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From Structure to Social Fabric: Comparing Participatory and Conventional Residential Design in the Context of Social Sustainability

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Abstract

This study investigates the role of residential architecture in fostering social interaction and strengthening residents' identification with their living environment. It focuses on two key dimensions through which housing environments support social cohesion: the spatial dimension, referring to the physical design of buildings and spaces, and the organizational dimension, which involves the engagement of prospective residents in planning, and in the co-creation and development of housing projects. Two dwelling-oriented projects located in Vienna's Leopoldstadt district were selected as case studies: Wohnprojekt Wien and PaN-Wohnpark. Wohnprojekt Wien represents a fully participatory model, characterized by maximum resident involvement throughout all stages of the design process. In contrast, PaN-Wohnpark followed a more conventional approach, involving only limited resident participation in the form of post-occupancy consultations. This participation was limited to aspects of social life, community management, and integration, without influence on the architectural or spatial layout of the buildings. Both projects were evaluated using ten architectural and spatial criteria previously developed by the author to assess features that promote neighborly interaction. The evaluation was based on qualitative field research, including site visits and expert interviews The findings indicate that the participatory design approach implemented in Wohnprojekt Wien significantly contributed to stronger social ties and a heightened sense of community among residents. In contrast, in PaN-Wohnpark—where participation was limited and occurred only after completion—the impact on social cohesion was considerably less pronounced. These results suggest that integrating participatory design methods into residential development can substantially enhance social sustainability by fostering informal social interactions and strengthening residents' sense of belonging. Importantly, the extent to which residents are empowered to influence decisions about their living environments appears to be a critical factor in achieving these outcomes.

Keywords: resource efficiency; housing design; community interaction; co-creation

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1. Introduction

Housing is not merely a physical structure but a social infrastructure that shapes everyday interactions, fosters a sense of belonging, and influences the cohesion of communities. In an era of growing urban inequality, demographic change, and environmental challenges, the design process itself has become a decisive factor in whether housing supports or undermines the principles of social sustainability. Participatory design—where future residents

are actively involved in shaping both private and shared spaces—offers a pathway to more inclusive, equitable, and resilient communities. By aligning spatial decisions with lived experiences and local needs, participatory processes have the potential to counteract social isolation, strengthen neighborhood networks, and ensure that housing serves not only economic but also human and cultural purposes.

This study investigates how residential architecture influences social interaction and residents' identification with their living environment. Specifically, it examines whether the adopted design approach—either bottom-up and fully participatory, or conventional with limited resident involvement—leads to measurable differences in social outcomes, particularly in terms of neighborly interaction and integration.

Recent research emphasizes the potential of participatory housing to enhance social sustainability by actively involving residents in spatial decision-making. Bukovszki et al. [1] highlight how participatory processes shape architectural outcomes, such as the configuration of apartments and shared spaces. Their findings suggest that informed resident engagement can lead to increased communal provisions, thereby contributing directly to the social dimension of sustainability. Similarly, Willoughby et al. [2] demonstrate that co-designing housing strengthens neighborhood bonds and reflects a resident-driven desire for connection and community. Milovanović et al. [3] further argue that participatory dialogue in the design process promotes social justice, inclusion, and the creation of high-quality public spaces, reinforcing community cohesion.

In contrast, conventional housing projects typically prioritize efficiency and standardization, often at the expense of social inclusion and interaction. Harris et al. [4] note that housing designed without resident input tends to emphasize cost minimization and technical rationality, resulting in limited responsiveness to local needs. Likewise, Elsinga et al. [5] observe that traditional housing policies are largely driven by economic and technical goals, leaving little room for values such as diversity, inclusion, and everyday interaction.

Given these contrasting approaches, there is a need to assess participatory and conventional models side by side—particularly in relation to their impact on social integration and the long-term sustainability of residential environments.

This article builds on the author's previous research on participatory housing design. One earlier study examined three residential complexes in Poland, revealing that vibrant communities may emerge not only from architectural solutions but also through the process of collective design [6]. Another study analyzed three participatory housing projects in Vienna, all governed by the same development plan. Although assessed using identical spatial criteria, each project embodied participatory principles in unique ways—through architectural innovation, distinctive common spaces, or resident-led features [7]. Both studies employed a set of ten architectural and spatial criteria previously developed by the author to evaluate features that support neighborly interaction [8].

Despite this growing body of work, comparative studies involving housing projects developed through conventional design remain scarce. Particularly rare are empirical studies that contrast participatory and traditional housing models within similar urban and regulatory contexts.

This study therefore compares two residential projects built in Vienna's Leopoldstadt district under the same spatial development framework and within a similar time frame, yet based on two fundamentally different design methods: a fully participatory, resident-led approach versus a conventional, limited-participation model. Vienna's long-standing support for non-profit housing and its structured urban development competitions make it a particularly suitable context for this comparison. By directly comparing these cases, this research contributes empirical evidence to debates on socially sustainable housing and to clarify the extent to which design methodology influences community formation.

