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Research Article

Patterns of Intergenerational Interaction in Community-Based Welfare Facilities in Japan: Group Size, Generational Richness, and Generation-Based Participation

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Abstract

This study examines patterns of intergenerational interaction in community-based welfare facilities in Japan by quantitatively analyzing group size, generational richness, and generation-based participation. Systematic observations were conducted at two facilities: the Kasugadai Community Center in Aikawa Town, Kanagawa Prefecture, and Kemetomo House Kids Nishi-Oi in Shinagawa Ward, Tokyo. Users were classified by age group and role, and interactions were analyzed as group-based social configurations. Compared with questionnaire-based approaches, systematic observation directly records actual behaviors and spatial practices, providing a more reliable account of everyday interaction patterns. The results indicate that most intergenerational interactions occurred in small groups of two to five participants. Single-generation and two-generation groups accounted for the majority of cases, while interactions involving three or more generations were rarely observed. These findings suggest that the simple co-presence of multiple generations within a facility does not necessarily lead to meaningful multigenerational exchange. From a spatial planning perspective, the results highlight the importance of environmental and organizational conditions in shaping interaction patterns. Rather than emerging spontaneously, intergenerational engagement often depends on specific spatial settings or structured activities. The study therefore provides empirical insights for architects, planners, and facility managers seeking to design community environments that actively support inclusive and sustained intergenerational encounters.

Keywords: Intergenerational interaction; Community-based welfare facilities; Generational richness; Spatial behavior analysis; Generation-based participation

1. Introduction

1.1 Research Background

Population ageing has become a major demographic challenge reshaping social life and care systems in many countries. Across OECD countries, the proportion of people aged 65 and over reached approximately 18% in 2022 (Organisation for Economic Co-operation and Development [OECD], 2023). Japan represents one of the most advanced cases of this demographic transition, with older adults accounting for more than 29% of the national population (Statistics Bureau of Japan, 2023). In this study, older adults refer to individuals aged 65 years and above, a threshold commonly used in research on urban ageing and demographic change (Buhnik, 2010; Hattori et al., 2017). Previous researchers agree that Japan can be understood as a frontrunner of the issues that other countries will face in the coming decades regarding depopulation and decline (Hattori et al., 2017; Matanle, 2014; Ortiz-Moya, 2020; Pineda et al., 2023, 2025).

Community-based welfare facilities have increasingly been developed to support everyday social participation and interaction within local communities, reflecting the broader relationship between the built environment and social life (French et al., 2014). Within these settings, intergenerational interaction is often regarded as an important mechanism for strengthening social cohesion and wellbeing in ageing societies (Gualano et al., 2018). Previous studies have also highlighted the significance of everyday social interaction occurring in ordinary community settings for residents' wellbeing and community life (Biglieri et al., 2024; Chase et al., 1999; Hinshaw, 2000; Pineda et al., 2024; Aelbrecht, 2016). However, the mere co-presence of different age groups does not necessarily lead to meaningful or sustained interaction.

This issue is particularly relevant in Japan, where demographic ageing, population decline, and urban shrinkage have reshaped local communities (Hattori et al., 2017; Martinez-Fernandez et al., 2016). In the Japanese context, community-based initiatives such as machizukuri have long emphasized local participation and intergenerational social interaction, highlighting the importance of spatial and community-based practices in sustaining social cohesion (Ariga, 2017; Machimura, 2017; Nakajima & Murayama, 2024).

Against this background, this study examines intergenerational interaction in community-based facilities in Japan through a group-based observational approach. Intergenerational interaction is conceptualized as observable co-participation within interaction groups, allowing analysis of how different generations come together in everyday social settings. By focusing on interaction groups as the basic unit of observation, the study investigates key characteristics of these interactions, including group size, generational composition, and generational richness, in order to better understand the structural patterns of intergenerational encounters in everyday community environments.

1.2 Previous Studies

Previous studies have examined intergenerational interaction from perspectives such as structured programs, community environments, and spatial design. Research shows that well-designed intergenerational programs can benefit both younger and older participants by improving perceptions of aging, strengthening emotional connections, and enhancing psychological well-being (Gualano et al., 2018).Research in urban studies and environmental design highlights how informal encounters occurring in ordinary places—such as streets, public spaces, and community facilities—can foster social cohesion and a sense of belonging. For instance, Chase et al. (1999) and Hinshaw (2000) argue that everyday urban environments can support spontaneous social interaction and strengthen community relationships. Similarly, Aelbrecht (2016) examined how public and semi-public spaces function as important settings for informal social encounters and social surveillance. More recent studies have further highlighted that accessible community spaces can support social participation and neighborhood well-being among diverse populations (Biglieri et al., 2024; Pineda et al., 2024).

Taken together, these studies highlight the growing recognition of the importance of intergenerational interaction for community cohesion and the well-being of older adults. Building on this perspective, the present study further investigates the characteristics and structural patterns of intergenerational interaction within community environments, with particular attention to how these interactions are distributed across different spatial settings.

Within this broader international context, Japan provides a particularly relevant setting for examining intergenerational interaction in community-based environments. Japanese community planning traditions—particularly practices associated with machizukuri (community-based urban development)—have long emphasized local participation, mutual support, and neighborhood-level social interaction (Ariga, 2017; Machimura, 2017). Recent studies have also highlighted the role of community facilities and local initiatives in supporting social participation in aging societies (Nakajima & Murayama, 2024).

Building on this context, the present study adopts an observational approach to empirically examine intergenerational interaction in community-based environments. Through systematic behavioral observation and recording, intergenerational encounters are categorized into interaction groups, allowing the structural characteristics of these interactions to be analyzed. This approach also documents the spatial distribution of interaction activities within the facility, providing a more detailed understanding of how intergenerational encounters occur and are organized across different spatial settings.

1.3 Research gap

Previous research on community-based welfare facilities has largely focused on older adults themselves and on the internal spatial and programmatic characteristics of such facilities (Asahi et al., 2021; Okuda & Yamaguchi, 2014; Suzuki et al., 2022; Watanabe & Takizawa, 1998). However, the integration of older adults into the community cannot be understood solely by examining older adults in isolation; it also requires attention to the intergenerational relationships through which everyday community life is constituted (Kaplan, 2002).Despite this, empirical studies that systematically examine the structure and composition of intergenerational interactions within community-based welfare facilities remain limited (Okuda & Yamaguchi, 2014; Suzuki et al., 2022).

