

Article

How Are Community Networks Associated with Satisfaction with the Child-Rearing Environment? Evidence from Ube City, Japan

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Abstract

Declining fertility and the shift away from three-generation co-residence have weakened traditional family-based child-rearing support in Japan, drawing attention to the role of networks in local communities. Using data from a citizens' attitude survey in a regional Japanese city (Ube City; $n = 1293$), this study examines how residents' perceptions of community networks—specifically mutual support and community vitality—are associated with satisfaction with the local child-rearing environment. Conventional mean-based approaches risk overlooking qualitative heterogeneity in such evaluations. Using cross-sectional secondary data, we combined multiple regression with latent class analysis (LCA) to explore this heterogeneity. Findings show that perceptions of community networks were positively associated with satisfaction across all models (composite index $b = 0.412$, $p < 0.001$). The strongest associations were with “learning opportunities” and “community-wide education” ($b = 0.477$ – 0.478). Three-generation households did not uniformly report higher satisfaction compared with nuclear-family households. The exploratory LCA identified three qualitatively distinct patterns, with an “evaluation-pending” group (intermediate scores, frequent “don't know” responses) comprising over 40% of respondents. This heterogeneity suggests that average scores may obscure the experiences of those directly engaged in child-rearing and that municipal surveys could include items identifying respondents' basis for evaluation.

Keywords: child-rearing environment; perceptions of community networks; satisfaction; latent class analysis; regional city



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1. Introduction

Declining fertility has become a prominent policy concern in developed countries [1]. Such demographic shifts are also closely linked to changes in family-formation patterns, including marriage and childbearing behavior [2]. Fewer children mean fewer siblings, thinning the layer of kin, such as aunts and uncles, on whom the next generation can rely. In Japan, where the everyday childcare support that co-resident grandparents once provided is becoming less available, the share of three-generation households fell sharply from 15.3% in 1986 to 3.8% in 2023 [3], and the total fertility rate reached a record low of 1.15 in 2024 [4]. These changes in family structure have weakened the family-based foundations of child-rearing support; “isolated child-rearing” (kosodate, written 孤育て—a homophone of 子育て [child-rearing] in which the character for “isolation” replaces that for “child”) has come to be recognized as a serious problem [5].

This development has led to a relook at the role of networks—including community networks. Prior research argues that parent networks support caregiving behavior and child development through emotional and instrumental support and the provision of child-rearing information [6–8]. As the family-centered support base contracts, whether community networks can partially substitute for traditional family functions has become an important policy issue.

Furthermore, the functions of community networks depend on institutional context. Countries combine public services, markets, and family/community networks differently in supporting child-rearing and, in contexts of limited institutional support, individuals are observed to acquire resources through informal networks of family, friends, and local institutions [9,10]. The institutional position of Japan is discussed in the literature review (Section 2).

In this backdrop, the relationship between community networks and child-rearing becomes salient. Prior studies, taking individual parents as the unit of analysis, have examined how structural features of networks (size, composition, contact frequency) and perceived social support relate to caregiving behavior and parenting stress [7,11]. Recent research examines how community-level network environments—such as local social capital and social cohesion—relate to parental psychological distress, maltreatment, and children’s social development [12,13]. However, most of these studies treat the relationship as an average association, and the subjective dimension of how residents themselves evaluate the child-rearing environment has not been sufficiently examined. Furthermore, when residents’ subjective evaluations are taken as the object of analysis, a question arises as to whether such evaluations should be assumed to be homogeneous across residents. The experiences underlying evaluations differ between direct users and non-users of child-rearing services, and conventional approaches that summarize residents’ evaluations using mean values risk overlooking such qualitative heterogeneity in evaluation patterns.

Accordingly, the present study addresses the following two research questions:

1. How are residents’ perceptions of community networks associated with their satisfaction with the child-rearing environment, after controlling for factors such as household composition?
2. What latent patterns exist in residents’ evaluations of the child-rearing environment, and what characterizes each pattern?

The study contributes to the literature in three ways. First, using large-scale citizens’ survey data from a regional Japanese city ($n = 1293$), it empirically examines the relationship between perceptions of community networks and satisfaction with the child-rearing environment. Second, by employing LCA in addition to multiple regression, it exploratorily reveals heterogeneity in residents’ evaluation patterns that conventional mean-based comparisons cannot capture. Third, by considering contextual factors such as household composition and residential area, it offers preliminary insights into the conditions under which the network–satisfaction association may vary. However, owing to constraints inherent in secondary data, these findings are limited to a description of patterns of association in a single municipality and do not support causal inference or broad generalization.

