portrait of how the use of those areas is differently perceived by participants. Participants were invited, both before and after the walk, to reflect on and state what they perceived as the most important benefit of urban biodiversity. (i.e., Improved air quality, Enhanced mental well-being, Climate regulation, Biodiversity education and awareness, Ecological resilience, Supporting pollinators, Recreational opportunities, Economic benefits, Others, I don't know). These benefits were selected after a screening of the relevant scientific literature in the field (Secretariat of the Convention on Biological Diversity, 2012; IUCN, 2024). We checked the changes in the answer distribution to verify the effect of the information shared during the walk, due to a short communication on vegetation cultivated in the Botanical Garden, and a second one on urban biodiversity at Lambretta Park. The Chi-squared analysis of the categorical selections of the two pairs (questionnaires 3-5; questionnaires 1-6) helped in checking if the pattern in answers changed along the walking path. An analysis of variance (ANOVA) was conducted to examine the effects of the questionnaire administration location and the specific questions on participants' responses. The ANOVA analysis provided an insight into the level of differences in the answers provided from one place to another with the aim of identifying where relevant opinion variation occurs. Eventually, an Equivalence Class Clustering and bottom-up Lattice Traversal analysis (ECLAT) has been applied to the participants' answers to identify the centrality[3] of the elements presented to them and how the answers are connected one another in terms of strength in the selection sequence. The ECLAT algorithm was applied to identify frequent answers patterns within participants' responses. A minimum support threshold of 0.1 was set, ensuring that only item combinations present in at least 10% of the responses were considered. The algorithm explored combinations ranging from individual items up to a maximum size equal to half the number of total questionnaires. Considering that all the six questionnaires are paired to a homologue one, this procedure aims to identify patterns that emerge from three of them.

3 Degree centrality is a fundamental measure of node importance in network analysis. It quantifies the number of direct connections (edges) a node has to other nodes within the network. In an undirected graph, it reflects how many immediate neighbors a node has, serving as a proxy for its local influence or activity.

A Transect Through Milan:
Experiencing Urban Biodiversity Across Diverse Urban Fabrics

Characteristics of the selected Path

In selecting the study area where to conduct the experiential walking, priority was given to the levels of walkability of urban space, the presence of diverse forms of urban biodiversity, and the inclusion of various urban fabrics characterized by different morphologies, typologies, and levels and accessibility of green spaces. A west-east transect was identified in proximity to the main campus of Politecnico di Milano, located in the northeastern sector of the city. The 4.135 km route (Figure 1) traversed a heterogeneous urban fabric, crossing two university campuses, a botanical garden, residential neighborhoods, a railway underpass, an urban garden - currently closed to the public, a former industrial district currently undergoing processes of urban regeneration, and ending at an urban public park. The area surrounding the path has greenery coverage of 29% as evaluated by an NDVI measure of the 25Km^2 surface centered in the middle of the path (Figure 8). The walk started from a dense urban environment (Celoria Street) and reached, at the end, a more natural environment (Lambretta Park) located at the city outskirts, characterized by vast spaces and the prevalence of natural elements on built ones. The path intersected three major public green spaces identified as biodiversity hotspots (the Botanical Garden, the San Faustino Garden and the Lambretta Park), each distinguished by different degrees of accessibility, maintenance, usage, and species composition. Additionally, tree-lined avenues, roadside vegetation, and private green areas abutting the street contributed to a complex and varied urban landscape, providing an optimal setting for examining how perceptions of urban biodiversity are influenced by the walkability levels and the morphology of the built environment.

Figure 3-4. *The Group of Participants exploring the Botanical Garden (above) and the San Faustino Garden (below)*
Source: Luca Lazzarini

The First Segment: From early to late 20th Century Campus Districts, toward the Botanical Garden of Statale University

Figure 5. *The Different Urban Fabrics crossed by the Participants along the First Segment of the Walk: From the Left to the Right, Celoria street, Early Twentieth-century Fabric; via Golgi, Late Twentieth-century fabric; the Botanical Garden of Statale University*
Source: Google Earth

The first segment of the route (about 1 km, from Celoria Street to the Botanical Garden) traverses an early twentieth-century urban fabric developed as part of the Pavia-Masera urban plan (1910–1912). This plan represented a continuation of earlier urban planning strategies aimed at facilitating the rapid, concentric expansion of Milan in response to industrialization. Within this framework, the decision was made in the early decades of the century to concentrate universities within an agricultural area located entirely outside the historical core of the city, "a self-contained district capable of reproducing the complexity of the city within itself"

(Brambilla, 2009). Politecnico di Milano campus' layout was designed in 1913 by Augusto Brusconi and Gaetano Moretti, conceived as a series of pavilions interspersed with green spaces and open-air passages. Along the southern side of Celoria Street, the coeval Statale University campus adopted a similarly permeable configuration: a pavilion-based layout in which individual buildings are separated by connective green courtyards, open spaces, and pedestrian passages. To the east, the subsequent Statale University campus–developed primarily in the post-war decades up until the 1990s–retained this dispersed morphological scheme while introducing a broader typological diversity and architectural languages. During the second half of the 20th century, the broader university area emerged as a site of architectural experimentation for prominent Milanese architects. Vico Magistretti designed the new headquarters of the Faculty of Biology between 1978 and 1981 as three towers with pyramidal roofs, each featuring four chimneys, and a lower, detached body composed of two semicircular lecture halls, joined by a linear volume. In proximity, during the 1990s, Francesco Soro designed a building for the Faculties of Biology and Physics, a 150-metre-long glass brick wall facing via Golgi and enclosing the campus premises.

The first segment of the walk thus unfolds from Leonardo da Vinci Square along the tree-lined Celoria Street, running parallel to the permeable frontage of the older Statale campus. The internal green courtyards reflect a design tradition rooted in the late 19th century, characterized by regular and symmetrical grass plots and carefully selected tree species. After, the route continues through the more recent Statale campus, open and accessible during the day, where greenery transitions to a more fragmented configuration: green elements assume a residual or marginal role, often confined to the edges of vehicular corridors, and paved surfaces are significantly more extended than permeable ones.

