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Analysis of Leisure Activities and Residential Intentions in Depopulated Areas: A Case Study of Wajima City, Ishikawa Prefecture

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Abstract: Population outflow from rural areas represents a significant social issue in Japan. Data from the Ministry of Internal Affairs and Communications suggest that insufficient leisure options contribute to rural residents' decisions to relocate. This study aims to examine the relationship between subjective well-being and the intention to reside in a specific region, considering the diversity of leisure activities available to rural residents. Our findings indicate that enhancing leisure activities improves subjective well-being but does not necessarily strengthen residents' intentions to reside in the area. Notably, those partaking in wider areas for leisure activities exhibited a lower inclination to stay in the region. This study contributes to the understanding necessary for developing sustainable rural societies.

Keywords: depopulation; Wajima City; leisure behavior; residential intentions; SWLS scale

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1. Research Background and Objectives

Population dynamics in Japan, characterized by significant declines and an aging demographic, have emerged as critical social issues. A key contributor to these challenges is the migration from rural to urban areas. In particular, Japan's urban areas have a low total fertility rate, and the concentration of the population in urban areas has contributed to the declining birth rate in the country as a whole. Population decline in depopulated areas, especially rural areas, is serious. Based on the current criteria in 2023, about 60% of Japan's municipalities are designated as depopulated areas. These designated areas had a population of approximately 22.93 million in 1960, but by 2020, the population declined to 11.67 million. This significant decline, by about half of the original value, causes a lot of challenges in maintaining local economies and communities in these areas. The survey by the Ministry of Internal Affairs and Communications in 2015 [1] identified the primary reasons of depopulation in rural areas as follows: the lack of employment opportunities, which was the most frequently cited reason, the lack of social infrastructure, the lack of educational opportunities, and the lack of recreational facilities. While disparities in social and living infrastructure between cities and rural areas generally receive substantial attention, the results of the survey also highlight significant dissatisfaction among residents, which is caused by insufficient leisure and recreational opportunities. Empirical evidence suggests that the younger generation in particular prioritizes leisure opportunities when they consider where to live. This observation aligns with findings from prior studies, including those conducted by Izuta et al. [2]. Therefore, enhancing leisure offerings in rural areas could be a strategic approach to mitigate the outflow of residents.

Significant individual differences in the range of behavior of leisure activities are anticipated among residents of rural areas. One of the factors contributing to this individual

difference is that the travel distances involved in leisure time participation tend to be longer in rural areas compared to urban areas. Omiya et al. [3] emphasized the importance of acknowledging the broad spectrum of leisure activities in depopulated areas and the provision of leisure opportunities. However, research into the provision of leisure and understanding of leisure needs in rural communities remains inadequate. Therefore, examining the correlation between residents' intentions to settle in rural areas and their preferences for leisure activity in depopulated areas is a critical area of study.

This study examines the range of leisure activities in rural areas and how the range of leisure activities of study participants affects their subjective well-being and their in- tension to settle in the area. The study focuses on Wajima City, Ishikawa Prefecture. Data were gathered through a questionnaire distributed to residents in October 2023. The responses were analyzed using the k-means clustering method to categorize residents based on their leisure activity profiles. Furthermore, we applied a factor analysis with quantification method type I, treating the leisure activity categories as independent variables and both subjective well-being and rural settlement intentions as dependent variables. This study aims to improve the quality of the social life of residents in underdeveloped areas and to help in urban planning, including the design of transportation infrastructure and the layouts of facilities. Ultimately, this study seeks to promote sustainable development in depopulated regions and provide foundational research for improving leisure opportunities for residents.

It is pertinent to note that the survey data used in this study were collected in October 2023 and thus are unaffected by the Noto Peninsula earthquake of 2024.

2. Review of Previous Research and Positioning of This Study

2.1. Summary of Previous Research

Research examining the location and frequency of residents' leisure activities spans various disciplines. Many studies have adopted a spatial perspective to analyze how individual attributes influence leisure behaviors. For example, Shibuya [4] categorized leisure activities based on the amount and frequency of time spent outdoors, analyzing activity areas and purposes across different categories to elucidate spatial patterns in leisure choices. Similarly, Kawagishi and Kitano [5] classified leisure activities in two Japanese cities based on location, supplementing their analysis with interviews concerning the amount of time allocated to each activity, thereby comparing patterns across the cities. These studies aim to enhance urban planning by integrating the spatial dynamics of leisure activities, ensuring residents enjoy and are fulfilled by their leisure time. Such research is predominantly conducted in the suburbs of major cities, where population densities provide rich data.

Further studies have focused on specific aspects of urban planning. Asanuma et al. [6] examined how existing leisure facilities could expand their functions and be placed more efficiently based on usage characteristics by the elderly and the distribution traits of the facilities. Manas [7] applied space syntax theory to assess the accessibility of public open spaces in suburban areas, exploring their potential role in providing leisure opportunities. Additionally, Yuzawa and Fujii [8] investigated the placement of new elderly welfare centers in urban suburbs to enhance seniors' quality of life, developing and evaluating a model to predict facility use. Collectively, these studies highlight the targeted provision of leisure opportunities in suburban settings of large cities, reflecting a significant trend toward improving urban residents' quality of life through strategic leisure planning.

Recent research has not only analyzed the spatial distribution of leisure activities but also examined residents' subjective well-being and intentions to continue residing in specific regions, aiming to clarify the relationship between leisure activities and lifestyle satisfaction. Studies related to subjective well-being include research by Sugeno et al. [9], which assessed the leisure activities and well-being of university students in Tokyo and rural areas, finding that students in Tokyo reported higher subjective well-being, correlating with their more frequent leisure activities and greater leisure satisfaction. Similarly,

Hashimoto and Atsumi [10] explored the relationship between leisure habits, such as the propensity to engage in activities and the types of activities, and life fulfillment among the elderly in the suburbs of Hiroshima Prefecture, elucidating the link between leisure activities and subjective well-being.