From the perspective of intergenerational solidarity and exchange theory, interactions between age groups involve reciprocal exchanges of knowledge, support, and experience, positioning older adults as active contributors to community life (Bengtson & Roberts, 1991; Kaplan, 2002). Social ecology theory further suggests that such interactions should be examined within multiple environmental contexts, including both the facility itself (microsystem) and its connections with the surrounding community (mesosystem) (Bronfenbrenner, 1979).
In addition, contact theory highlights that the quality and conditions of intergroup contact influence the development of positive relationships (Allport, 1954; Pettigrew & Tropp, 2006). However, empirical studies that examine how these spatial and organizational factors shape intergenerational interaction patterns in shared welfare spaces remain limited (Okuda & Yamaguchi, 2014; Watanabe & Takizawa, 1998).

1.4 Research Objectives and Analytical Framework

In response to limitations in previous research, this study shifts the analytical focus from older adults in isolation to intergenerational interactions within community-based welfare facilities, examining the structural characteristics of interaction groups formed among community members. While studies on urban shrinkage and ageing typically define older adults as residents aged 65 and above (Buhnik, 2010; Hattori et al., 2017; Martinez-Fernandez et al., 2016), in this study the identification of older adults is based on observed behavioral characteristics rather than demographic data, and refers to older users who appear to be of retirement age.

To analyze these interaction patterns, the study employs three group-level attributes: group size, generational richness, and generation-based participation. Group size refers to the number of individuals involved in an interaction group. Generational richness indicates the number of different age cohorts represented within the group, reflecting the diversity of generations participating in the interaction. Generation-based participation examines how frequently different age groups take part in interaction groups and how older adults are positioned within these configurations.

Empirically, the study investigates two small-scale multifunctional community-based welfare facilities located in Tokyo and Kanagawa. Through systematic observation, interaction-group coding, and statistical analysis, the research identifies the structural characteristics of intergenerational interaction groups observed in these shared spaces. Accordingly, the objectives of this study are threefold: (1) to quantify the size distribution of interaction groups, (2) to examine the generational composition of these groups, and (3) to analyze participation patterns across different age groups, with particular attention to the role of older adults in intergenerational interaction.

2. Methods

2.1 Study Context and Facility Selection

This study examines intergenerational interaction in community-based welfare facilities and selects two cases in eastern Japan: the Kasugadai Community Center in Aikawa Town, Kanagawa Prefecture (hereafter Kasugadai) and Kemetomo House Kids Nishi-Oi in Shinagawa Ward, Tokyo (hereafter Kemetomo House) (Figure 1). The two facilities were selected because both intentionally support intergenerational coexistence through spatial design and daily operation rather than for geographic comparison.

Both facilities function as multifunctional spaces used by older adults, children, and working-age users. In addition to registered service users, some shared spaces are open to local residents, making them appropriate settings for observing everyday intergenerational interaction in welfare facility environments.

Kasugadai (Figure 2a), opened in 2022 in Aikawa Town, Kanagawa Prefecture, was created through the renovation of a former supermarket building. The facility is located in a residential neighborhood and is surrounded by schools, parks, and small commercial facilities within an approximately 500 m walking radius (Figure 3a), indicating that it is embedded in the daily activity area of nearby residents. The facility integrates several welfare services, including a group home for people with dementia, disability support services, and long-term care services. Some spaces and activities are also open to local residents.

Kemetomo House (Figure 2b) is located in a dense residential area of Nishi-Oi in Shinagawa Ward, Tokyo. Similar to Kasugadai, the surrounding neighborhood includes everyday destinations such as s chools, parks, and supermarkets within a roughly 500 m radius (Figure 3b). The facility combines a small-scale multifunctional in-home care service for older adults with a nursery school and shared community spaces, some of which

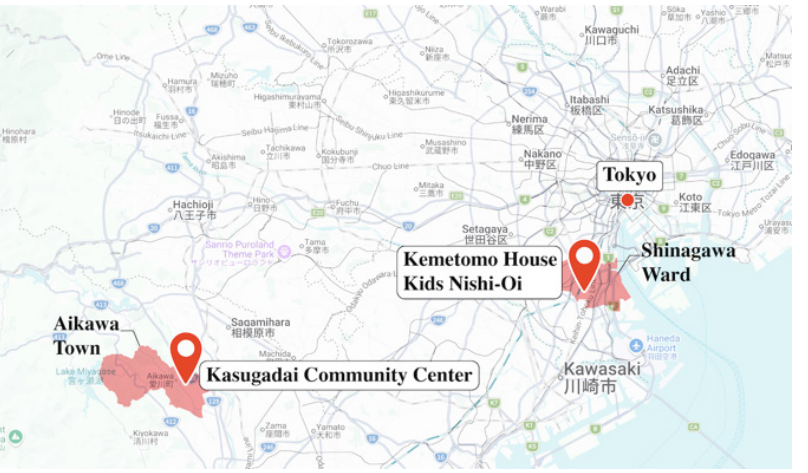


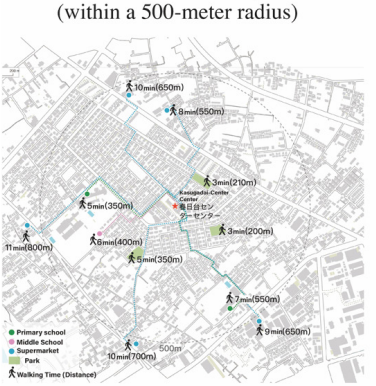
Figure 1. Location of the two facilities **Note:** The map shows the geographical locations of the two case study facilities.

a. Scene of Kasugadai (photo by author, 2023)

b. Scene of Kemetomo House (photo by author, 2023)

Figure 2 Site views of the two facilities (photo by author, 2023)

a. Facilities around Kasugadai (within a 500-meter radius)



b. Facilities around Kemetomo House (within a 500-meter radius)

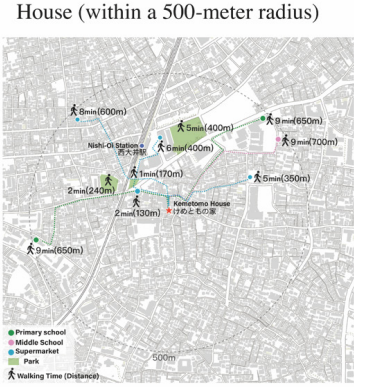


Figure 3 Physical environment of the two facilities

are accessible to neighborhood users. Although the two facilities differ in scale, layout, and local context, both were designed and operated to encourage everyday intergenerational use. Their shared orientation makes them suitable cases for examining the structural characteristics of interaction groups in community-based welfare facilities.