2. Materials and Method

The investigation included two residential projects located in the Leopoldstadt district of Vienna: Wohnprojekt (Table 1, Figure 1) and PaN-Wohnpark (Table 2, Figure 2). While Wohnprojekt represents a fully participatory model with maximum resident involvement throughout the design process from the beginning, PaN-Wohnpark followed a more conventional approach, involving limited resident participation mainly through consultations on shared spaces, without any significant influence on the design of private apartments (Table 3). Both projects were created as part of a competition organized by the city of Vienna entitled "Intercultural Life". The first stage of the competition was won by Wohnprojekt and the second stage by PaN-Wohnpark.

Table 1. Basic data of the Wohnprojekt, based on primary research.

Data	Description
Krakauerstraße 19, 1020 Vienna, Austria	Address
4.5 km, well connected to the city centre	Proximity to the city centre
This detached structure belongs to an urban block	Structure arrangement
einszueins architektur	Design office
October 2009	Initiation of the project
December 2013	Construction finalization
39	Total number of dwellings
8 above-grade	Floor count
3300 m^2	Usable space
700 m^2	Common interior spaces



(**a**) (**b**)

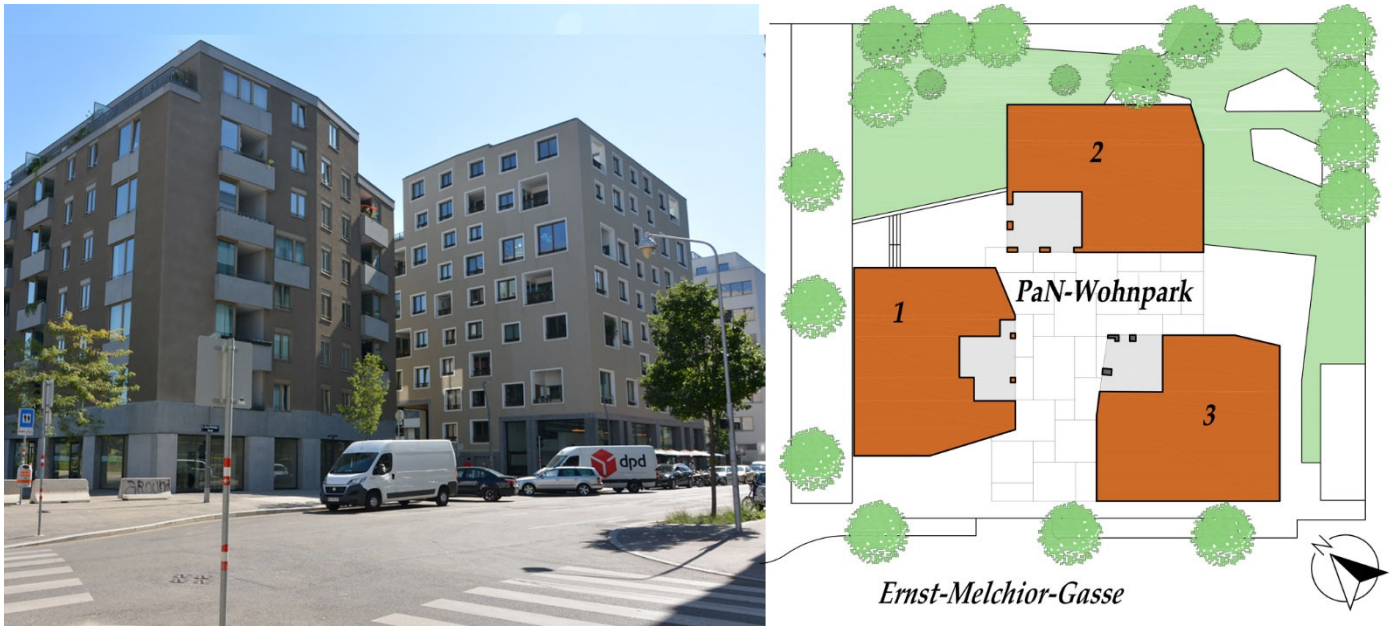
Figure 1. View of the Wohnprojekt building © K. Kołacz (**a**), Building site plan Wohnprojekt (own study based on https://premiobaffarivolta.ordinearchitetti.mi.it/portfolio_page/06_wohnprojekt-wien-einszueins-architektur-bayer-und-zilker-gmbh/ (accessed on 29 July 2025)) [9] (**b**).

The Wohnprojekt is a grassroots housing initiative launched by one member of the local community who aspired to live in an environment aligned with the principles of sustainable development—economically, environmentally, and socially. He envisioned a vibrant residential setting and shared his idea with a group of friends. This led to the

formation of a building collective consisting of 15 individuals, who decided to construct a residential building for an active and mutually supportive community. Among them was chief architect of the project, who assumed responsibility for overseeing the entire development process.

Table 2. Core data on the PaN-Wohnparkt, based on primary research.