The path leads to the Botanical Garden of Statale University, the first green public space visited by participants. Established in 2001 on the site of a former abandoned farmhouse granted by the Municipality of Milan, the Botanical Garden is managed by the Department of Biosciences of the Statale University and is open to the public from March to October. The 22.000 square meters area hosts a variety of natural habitats characteristic of the Lombardy region, supporting scientific research and educational activities, while also bringing citizens closer to nature and enhancing their awareness of both native and non-native plant species, spontaneous or cultivated. The layout includes several paths crossing diverse ecological zones, bringing visitors to venture into densely vegetated areas, to skirt the course of a stream and a pond or traverse open lawns, with benches available for rest. Along the way, visitors may observe a wide set of plant species and encounter various insect species. At the core of the Garden there are three greenhouses, which function as growth chambers, shelters for certain plant species during the winter, and spaces dedicated to scientific research. Visitors can observe research activities from outside the glass walls and develop a greater appreciation for the role of plants within the urban ecosystem. The Botanical Garden is separated from the adjacent road by a metal fence enveloped by a dense hedge, which obstructs views from outside. In a few sections, the hedge lowers and allows partial visibility into the Garden. The space becomes fully visible only at the main entrance, in front of Francesco Soro's

building, where the hedge gives way to a metal fence and gate, offering unobstructed views into the Garden's interior.

The Second Segment: Crossing Infrastructure, through the Ortica Neighborhood, to the San Faustino Garden

Figure 6. *The Different Urban Fabrics crossed by the Participants along the Second Segment of the Walk: From the Left to the Right, the First Train unraveling below Railways; Ortica Neighborhood; The San Faustino Garden*
Source: Google Earth

The second segment (1.5 km-long) traverses a residential area composed of linear, collective housing blocks constructed during the 1960s and 1970s, characterized by green buffer zones, as strips of vegetation separating them from the street or private green areas adjoining the road, often hosting large canopy trees. The route proceeds toward the railway, whose embankments support a dense thicket of spontaneous vegetation, forming a linear grove. A tunnel and an underground passage allow to cross two railways, after which the route enters the Ortica neighborhood, formerly a working-class district that, over time, became increasingly enclosed by road and rail infrastructures, remaining somewhat separated from the rest of the city, retaining both its spatial configuration and its social identity. The name "Ortica" derives from the Italian words *orto* and *ortaglia*, referring to plots of land cultivated for vegetables, reflecting the medieval identity of the district, when it consisted of an agricultural settlement near the Lambro River, composed of a small church and a few farmhouses. In the mid-19th century, the area was intersected by Milan's first railway line to Treviglio, located in the east of the city. This development introduced a division between the northern section, which underwent early industrialization, and the southern section, which retained its rural character. Ortica was originally part of the municipality of Lambrate, which was then annexed to Milan in 1923. Before and after the Second World War, several industrial plants were established in and around the area like the Innocenti-Lambretta factory, which produced steel tubing and later cars and motorbikes. Many workers employed in these factories resided in Ortica, which fostered a strong sense of community and social cohesion. During the deindustrialization of Milan in the 1990s, the Innocenti plant was closed, and the city has grown around Ortica, both in terms of infrastructures and urban development. Today, the neighborhood presents a heterogeneous urban character:

certain areas retain low-rise residential buildings that reflect the former rural landscape and maintain the community's working-class identity, while in the north of the railway, the urban fabric is characterized by the presence of zones undergoing densification and former industrial plots currently subjected to urban regeneration. Consequently, Ortica's urban fabric is highly fragmented, shaped by the presence of various transportation infrastructures as well as both permanent and temporary fenced-off areas.

The second segment of the route follows via San Faustino and leads to San Faustino Garden, a neighborhood green space recently named after the Mirabal sisters, called "Las Mariposas"[4]. The garden is approximately two hectares and is situated adjacent to the railway embankment and bordered by two elderly care facilities, with its fourth side facing via San Faustino and enclosed by a metal fence. The area was formerly a wasteland, used as an illegal dumping site; it was reclaimed in 2017 by a consortium of non-profit associations, who secured the space through a public call for proposals. These groups restored existing vegetation and transformed the site into a community garden. Since that moment, the garden was the place for many projects, including the co-design of a small, sustainable therapeutic garden for the elderly, aimed at evaluating the cognitive and social benefits of urban nature (Boffi *et al.*, 2022). In 2022, the loan-for-use agreement expired and was not renewed, leading to the closure of the garden to the public. In the following years, the vegetation initially restored by local associations continued to grow spontaneously, turning the space into a valuable site for observing biodiversity dynamism. The central area features numerous trees, such as mulberries and cherry trees, alongside spontaneous species like *Acer negundo* and invasive alien species as *Ailanthus altissima* (Fumagalli *et al.*, 2020). The garden also supports a variety of vascular plants, shrubs, birds, and insects. Currently, the San Faustino Garden serves as a project site for LABU – Laboratorio per la Biodiversità Urbana (Laboratory for Urban Biodiversity) coordinated by Politecnico di Milano, under *Spoke 5* of the National Biodiversity Future Center (NBFC) research project. The NBFC is one of five national research centers in Italy funded by the National Recovery and Resilience Plan through the NextGenerationEU program; research conducted within *Spoke 5* focuses on the conservation, restoration, and enhancement of urban biodiversity. LABU is leading a co-creation process to design an inclusive, multifunctional, and multispecies garden in this location, where social activities support practices of nature preservation and monitoring.

4 Aida Patria Mercedes, Maria Argentina Minerva, Antonia Maria Teresa Mirabal led the resistance against the dictatorship of Rafael Trujillo in the Dominican Republic and were brutally murdered in 1960.

The Third Segment: Walking in an Area under Regeneration toward Lambretta Park, facing Future Perspectives

Figure 7. *The Different Urban Fabrics crossed by the Participants along the Third Segment of the Walk: From the Left to the Right Rubattino District; A Residential Complex Part of an Urban Regeneration Program (PRU) implemented between 1995 and 2000; the Lambretta Park*
Source: Google Earth

The third and final segment of the walk (about 1.5 km) extends through the northern area of Ortica neighborhood, merging with Rubattino district, an area characterized by larger urban plots and several former industrial sites currently undergoing regeneration, like the 12.000 square meters area right across the street from San Faustino Garden, which has recently undergone rapid transformation. Around the corner of a large military barracks, an extended decommissioned industrial area, already remediated, was subsequently left unused, remaining closed for an extended period. Over time, spontaneous vegetation reclaimed the site, giving rise to dense groves that, although visible from the street, remain physically inaccessible. Proceeding toward Lambretta Park, the destination of the walk, the path traverses a spatial sequence characterized by different articulations, part of an Urban Regeneration Program (PRU[5]) implemented between 1995 and 2000 by Alfio Grifoni, Alpina S.p.A., and LAND. A tree-lined pedestrian promenade is the backbone of the spatial layout of a residential complex composed of 18 C-shaped buildings arranged in pairs. Six of these buildings face the promenade with open green courtyards which, although fenced up, visually and spatially integrate with the greenery of the pedestrian axis, generating a cohesive and immersive vegetated environment. Lambretta Park, also realized within the framework of the same PRU, is a public green space equipped with sports and leisure amenities and embedded with diverse vegetation. The tree composition includes species such as black locust (*Robinia pseudoacacia*), field maple (*Acer campestre*), European hornbeam (*Carpinus betulus*), European ash (*Fraxinus excelsior*), various species of alder (*Alnus spp.*), flowering ash (*Fraxinus ornus*), London plane (*Platanus x acerifolia*), Lombardy poplar (*Populus nigra 'Italica'*), oak (*Quercus spp.*), and white willow (*Salix alba*).