Further studies, such as that of Yuba et al. [11], have focused on the accessibility of urban recreational activities (e.g., concerts, performances, and sporting events) and its impact on subjective well-being, suggesting that improved access to such activities could enhance life satisfaction. Examples of research outside of Japan include a study by Chidambaram and Scheiner [12], which employed a multiple regression analysis to demonstrate the influence of transportation access for leisure travel on the well-being of elderly residents in rural Germany. Mouratidis [13] examined the impact of compact city development on residents' well-being, with a particular focus on relationship satisfaction and leisure, discussing how such urban planning contributes to city sustainability.

Additionally, Morimoto et al. [14] investigated leisure activity tendencies and their correlation with settlement intentions among young people in various regions of Japan (within Tokyo's 23 wards, outside of Tokyo's 23 wards, and in Northern Kanto), highlighting a significant relationship between leisure satisfaction and the desire to settle in rural areas. However, most research focusing on settlement intentions typically centers on lifestyle conveniences, such as shopping accessibility [15], and remains sparse in direct association with leisure activities. In Western contexts, studies often address settlement intentions within the framework of race and refugees. For instance, Quirke [16] reported that active leisure participation enhanced mental health and social capital among ethnically diverse immigrants in Canada. Doherty and Taylor [17] discussed the role of sports in integrating young immigrants into Canadian society, noting ongoing challenges related to anti-immigrant sentiments during such activities. Research on depopulation, such as that by Llorent-Bedmar et al. [18], has identified the lack of fulfilling leisure opportunities as a contributing factor to population outflow, suggesting that insufficient leisure offerings instill a sense of inferiority among residents of depopulated areas and promote a preference for urban living.

2.2. Positioning of This Study

Given the characteristics and limitations identified in prior research, the positioning of this study is delineated as follows. Most aforementioned studies have focused on relatively populous urban centers or their suburbs, with few addressing leisure activities in depopulated areas. Moreover, many studies examining settlement intentions in such areas have primarily used material satisfaction metrics, such as retail accessibility, as explanatory variables; research exploring the psychological satisfaction of residents remains limited. Therefore, this study targets individuals aged 15 to 64 years residing in Wajima City, Ishikawa Prefecture, and investigates the relationship between leisure activity trends, subjective well-being, and settlement intentions among this demographic. Data collection was conducted via questionnaires, and subjective well-being was assessed using the Diener Satisfaction With Life Scale (SWLS) [19], a method previously employed in civil engineering research. This scale involves five questions and allows for a maximum score of 35 points. A distinctive feature of this study is its exploration of the accessibility of leisure spaces and activities among residents in depopulated areas.

3. Overview of Research Methods

3.1. Survey Region and Questionnaire Survey

The questionnaire survey in this study was conducted in Wajima City, Ishikawa Prefecture, which is the targeted area on the map in Figure 1. As of the end of 2023, Wajima City had a total population of 21,980, making it the most populous among the four Oku-Noto cities and towns (Wajima City, Suzu City, Noto Town, and Anamizu Town). However, it is a region grappling with significant depopulation and aging, experiencing a population decrease of nearly 60% over the past 60 years, from 1960 to 2023. The aging rate

is notably high at 45.7%, substantially exceeding the national average. In terms of leisure infrastructure, the city lacks prominent facilities, and accessibility of entertainment in neighboring areas such as Suzu City and Noto Town is limited owing to its rural character and the sparse concentration of commercial spaces. The nearest major city, Kanazawa City, which hosts the largest commercial hub in Ishikawa Prefecture, is approximately 2–3 h away by car. Wajima City, Ishikawa Prefecture, is located in an area of Japan that is significantly depopulated and isolated from neighboring metropolitan areas. For the above reasons, Wajima City was selected for this study in order to examine the construction of a sustainable local society.

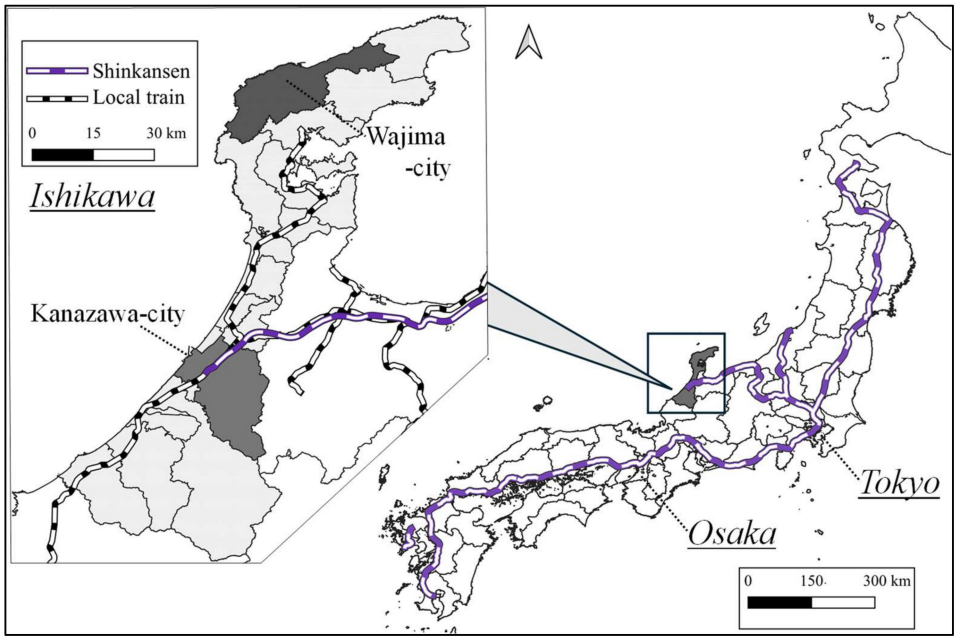

Figure 1. Zoomed-out map of research's targeted region.

Table 1 provides a summary of the questionnaire survey implemented in this study.

Table 1. Overview of questionnaire survey.