Data	Description
Ernst-Melchior-Gasse 11, 1020 Vienna, Austria	Address
4.5 km, well connected to the city centre	Proximity to the city centre
Three detached structures belong to an urban block	Structure arrangement
Werner Neuwirth (Vienna, Austria) vonBallmoosKrucker Architekten (Zurich, Switzerland) SergisonBates Architects (London, UK)	Architects
March 2010	Initiation of the project
September 2013	Construction finalization
93	Total number of dwellings
8 above-grade	Floor count
8680 m^2	Usable space
600 m^2	Common interior spaces



(**a**) (**b**)

Figure 2. View of the PaN Wohnpark buildings © K. Kołacz (**a**), Building site plan of three buildings of PaN-Wohnpark (own study based on https://bdt.degruyter.com/entry/bdt_24_013 (accessed on 29 July 2025)) [10] (**b**).

The first meeting, during which the primary objectives of the project were established, took place in October 2009. It was agreed that the project should be developed through a participatory design process. The building was to incorporate shared spaces and be constructed using energy-efficient materials. The group also established shared principles for community living that promoted a sustainable lifestyle and working culture. These included a preference for public transportation and bicycles, shared use of a limited number of electric vehicles, the cultivation of vegetables on-site, provision for waste separation, the implementation of so-called "time banks" based on reciprocal, non-monetary exchange of services, and communal use of specific spaces such as a laundry room, kitchen, and

storage facilities. These shared amenities were intended not only to foster social integration among residents but also to reduce the consumption of resources such as water, electricity, and food.

Table 3. Comparison of design approaches: Wohnprojekt Wien vs PaN-Wohnpark, based on primary research.

PaN-Wohnpark	Wohnprojekt Wien	Category
PaN Association, city of Vienna (top-down)	Residents (bottom-up *Baugruppe*)	Project Initiator
Three offices from competition: Neuwirth/von Ballmoos Krucker/Sergison Bates	einszueins Architektur, selected by the resident group	Architect(s)
After architectural design competition	Before architectural design	Moment of resident involvement
Minimal–apartment typologies predefined	Full–residents co-designed their private units	Influence on apartment design
Partial–shared room, loggias, communal garden based on consultations	Full–~700 m^2: kitchen, library, workshop, guest rooms, laundry, etc.	Influence on common spaces
Thematic consultations and moderated meetings by wohnbund:consult	Continuous collaboration; workshops; sociocratic decision-making	Form of participation
Consultative only–final decisions made by developer/co-op	Sociocracy–consent-based internal democracy	Decision-making model
Managed by the cooperative/external body	Resident-run, autonomous community	Community governance
Cultural integration, architectural diversity, shared use	Sustainability, co-living, ecological responsibility, self-organization	Key values and goals

In early 2010, the group decided to accelerate the implementation of the project and began searching for viable opportunities to realize it. At the time, conditions for the development of co-housing initiatives in Vienna were relatively challenging. The city did not allocate municipal land for such projects. Consequently, the group chose to participate in a design competition for the development of a municipal plot located at the intersection of Kraukerstrasse and Ernst-Melchior-Gasse, within the area of the former Nordbahnhof (North Railway Station). This competition followed a model typical for Vienna: it was open exclusively to non-profit developers in collaboration with architects, and the resulting residential buildings were co-financed by the municipality. Submissions were required to include an architectural design, cost estimations, and a development strategy. Importantly, the primary evaluation criterion was not the price of the land—set at a fixed rate by the city—but rather the quality of the proposed solutions. As is standard in such Vienna-based competitions for non-profit developers, the projects were evaluated according to the four-pillar model, which considers: economy, architecture, ecology, and sustainability. Additionally, the theme of this specific competition was "Intercultural Living."

The architectural office einszueins architektur, entered the competition in collaboration with Superblock Architekten, the authors of the adjacent building's design, and the non-profit developer Schwarzatal. Their proposal not only won the competition but also received the Environmental Award.

The Wohnprojekt emerged through approximately 30 design workshops. Prior to the planning of the building, several meetings were held in which architects and project developers answered questions and explained the various phases of the implementation process to prospective residents. The participatory process was structured in three stages. The first,

informational phase, involved all members of the building group, which eventually grew to 55 participants. In the second phase, a smaller "design group" consisting of 8–10 future residents was formed. This group participated in monthly workshops focused on developing the building's design. Some workshops were led by architects, who proposed design solutions based on their professional expertise, which were then discussed collaboratively. In other sessions, ideas and suggestions from residents were considered and decisions were made regarding the types of shared spaces to be included in the building.

The third phase of participation focused on the design of private apartments. Their size and layout were discussed during individual consultations with each family. Project-related decisions were made using sociocratic principles, which ensured equality in decision-making. Every community member had the right to raise objections, provided they presented a justified rationale. In the absence of objections, consensus was assumed.

The PaN-Wohnpark housing project represents a conventional approach to housing development, characterized by limited resident involvement. Participation was restricted to post-occupancy consultations, with no influence on the architectural or urban design. Nonetheless, the project placed a strong emphasis on social integration and the activation of shared communal spaces [10–12].