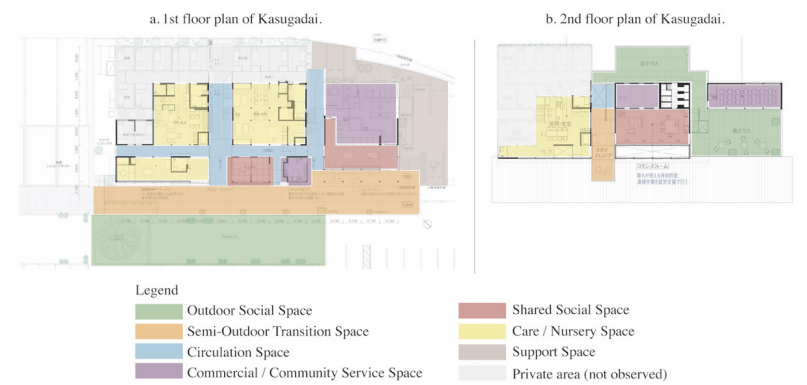


Figure 4 Spatial layout and functional zoning of Kasugadai
Source: modified from Shinkenchiku (2022)

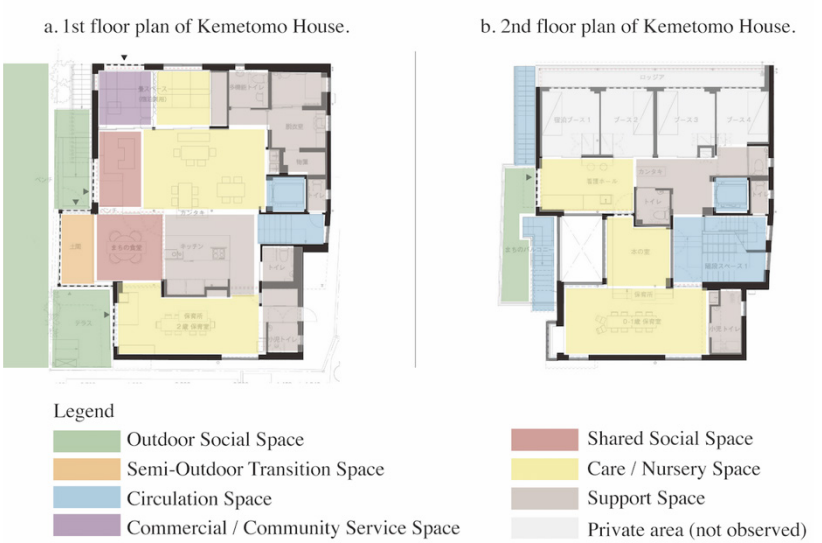


Figure 5 Spatial layout and functional zoning of Kemetomo House
Source: modified from Shinkenchiku (2019)

2.2 Observation Design and Data Collection

Field observations were conducted at the two selected community-based welfare facilities during July and August 2023. Each site was observed for approximately one week, primarily between 9:00 a.m. and 5:00 p.m., covering typical daytime activity periods within the facilities. Observations were conducted mainly on weekdays. On several days, observation sessions were limited to half-day periods due to practical constraints. Occasional organized activities involving larger groups, such as fire drills, were also recorded and included as interaction groups. Because such events occurred infrequently, they were treated as context-specific episodes and did not substantially influence the overall patterns of everyday intergenerational interaction.

To support the observation process, the spatial layouts of the two facilities were documented and divided into functional zones, which served as the spatial framework for behavioral mapping. Figure 4 and Figure 5 illustrate the spatial organization and functional areas of the two facilities, based on drawings published in Shinkenchiku (2019, 2022). Functional zones were identified based on the primary activities and spatial characteristics of each area, allowing interaction groups to be consistently located and recorded within specific spaces.

A non-participant, systematic observation approach was adopted. The researcher did not intervene in ongoing activities and recorded behaviors as they naturally occurred within the facilities and their immediate surroundings. Data collection followed a progressive observation strategy. During the initial stage, observations focused on general activity patterns and the presence of users from different age groups across the facilities. As familiarity with the sites increased, the observation focus became more refined, with particular attention given to the participation of older adults and the formation of intergenerational interaction groups involving multiple generations.

User presence and behaviors were documented using structured recording sheets incorporating simplified floor plans and predefined legends. These sheets allowed the consistent recording of user attributes (such as age group and gender), behavioral descriptions, spatial locations, and observation times. This framework enabled the systematic collection of integrated information on who was engaged in what activity, where, and when.

Compared with questionnaire-based approaches often used in studies of social interaction, systematic observation allows researchers to record actual behaviors and spatial practices as they occur. By documenting users' locations, activities, and group configurations in real time, this method provides a direct account of how interaction groups emerge within specific spatial contexts. The resulting dataset forms the empirical basis for the subsequent analysis of intergenerational interaction patterns.

2.3 Definition, Identification, and Coding of Interaction Groups

In this study, an interaction group is defined as one or more individuals engaged in a shared activity or mutual interaction within a specific spatial and temporal context. Groups may consist of a single individual or multiple participants and are treated as the primary analytical unit for examining intergenerational interaction patterns.

Interaction groups were identified through direct observation during fieldwork. A group was considered to form when individuals demonstrated spatial proximity, interactional orientation, and behavioral coherence—for example, facing one another, engaging in conversation, or participating in a shared activity. Group boundaries were considered to dissolve when these conditions no longer applied, such as when participants dispersed, shifted to separate activities, or ceased orienting toward one another. Interaction groups therefore represent temporally bounded interaction configurations rather than fixed social units.

Following the observations, individual-level records were reorganized analytically at the group level. Individuals involved in the same interaction context during a given observation period were assigned to the same interaction group, while individuals not engaged in interaction were treated as separate groups. Each interaction group was assigned a unique identifier based on the observation date, time segment, and group sequence number, allowing all related records to be consistently linked.

Solo activities were coded as interaction groups with a group size of one. These cases represent instances of non-interactive presence and were included to ensure comprehensive accounting of all observed users. As non-interactive cases can be readily identified by group size during analysis, their inclusion does not affect subsequent analyses focusing on intergenerational interaction patterns.

2.4 Operationalization of Analytical Attributes

To analyze the structure of intergenerational interaction groups, several analytical attributes were operationalized, including generational categories, group size, generational richness, and generation-based participation patterns.

Age cohorts were identified through observable characteristics rather than verified demographic information. Classification was based on patterns of space use, degrees of behavioral autonomy, and contextual cues related to users' roles within the facilities. A two-step procedure was employed. First, users were distinguished according to their degree of autonomy in facility use, differentiating between freely visiting community members and individuals whose presence was associated with institutional roles or services, such as residents, children enrolled in care programs, staff members, and other affiliated users. Second, community users were further categorized into generational groups corresponding to general physical and behavioral characteristics observable during fieldwork. These categories function as analytical constructs for examining intergenerational interaction rather than as precise demographic classifications. Although older individuals from the surrounding community were occasionally observed, their presence was limited; therefore, the term older adults in this study primarily refers to elderly residents of the facilities unless otherwise specified.