Survey Name	**Survey on the Life of Wajima City Residents**
Target region	Wider Wajima City area
Target population	Random selection of 15–64-year-olds
Survey period	September 2023
Number of distributed forms	3000 forms
Collected forms	858 forms
Valid forms	400 forms
Main survey items	• Personal attributes (e.g., age, gender) • Life satisfaction (e.g., health, purchases, friendships) • Leisure activity trends (e.g., types, frequency, and activity location) • Subjective well-being evaluation • Rural settlement intention evaluation

Residents aged 15–64 years from Wajima City were randomly selected for the survey, with a total of 3000 questionnaire forms distributed. The distribution was handled by a posting company, and responses were collected by mail. Of the 858 questionnaires retrieved, 400 were deemed valid for analysis. In this study, items related to personal attributes and

life satisfaction, which were pointed out to influence changes in settlement intention in previous studies, were incorporated into the questionnaire. That is, survey questions included personal attributes such as age, gender, and occupation; life satisfaction metrics such as health and fulfillment regarding purchases; and details on leisure activities, including types, locations, frequency, and satisfaction with these activities. The indicators related to life satisfaction were rated on a three-point scale from 1 to 3 (satisfied to unsatisfied) for family background, friendships, satisfaction with leisure activities, daily shopping, and economic environment. Assessments of individual well-being and rural settlement intentions were also conducted. This study analyzes data obtained from the collected questionnaires.

Figures 2 and 3 show the personal attributes of the respondents. There was no significant difference between the number of males and females, and the largest age distribution was in the 50–59 age group.

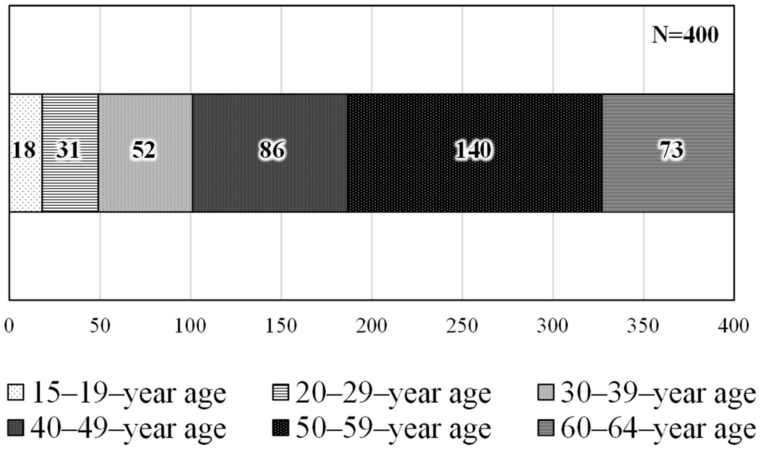

Figure 2. Age composition of analysed subjects.

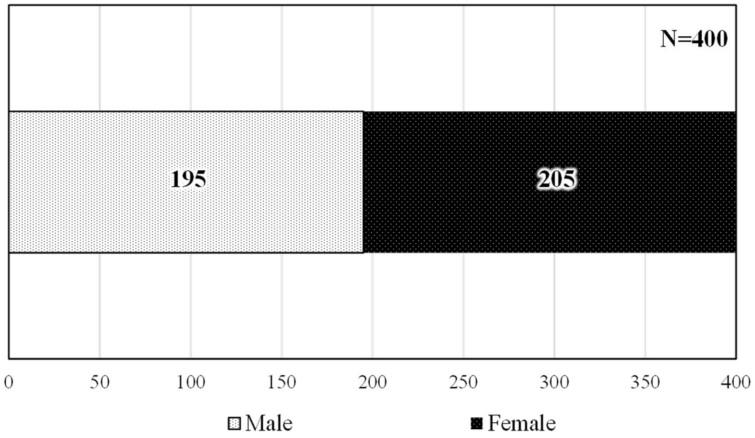

Figure 3. Gender composition of analysed subjects.

3.2. Overview of Subjective Well-Being Scale

In this study, we utilized the Satisfaction With Life Scale (SWLS) [19] by Diener to measure respondents' subjective well-being. Wajima City, Ishikawa Prefecture is located in an area of Japan that is significantly depopulated and isolated from neighboring metropolitan areas. For the above reasons, Wajima City was selected for this study as a region in which to examine the construction of a sustainable local society. The SWLS involves five questions, presented in Table 2, rated on a seven-point scale ranging from 'not at all applicable' (1 point) to 'extremely applicable' (7 points). The total possible score, aggregating all responses, is 35 points, with higher scores indicating greater subjective well-being.

Table 2. SWLS questions.

Question Content
(1) My life is close to ideal in almost all aspects.
(2) My life is very wonderful.
(3) I am satisfied with my life.
(4) I have obtained many valuable things in my life.
(5) Even if I could relive my life, I would hardly change anything.

We analyzed trends in subjective well-being scores across different attributes. Table 3 details these scores by attribute. Initially, examining the relationship between age and subjective well-being, respondents in their 30s had an average score of 22.09 points. A *t*-test was conducted to compare age groups; however, no statistically significant differences were found, suggesting no significant correlation between age and the distribution of subjective well-being scores.

Table 3. Mean subjective well-being score for each attribute.

	Attribute	Score Mean	Standard Deviation	*n*
Age	10s	19.77	5.46	22
	20s	20.00	5.17	31
	30s	22.09	6.19	55
	40s	20.01	6.16	94
	50s	21.02	5.47	150
	60s	20.44	5.67	183
Gender	Male	20.40	6.26	399
	Female	20.87	5.78	458

Regarding gender, average scores were 20.40 for males and 20.87 for females, indicating marginally higher scores among females. However, using the Kruskal–Wallis test to assess the independence of subjective well-being scores across age groups revealed no significant differences by gender. These results suggest that there is no significant correlation between gender and the distribution of subjective well-being scores. The standard deviation, indicating the spread of the data, was lowest at 5.17 for respondents in their 20s and highest at 6.19 for those in their 30s.

3.3. Overview of Rural Settlement Intention Scale

In this study, the rural settlement intention score was assessed by asking respondents whether they wished to continue residing in Wajima City. According to the evaluation method, the following question was posed: 'Do you want to continue living at your current address?' Responses were rated on an 11-point scale (0 points for 'do not wish to continue living at address', 5 points for 'cannot say either way', and 10 points for 'wish to continue living at address'), which defined the rural settlement intention score.

Subsequently, we analyzed trends in the rural settlement intention scores by attribute. Table 4 shows the average scores and standard deviations. The data indicate that older respondents typically had higher rural settlement intention scores, with an average score of 3.50 points for those in their 10s and 6.22 points for those in their 60s. The standard deviation, reflecting data dispersion, was smallest for those in their 10s at 2.19 and largest for those in their 40s at 3.22. A Kruskal–Wallis test was applied to verify the independence of rural settlement intention scores by age group, yielding a 5% significance result. This statistically indicates significant differences in the intention to settle in the region

by age. However, no significant differences were observed when testing for independence by gender, suggesting that gender does not significantly influence rural settlement intention scores.