The remainder of this paper is organized as follows. Section 2 reviews the prior literature, Section 3 describes the data and methods, Section 4 presents the results, and Section 5 discusses the implications and limitations of the findings. Section 6 concludes the paper.

2. Literature Review

2.1. The Child-Rearing Support Functions of Community Networks

Community networks provide a variety of resources to households engaged in child-rearing. House’s [14] typology of social support offers a useful framework for organizing

the support functions delivered through such networks, classifying social support into four types: emotional support, such as the provision of empathy and affection; instrumental support, such as concrete assistance and the provision of goods; informational support, including the provision of information useful for problem-solving; and appraisal support, the provision of information relevant to self-evaluation. As House [14] acknowledged that informational and appraisal support are difficult to clearly distinguish from other forms of support, and that instrumental support also entails psychological consequences. This study focuses on the three types on which empirical evidence abounds in the context of child-rearing: emotional, instrumental, and informational support.

Information related to child-rearing is difficult for parents to obtain in isolation and often circulates through connections to local networks. Childcare facilities and community-based social service organizations function as hubs that connect mothers with one another and with professionals. Small [8] showed that childcare centers, by linking mothers with one another, serve as conduits for information and resources related to child-rearing. Domínguez and Watkins [10] demonstrated that for low-income minority mothers, networks spanning family, friends, and institutions can serve as routes for resource acquisition relevant to both daily survival and upward mobility. Such networks also function as channels of instrumental support that help distribute everyday child-rearing burdens, and informal support from nearby kin and neighbors has been shown to be an important resource for child-rearing households [15,16]. In addition, participation in social networks reduces parents' sense of isolation and alleviates relationship anxiety, thereby exerting positive effects on caregiving behavior [7,11]. Consistent with House's framework, Japanese research on child-rearing has positioned networks as an important pathway supporting mothers' psychological well-being—including life satisfaction and the alleviation of parenting anxiety [6]. Thus, community networks' child-rearing support functions operate in a multilayered manner through the channels of information, practical assistance, and psychological stability.

The network functions outlined above overlap with several dimensions addressed by social capital research. Social capital has been conceptualized in multiple ways, encompassing trust and norms of reciprocity as well as resources embedded in social networks [17–19], but the measurement used in this study is limited to residents' perceptions of the local network environment and does not capture these other dimensions. In this study, we refer to this variable as “perceptions of community networks” and distinguish it from a comprehensive measurement of social capital (described in Section 3.2).

Moreover, the importance of networks' child-rearing support functions is likely to depend on the institutional context in which they are embedded. Saraceno [9] compared four southern European and East Asian countries (Italy, Spain, Japan, and South Korea), which have been grouped together as familialistic welfare states, and distinguished several forms of familism, including “familism by default” (in which child-rearing responsibilities are left to families because public care services and economic support are scarce), “prescribed familism”, and “supported familism.” By contrast, the Nordic countries provide universal high-quality childcare, which serves as an institutional foundation enabling women to combine employment with family formation [20]. In the United States and the United Kingdom, while market mechanisms are well developed [21], community-based support programs are also maintained; in the United States, for example, these connect with local informal support networks to support family child-rearing [8]. Considering these institutional differences, in regional Japanese cities—where family-based support is being weakened by the increasing prevalence of nuclear families—community networks are likely to be in a position to take on broader support functions, going beyond merely supplementing public services.

The importance of community-based child-rearing support has been reaffirmed through the COVID-19 pandemic. The pandemic restricted face-to-face interaction and deepened parental isolation, yet it also showed that, precisely in times of crisis, local and neighborhood ties can serve as a source of support. Panel data from Switzerland indicate that residents who improved their relations with neighbors experienced smaller declines in subjective well-being and trust during the pandemic [22], and a cross-national study of parents in four European countries found that social support played a protective role, shielding parental well-being from the adverse effects of stress [23]. In Japan as well, a lack of opportunities for mothers to consult friends and neighbors was strongly associated with heightened loneliness [24]. Because the present data were collected in 2023, residents' evaluations of the local child-rearing environment are situated in this post-pandemic context.