Developed in response to the 2010 Bauträgerwettbewerb (developer competition) organized by wohnfonds_wien under the theme Intercultural Living, the project was a collaboration between the umbrella organization Partner aller Nationen (PaN) and the Viennese housing cooperative Neues Leben [10,11,13]. A central requirement of the competition was the implementation of both architectural and social innovation, which was addressed through a pluralistic, team-based design strategy [10,12]. The project was designed by three architectural studios: Werner Neuwirth Architekten (Vienna), Sergison Bates Architects (London), and von Ballmoos Krucker Architekten (Zurich) [10,14]. The international collaboration was intended to reflect the overarching theme of intercultural living [10,14]. The architectural and urban design was developed without direct involvement of future residents during the competition or early planning phases. Instead, the project brief was defined by the client and coordinated among the architectural teams prior to the design development [10].

However, the participatory dimension of the project emerged through a structured process of post-occupancy community-building, coordinated by the Viennese consultancy wohnbund: consult. The firm implemented a phase of interim settlement management (Siedlungsbetreuung), beginning shortly before and continuing for approximately six months after residents moved in. During this period, weekly thematic workshops were conducted, focusing on youth engagement, shared spaces, intercultural exchange, and the co-creation of community activities [11].

Although this process did not influence the spatial or architectural design, it had a substantial impact on the social use of shared infrastructure, including common rooms, loggias, courtyards, and the internal event program. Additionally, a pre-occupancy online survey was conducted among incoming residents to identify their preferences and expectations, representing a transitional form of informational participation [11].

The case of PaN-Wohnpark thus exemplifies a hybrid form of participatory housing, in which user integration was deferred until the post-design phase, yet remained structured, facilitated, and meaningfully embedded into the social dynamics of the residential environment. Despite the collection of valuable input through these post-occupancy workshops, residents were not actively involved in the architectural design process. In contrast to projects like Wohnprojekt Wien, where residents participated in decision-making through sociocratic principles, the final authority in the PaN-Wohnpark project remained with the developer (see Table 3).

Both projects were evaluated using ten architectural and spatial criteria previously developed by the author to assess features that promote neighbourly interaction [8]. The criteria draw on sociological, psychological and architectural theories addressing how architectural and spatial features support the development of neighborly ties and residents' attachment to their place of living. Among these are: appropriate spatial scale for housing estates and individual units; residential buildings corresponding to human scale; gradual transition from private to communal and public area; outdoor commons; green spaces; common indoor spaces, supporting infrastructure; household diversity; territorial identity; detailing (Table 4).

Table 4. Evaluation criteria: architectural and urban elements fostering the formation of social contacts, based on primary research. {7,8}.

Visual Symbol	Details	Criterion for Assessment	No.
	Max apartments: 30/building; 150/quarter	Appropriate spatial scale for housing estates and individual units	1
	Max floors: 4	Residential buildings corresponding to human-scale	2
	Private–social space boundaries allow domestic activities to flow outward; social–public boundaries are defined by buildings, walls, or hedges. Social spaces remain well connected to the city center.	Gradual transition from private to communal and public area	3
	Shared outdoor space: easily accessible, high-quality, well- lit by sunlight	Outdoor commons	4
	Gardens, parks, and greenery improve the appeal of communal areas.	Green spaces	5
	Common indoor spaces, adjacent to main passages, provide areas for shared leisure and daily activities, such as kitchens and laundry rooms.	Common indoor spaces	6
	Services on the building's ground floor or within its quarter	Supporting infrastructure	7
	Age diversity of residents. A diverse layout of building plans adapted to the requirements of residents of different ages.	Household diversity	8
	Compact layout: central courtyard, short private street; architectural elements (e.g., a gate) reinforce territoriality	Territorial identity	9
	Small architecture elements structuring outdoor spaces, enhancing resident identification; quality ensured by lighting and surface design.	Detailing	10

The evaluation was based on qualitative field research. Project data were collected through an interview with one of the architects of Wohnprojekt Wien, and from publicly available information on the official websites of the architectural offices involved in both developments [10–14]. Interviews were conducted only with the architect of the participatory project, as the primary focus of the study is architectural design. While surveys and interviews with residents are undoubtedly valuable, it was determined that this type of research would be more appropriately conducted by sociologists. Spatial observations of the areas within and between the buildings were conducted on the same day—between 10:00 and 12:00 for PaN-Wohnpark, and between 13:00 and 15:00 for Wohnprojekt Wien—

approximately four years after the first residents had moved into each project. The following flowchart illustrates the steps undertaken in the adopted qualitative method (Figure 3).