Table 4. Mean rural settlement intention score for each attribute.

	Attribute	Mean Score	Standard Deviation	*n*
Age	10s	3.50	2.19	22
	20s	4.71	2.88	31
	30s	6.24	2.64	55
	40s	5.41	3.22	94
	50s	5.79	2.86	150
	60s	6.22	2.78	183
Gender	Male	6.26	2.91	399
	Female	6.11	3.04	458

3.4. Participation in Leisure Activities Among Wajima City Residents

The questionnaire utilized in this study included 23 leisure activity items derived from the FY2021 Basic Survey on Social Life conducted by the Ministry of Internal Affairs and Communications [1]. We collected data on the frequency and location of these activities for each item. This section presents a summary of participation data for Wajima City residents in these activities to lay the basis for subsequent analyses. Participation in a particular leisure activity was defined as engaging in that activity at least once over the past year. Figure 4 shows the participation rates for each leisure activity among Wajima City residents. Activities with high participation rates include the following: 1. TV/radio (91.0%), 2. PC/games (62.5%), 3. Reading/manga (54.8%), and 19. Eating out/social dining (53.8%).

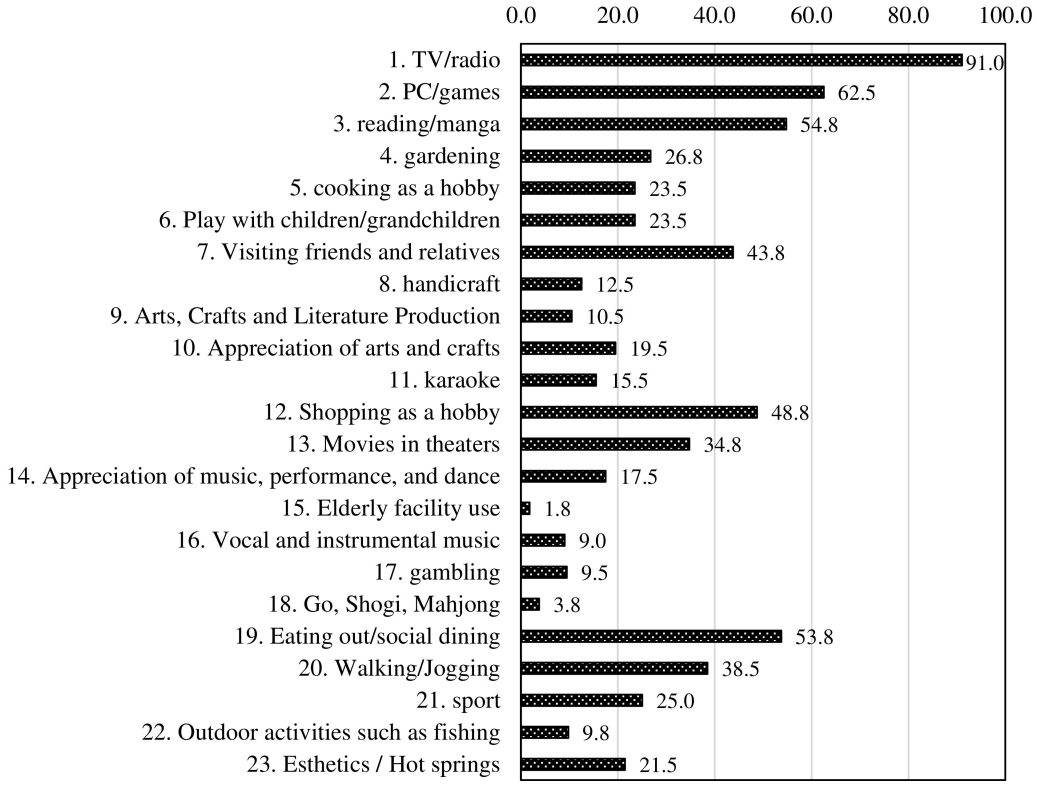

Figure 4. Participation rate by leisure item among Wajima City residents (multiple answers) (%).

Leisure activities with high participation rates are indicative of those that are readily accessible or require minimal effort or travel. Activities presumed to necessitate travel outside the city, such as 11. Karaoke (15.5%) and 13. Watching movies at the cinema (34.8%), show lower participation rates.

3.5. Analysis Process

Regarding the analysis flow, first, in Section 4, grouping is conducted using the non-hierarchical clustering k-means method based on the range of activities and frequency of activities of the analyzed subjects. The k-shape method is a non-hierarchical clustering method that is frequently used when the number of target individuals is large. Deep learning methods were not used in this study due to the sample size. K-means method is a method to classify each datum so that the total distance between each datum and the cluster center of gravity after classification is minimized. This grouping makes it possible to classify the analyzed subjects according to the degree of regional mobility associated with each leisure activity. In Section 5, a quantitative class I analysis was conducted using subjective well-being and intention to settle in the region as explanatory variables, with the range of leisure activities obtained in Section 4 as one of the explanatory variables and with subjective well-being and settlement intention, respectively, as the objective variables. Quantification analysis is a method of converting qualitative factors that cannot be expressed numerically into numerical values and showing their contribution to the target variable. Quantification type I is one of the analytical methods of quantification theory, which uses qualitative data as the explanatory variable and quantitative data as the objective variable. Deep learning methods were not used in this study due to the sample size. In this study, this analysis method was employed because the analysis items included qualitative data such as personal attribute data.

4. Cluster Analysis of Leisure Activity Area

Next, we conducted a nonhierarchical cluster analysis using respondents' selection tendencies for leisure activities as the explanatory variable. This method enables the classification of respondents based on their patterns of leisure activity area usage. This analysis also serves as a foundation for the quantitative analyses that will be discussed in Section 5 and beyond.