5. The buildings were designed by Studio Geroldi, Antonio Gallo, Luca Imberti, Marina Basso, Alfio Grifoni, Caputo Partnership.

Faunal biodiversity is also present, with occasional sightings of wild rabbits. The Lambro River crosses the park within a straight riverbed, modified in the past century to accommodate large-scale industrial plants. In this context, Parco dell'Acqua (Park of Water) sews the presence of the river and the elevated *tangenziale est* (eastern ring road), affecting the area with a massive, concrete structure and persistent traffic noise. Beneath the viaduct, an irregularly shaped body of water reflects the concrete pillars of the vehicular road, outlining a humid artificial/natural landscape serving as habitat for aquatic fauna, including freshwater turtles. Lambretta Park borders the former site of the Innocenti-Lambretta factory, a series of long, linear steel sheds, skeletal remains left in a state of abandonment since the 1990s. In 2021, the public competition "Magnifica Fabbrica" was launched, inviting architectural proposals to regenerate the site into a new multifunctional complex serving Milan's Teatro alla Scala. The competition envisioned the transformation of 66.450 square meters into scenography and costume workshops, rehearsal, and storage spaces, while simultaneously expanding Lambretta[6] with 800 square meters. The winning proposal[OBJ] includes the creation of a green space adjacent to Lambretta Park known as "Palazzo di Cristallo" (Crystal Palace), characterized by a highly diverse and ecologically complex landscape. The design features a sequence of semi-sunken parterres arranged along a central pedestrian axis. These recessed basins are designed to foster biodiversity and vegetation growth. Plant species will be selected with the aim of enhancing ecological diversity, attracting pollinating insects, and minimizing maintenance needs. Certain zones will be managed as wild grasslands, with mowing limited to defined pathways to preserve a naturalistic character (SD Partners *et al.*, 2021). The "Magnifica Fabbrica" complex will complete the PRU, integrating the area in the urban fabric and in the public urban life mediating, at the same time, this relationship through landscapes and habitats reviving the site's agricultural past and referring to remaining cultivated fields.

6. The winning proposal was developed by a team formed by SD Partners (Massimo, Giuliani, Alessandro Viganò, Beatrice Meroni), FRPO Rodríguez y Oriol Arquitectos (Pablo Oriol, Fernando Rodríguez), Walk Architecture & Landscape (Juan Tur Mc Glone), Studio Gibelli, engineer Luca Stefanutti, Agroservice, TRM, and Mecanismo Ingeniería.

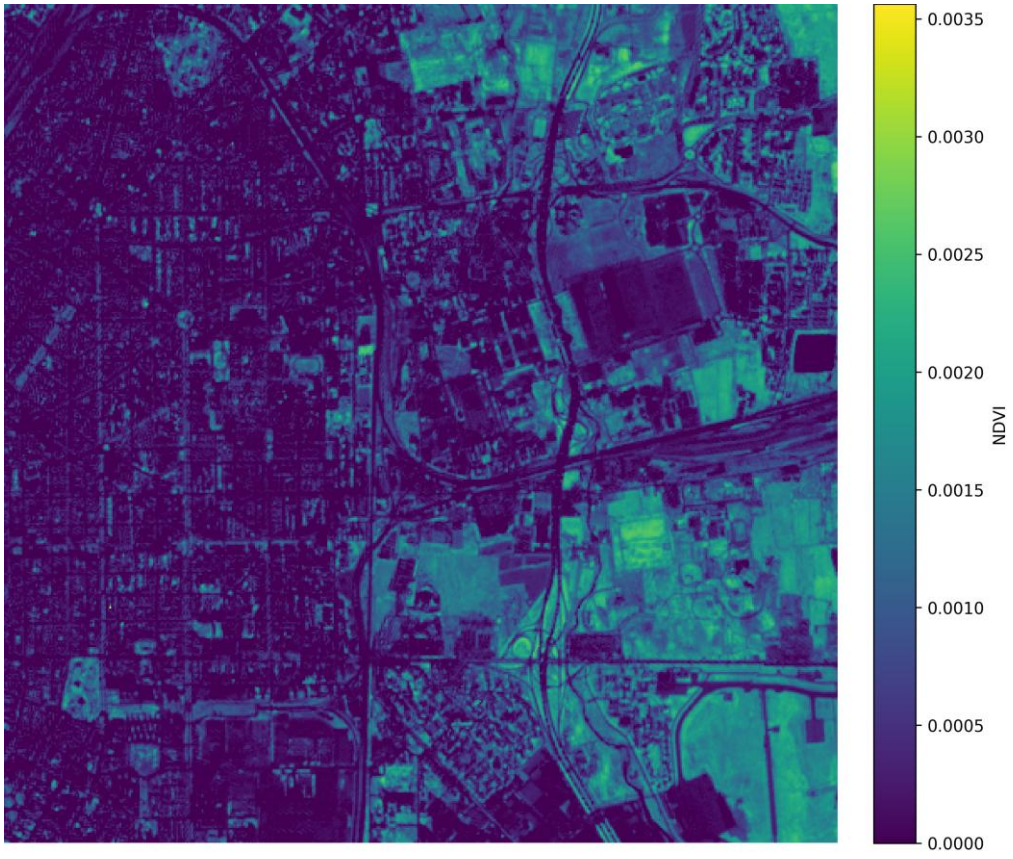

Figure 8. *NDVI Map of the Area*
Source: Sentinel2 satellite, data extracted for April 15th 2024. Area analyzed 25Km^2

Results

Answers Frequency Comparison

By comparing responses to homologous questionnaires administered along the route, it is possible to identify variations and fluctuations in participants' ratings. Regarding the common question between Questionnaire 3 (administered at the Botanical Garden) and Questionnaire 5 (administered at San Faustino Garden), only 45% of participants provided the same assessment of the restorative properties of the two locations; 45% rated San Faustino as less restorative, while 10% rated it as more restorative (Figure 9). Comparing the answers to the three shared questions between Questionnaire 2 (administered before entering the Botanical Garden) and Questionnaire 4 (administered before entering San Faustino), the following patterns emerge: (i) 45% of participants reported a higher animal diversity along the segment leading to San Faustino Garden compared to the segment toward the Botanical Garden; (ii) 55% recognized a greater variety of vegetation in the second segment of the route; (iii) 35% reported an overall increase in the perception of natural elements in the second segment compared to the first. For all three questions asked outside the parks, only a minority reported a decrease in the second segment relative to the first.