2.2. Transformation of the Child-Rearing Environment in Regional Japanese Cities

Within the institutional context discussed in Section 2.1, the relationship between household form and the child-rearing environment is not straightforward. Three-generation co-residence does not invariably imply a positive family environment; differences in values across generations have been reported as contributing to negative evaluations of co-residence [25]. In the United States as well, the recent increase in three-generation households has been driven largely by changes in marital relationships and increased Social Security receipt [26]. Therefore, in addition to the form of the household, how households are connected to community networks is an important perspective for understanding the child-rearing environment. Furthermore, the distribution of community resources and the nature of local social relations are not uniform across regions, and the meaning of the same form of household can vary depending on the area of residence.

The fact that the manner of connection to community networks differs across regions suggests that the association between perceptions of community networks and the evaluation of the child-rearing environment may also vary by the characteristics of the area of residence. Given such contextual diversity, how to conceptualize residents' "evaluations" of the child-rearing environment also requires consideration. Research on neighborhood environments has shown that residents' subjective evaluations—such as their own assessments of trust and collective efficacy—have greater explanatory power for neighborhood satisfaction than do objective area indicators such as poverty or unemployment rates [27]. In child-rearing as well, factors such as social support and institutional support influence parents' subjective parenting experiences [28]. The term "satisfaction with the child-rearing environment" used in this study refers to residents' cognitive evaluation of the local child-rearing environment as captured in the citizens' attitude survey, and is positioned within the framework of such neighborhood-satisfaction research. Neighborhood satisfaction has been shown to be determined by multiple evaluative dimensions, including trust, the physical environment, and perceptions of crime [27]. The present study's approach in analyzing both the composite index and individual items reflects this multidimensionality.

However, such subjective evaluations of the neighborhood environment are not made by all residents on the same cognitive footing. In survey methodology, "satisficing" refers to respondents' tendency to avoid the cognitive effort required to produce an optimal answer, settling instead for a merely satisfactory one [29]. This behavior manifests in a variety of response strategies, including acquiescence (agreeing with assertions), endorsing the status quo, non-differentiation among objects in ratings, and selecting "don't know." At least some "don't know" responses are said to reflect satisficing rather than a true non-attitude [30]. Even in evaluations of the child-rearing environment, the cognitive basis of evaluation differs between direct users and non-users of child-rearing services, and satisficing may be more likely to occur among the latter. Such heterogeneity in the basis of

evaluation warrants consideration when examining residents' evaluation patterns. In addition to differences in cognitive basis, substantive heterogeneity in evaluations of the child-rearing environment may also exist. For example, the experiences that form the object of evaluation differ between households raising children and households without children. The former have direct contact with child-care facilities and local child-rearing support services, while the latter must rely on indirect information and impressions. Such differences in experience may give rise not only to differences in the level of evaluation but also to differences in the very structure of evaluation in which dimensions are emphasized. Conventional approaches that compare group means tend to overlook the existence of such qualitatively distinct evaluation patterns.

2.3. Positioning of the Present Study

As discussed in Sections 2.1 and 2.2, individual findings have accumulated regarding the pathways by which community networks support child-rearing through informational, instrumental, and emotional support [7,8,10,11,15]. Subjective evaluations of the neighborhood environment are known to consist of multiple dimensions including safety, the physical environment, and social relations [27]. However, several unexamined issues remain in this literature strand, which the present study seeks to address.

First, most studies examine specific support functions or specific evaluative dimensions in isolation, and the question of how residents perceive the local network environment as a whole, and how this perception is connected with the subjective evaluation of the child-rearing environment, has not been sufficiently addressed. Few studies have examined the relationship between residents' perceptions of community networks and their evaluations of the child-rearing environment in regional Japanese cities, where the prevalence of nuclear families is increasing and the level of development of public services differs from that in metropolitan areas. Given that three-generation co-residence is losing its intergenerational support functions [31], an analysis centered on perceptions of community networks—rather than the form of household—is needed. Furthermore, the literature predominantly examines associations among variables through regression analysis or comparisons of mean values, and insufficient attention has been paid to the possibility that residents' evaluations of the child-rearing environment may be classified into multiple qualitatively distinct patterns. Respondents who lack direct experience or information about the object of evaluation may not hold stable, pre-formed attitudes and construct their evaluations on the spot, drawing on cues in the question [29,30]. In evaluations of the child-rearing environment as well, the process by which evaluations are constructed is likely to differ depending on whether the respondent has experience using child-rearing services; accordingly, response patterns may diverge qualitatively.