In this analysis, we identified the main areas where each respondent engaged in leisure activities and grouped these into five categories. Figure 5 provides a conceptual diagram illustrating this classification process. Henceforth, these five groups are referred to as 'leisure activity area groups.' In this study, we identified three spatial areas as locations where Wajima City residents participated in leisure activities: 1. Home and surrounding area; 2. Wajima City suburban area (encompassing Wajima City and Anamizu Town); and 3. Areas outside of the first two areas. We performed a k-means cluster analysis based on the number of leisure activity items and the number of days spent on leisure activities in these specified areas.

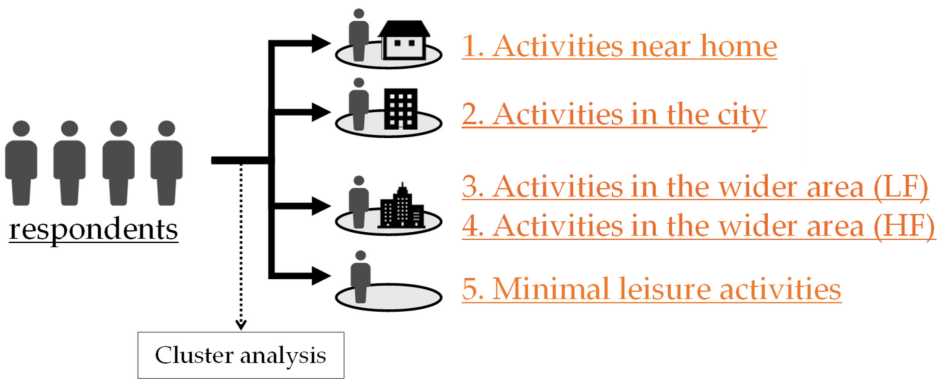

Figure 5. Conceptual diagram of cluster analysis for leisure activity areas.

Table 5 shows the results of the nonhierarchical cluster analysis. The five groups identified are defined as follows:

1. Activities near home: This group engaged extensively in leisure activities close to home, with a high number of leisure activity items (5.1) and many days spent on these activities (129.8 days), indicating a strong local orientation towards leisure;
2. Activities in the city: Respondents in this group primarily participated in leisure activities within Wajima City suburbs;
3. Activities in the wider area (low frequency);
4. Activities in the wider area (high frequency): These groups were characterized by engaging in a significant number of leisure activities over many days in broader areas, with the low-frequency group having fewer days compared to the high-frequency group;
5. Minimal leisure activities: This group showed minimal participation in leisure activities, evidenced by low number and frequency of activities across all regions.

Table 5. Results of nonhierarchical cluster analysis relating to leisure activity areas.

Group	*n*	Days Spent on Activities (Cumulative Total)			Number of Activity Items		
		Near Home	Wajima City Suburbs	Wider Area	Near Home	Wajima City Suburbs	Wider Area
1. Activities near home	76	129.8	18.4	54.5	5.1	1.0	1.6
2. Activities in the city	83	63.1	187.7	39.6	3.4	2.8	1.8
3. Activities in the wider area (low frequency)	47	37.5	15.2	90.3	3.7	0.7	3.4
4. Activities in the wider area (high frequency)	47	31.8	50.0	181.8	3.9	0.9	4.3
5. Minimal leisure activities	147	26.5	16.0	31.6	2.4	0.8	1.0
Mean		56.8	53.0	62.4	3.5	1.2	1.9

Table 6 compares the personal attributes of respondents within each cluster. Notably, the average age of respondents in the group with minimal leisure activities was the highest at 50.1 years, suggesting a trend by which residents' participation in leisure activities decreases with age.

Table 6. Attribute values of clusters relating to leisure activity areas.

Group	*n*	Mean Age	Gender Ratio	
			Male Ratio	Female Ratio
1. Activities near home	76	45.1	0.45	0.55
2. Activities in the city	83	46.3	0.58	0.42
3. Activities in the wider area (low frequency)	47	47.0	0.32	0.68
4. Activities in the wider area (high frequency)	47	46.1	0.53	0.47
5. Minimal leisure activities	147	50.1	0.49	0.51
Mean		47.5	0.48	0.52

5. Factor Analysis of Leisure Activity Area, Well-Being, and Intention to Settle

In this section, we explore the relationship between leisure activity orientation, subjective well-being scores, and rural settlement intention scores among Wajima City residents.

We begin with a factor analysis of their subjective well-being scores in Section 5.1, followed by an analysis of their rural settlement intention scores in Section 5.2.

5.1. Factor Analysis of Leisure Activity Area Groups and Subjective Well-Being Scores

This subsection elucidates the relationship between individual leisure activity areas and subjective well-being. We employed quantification type I, using subjective well-being scores as the objective variable and the leisure activity area groups defined in Section 3.2 (1. Activities near home, 2. Activities in the city, 3. Activities in the wider area (low frequency), 4. Activities in the wider area (high frequency), and 5. Minimal leisure activities) as explanatory variables. This analysis assessed how differences in leisure activity area orientation impacted subjective well-being. Additional explanatory variables included personal attributes such as gender and age, along with indicators of life satisfaction (individual health, friendships, overall satisfaction with leisure time, and satisfaction with daily shopping), each evaluated on a three-point scale (dissatisfied, normal, and satisfied).

Figure 6 presents the results of this analysis. The analysis revealed that satisfaction with individual friendships was the most influential factor, with a squared multiple regression coefficient of 0.2455. In descending order, the leisure activity area groups that contributed most significantly to increases in subjective well-being were as follows: 2. Activities in the city, 3. Activities in the wider area (low frequency), 1. Activities near home, 4. Activities in the wider area (high frequency), and 5. Minimal leisure activities. The group with minimal leisure activities was significantly correlated with lower subjective well-being scores, confirming that engaging in fulfilling leisure activities enhances their well-being. Notably, the group with activities in the city, which consists of easily accessible leisure activities, exhibited the highest increase in subjective well-being scores. Conversely, the group with activities near their homes showed a lower impact, suggesting that having leisure activities involving movement away from their homes contributes more significantly to improving their subjective well-being.

Regarding life satisfaction variables, the analysis confirmed that higher satisfaction in areas such as individual health, friendships, leisure time, and daily shopping was correlated with higher subjective well-being scores, while lower satisfaction in these areas was correlated with lower subjective well-being scores.