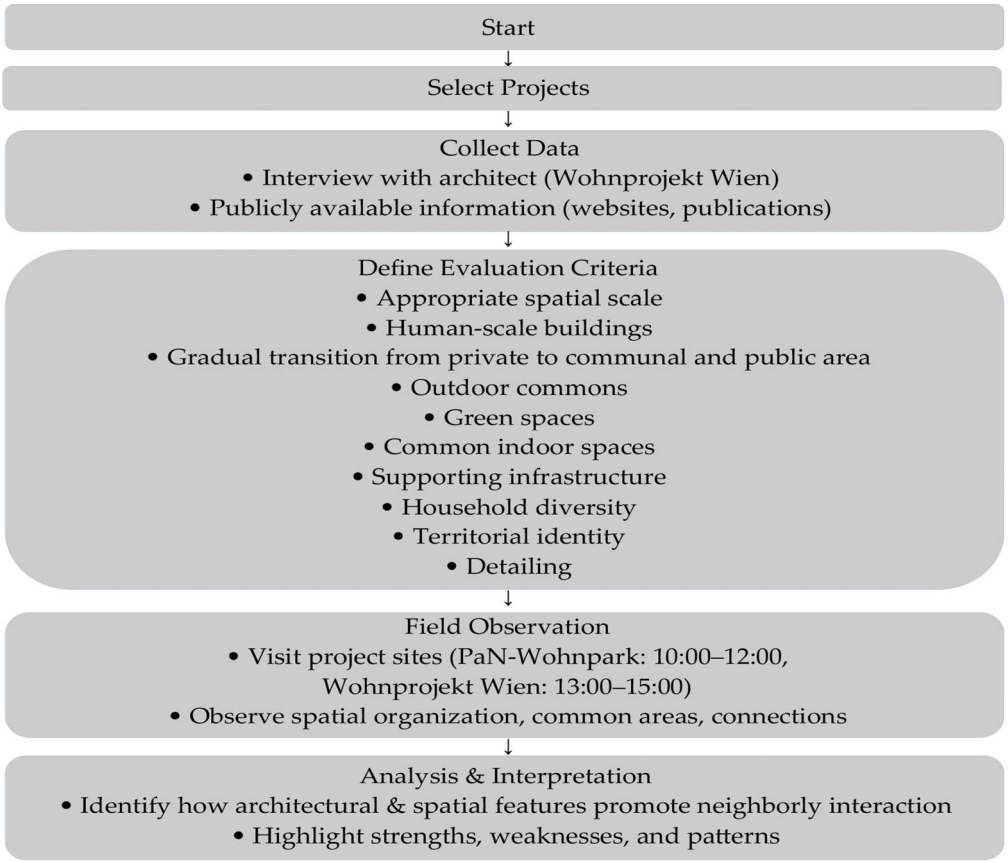


Figure 3. Flow Chart of Research Process.

3. Results

The Wohnprojekt does not meet the first two evaluation criteria (Table 5): the number of apartments slightly exceeds 30, and the building's height surpasses four above-ground stories. However, the remaining eight criteria were met. The PaN Wohnpark project shows similar characteristics. Each of its three buildings contains between 28 and 32 apartments. As the number is near the established threshold of 30 units, half a point was assigned for this criterion. The building heights are comparable to those in the Wohnprojekt—eight stories above ground level (Tables 1 and 2)—and conform to the maximum allowable height defined in the local development plan.

Importantly, the failure to fully meet the first two criteria did not appear to significantly impact the level of social contact in either project. On the contrary, the number of apartments and the chosen building height seem to represent a compromise between economic efficiency and the social needs of the residential community.

In both projects, the apartments were designed to accommodate a diverse group of residents. The thematic focus of the urban development competition, initiated by the city, was to promote intercultural living. However, it should be noted that the apartments in PaN Wohnpark were not designed for specific residents. Instead, the architectural studios proposed a variety of apartment types and shared spaces—lounges, a music room, a children's room, courtyards, storage for bicycles and strollers, rooftop terraces, and loggias—all intended to support a socially and demographically diverse community.

Table 5. Assessment criteria applied in the Wohnprojekt and PaN Wohnpark, based on primary research.

Visual Symbol	Indication of Criterion Fulfillment		Criterion for Assessment	No
	PaN Wohnpark	Wohnprojekt		
	Partial fulfillment	Unfulfilled	Appropriate spatial scale for housing estates and individual units	1
	Unfulfilled	Unfulfilled	Residential buildings corresponding to human-scale	2
	Fulfilled	Fulfilled	Gradual transition from private to communal and public area	3
	Fulfilled	Fulfilled	Outdoor commons	4
	Fulfilled	Fulfilled	Green spaces	5
	Fulfilled	Fulfilled	Common indoor spaces	6
	Fulfilled	Fulfilled	Supporting infrastructure	7
	Fulfilled	Fulfilled	Household diversity	8
	Fulfilled	Fulfilled	Territorial identity	9
	Fulfilled	Fulfilled	Detailing	10

By contrast, in the Wohnprojekt, each apartment was individually designed. According to architect, interviewed by the author, the intention shared by the city authorities, architects, and the founding group of residents was to create a community composed of people of different ages, professions, and cultural backgrounds. The youngest resident of the building at Krakauerstraße 19 is 21 years old, while the oldest is 73. The majority are between 35 and 50 years old. As Zilker points out, individuals aged 50–65 are generally the most inclined to participate in co-housing initiatives, whereas those aged 20–30 are the most difficult to recruit. This reluctance is attributed to their continued education, uncertain long-term plans, and limited financial resources. To address this, the architects from einszueins architektur, in cooperation with future residents, designed a large shared apartment with multiple bedrooms and bathrooms. This unit is intended for students, who can rent individual rooms while enjoying access to both peer-group living and communal facilities.

Both projects offer generous indoor and outdoor communal spaces that promote social interaction. Wohnprojekt, however, includes a greater number and variety of such spaces (Figure 4). Unlike PaN Wohnpark, their type, size, location, and management were all carefully coordinated with residents during the design process. The ground floor of Wohnprojekt features a spacious entrance hall with lounge seating, a children's playroom, a kitchen with a dining area, and sanitary facilities.