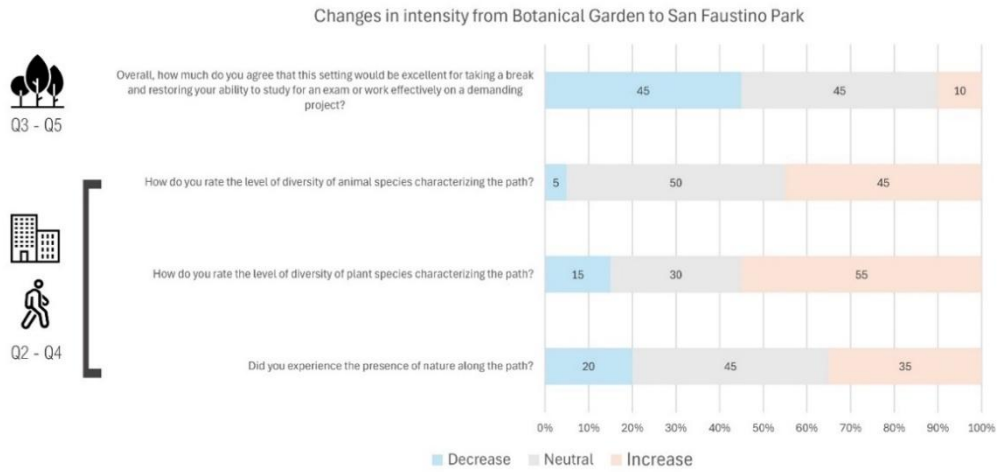

Figure 9. *Changes in Participants' Opinions comparing Answers to the same Questions at separate places. First Question was asked firstly at the Botanical Garden and after at the San Faustino Garden. The other Three Questions were asked before entering the Two Parks*

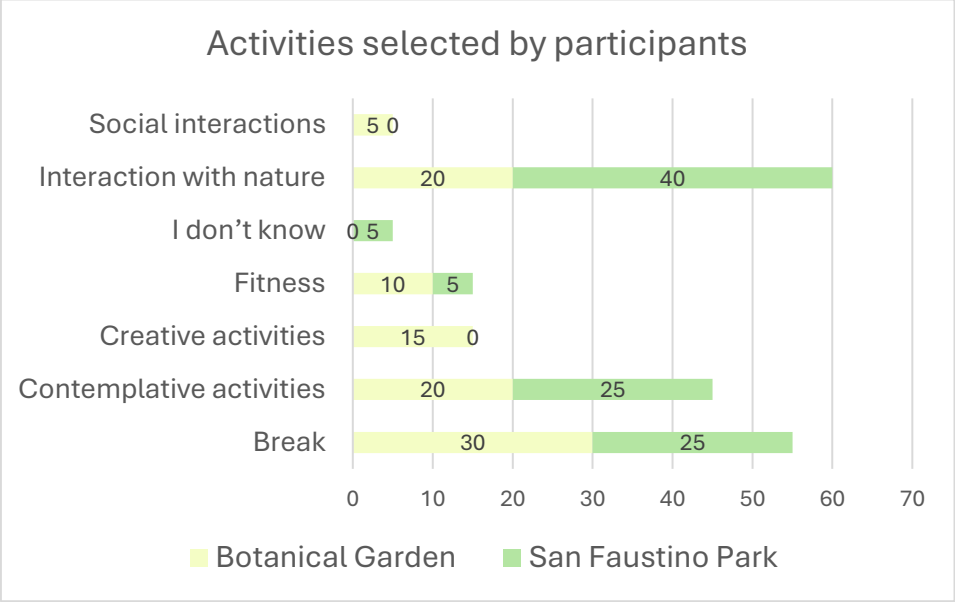

Figure 10. *Percentage of Selections for each listed Activity in the Two Parks. The main difference is the "Interaction with Nature" that is Double for San Faustino Garden compared to the Botanical Garden. Data related to Questionnaires 3 and 5*

In both parks, participants were asked to indicate the activities they considered most appropriate for the location (Figure 10). A comparison of responses reveals a greater variety of activities attributed to the Botanical Garden compared to San Faustino Garden. For the Botanical Garden, the most frequently selected activity was "break" (30% of responses), followed by "contemplative activities" (20%). In the case of San Faustino, the most frequently selected activity was clearly "interaction with nature" (40%), followed by "break" and "contemplative activities" (25%).