Group size was defined as the number of individuals participating in a given interaction group at a specific observation moment. Individuals who were mutually oriented and engaged in the same activity or interaction were counted as members of the same group. Solo activities were coded as groups with a size of one, allowing both interactive and non-interactive configurations to be captured within the dataset.

Generational richness refers to the number of distinct age cohorts represented within an interaction group and serves as an indicator of generational diversity. Solo groups were assigned a generational richness value of zero because they did not involve interaction with others. Groups composed of participants from a single

age cohort were assigned a value of one, while groups including two or more cohorts were assigned higher values accordingly.

Generation-based participation was analyzed by examining the generational composition of interaction groups. For groups with generational richness values of two or higher, combinations of age cohorts were identified and quantified. Comparing the frequency of these combinations allows interaction tendencies among different generations to be observed, with particular attention given to the participation patterns of older adults.

2.5 Data Analysis and Methodological Considerations

For analysis, individual observation records were aggregated using interaction-group identifiers to generate group-level datasets. Descriptive statistics were then calculated to summarize interaction patterns, including the frequency and percentage distributions of group size, generational richness, and generation-based participation. The composition of interaction groups was examined by comparing the relative frequencies of different generational combinations, with particular attention given to the participation patterns of older adults. Because the study focuses on describing observed interaction structures rather than testing causal relationships, the analysis relied on descriptive statistics rather than inferential statistical methods.

Individual participation was additionally quantified using the unit of person-times, in which one person-time represents a single observed presence of an individual during a defined observation interval. This measure captures both the number of users and the frequency of their observed presence across observation periods, providing a descriptive indicator of participation within interaction groups. All data processing and statistical calculations were conducted using Microsoft Excel. Several methodological considerations should be noted. All observations and coding were conducted by a single researcher, which may involve subjective judgment in identifying interaction groups and their boundaries. However, this approach ensured internal consistency across observation sessions. To reduce arbitrariness, observations followed a predefined recording protocol with fixed time intervals and consistent criteria for identifying group formation based on spatial proximity, shared activities, and mutual orientation.

The observations were limited to daytime periods over approximately one week at each site, and participant age groups were inferred from observable characteristics rather than verified demographic information. The findings are therefore context-specific and intended to describe interaction patterns within the observed facilities rather than to support statistical generalization.

3. Results

This section presents the empirical results of the observational analysis, focusing on the structural characteristics of intergenerational interaction groups within the two community-based welfare facilities. Results are organized according to key analytical attributes, including interaction group size, generational richness, and age-based participation patterns. Facility-specific tendencies are indicated where relevant to highlight similarities and differences in interaction structures.

3.1 Overview of Observed Interaction Groups

Across the two facilities, a total of 384 interaction groups were identified, ranging from solo activities (group size = 1) to large, event-based gatherings, including a small number of cases with missing generational data. Overall, small interaction groups were predominant, with groups of two to five participants accounting for the majority of observed interaction episodes. Solo activities also constituted a notable portion of observed space use, indicating the coexistence of individual and social modes of engagement within the facilities.

In terms of generational composition, most interaction groups were composed of one or two generational categories, while groups involving three or more generations appeared only occasionally. This indicates that although multiple generations coexisted within the same environment, everyday interactions tended to remain generationally concentrated, and highly diverse intergenerational groupings were relatively limited.

Regarding participation patterns across age groups, older adults were frequently observed as active participants within the facilities. However, their involvement often occurred within specific generational pairings—particularly with staff members or childcare-related users—rather than across a broad spectrum of generations. This suggests that intergenerational interaction was common but selectively structured, shaped by the institutional and spatial contexts of the facilities.

Taken together, these general tendencies provide an overall picture of interaction structures within the observed environments. Building on this overview, detailed analyses of group size, generational richness, and generation-based participation are presented in the

following sections. These results should be interpreted as patterns across analytically defined generational categories, rather than as precise age-based cohorts.

3.2 Group Size Distribution

Table 1 and Figure 6 present the distribution of interaction groups by group size, showing both the number of groups and their corresponding person-times. Across the observations, interaction groups consisting of two to five participants accounted for the largest share of interactions. Among them, dyadic groups were the most frequent, with 113 groups and 226 person-times (18.1% of the total), indicating that two-person interactions represent the most common form of social engagement in the observed settings. Groups of three and five participants also appeared frequently, contributing 168 (13.5%) and 180 (14.4%) person-times, respectively.

Solo activities (group size = 1) accounted for 96 groups and 7.7% of total person-times, indicating that a portion of facility use occurred without direct social interaction. Although large groups appeared less frequently, some involved a substantial number of participants. For example, groups of ten and thirty-eight participants accounted for 6.4% and 6.1% of total person-times, respectively, suggesting that these events, while infrequent, tended to involve many participants and persist over longer observation intervals. Overall, the results show a clear concentration of interaction activity within small group sizes, while larger groups were typically associated with specific organized contexts.

Table 1 Distribution of Interaction Groups by Group Size

Group size	Number of groups	% of groups	Person-times	% of person-times
1	96	25.0%	96	7.7%
2	113	29.4%	226	18.1%
3	56	14.6%	168	13.5%
4	34	8.9%	136	10.9%
5	36	9.4%	180	14.4%
6	12	3.1%	72	5.8%
7	8	2.1%	56	4.5%
8	4	1.0%	32	2.6%
9	6	1.6%	54	4.3%
10	8	2.1%	80	6.4%
11	1	0.3%	11	0.9%
12	2	0.5%	24	1.9%
13	3	0.8%	39	3.1%
38	2	0.5%	76	6.1%
Not recorded	3	0.8%	–	–

Note: Total interaction groups = 384. Number of Groups and % of Groups show counts and proportions of each group size, while Person-Times and % of Person-Times indicate individual occurrences across observation intervals. One person-time represents one observed presence and differs from group size, which counts participants in a single interaction group. Groups of size 1 represent non-interactive presence and are analytically separable from multi-person interaction groups.