5.2. Relationship Between Groups and Rural Settlement Intention Score

In this section, we analyze the influence of an individual's leisure activity area on their rural settlement intention score. As in the previous section, we employed quantification type I to examine how differences in leisure activity area orientation impact rural settlement intention scores. Given the significant bias in the distribution of rural settlement scores across generations, as indicated in Table 4, we adjusted the rural settlement intention scores for each age group. The adjusted rural settlement intention score was used as the objective variable in the quantification type I analysis.

In this study, we applied the equipercentile method [20] to address age-related bias in rural settlement intention scores. The equipercentile method, a type of histogram equalization, calculates a relative cumulative frequency (score percentile) based on the distribution of subject scores among the adjusted groups. It also determines a reference percentile that serves as the basis for the adjustment. The subject's score is then converted to a reference score corresponding to the closest subject percentile. This method redefines the adjusted score according to the ranking within each group and corrects for the mean and variance between groups. It is similarly used for score adjustments in university entrance examinations.

Table 7 shows changes in the mean and variance of rural settlement intention scores for each age group before and after the adjustment using the equipercentile method. This adjustment ensured that the means converged to approximately 5.0 points and the variance to between 7.5 and 10 points for each age group. A subsequent analysis using

the Kruskal–Wallis test revealed no significant differences between age groups, confirming that the age bias in rural settlement intention scores was effectively corrected.

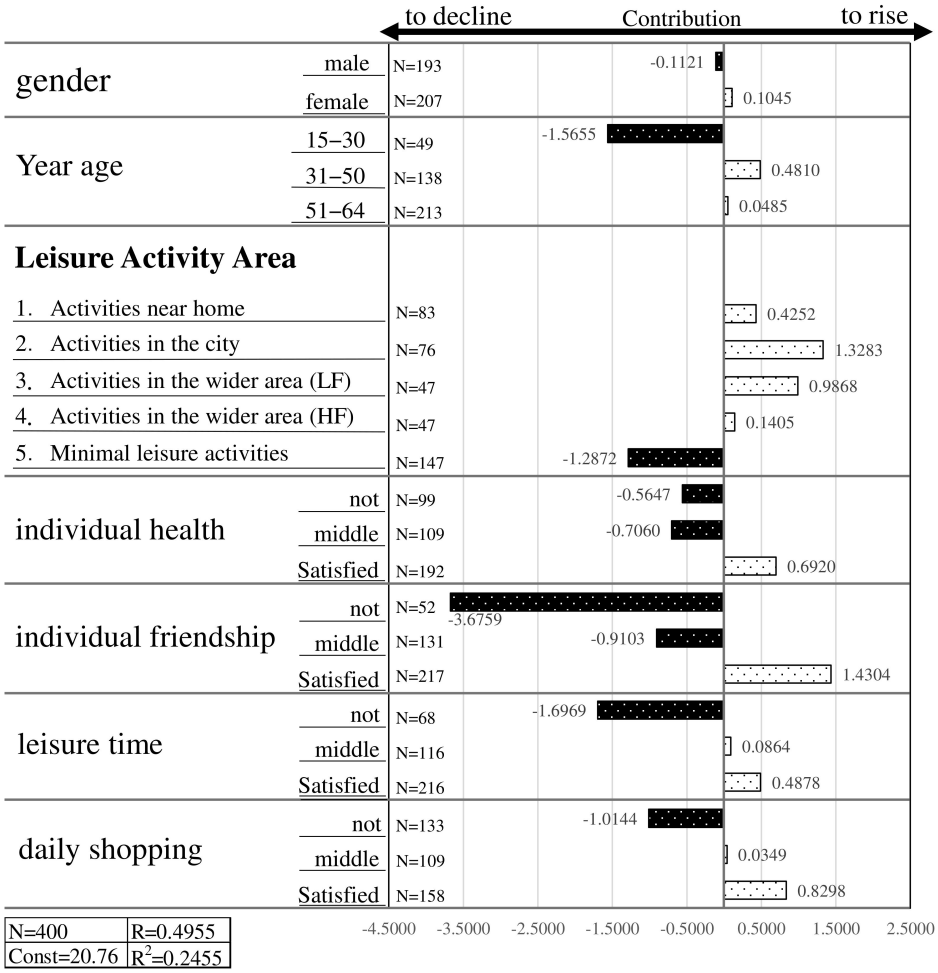

Figure 6. Factor analysis of leisure activity areas and subjective well-being.

Table 7. Settlement intention scores before and after adjustment.

Group	Average		Variance	
	Before Adjustment	After Adjustment	Before Adjustment	After Adjustment
10s	3.22	5.06	3.36	9.70
20s	4.71	5.00	8.55	8.40
30s	6.21	5.06	7.34	9.74
40s	5.55	4.98	10.77	10.52
50s	5.82	5.06	8.29	8.34
60s	6.08	4.92	8.08	10.58

Figure 7 shows the results from the factor analysis using quantification type I, with the rural settlement intention score as the objective variable. The squared multiple regression coefficient, indicating accuracy, was 0.2071. Similar to the previous section, we included leisure activity area groups and indicators of personal attributes and life satisfaction as explanatory variables. Additionally, variables related to the respondents' subjective well-being score tendencies were incorporated into this analysis. The factor analysis showed that the most influential factor on rural settlement intention scores was the leisure activity

area group. When ranking the leisure activity area clusters by their contribution to improving rural settlement intentions, the results were as follows: 1. Activities near home (+0.4878 points), 5. Minimal leisure activities (+0.3574 points), 2. Activities in the city (−0.2466 points), 3. Activities in the wider area (low frequency) (−0.5034 points), and 4. Activities in the wider area (high frequency) (−1.771 points). These findings suggest that individuals partaking in leisure activities over wider areas exhibit lower intentions to settle in the region. Furthermore, an analysis of factors related to the subjective well-being scores revealed that having a higher subjective level of well-being tended to enhance one's intentions to settle in the region. This suggests that a fulfilling residential life is directly linked to the desire to remain at one's current address. Among the life satisfaction indicators, satisfaction with an individual's economic environment negatively impacted settlement intentions. The factor scores for economic satisfaction were ranked as follows: dissatisfied (0.1435 points), average (−0.0530 points), and satisfied (−0.0952 points). Moreover, regarding overall satisfaction with leisure time, the satisfied factor score was −0.1199 points, indicating that satisfaction with leisure time does not necessarily correlate with an increased intention to settle in the region.