The present study addresses these gaps through an empirical examination using citizens' attitude survey data from a regional Japanese city (Ube City). It uses multiple regression analysis to examine the association between residents' perceptions of community networks and their satisfaction with the child-rearing environment, employs LCA to exploratorily reveal heterogeneity in residents' evaluation patterns, and further examines whether the characteristics of the area of residence moderate this association. However, as a cross-sectional analysis of a single municipality conducted under the constraints of secondary data, it is not intended to support causal inference or broad generalization. Its purpose is to provide preliminary insights into the gaps identified.

3. Materials and Methods

3.1. Research Design and Data Source

This study conducts a secondary analysis of data from the 2023 Citizens' Attitude Survey conducted by Ube City [32] that targeted 3000 residents aged 18 years and older, drawn from all districts of the city through stratified random sampling. It was administered by mail (64.3%) and over the Internet (35.7%). The number of valid responses was 1293 (valid response rate: 43.1%).

A response rate of 43.1% is a standard level for a municipal citizens' attitude survey, but the possibility of non-response bias must be kept in mind. In particular, with respect to community networks, the study topic, residents more actively engaged in local activities are more likely to respond, which could bias the distribution of perceived community network scores upward relative to the population as a whole [33]—a point to consider in interpreting the results.

3.2. Variables and Measures

The dependent variable, satisfaction with the child-rearing environment, was operationalized as the mean of responses to five items concerning the local child-rearing and educational environment. Each item offered five response options: "agree", "somewhat agree", "somewhat disagree", "disagree", and "don't know/cannot say." Respondents were asked whether they thought the city was a place where it was easy to raise children; whether they thought children were growing up healthy and resilient; whether the school education programs were substantive; whether parents and local residents were participating in school-related activities such that community-wide education was advancing; and whether they were blessed with learning opportunities such as lifelong learning. The mean of these five items was used as the indicator of satisfaction with the child-rearing environment. The items were originally designed as items for child-rearing-related policies in Ube City, aimed at capturing multifaceted evaluations of the child-rearing environment. The reliability of the scale was Cronbach's $\alpha = 0.834$, indicating sufficient internal consistency [34]. In the analysis, responses were recoded to a 1–5 scale (5 = agree, 4 = somewhat agree, 2 = somewhat disagree, 1 = disagree), with "don't know/cannot say" coded as the midpoint (3). The same coding was applied to the two community-network items.

However, because the five items span different dimensions—from everyday ease of child-rearing to school education and learning opportunities—our analyses used each item as a dependent variable, in addition to the analyses based on the composite index, examining how association with perceptions of community networks differs across items.

The independent variable, perceptions of community networks, was measured as the mean of two items: whether respondents thought that their local area had mutual-support systems and an environment in which people can live in their own way (Q34), and whether they thought that their local community was active (Q37). The mean of these responses was used as the indicator. To clarify the terminology used in this study, we refer to the totality of social ties among residents that respondents perceive to exist within their own area of residence as "community networks", and the corresponding measured variable as "perceptions of community networks." This concept is grounded in neighborhood research focused on local social ties [35]. The concept of personal community networks, as used by Wellman and Wortley [15], refers to egocentric networks not limited to a specific locality and is therefore distinct from the area-bound measurement employed in this study. Because Cronbach's alpha is less suitable for two-item scales, we report the inter-item correlation: the two items were correlated at $r = 0.50$ ($p < 0.001$), corresponding to a Spearman–Brown reliability of 0.66. Although this two-item index is a modest operationalization drawn from an existing municipal survey, both items capture residents' perceptions of

the local network environment. The discriminant validity of this two-item index with respect to the satisfaction measure was examined through confirmatory factor analysis (see Section 4.2).

To state the measurement positioning more concretely, the two items in this study capture residents' subjective perceptions of the local mutual-support system and the vibrancy of community activities. These items are drawn from an existing municipal survey and not designed specifically for social capital research, a measurement constraint that must be acknowledged.

The control variables are gender, age, household composition, occupation, area of residence, and length of residence. Household composition was classified into six categories: single-person, couple-only, two-generation with children, two-generation with adult children, three-generation, and others, with two-generation households with children serving as the reference category. Area of residence was classified into four: South-central, Western, Eastern, and Northern areas. The sample includes households without children. Evaluations of the child-rearing environment reflect not only the perceptions of those directly involved but also residents' overall perceptions of their community, and households without children were included to capture interest in the area-wide child-rearing support system. However, evaluations from households without children are likely to be based on general impressions rather than direct experience; this point was considered while interpreting the results.