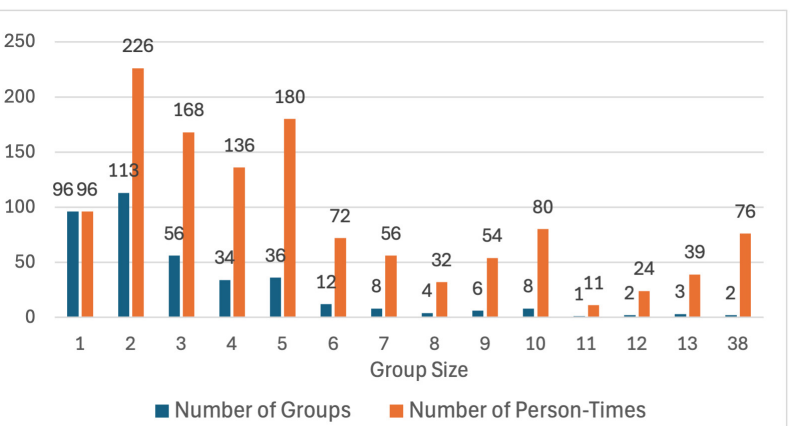


Figure 6 Distribution of Interaction Group Sizes by Number of Groups and Person-Times
Note: Bars represent the number of groups (left axis) and person-times (right axis) for each group size category.

Table 2 Group Size Distribution by Facility

Group Size (No. of Persons)	Number of Groups – Kasugadai	Number of Groups – Kemetomo House	%– Kasugadai	% – Kemetomo House
1	68	31	25.30%	27.00%
2	77	34	28.60%	29.60%
3	36	20	13.40%	17.40%
4	27	8	10.00%	7.00%
5	21	14	7.80%	12.20%
6	6	5	2.20%	4.30%
7	8	–	3.00%	–
8	3	1	1.10%	0.90%
9	5	1	1.90%	0.90%
10	8	–	3.00%	–
11	1	–	0.40%	–
12	1	1	0.40%	0.90%
13	3	–	1.10%	–
38	2	–	0.70%	–
Not recorded	3	–	1.10%	–
Total	269	115	100.00%	100.00%

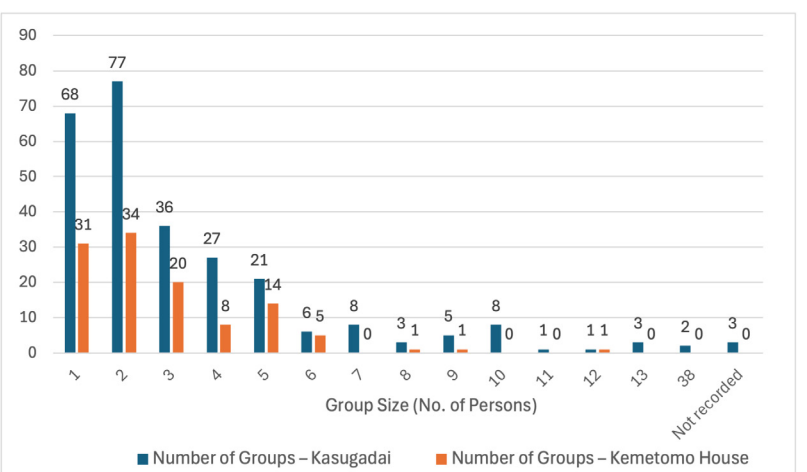


Figure 7 Distribution of Interaction Groups by Group Size in Two Facilities

The distribution of group sizes differed slightly between the two facilities (Table 2; Figure 7). In both cases, dyadic and triadic groups represented the majority of observed interactions, indicating that everyday social activities were largely organized through small-scale encounters rather than large gatherings.

At Kasugadai, the distribution showed a relatively wider range of group sizes, including several medium- and large-sized gatherings of five or more participants. These larger groups were often associated with organized activities such as communal dining, care programs, or facility events. In contrast, Kemetomo House exhibited a more compact distribution, with interactions predominantly occurring in smaller groups. Dyadic interactions were the most frequent type (29.6%), and although groups of more than six participants did occur, they were relatively rare. This pattern corresponds to the facility's smaller spatial scale and its emphasis on informal everyday interaction among children, caregivers, and older adults.

Taken together, these results indicate that while small-group interaction constitutes the dominant form of social engagement in both facilities, differences in facility scale and activity organization contribute to variations in the range of group sizes observed.

3.3 Generational richness within Interaction Groups

Table 3 and Figure 8 present the overall distribution of generational richness across all observed interaction groups. Generational richness refers to the number of distinct generational categories represented within a group. Groups with a generational richness value of 0 correspond to single-person cases (group size = 1), which do not involve interaction with others. Groups with a generational richness of 1 include at least two participants but all belong to the same generational category.

The results indicate a strong concentration of interaction groups with low levels of generational diversity. Single-generation interactions accounted for the largest proportion of observed cases (38.0%), followed by two-generation groups (32.3%). Single-person groups represented 25.8% of the dataset. In contrast, groups involving three or more generations were relatively rare, collectively accounting for only 3.2% of observations, while cases involving four or five generations occurred only occasionally. Overall, these findings suggest that everyday interactions within the observed facilities were predominantly organized around one or two generational categories rather than broadly mixed age groups.

Table 3 Number and Percentage of Interaction Groups by Level of Generational Richness

Generational Richness	Number of Groups	Percentage
0	99	25.8%
1	146	38.0%
2	124	32.3%
3	8	2.1%
4	3	0.8%
5	1	0.3%
Not recorded	3	0.8%
Total	**384**	**100%**