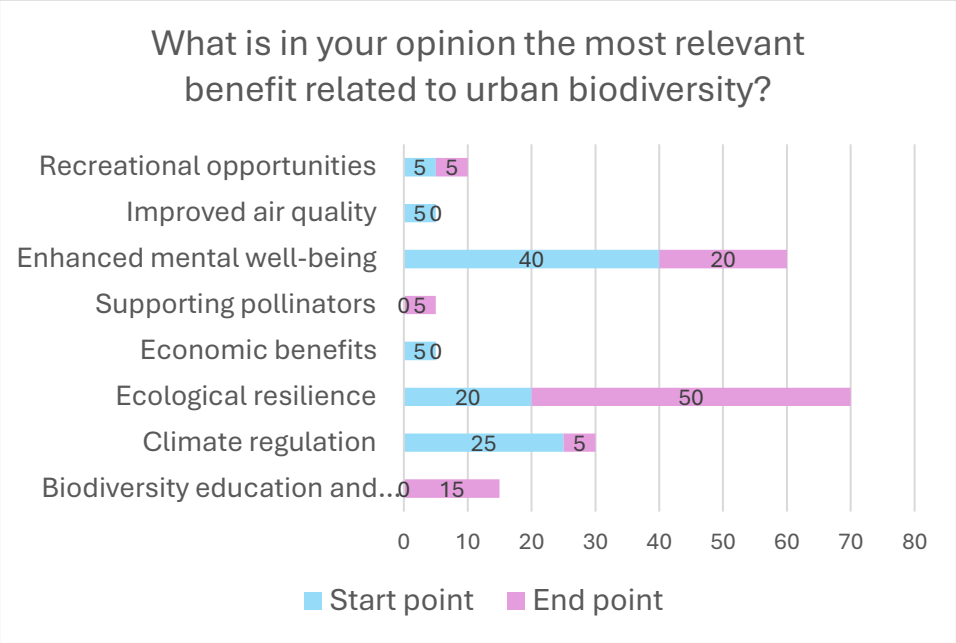

Figure 11. *Comparison of the Answers provided at the Beginning and at the End. Data expressed in Percentage and related to Questionnaires 1 and 6.*

Participants were asked at both the beginning and the end of the route to indicate what they considered the most important benefit of biodiversity. The responses show that prior to the experiential walk, 40% of participants identified "enhanced mental well-being" as the main benefit. However, by the end of the route, the frequency of this response was halved. At the final point of the walk, the most frequently selected response was "ecological resilience" (50%), a benefit that only 20% of participants had considered important at the beginning (Figure 11).

Comparison of Ratings: Analysis of Variance

The two-way ANOVA within analysis (Table 1) comparing Questionnaires 2 and 4 revealed two important findings administered in Golgi Street and San Faustino Street. First, even though the questionnaires were identical, participants' overall responses differed significantly between the two administrations ($F(1, N) = 4.76$, $p = 0.03$). This suggests that when or where the questionnaire was completed may have influenced their judgments—perhaps due to changes in mood, recent experiences, or the surrounding context. Second, there was a significant difference in how participants answered the three questions ($F(2, N) = 43.62$, $p < 0.001$). This is expected, as each question focused on a different aspect of the experience. The fact that participants responded differently to each one confirms that the questionnaire successfully captured distinct dimensions of what they perceived along the route. Importantly, there was no significant interaction between the questionnaire administration and the specific questions ($F(2, N) = 0.48$, $p = 0.62$). This means that although the overall level of responses changed over time, the pattern across the three questions stayed the same. In other words, the questionnaire remained internally consistent, even if participants' general impressions shifted. This stability

in how questions relate to each other over time supports the reliability of the instrument in capturing structured perceptions, despite contextual variation.

Table 1. *ANOVA Two-ways within Analysis for Questionnaires 2 and 4*

	sum_sq	Deg. of freedom	F	PR(>F)
C(Questionnaire)	4.03	1.00	4.76	0.03
C(Question)	73.85	2.00	43.62	0.00
C(Questionnaire):C(Question)	0.82	2.00	0.48	0.62

Considering that Questionnaire 3 and 5 administered in the Botanical Garden and the San Faustino Garden contains one rating question only, a one-way analysis of variance was conducted to examine whether there was a significant difference in participants' responses between the two questionnaires (

Table ***2***). The analysis was restricted to participants who completed both questionnaires to control between-subject variability. The results showed that the difference between questionnaires was not statistically significant, $F(1,38)=2.46$ $p=0.125$. Although there was a difference in mean responses between the two administrations, this difference did not reach statistical significance at the conventional p-value of 0.05. Therefore, we fail to reject the null hypothesis and conclude that there is not sufficient evidence to suggest that participants' perceptions changed significantly between the two sites. In other terms, the lack of a statistically significant difference suggests that respondents' perceptions of the restorative quality of the setting did not change between the two survey administrations.

Table 2. *ANOVA One-way within Analysis for Questionnaires 3 and 5*

	sum_sq	Deg.of freedom	F	PR(>F)
C(Questionnaire)	3.60	1.00	2.46	0.12

Analysis of Categorical Responses

The Chi-squared test of the activities selected by participants in questionnaires 3 and 5 shows that the p-value is 0.811, which is well above the common significance threshold of 0.05. This indicates that there is no statistically significant difference between the responses in the two questionnaires. In other words, the distributions of responses are similar, suggesting consistency or stability in how participants answered the categorical question across the two survey instances. Conversely, the results of the Chi-squared test between categorical answers of Questionnaire 1 and 6 administered in Leonardo Da Vinci Square and Lambretta Park, indicate a p-value of 0.041; this suggests a significant difference between the responses provided by participants in the two questionnaires. In other words, the responses are not consistent or stable comparing the beginning and the end of the path and indicate a shift in participants' perception of biodiversity benefits because of the experiential walk.

Eclat Analysis, Profile Emerging from Network Centrality

The key element for participants is the high relevance of biodiversity (centrality = 0.97; point 1 in Figure 12), followed by the acknowledgment of low animal diversity in the route area (centrality = 0.85; point 2 in Figure 12). Participants strongly attribute a restorative capacity to the Botanical Garden (centrality = 0.66; point 3 in Figure 12) and, by the end of the route, identify ecological resilience as the primary benefit of biodiversity (centrality = 0.64; point 4 in Figure 12). Additionally, San Faustino is perceived as playing a significant role in fostering interaction with nature (centrality = 0.61; point 5 in Figure 12). Conversely, aspects related to "Biodiversity education and awareness" are considered highly marginal (centrality = 0.14), as is "mental well-being" (centrality = 0.21). It is worth noting that centrality here refers to the relative importance of specific response patterns based on co-occurrence frequencies derived from the ECLAT association rules.