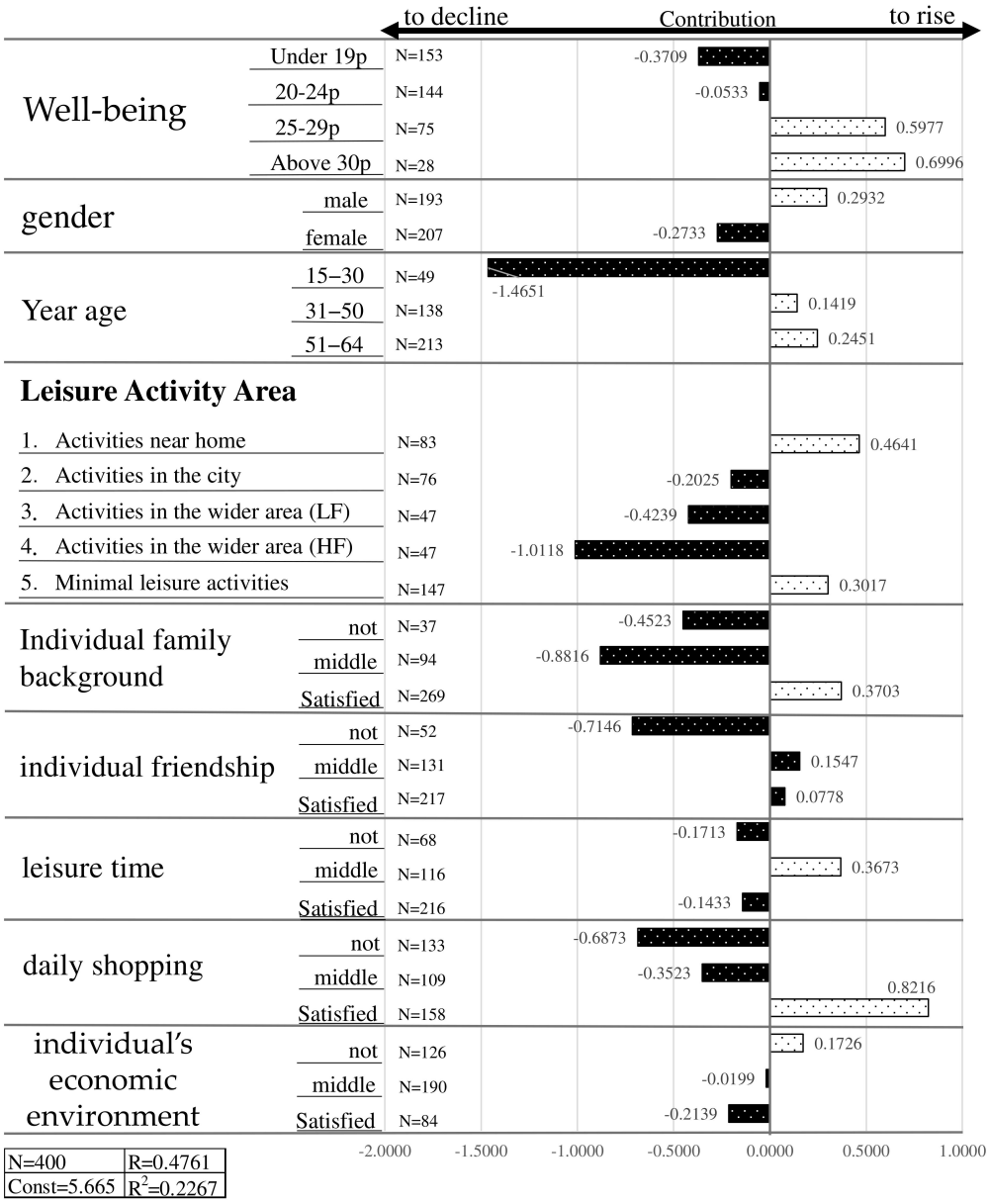

Figure 7. Factor analysis of leisure activity areas and rural settlement intentions.

6. Summary and Future Issues

In this study, we conducted factor analyses of subjective well-being and rural settlement intention scores by categorizing leisure activity areas using a nonhierarchical cluster analysis and employing quantification type I. The results of this study follow previous studies by Yuba et al. [11] and Arikawa et al. [15] in that subjective well-being and settlement intention increase as life satisfaction related to friendship satisfaction and daily purchases increase. In the analysis of leisure time, the subject of this study, we introduced a new concept of the range of leisure time activities and showed the relationship between the degree of mobility during leisure time, subjective well-being, and settlement intentions. The results indicated that among the leisure activity area groups, the group with activities in the city had the most significantly enhanced subjective well-being scores. The group with minimal leisure activities had subjective well-being scores that were negatively impacted, confirming that a lack of active participation in leisure activities is associated with decreased well-being. Additionally, having activities near the residents' home had the most significant contribution to improving their rural settlement intention scores. However, partaking in activities outside of the city negatively influenced this score, aligning with observations that individuals engaged in leisure activities over a wide area demonstrated a reduced intention to settle in the region. These findings suggest that leisure activities over a wide area do not necessarily correlate with an increased intention to settle in the area though they may enhance subjective well-being. Kitagawa et al. [21] reported that elderly people living in mountainous areas have a higher subjective sense of well-being when they have a higher degree of freedom regarding their day-to-day mobility, which is consistent with the trend observed in this study. The study by Nakayama [22] also points out that young people who prefer an urban lifestyle tend to have a strong desire to live in urban areas, which may explain the underlying factor of low settlement intentions among residents with a large range of leisure activities in this study. On the other hand, 2. "Activities in the city" has the highest contribution to subjective well-being and a relatively small contribution to the decline in settlement intentions. In order to increase the number of permanent residents, it is recommended to expand the interaction among residents through events in the city that are relatively close to their homes.