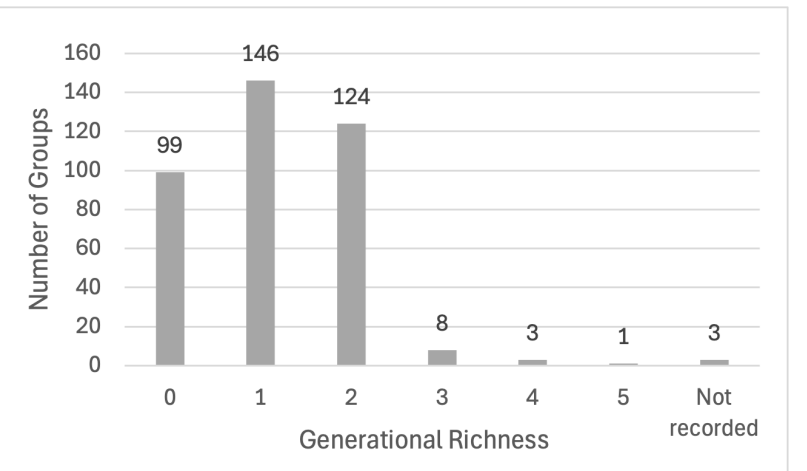
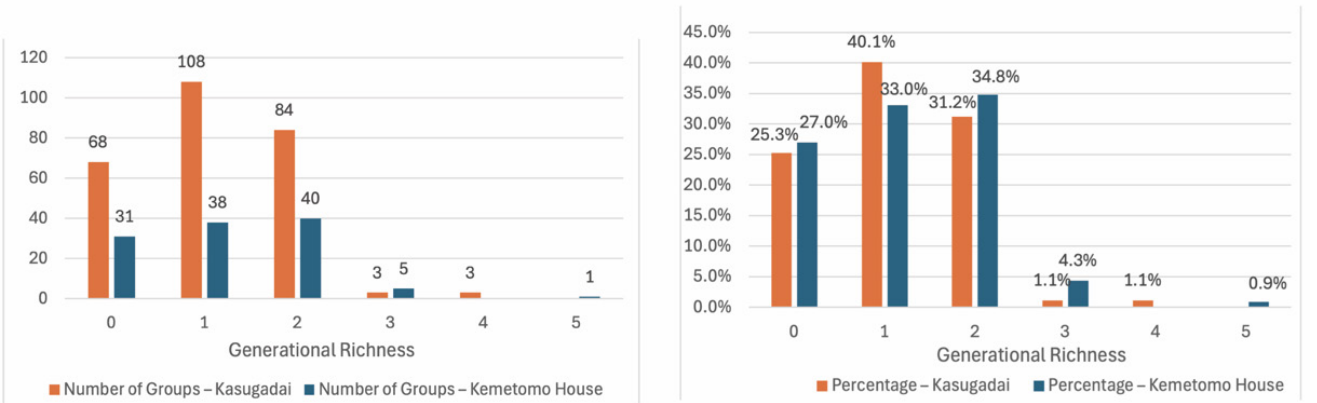


Figure 8 Overall Distribution of Generational Richness across Interaction Groups

Generational Richness	Number of Groups – Kasugadai	Number of Groups – Kemetomo House	Percentage – Kasugadai	Percentage – Kemetomo House
0	68	31	25.3%	27.0%
1	108	38	40.1%	33.0%
2	84	40	31.2%	34.8%
3	3	5	1.1%	4.3%
4	3	0	1.1%	0.0%
5	0	1	0.0%	0.9%
Not recorded	3	0	1.1%	0.0%
Total	**269**	**115**	**100%**	**100%**

Table 4 Facility-Specific Distribution of Generational Richness within Interaction Groups



(a) Number of interaction groups

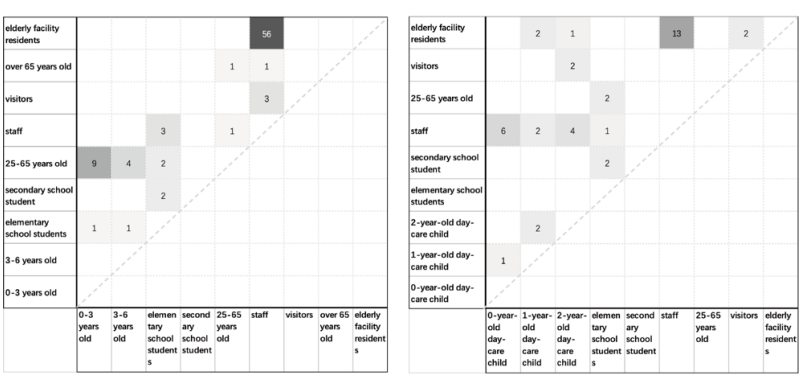
(b) Percentage distribution of generational richness

Figure 9 Distribution of generational richness across interaction groups in the two facilities
Note: (a) Absolute number of interaction groups by level of generational richness.
(b) Percentage distribution of interaction groups across generational richness categories. The two facilities are presented in parallel to facilitate comparison across both absolute and relative measures.

Facility-specific patterns of generational richness are summarized in Table 4 and illustrated in Figure 9. In both Kasugadai and Kemetomo House, interaction groups with low generational richness predominated. At Kasugadai, single-generation groups accounted for the largest proportion of interactions (40.1%), followed by two-generation groups (31.2%), while single-person cases represented 25.3% of observations. Groups involving three or more generations were uncommon, accounting for only 2.2% of the total.

A similar pattern was observed at Kemetomo House. Two-generation groups slightly outnumbered single-generation groups (34.8% and 33.0%, respectively), while single-person cases accounted for 27.0% of observations. Compared with Kasugadai, Kemetomo House exhibited a somewhat higher proportion of three-generation interactions (4.3%), although groups involving four or five generations remained rare.

Taken together, the results from both facilities reveal a consistent pattern in which interaction groups were largely structured around limited generational combinations. While multi-generational interactions involving three or more generations were present, they constituted only a small share of the overall distribution.



(a) Kasugadai

(b) Kemetomo House

Figure 10 Generational composition patterns within two-generation interaction groups in the two facilities Note: Heatmaps illustrate the frequency of different generational pairings observed in (a) Kasugadai and (b) Kemetomo House. Darker shading indicates higher frequencies, and the numbers shown in each cell correspond to the number of observed interaction groups.

3.4 Generation-based Participation Patterns

To further examine how different generations participated in intergenerational interaction, this section analyzes the composition and spatial distribution of two-generation interaction groups. These groups were selected for detailed analysis because they represent the most common form of intergenerational interaction observed in the dataset. Figure 12 illustrates the generational pairing patterns in the two facilities.

Across both facilities, intergenerational participation was unevenly distributed across the range of possible generational pairings. Rather than forming a balanced mixture of generations, interactions were concentrated in a limited number of recurrent pairings, indicating that intergenerational encounters tended to follow specific structural patterns shaped by the institutional context.

In Kasugadai (Figure 10a), interaction groups involving older adults and staff accounted for a substantial proportion of observed cases. This concentration suggests that intergenerational contact involving older adults was largely embedded within institutionally structured routines and care-related activities. Interactions between older adults and other community users, such as visitors, children, or students, were comparatively rare, indicating limited opportunities for broader generational encounters beyond staff–resident interaction.