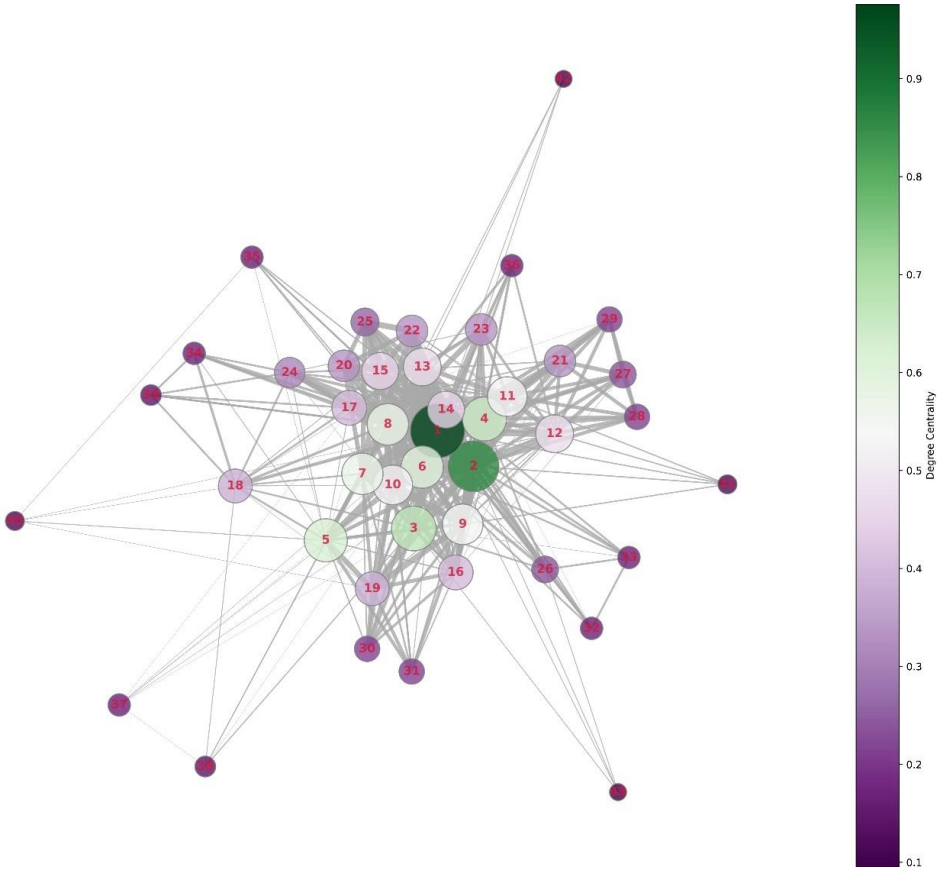

Figure 12. *Lattice Network representation of the Participants' Answers Hierarchy*
Source: Elaboration by the authors

Discussion

ANOVA analyses suggest that experiencing the Botanical Garden as part of an

urban route likely had a significant influence on participants' perceptions of neighborhood biodiversity, although individuals tend to maintain a certain internal coherence in their responses. The analysis of categorical responses shows that participants preserve a consistent pattern in the activities selected for the two parks, despite some location-specific variations. In contrast, what changes significantly are the opinions recorded at the beginning and end of the route regarding the perceived benefits of biodiversity. The research results indicate that respondents view ecological resilience as a recognized benefit of urban biodiversity, while climate regulation and recreational opportunities are less commonly recognized as such. Additionally, the study highlighted participants' scarce species literacy, evident in their limited ability to identify the animal and plant species encountered along the path. This supports what was already highlighted by Bele and Chakradeo (2021) concerning both a lack of knowledge about biodiversity and a limited capacity to perceive it as a benefit in dense urban environments which often emerge in studies of public perception of biodiversity. As also shown in a similar study made by Qiu *et al.* (2013), this attitude is influenced by multiple disturbances in public spaces and challenges in accessing and experiencing some of the areas where biodiversity may thrive. Moreover, the data show a strong perceived restorative effect of green areas, alleviating stress and disturbances encountered during the walk and contributing to the revitalization of participants' psychological and physical resources. The ECLAT analysis highlighted a clear hierarchy in the participants' perceptions. Biodiversity emerged as the most central concern across responses, particularly in terms of its general relevance and the perceived lack of animal diversity along the route. High centrality was also attributed to the Botanical Garden's restorative potential and to the recognition of ecological resilience as a key benefit by the end of the experience. In contrast, dimensions such as educational aspect or personal well-being appeared as peripheral elements in participants' evaluations, indicating a lower perceived relevance within the overall experience.

Conclusions

In the selection of activities attributed to the two parks, San Faustino Garden is more strongly associated with interaction with nature, while the Botanical Garden presents a wider variety of activities. This counterintuitive disparity is likely since San Faustino appears less structured compared to the Botanical Garden (excluding the northern part, which was recently renovated, Boffi *et al.*, 2022). Additionally, the presence of urban gardens, which suggest more direct community involvement in managing natural elements, may have contributed to this selection, while in the Botanical Garden, the elements appear more contemplative. The interaction with the park environment and the acquisition of information on plant species, particularly at the Botanical Garden, significantly influenced the participants' responses. Specifically, the role of ecological resilience increased in relevance following the direct observations in both parks and the lectures presented at the Botanical Garden and Lambretta Park. The use of experiential walking, combined with educational moments, contributed to the development of greater awareness of the value of

biodiversity in the urban environments observed along the route. Knowledge of small natural areas within the urban fabric should be more widely shared with the community that studies, works, and lives in this neighborhood so that citizens could become more aware of the biodiversity and have greater contact with nature (Campbell-Arvai, 2019). Some limitations of the study include the small number of participants and the fact that data collection was conducted only once. A repetition of the walking experience along the same path is planned for the near future, with the aim of collecting a larger dataset across the same transect. Furthermore, a deeper understanding of the results would benefit from the application of targeted psychometric analyses.

Lastly, the methodological contribution of this study offers valuable insights for urban planning and design. From a planning perspective, the questionnaire can serve as a practical tool to support participatory processes, particularly by raising local communities' awareness of the value and benefits of biodiversity, and the importance of strengthening the multispecies entanglements and the interactions with more-than-human ecologies in urban development (Houston *et al.*, 2017). Additionally, administering the questionnaire during the experiential walk plays a key role in generating what Haraway (2016) refers to as embodied knowledge, a form of knowledge that is always situated, partial, and shaped by the physical, social, and political position of the knowing subject. This knowledge has the potential to inform more context-sensitive and nature-positive planning strategies and interventions, acknowledging nature as a dynamic entity whose rights and interests should be considered on par with those of humans (Hernandez-Santin *et al.*, 2023).

The experiential walking through a wide range of urban fabrics also unveiled the different conditions of nature within the urban environment, shaped by different factors: the urban morphology and architectural typologies adopted during different phases of Milan's development; the types of greenery associated with various settlement forms; the degree of public accessibility in the traversed environments; the varying levels of visibility into inner green spaces from the street, providing valuable insights for developing architectural and urban design strategies that can enhance the visibility and accessibility of nature in the city, fostering awareness of urban biodiversity, an essential factor, as noted by Nilon (2024), in engaging urban dwellers in the effort to conserve, restore, and promote biodiversity in urban settings.