Additionally, there is approximately 150 m^2 of bicycle storage (Figure 4c) and an underground parking garage, accessible from Ernst-Melchior-Gasse (Figure 4d), which also

serves a neighboring building. The basement contains a carpentry workshop with three storage rooms, a pantry, a laundry room, and a multipurpose conference room used for events, workshops, and lectures (Figure 4g,h). A movable partition wall allows this room to be divided into two smaller spaces.

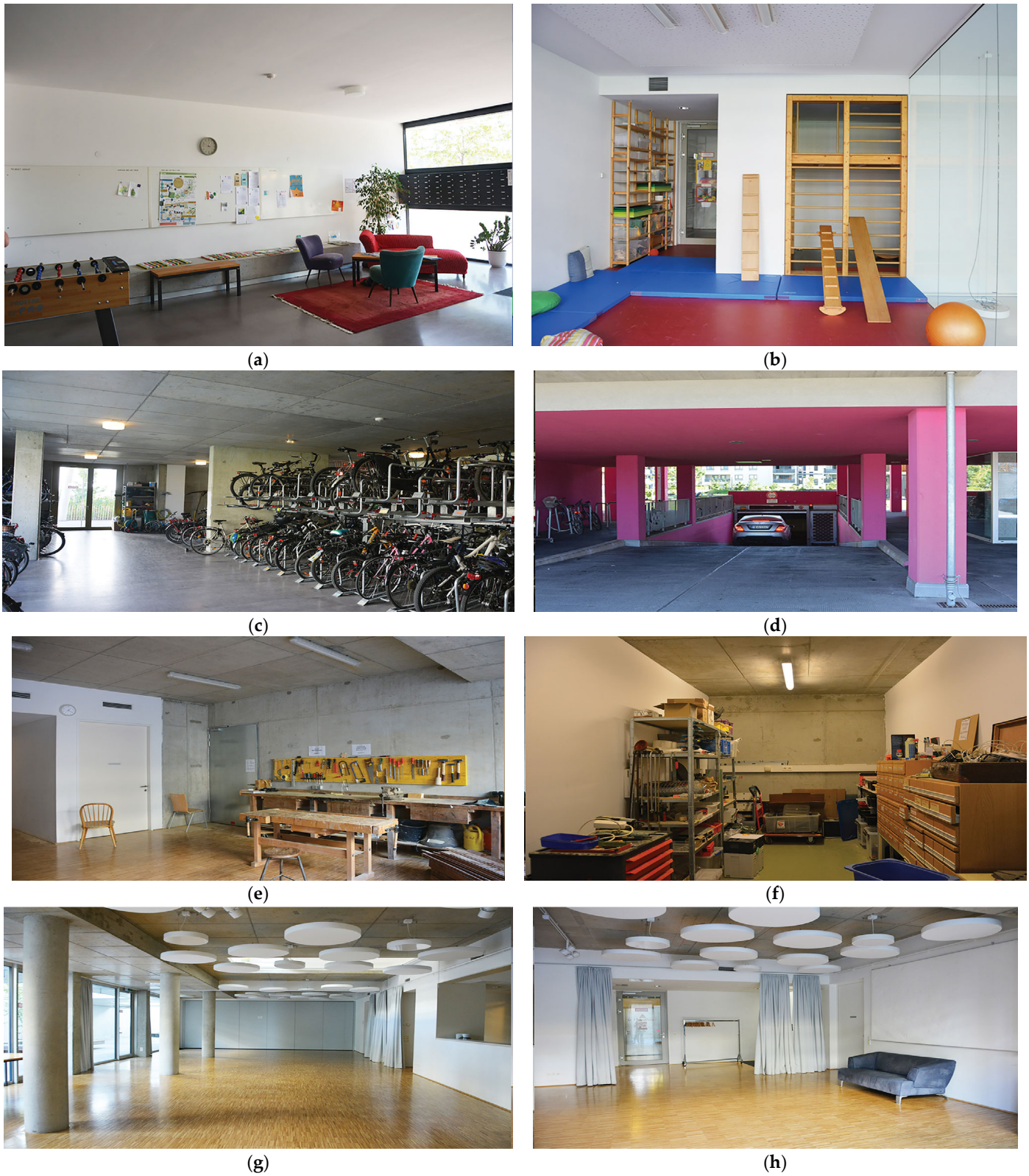


Figure 4. *Cont.*



(**i**) (**j**)

Figure 4. Interior common spaces in the Wohnprojekt, © K. Kołacz: entrance hall (**a**), children's playroom (**b**), bicycle storage (**c**), garage entrance (**d**), carpentry workshop (**e**), storage room (**f**), conference rooms (**g**,**h**), café *Salon am Park* (**i**), office of einszueins architektur (**j**).

Use of the communal kitchen requires prior coordination (Figure 5b). Residents who wish to prepare meals must post the menu and time in advance. Others may sign up on a list posted on the kitchen door and contribute a small fee to cover meal costs. All community members are encouraged to take turns in meal preparation.