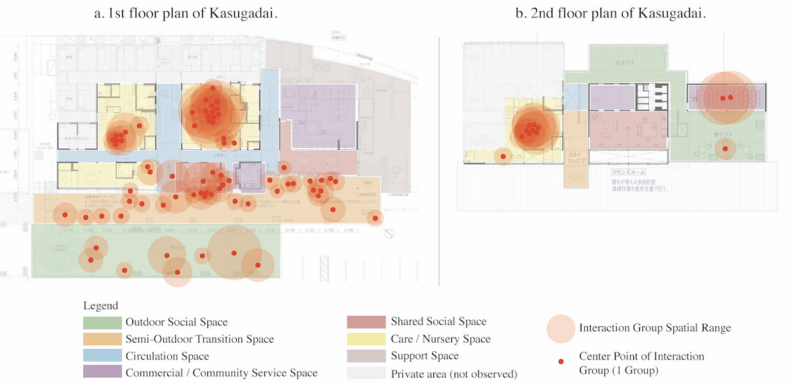


Figure 11 Spatial distribution of two-generation interaction groups in Kasugadai

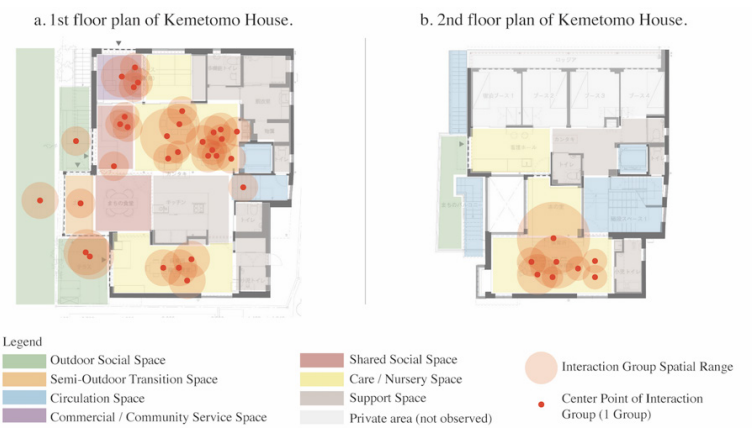


Figure 12 Spatial distribution of two-generation interaction groups in Kemetomo House

Table 5 Spatial distribution of two-generation interaction groups

Spatial Zone	Kasugadai (N)	Kasugadai (%)	Kemetomo House (N)	Kemetomo House (%)
Outdoor Social Space	9	10.71	4	10
Semi-Outdoor Transition Space	24	28.57	1	2.5
Circulation Space	2	2.38	1	2.5
Commercial / Community Service Space	2	2.38	4	10
Shared Social Space	11	13.1	4	10
Care / Nursery Space	36	42.86	26	65
Support Space	0	0	0	0
Total	**84**	**100**	**40**	**100**

Note: N = number of interaction groups.

A somewhat different pattern was observed in Kemetomo House (Figure 10b). While staff-related interactions remained prominent, older adults appeared in a wider range of generational pairings, including interactions with visitors and with younger age groups associated with childcare-related activities. These encounters typically occurred within shared spaces where childcare and care services overlapped. Although such interactions took place under staff supervision, they suggest a broader distribution of older adults' participation across generational contexts compared with Kasugadai.

The spatial distribution of two-generation interaction groups further illustrates how intergenerational encounters were organized within the facilities (Figure 11, Figure 12, Table 5). In Kasugadai, 84 two-generation interaction groups were recorded. The largest proportion occurred in care or nursery spaces (42.86%), followed by semi-outdoor transition areas (28.57%) and shared social spaces (13.10%). Outdoor social spaces accounted for 10.71% of interactions, while circulation spaces and commercial or community service spaces hosted only a small number of cases.

A similar spatial concentration was observed in Kemetomo House. Among the 40 recorded interaction groups, most occurred in care or nursery spaces (65.00%), with outdoor social spaces, shared social spaces, and commercial or community service areas each accounting for roughly 10% of interactions. Circulation spaces and semi-outdoor areas showed only limited interaction activity.

Overall, the spatial distributions indicate that intergenerational interactions were closely associated with activity-oriented environments where different generations were routinely present, particularly childcare rooms and care-related activity spaces. In Kasugadai, semi-outdoor transition spaces also hosted a noticeable share of interactions, reflecting the facility's more open spatial structure. Although interactions in commercial or community service spaces were relatively infrequent, they occasionally involved encounters between older adults and visitors from other generations, suggesting the presence of informal intergenerational contact beyond formal caregiving contexts.

4. Discussion

4.1 Structured Patterns of Intergenerational Interaction

Previous research has emphasized the importance of intergenerational interaction in community settings, highlighting its potential to strengthen social cohesion, mutual understanding, and wellbeing across age groups (Gualano et al., 2018). However, an analysis of interaction groups and their generational composition in community-based facilities revealed that, although multiple generations coexisted within shared environments, interaction groups were predominantly characterized by low levels of generational richness.

These findings suggest that the co-presence of different generations does not necessarily lead to diverse intergenerational interaction at the group level. Instead, interaction tended to occur within recurrent group configurations shaped by institutional roles, daily routines, and activity contexts. Staff members frequently appeared as key actors within two-generation groups, functioning as intermediaries who connected participants from different generations. While this role may facilitate contact between otherwise socially separated participants, it may also reinforce role-based interaction patterns that limit more spontaneous cross-generational engagement. In the Japanese context, social norms related to avoiding meiwaku (causing inconvenience to others) may further contribute to cautious interaction patterns, reducing the likelihood of initiating informal cross-generational contact without mediation. This observation aligns with studies on community-based practices in Japan, which emphasize the role of organizational actors and community coordinators in structuring opportunities for social participation and interaction (Ariga, 2017; Machimura, 2017; Nakajima & Murayama, 2024).

4.2 Older Adults' Bounded Integration within Interaction Groups

Shifting the analytical focus to older adults, this section examines how they were positioned within the interaction structures identified above. While older adults were regularly present and actively involved in everyday interactions, their participation followed selective and patterned forms rather than spanning the full range of possible interaction configurations. The concept of bounded integration is used here to capture this condition, in which older adults are socially engaged within community-based facilities while remaining embedded within relatively stable and institutionally shaped interaction contexts.

Across different interaction group types, older adults most frequently appeared either in single-generation groups involving peers or in two-generation groups structured around institutional roles, particularly those involving staff members. Interaction groups spanning three generations were observed only rarely, and older adults' participation in such groups was highly context-dependent, typically occurring in organized activity settings involving staff and school-aged children. Together,

these patterns indicate that older adults' everyday social involvement was concentrated within a limited set of institutionally mediated interaction contexts, supporting the characterization of their participation as a form of bounded integration. This pattern is consistent with previous studies suggesting that older adults' social participation in ageing and shrinking communities often remains embedded within relatively limited social networks and institutional settings rather than extending across broader community interactions (Buhnik, 2010; Martinez-Fernandez et al., 2016).