Two main areas for future research have been identified. First, the distribution of questionnaires within Wajima City was random, resulting in a disproportionately small number of responses from younger residents, particularly those under 30, a demographic notably experiencing population outflows. Additionally, it was not possible to specifically analyze residents with diverse social backgrounds, like those who recently moved to Wajima, owing to the low number of responses from these groups. Refining the distribution strategy of the questionnaires will be required in future studies to target these specific demographics more effectively. Second, the low coefficient of determination observed, especially in the analysis of settlement intentions, suggests that the accuracy of the model needs to be enhanced. Future analyses could improve the study's accuracy by narrowing the scope of the study and implementing other methodological adjustments to precisely account for generational differences in rural settlement intentions. It is also necessary to examine causal inferences, for example, by employing a path analysis, which was not employed in this study. Path analysis is an analytical method that shows causality among multiple factors, and it is important to show the interrelationships among the factors used as explanatory variables. Future works are also needed to analyze the specific improvement methods of leisure facilities and concrete procedures to improve residents' sense of well-being. In the Noto Peninsula in recent years, local exchange events sponsored by the local government have become more active, and we would like to examine whether such events are linked to an increase in the subjective well-being of local residents and their intentions to settle in the area.

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References

1. Ministry of Internal Affairs and Communications. *Survey Research on the Current State of ICT Utilization in Rural Regions*; Ministry of Internal Affairs and Communications: Tokyo, Japan, 2015.
2. Izuta, G.; Nakagawa, K.; Tanaka, Y. Attitudes of young people towards their hometowns–An attempt to understand their feelings by identifying the factors related to the sense of urbanity. *Bull. Yonezawa Women's Jr. Coll.* **2017**, *53*, 69–88.
3. Omiya, I.; Saito, Y.; Hashimoto, S. A study on leisure activities of migrants in a rural village from the perspectives of their backgrounds. *Pap. Environ. Inf. Sci.* **2010**, *24*, 369–374.
4. Shibuya, K. Spatial structure of day trips in Tokyo Metropolitan area—The case of residents around Machida Station. *Geogr. Space* **2016**, *9*, 171–188.
5. Kawagishi, U.; Kitano, K. The characteristics and trends of leisure activities under the viewpoint from time and space distribution—Study on the leisure facilities in neighboring districts Part 1. *J. Archit. Plan. Trans. AIJ* **1996**, *487*, 167–176. [CrossRef] [PubMed]
6. Asanuma, Y.; Taniguchi, H.; Amano, K. The characteristics of facilities affecting utilization of leisure facilities by the aged in urban area—A study on the structure of utilization of regional facilities by the aged in urban area, Part 3. *J. Archit. Plan. Trans. AIJ* **1998**, *507*, 111–118. [CrossRef] [PubMed]
7. Manas, J. Identification of local accessibility hubs and leisure amenities in suburbanized settlements: Case study on the suburban zone of Prague. *Sage Open* **2003**, *13*, 21582440231184402. [CrossRef]
8. Yuzawa, A.; Fujii, T. An allocation problem of aged welfare center considers user's characteristics. *J. City Plan. Inst. Jpn.* **2001**, *36*, 427–432.
9. Sugeno, T.; Ohmori, N.; Osada, T. Leisure activities and subjective well-being of university students. *J. Jpn. Soc. Civ. Eng. Ser. D3 Infrastruct. Plan. Manag.* **2018**, *74*, 809–816. [CrossRef] [PubMed]
10. Hashimoto, S.; Atsumi, N. A study on the relationship between the leisure activities and the feeling of happiness of aged person. *J. Jpn. Soc. Civ. Eng. Ser. D3 Infrastruct. Plan. Manag.* **2015**, *71*, 567–576. [CrossRef]
11. Yuba, M.; Kawabata, Y.; Fujii, S. The impact of leisure accessibility on subjective well-being. *J. Jpn. Soc. Civ. Eng. Ser. D3 Infrastruct. Plan. Manag.* **2020**, *75*, 267–276. [CrossRef] [PubMed]
12. Chidambaram, B.; Scheiner, J. Leisure quality among German parents—Exploring urbanity, mobility, and partner interaction as determinants. *Sustainability* **2021**, *13*, 5883. [CrossRef]
13. Mouratidis, K. Urban planning and quality of life: A review of pathways linking the built environment to subjective well-being. *Cities* **2021**, *115*, 103229. [CrossRef]
14. Morimoto, E.; Ohmori, N.; Sugeno, T.; Osada, T. Leisure activities of young people–Toward settlement in local cities. *J. Jpn. Soc. Civ. Eng. Ser. D3 Infrastruct. Plan. Manag.* **2017**, *73*, 537–547. [CrossRef]
15. Arikawa, T.; Tsukai, M.; Kuwano, M.; Fujiyama, K.; Yamada, K. An analysis on the willingness of settling by the convenience of daily activity in middle-mountainous area. *Infrastruct. Plan. Rev.* **2009**, *26*, 383–391. [CrossRef]
16. Quirke, L. Searching for joy: The importance of leisure in newcomer settlement. *J. Int. Migr. Integr.* **2015**, *16*, 237–248. [CrossRef]
17. Doherty, A.; Taylor, T. Sport and physical recreation in the settlement of immigrant youth. *Leisure/Loisir* **2007**, *31*, 27–55. [CrossRef]
18. Llorent-Bedmar, V.; Palma, V.C.D.; Navarro-Granados, M. The rural exodus of young people from empty Spain. Socio-educational aspects. *J. Rural. Stud.* **2021**, *82*, 303–314. [CrossRef]
19. Sumino, Z. Attempt to create Japanese version of the Satisfaction with Life Scale (SWLS). In Proceedings of the 36th Annual Convention of the Japanese Association of Educational Psychology, 1994; p. 192.
20. Maekawa, S. On the score adjustment method used in the national center test. *J. Soc. Instrum. Control Eng.* **2001**, *40*, 568–571.

21. Kitagawa, N.; Suzuki, H.; Nakai, S.; Fujii, S. The impact of daily travel on subjective well-being. *J. Jpn. Soc. Civ. Eng. Ser. D3 Infrastruct. Plan. Manag.* **2011**, *67*, 697–703. [CrossRef]
22. Nakayama, C. Mobility Pattern and the Attitude toward Rural Life: Multvariate Analysis of Consciousness of Japanese Students. *Kyoto J. Sociol.* **1998**, *6*, 81–112. Available online: http://hdl.handle.net/2433/192562 (accessed on 8 October 2024).