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Author Contributions

The authors' contribution according to CRediT (Contributor Roles Taxonomy) is described as follows. Luca Lazzarini (LL); Gabriele Stancato (GS); Francesca Zanotto (FZ); Barbara Ester Adele Piga (BP). Conceptualization and data curation: LL, GS & FZ; formal analysis: GS; funding acquisition: BP; investigation: LL, GS & FZ; methodology: LL, GS, FZ, BP; software: GS; Visualization: GS; writing – original draft: LL, GS & FZ; writing – review & editing: LL, GS, FZ, BP.

References

Andersson, E., D. Haase, P. Anderson, et al. "What Are the Traits of a Social-Ecological System: Towards a Framework in Support of Urban Sustainability." *npj Urban Sustainability* 1 (2021): 14. https://doi.org/10.1038/s42949-020-00008-4.

Augoyard, J.-F. *Pas à pas. Essai sur le cheminement quotidien en milieu urbain.* Paris: Seuil, 1979.

Bele, A., and U. Chakradeo. "Public Perception of Biodiversity: A Literature Review of Its Role in Urban Green Spaces." *Journal of Landscape Ecology* 14, no. 2 (2021): 1–28. https://doi.org/10.2478/jlecol-2021-0008.

Boffi, M., L. G. Pola, E. Fermani, G. Senes, P. Inghilleri, B. E. A. Piga, G. Stancato, and N. Fumagalli. "Visual Post-Occupancy Evaluation of a Restorative Garden Using Virtual Reality Photography: Restoration, Emotions, and Behavior in Older and Younger People." *Frontiers in Psychology* 13 (2022): 927688. https://doi.org/10.3389/fpsyg.2022.927688.

Boffi, M., L. Pola, N. Fumagalli, E. Fermani, G. Senes, and P. Inghilleri. "Nature Experiences of Older People for Active Ageing: An Interdisciplinary Approach to the Co-Design of Community Gardens." *Frontiers in Psychology* 12 (2021): 4175. https://doi.org/10.3389/fpsyg.2021.702525.

Bornioli, A., G. Parkhurst, and P. L. Morgan. "The Psychological Wellbeing Benefits of Place Engagement During Walking in Urban Environments: A Qualitative Photo-Elicitation Study." *Health & Place* 53 (2018): 228–236. https://doi.org/10.1016/j.healthplace.2018.08.018.

Brambilla, P. *Itinerari di architettura milanese. L'architettura moderna come descrizione della città. Le Università Milanesi.* Milan: Fondazione dell'Ordine degli Architetti P.P.C. della Provincia di Milano, 2009. https://oami.s3.eu-south-1.amazonaws.com/media/cultura/itinerari/24-le-universita-milanesi.pdf.

Bruno, A., I. Arnoldi, B. Barzaghi, M. Boffi, B. Casiraghi, B. Colombo, P. D. Gennaro, et al. "The One Health Approach in Urban Ecosystem Rehabilitation: An Evidence-Based Framework for Designing Sustainable Cities." *iScience* 27, no. 10 (2024): 1–15. https://doi.org/10.1016/j.isci.2024.110959.

Campbell-Arvai, V. "Engaging Urban Nature: Improving Our Understanding of Public Perceptions of the Role of Biodiversity in Cities." *Urban Ecosystems* 22 (2019): 409–423. https://doi.org/10.1007/s11252-018-0821-3.

Careri, F. *Walking as an Aesthetic Practice.* Barcelona: Land & Scape Series, Gustavo Gili, 2002.
Cooke, A., D. Smith, and A. Booth. "Beyond PICO: The SPIDER Tool for Qualitative Evidence Synthesis." *Qualitative Health Research* 22, no. 10 (2012): 1435–1443. https://doi.org/10.1177/1049732312452938.
Decandia, L., and L. Lutzoni, eds. *La strada che parla. Dispositivi per ripensare il futuro delle aree interne in una nuova dimensione urbana.* Milan: FrancoAngeli, 2016.
De Certeau, M. *L'invention du quotidien. Arts de faire.* Paris: Gallimard, 1980.
Felsten, G. "Where to Take a Study Break on the College Campus: An Attention Restoration Theory Perspective." *Journal of Environmental Psychology* 29, no. 1 (2009): 160–167. https://doi.org/10.1016/j.jenvp.2008.11.006.
Fumagalli, N., E. Fermani, G. Senes, M. Boffi, L. Pola, and P. Inghilleri. "Sustainable Co-Design with Older People: The Case of a Public Restorative Garden in Milan (Italy)." *Sustainability* 12, no. 8 (2020): 3166. https://doi.org/10.3390/su12083166.
Gatersleben, B., and M. Andrews. "When Walking in Nature Is Not Restorative—The Role of Prospect and Refuge." *Health & Place* 20 (2013): 91–101. https://doi.org/10.1016/j.healthplace.2013.01.001.
Giovannoni, G. "Eterotopie della deambulazione." In *Compresenze. Corpi, azioni e spazi ibridi nella città contemporanea,* edited by G. Caudo, J. Hetman, and A. Metta, 188–191. Rome: RomaTre-Press, 2017.
GO FAIR. "FAIR Principles." 2025. https://www.go-fair.org/fair-principles/.
Haraway, D. J. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14, no. 3 (1988): 575–599. https://doi.org/10.2307/3178066.
Haraway, D. J. *Staying with the Trouble: Making Kin in the Chthulucene.* Durham and London: Duke University Press, 2016.
Hernandez-Santin, C., M. Amati, S. Bekessy, and C. Desha. "Integrating Biodiversity as a Non-Human Stakeholder within Urban Development." *Landscape and Urban Planning* 232 (2023): 104678. https://doi.org/10.1016/j.landurbplan.2022.104678.
Houston, D., J. Hillier, D. MacCallum, et al. "Make Kin, Not Cities! Multispecies Entanglements and 'Becoming-World' in Planning Theory." *Planning Theory* 17, no. 2 (2017): 190–212. https://doi.org/10.1177/1473095216688042.
IUCN. *Kunming-Montreal Global Biodiversity Framework: Policy Brief.* 2024. https://iucn.org/resources/issues-brief/kunming-montreal-global-biodiversity-framework.
Jackson, L. E. "The Relationship of Urban Design to Human Health and Condition." *Landscape and Urban Planning* 64, no. 4 (2003): 191–200. https://doi.org/10.1016/S0169-2046(02)00230-X.
Just, J. "Multispecies Walking: Ways of Knowing and Researching Landscapes with Experts." In *Researching Otherwise: Pluriversal Methodologies for Landscape and Urban Studies,* edited by N. Bathla, 241–259. Zurich: gta Verlag, 2024.
Kaplan, S. "The Restorative Benefits of Nature: Toward an Integrative Framework." *Journal of Environmental Psychology* 15 (1995): 169–182.
Kellert, S. R., J. H. Heerwagen, and M. L. Mador. *Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life.* Hoboken, NJ: Wiley, 2008.
Lebov, J., K. Grieger, D. Womack, D. Zaccaro, N. Whitehead, B. Kowalcyk, and P. D. M. MacDonald. "A Framework for One Health Research." *One Health* 3 (2017): 44–50. https://doi.org/10.1016/j.onehlt.2017.03.004.
Lindal, P. J., and T. Hartig. "Effects of Urban Street Vegetation on Judgments of Restoration Likelihood." *Urban Forestry & Urban Greening* 14, no. 2 (2015): 200–209. https://doi.org/10.1016/j.ufug.2015.02.001.
Meda, P. *Orti e giardini botanici di Lombardia.* Bergamo: Edizioni Junior, 2002.
Merleau-Ponty, M. *Phenomenology of Perception.* New York: Humanities Press, 1962.