4.3 Spatial Distribution and Environmental Influences

In addition to institutional and organizational factors, spatial configuration may also have influenced the observed interaction patterns. Kemetomo House has a compact, domestic-scale layout where activities occur in close proximity, which may increase opportunities for incidental encounters across generations. In contrast, Kasugadai is organized within a larger spatial environment adjacent to a public plaza. Its broader spatial range and clearer functional zoning may lead users from different generations to gather in separate areas, increasing physical distance and reducing opportunities for everyday intergenerational contact. These observations suggest that spatial scale and layout interact with institutional routines in shaping how intergenerational interaction unfolds within the two facilities.

The spatial distribution of interaction groups further indicates that intergenerational encounters were closely linked to specific spatial settings, consistent with studies emphasizing the role of spatial configuration and shared activity environments in facilitating informal social contact (Aelbrecht, 2016). Care- and childcare-related areas functioned as primary interaction sites, reflecting their role as everyday social infrastructures that support routine contact (Biglieri et al., 2024). Transitional semi-outdoor spaces, particularly in Kasugadai, also supported encounters by connecting indoor and outdoor areas and allowing temporary stays or observation of nearby activities. In addition, small service-oriented spaces such as snack counters occasionally facilitated interaction between older adults and community visitors.

From a theoretical perspective, these spatial conditions can be understood through the concepts of third place and spatial agency. Semi-public transitional spaces may function similarly to third places by enabling informal encounters beyond structured activities (Oldenburg, 1999), while also allowing users and staff to shape interaction through everyday spatial practices, reflecting forms of spatial agency (Awan et al., 2011).

4.4 Implications for Community-Based Facility Design and Management

Taken together, these findings have important implications for the design and management of community-based facilities. The results suggest that simply bringing different generations into the same physical environment is insufficient to foster meaningful intergenerational interaction. Instead, spatial arrangements and programmatic interventions that encourage shared activities and reduce role-based separation are more likely to support diverse and sustained interaction. From this perspective, intergenerational interaction is better understood not as a spontaneous outcome of co-presence, but as a socially and spatially mediated process that requires intentional support. Previous studies have similarly emphasized the importance of structured intergenerational initiatives. For example, research on intergenerational programs has shown that organized activities—such as shared learning programs, creative workshops, and community service projects—can create structured opportunities for collaboration and everyday encounters between younger and older participants (Jarrott, 2011). Likewise, studies of multigenerational community initiatives highlight how community centers and coordinated activity programs can function as platforms that bring together children, older adults, and local residents through shared activities and social participation (Kaplan et al., 2020).

These observations suggest several implications for facility planning and management. Given that interaction groups were often small and structured, spatial design may consider incorporating spaces that support small shared activities, such as flexible seating areas or multipurpose rooms. Programmatic strategies and activity planning may further expand opportunities for intergenerational engagement by organizing activities that involve multiple generations while also enabling more spontaneous forms of interaction. In addition, spatial planning may incorporate semi-outdoor transitional areas and informal "third places," such as community cafés or small service-oriented spaces, which can facilitate low-threshold encounters between different age groups and support everyday intergenerational contact.

4.5 Limitations and Future Research

Several limitations of this study should be acknowledged. First, the analysis was based on two case-study facilities, which may limit the generalizability of the findings. Future studies involving a larger number of sites could provide a broader understanding of intergenerational interaction patterns.

Second, interaction groups with higher levels of generational richness were relatively rare, which limited more detailed analysis of highly diverse groups. Extended observation periods or additional case studies may enable more detailed investigation of such interactions.

Finally, the study relied primarily on behavioral observation and therefore focused on observable interaction patterns rather than participants' subjective experiences. Given the exploratory nature of the study and practical constraints during fieldwork, questionnaire surveys were not included in the data collection process. Future research could incorporate qualitative interviews with users and staff to better understand the motivations and meanings underlying intergenerational encounters.

In addition, the observations were conducted within the specific socio-cultural context of Japan. Cultural norms and social practices may influence how intergenerational interactions unfold in everyday settings. Comparative studies conducted in different cultural contexts could therefore provide further insight into how cultural factors shape patterns of intergenerational interaction in community-based welfare facilities.

5. Conclusion and Future Directions

Across both facilities, interaction groups were predominantly characterized by low levels of generational richness. Most observed interactions involved participants from one or two generational categories, while groups spanning three or more generations occurred only rarely. These patterns indicate that intergenerational interaction does not emerge automatically from shared space alone, but is shaped through recurrent configurations linked to institutional roles, daily routines, and organized activity contexts.

By focusing on interaction groups as the unit of analysis, this study provides empirical insight into the interaction patterns of older adults within community-based welfare facilities. The findings suggest that older adults' participation in everyday social life is characterized by a form of bounded integration, in which their interactions tend to occur within a limited range of contexts and group configurations. In many cases, these interactions are mediated by staff members and shaped by organized activities and institutional routines. As a result, rather than emerging as spontaneous encounters among co-present generations, older adults' intergenerational interactions often take place within recurrent, structured, and relatively predictable settings.

The spatial distribution of interaction groups observed in this study indicates that intergenerational encounters tend to cluster around particular activity settings rather than occurring evenly across the facilities. Interaction was most frequently observed in spaces associated with routine care or childcare activities, where staff-mediated contact and shared activities brought participants from different generations together. Transitional and semi-public areas also occasionally supported incidental encounters by allowing observation and temporary engagement with ongoing activities.

From a practical perspective, these findings suggest that promoting intergenerational exchange requires more than simply co-locating different age groups within the same facility. For designers, spatial arrangements that encourage shared activities and overlapping use of space may increase opportunities for informal interaction. For managers, programming strategies and staff facilitation may play an equally important role in shaping how and where intergenerational engagement takes place within community-based welfare facilities.

Future research could extend this approach by examining a broader range of facility types, residential environments, and social contexts, as well as by conducting comparative studies across different cultural settings. Such research would help clarify how everyday intergenerational interactions vary across institutional arrangements, community structures, and cultural norms. In addition, future studies could incorporate new recording and observation techniques to obtain richer and more detailed empirical data on everyday social interaction. By expanding the range of research contexts and methodological approaches, future work may provide deeper insight into how intergenerational interaction is formed, maintained, and transformed in different community environments.

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Disclosure

The authors declare no conflicts of interest.

Data Availability Statement

The data supporting the findings of this study, including observational records of intergenerational interaction groups, are available from the corresponding author upon reasonable request.

CRediT Authorship Contribution Statement

Li Yuan: Conceptualization; Methodology; Validation; Formal analysis; Investigation; Resources; Data curation; Writing – original draft; Writing – review and editing; Visualization; Project administration.
Shimizu Ikuro: Conceptualization; Methodology; Validation; Resources; Writing – review and editing; Supervision; Project administration; Funding acquisition.

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