The building also includes two commercial units: the *Salon am Park* café (Figure 4i) and the headquarters of einszueins architektur (Figure 4j). Several outdoor communal spaces were also designed to encourage social interaction and contact with nature (Figure 5a). These include a vegetable garden maintained by residents and a recreational garden within the block featuring benches, a sandbox, and play equipment for children. These amenities are used not only by the building's residents but also by neighbors. In front of the conference room, an outdoor area with wooden decking and benches has been created. At its center stands a tree, symbolizing community life in harmony with nature. Further opportunities for interaction are provided by nearby Rudolf-Bednar-Park, a public space popular with both children and the elderly.

In both projects—reflecting the thoughtful work of the architects—the boundaries between private, semi-private, and public zones are subtly articulated. The semi-open courtyard of the Wohnprojekt features a soft transition marked by changes in surface materials. Similarly, the three buildings of PaN Wohnpark form a block that, while defining an internal social boundary, remains permeable to public visitors. This approach establishes a clear yet inclusive neighborhood perimeter, allowing for a smooth transition from semi-private communal areas to the surrounding urban fabric. Both sites—located on the grounds of the former Nordbahnhof (North Railway Station)—are well integrated into the city due to excellent access to public transportation.

The architectural design in both cases fosters social interaction through deliberate spatial planning. Floor plans ensure a gradual transition from private apartments on the upper floors to communal areas on the ground floor and in the basement, all oriented toward internal courtyards. Public-facing functions, such as cafés or office spaces, are placed along the street, maintaining openness and interaction with the broader community.

A more detailed comparison of the buildings at Ernst-Melchior-Gasse 11 and Krakauerstraße 19 reveals that, although both share similar architectural strategies to promote social interaction, the actual social dynamics differ (Table 6). Observations in the field (Figure 5a–d) show that while the outdoor spaces around Ernst-Melchior-Gasse 11 were

also actively used, the interactions among residents were generally more passive. People spent time near one another but did not engage in conversation or shared activities; instead, they simply coexisted peacefully in the same environment.



Figure 5. Observed social interactions, © K. Kołacz: Wohnprojekt common outdoor space (**a**), Wohnprojekt residents preparing dinner in the common kitchen (**b**), PaN Wohnpark inner courtyard (**c**), PaN Wohnpark common outdoor space (**d**).

These findings underscore the importance of participatory design in fostering stronger social bonds. Residential architecture shaped through participatory processes can promote social interaction in two fundamental ways: through its spatial form—via architectural design—and its organizational form—via the engagement of upcoming residents in the planning, construction, and ongoing management of their shared environment. The frequent, warm interactions observed among residents at Krakauerstraße 19 can be attributed not only to the design of the space but also to the participatory development process. The four-year collaborative effort to co-create the Wohnprojekt gave residents the opportunity to build relationships long before moving in, which translated into more active and intentional social engagement once the building was inhabited. In contrast, the more passive social atmosphere at PaN Wohnpark reflects a more conventional development process that, despite well-designed spaces, lacked this foundational phase of community building.

Table 6. Comparative characteristics of Wohnprojekt and PaN Wohnpark, based on primary research.

Remarks/Notes	PaN Wohnpark (Ernst-Melchior-Gasse 11)	Wohnprojekt (Krakauerstraße 19)	Aspect	Dimension
Participation strengthened community ties before moving in	Conventional development with architectural competition	Participatory, co-designed with future residents (4-year process)	Mode of development	Design process
Both exceed/approach limit but without harming social contact	28–32 per building (near threshold of 30)	Slightly above 30	No. of apartments	Scale & form
Both beyond "human scale" criterion	>4 above-ground floors	>4 above-ground floors	Height	
Wohnprojekt: broader scope & tailored to residents	Lounges, music room, children's room, bicycle/stroller storage	Entrance hall, kitchen & dining, children's room, carpentry workshop, laundry, pantry, conference room (partitionable)	Indoor	Communal spaces
Both provide outdoor commons; Wohnprojekt more diverse	Courtyards and semi-open block interior	Vegetable garden, recreational garden, terrace with symbolic tree, access to Rudolf-Bednar-Park	Outdoor	
Wohnprojekt integrates public-facing activities	None	Café, architectural office	Commercial/public functions	
Wohnprojekt: greater demographic mix	No specific resident group targeted	Age range: 21–73, most 35–50; strong diversity of backgrounds	Profile	Residents
Wohnprojekt: stronger tool for attracting hard-to-recruit groups	Variety of apartment types	Shared flat for students (multi-room)	Special solutions	
Direct outcome of participatory vs. conventional process	Passive coexistence; residents share space but rarely activities	Active, frequent, intentional; communal meals, gardening, workshops	Interaction pattern	Social life
Both balance privacy and openness	Three-building block with permeable boundaries	Semi-open courtyard, soft material transitions	Boundary articulation	Territorial identity

4. Discussion

The comparative analysis of Wohnprojekt Wien and PaN-Wohnpark underscores the pivotal role of participatory design processes in promoting social sustainability within residential environments. While both projects incorporated architectural features commonly associated with fostering neighborly interaction—such as shared spaces, green areas, and human-scale design—the timing and depth of resident involvement emerged as the most significant differentiating factor.