Methley, A. M., S. Campbell, C. Chew-Graham, R. McNally, and S. Cheraghi-Sohi. "PICO, PICOS and SPIDER: A Comparison Study of Specificity and Sensitivity in Three Search Tools for Qualitative Systematic Reviews." *BMC Health Services Research* 14, no. 1 (2014): 579.

McFarlane, C. *Learning the City: Knowledge and Translocal Assemblage.* London: Wiley, 2011.

Nilon, C. H. "History of Urban Biodiversity Research and Practice." In *Routledge Handbook of Urban Biodiversity,* edited by C. H. Nilon and M. F. J. Aronson, 9–18. London: Routledge, 2024.

Oke, C., S. A. Bekessy, N. Frantzeskaki, et al. "Cities Should Respond to the Biodiversity Extinction Crisis." *npj Urban Sustainability* 1 (2021): 11. https://doi.org/10.1038/s42949-020-00010-w.

Piga, B. E. A. "Experiential Simulation for Urban Design: From Design Thinking to Final Presentation." In *Urban Design and Representation: A Multidisciplinary and Multisensory Approach,* edited by B. E. A. Piga and R. Salerno, 23–36. Cham: Springer International Publishing, 2017. https://doi.org/10.1007/978-3-319-51804-6_3.

Piga, B. E. A., N. Rainisio, and M. Boffi. "The Experiential Walk Diary: Mapping Urban Experience Combining Architecture and Psychology." *Urbanistica Informazioni* 289 (2020): 14–18. http://www.urbanisticainformazioni.it/IMG/pdf/ui289si_sessione_speciale_7.pdf.

Piga, B. E. A. "Experiential-Walk: Experiencing and Representing the City for Urban Design Purposes." In *Experiential Walks for Urban Design: Revealing, Representing, and Activating the Sensory Environment,* edited by B. E. A. Piga, D. Siret, and J.-P. Thibaud, 1–19. Cham: Springer, 2021. https://doi.org/10.1007/978-3-030-76694-8_11.

Piga, B. E. A., D. Siret, and J.-P. Thibaud, eds. *Experiential Walks for Urban Design: Revealing, Representing, and Activating the Sensory Environment.* Cham: Springer International Publishing, 2021.

Piga, B. E. A., G. Stancato, N. Rainisio, and M. Boffi. "How Do Nature-Based Solutions' Color Tones Influence People's Emotional Reaction? An Assessment via Virtual and Augmented Reality in a Participatory Process." *Sustainability* 13, no. 23 (2021): Article 13388. https://doi.org/10.3390/su132313388.

Piga, B. E. A., N. Rainisio, G. Stancato, and M. Boffi. "Mapping the In-Motion Emotional Urban Experiences: An Evidence-Based Method." *Sustainability* 15, no. 10 (2023). https://doi.org/10.3390/su15107963.

Qiu, L., S. Lindberg, and A. Nielsen. "Is Biodiversity Attractive? On-Site Perception of Recreational and Biodiversity Values in Urban Green Space." *Landscape and Urban Planning* 119 (2013): 136–146. https://doi.org/10.1016/j.landurbplan.2013.07.007.

Rainisio, N., M. Boffi, B. Piga, G. Stancato, and N. Fumagalli. "Community-Based Participatory Research for Urban Regeneration: Bridging the Dichotomies Through the Exp-EIA Method." *Journal of Community & Applied Social Psychology* 34, no. 5 (2024): 1–18. https://doi.org/10.1002/casp.2877.

Ritter, M., and M. Schmitz, eds. *Lucius Burckhardt: Why Is Landscape Beautiful?* Basel: Birkhäuser, 2015.

Salmoiraghi, M. *Cent'anni all'Ortica: Storia fotografica.* Cinisello Balsamo: Arti Grafiche P. Lupi, 1991.

SD Partners, et al. *Concorso Magnifica Fabbrica – Relazione tecnico-illustrativa.* Milan, 2021. https://www.magnificafabbrica.concorrimi.it/documents/public/download/3965d7f9a02543c1d5ed596f35f4c4a7%EF%B9%96area=milano.pdf.

Secretariat of the Convention on Biological Diversity. *Cities and Biodiversity Outlook—Executive Summary.* Montreal, 2012.

Thibaud, J.-P. "Commented City Walks." *Wi: Journal of Mobile Culture* 7, no. 1 (2013): 1–32. https://hal.archives-ouvertes.fr/hal-00980752.

Tuan, Y.-F. *Space and Place: The Perspective of Experience.* Minneapolis: University of Minnesota Press, 1977.

Vergunst, J. L., and T. Ingold, eds. *Ways of Walking: Ethnography and Practice on Foot.* London and New York: Routledge, 2016.

World Health Organization, Food and Agriculture Organization of the United Nations, World Organisation for Animal Health, and United Nations Environment Programme. *One Health Joint Plan of Action (2022–2026): Working Together for the Health of Humans, Animals, Plants and the Environment.* Geneva: WHO, 2022. https://www.who.int/publications/i/item/9789240059139.

Wunderlich, F. M. "Walking and Rhythmicity: Sensing Urban Space." *Journal of Urban Design* 13, no. 1 (2008): 125–139. https://doi.org/10.1080/13574800701803472