In Wohnprojekt Wien, residents were engaged from the earliest planning stages, contributing not only to the architectural design but also to the formation of a shared vision for community life. This bottom-up approach enabled future residents to develop interpersonal relationships well before occupancy, supported by a collective decision-making structure grounded in sociocratic principles. The spatial layout—characterized by a gradual transition from private to communal to public zones—directly reflected these collaborative values. Consequently, social interactions within the community were observed to be active, frequent, and inclusive, often manifesting in shared activities such as communal cooking, gardening, and collective events.

By contrast, PaN-Wohnpark followed a more conventional, top-down development model in which resident participation was introduced only after occupancy. Although the project also included shared spaces and aimed to support intercultural exchange, the limited scope and delayed timing of resident engagement impeded the formation of strong social

ties. Interactions in communal areas were largely passive, pointing to a more fragmented and less cohesive social dynamic. This contrast highlights that, while architectural design can facilitate opportunities for interaction, it does not in itself guarantee the development of a vibrant, connected community without corresponding participatory processes.

Beyond the residential context, participatory design offers specific opportunities and challenges when applied to building complexes with defined functions—such as educational campuses, healthcare facilities, cultural centers, or office clusters—and to public spaces like parks, squares, and waterfronts. In public or multi-user projects, stakeholder diversity can enrich design outcomes, ensuring functional relevance and enhancing the sense of collective ownership. However, conflicting priorities, differing expectations, and varying levels of technical understanding can complicate consensus-building, potentially diluting the design vision or extending project timelines.

These dynamics are also highly dependent on social and cultural conditions. Effective participatory design presupposes a certain level of civic engagement, communication skills, and mutual trust among stakeholders. In contexts with limited social capital, participation risks becoming symbolic rather than substantive, reducing its impact on the final outcome.

These findings align with previous research linking participatory design to greater social cohesion and community resilience [1–3]. At the same time, the case of PaN-Wohnpark suggests that structured post-occupancy interventions—such as moderated workshops and resident-led activities—can still contribute meaningfully to the social fabric, even if they fall short of the depth achieved through full co-creation. Participation should therefore be understood not only as a spatial phenomenon but also as an organizational and temporal dimension of social sustainability.

Furthermore, this study illustrates that the opportunity to co-design private apartments—as was possible in Wohnprojekt Wien—may enhance residents' sense of ownership and identification with their living environment. In contrast, the standardized apartment typologies in PaN-Wohnpark positioned residents primarily as end-users rather than as co-creators, potentially limiting emotional investment in the place.

This research also supports broader urban theory, which emphasizes that achieving high-quality urban space requires simultaneous decision-making across three scales: spatial planning, urban design, and architectural design [15]. Each of these layers influences the others and should be considered collectively rather than in isolation.

Nevertheless, this study is not without limitations. The analysis is based on qualitative field observations conducted during a single day and time frame, which may not fully capture the diversity and dynamics of everyday social interactions.

It should also be acknowledged that participatory design alone does not automatically result in strong neighborhood ties. As other studies have shown, the conditions of implementation, ongoing maintenance of shared spaces, and sustained resident engagement over time are equally important factors in cultivating long-term social cohesion [16]. As such, it remains uncertain whether the neighborhood relations observed in these case studies will persist, evolve, or diminish in the coming years.

Despite these limitations, the comparison offers valuable insights into the ways in which participatory processes influence not only the physical form of housing projects but also their social outcomes. The findings highlight the importance of user agency as a fundamental component of sustainable residential development and call for greater integration of participatory frameworks in future urban housing initiatives.

5. Conclusions

This study examined how different approaches to residential design—participatory versus conventional—affect the social dynamics within housing developments. By analyzing two projects constructed under similar urban, regulatory, and temporal conditions in Vienna, it isolated the role of resident participation as a key variable influencing social sustainability.

The findings demonstrate that participatory design fosters stronger community bonds, more active social interaction, and greater resident identification with the living environment. These effects are particularly evident when future residents are involved in both the spatial and organizational dimensions of housing development. In contrast, conventional design processes that limit resident input to post-occupancy stages may provide well-designed physical environments but fail to cultivate equally vibrant social structures.

This research contributes to the growing body of evidence that supports participatory housing models as tools for enhancing urban cohesion, inclusion, and resilience. It also underscores the importance of embedding participatory methods into housing policy and urban planning frameworks—particularly in cities striving to balance technical efficiency with social value.

Future studies should aim to include longitudinal data, resident interviews, and larger sample sizes to further explore how different modes of participation shape long-term community development. Additionally, exploring hybrid models—combining early involvement with post-occupancy support—could offer practical pathways for scalable and inclusive housing innovation.

Overall, the empowerment of residents in shaping their environments appears to be not only a matter of social justice but also a prerequisite for achieving truly sustainable and livable cities.

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Informed Consent Statement: Verbal informed consent was obtained from all participants prior to the interviews, using a standardized verbal consent script. Participants were informed about the aims of the study, the voluntary nature of their participation, their right to withdraw at any time.

Data Availability Statement: Data are contained within the article.

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