3.3. Analytic Strategy

The analysis was conducted in the following steps. First, we conducted multiple regression analysis. We constructed models in which satisfaction with the child-rearing environment (the composite index and the five individual items) was regressed on perceptions of community networks, household composition, area of residence, and the control variables (Model 1). To examine the moderating effect of area of residence, we additionally estimated a model that included an interaction term between perceptions of community networks and area of residence (Model 2). For all models, we report R^2 and adjusted R^2 , checking for multicollinearity using variance inflation factors (VIFs).

Second, we assume that residents' evaluations of the child-rearing environment may not lie in a simple satisfaction–dissatisfaction continuum but may instead be classifiable into multiple groups that differ qualitatively in terms of the level of evaluation and the profile across items. To explore this heterogeneity, we adopted LCA. Based on the response patterns to Q20–Q24, we classified residents into multiple latent classes. Models with two to four classes were estimated, and the optimal number of classes was determined based on the AIC, BIC, and entropy. The LCA results are positioned as exploratory analysis, and the relationships between the identified classes and household composition, perceptions of community networks, and area of residence were examined descriptively through cross-tabulations. Statistical analyses were performed using Stata version 18.0 (StataCorp LLC, College Station, TX, USA). The five indicators (Q20–Q24) were entered as ordinal (categorical) variables. The procedure is therefore latent class analysis rather than latent profile analysis. The class-specific means and standard deviations reported in Section 4.3 are descriptive summaries of observed responses within each class.

Finally, considering that the dependent variables are measured on a 5-point ordinal scale, we conducted ordered logistic regression as a supplementary analysis to check the robustness of the OLS results. In addition, because both the predictor and the outcome are self-reports from the same instrument, we conducted Harman's single-factor test and compared one- and two-factor confirmatory factor models as diagnostics for common method bias, adopting the conventional threshold of 0.85 for the correlation between latent factors

as the criterion for their distinguishability. We also examined the discriminant validity of the two constructs by re-estimating the main model after excluding the most conceptually proximate item and by using only the mutual-support item as the predictor.

4. Results

4.1. Descriptive Statistics

Table 1 presents the descriptive statistics for the basic attributes of the survey participants and the main variables. Women accounted for 59.5% of the sample. Age was distributed with late 40s–50s as the central range ($M = 3.773$, $SD = 1.622$). A wide range of age groups was represented. Household composition centered on couple-only households and two-generation households with children ($M = 2.574$, $SD = 1.308$).

Table 1. Descriptive statistics of variables used in the analysis.

Variable	Sample Size	Mean	Standard Deviation	Minimum	Maximum
Gender	1270	0.595	0.491	0	1
Age	1282	3.773	1.622	1	6
Household type	1180	2.574	1.308	1	6
Occupation	1279	3.312	2.576	1	8
Residential area	1293	1.974	0.984	1	4
Length of residence	1284	3.166	1.121	1	4
Ease of child-rearing	1263	3.521	1.002	1	5
Environment for healthy growth	1263	3.633	0.976	1	5
School education	1259	3.262	0.948	1	5
Community-wide education	1262	3.132	0.985	1	5
Learning opportunities	1263	3.036	1.062	1	5
Mutual support	1274	3.121	1.155	1	5
Community vitality	1271	2.939	1.177	1	5

A characteristic of the present sample is the somewhat higher proportion of women (59.5%), which exceeds the proportion of women in the Ube City population (52.1%; Ube City Basic Resident Register by age, as of 1 January 2026) by approximately 7 percentage points, indicating a stronger response tendency among women. With regard to age, the share of those aged 70 and over in Ube City’s population aged 18 and over is approximately 28.0%, indicating a substantial weight of the older population. Generally, response rates among women and middle-aged or older respondents are relatively high in municipal citizens’ attitude surveys, and the present sample likely reflects this tendency. This bias may be related to the non-response bias mentioned earlier, and its potential influence on the results is discussed in Section 5.4.

Among the five items measuring satisfaction with the child-rearing environment, “ease of child-rearing” ($M = 3.521$, $SD = 1.002$) and “environment for healthy growth” ($M = 3.633$, $SD = 0.976$) received relatively high evaluations, whereas “learning opportunities” ($M = 3.036$, $SD = 1.062$) received the lowest. With respect to perceptions of community networks, the items were “mutual support” ($M = 3.121$, $SD = 1.155$) and “community vitality” ($M = 2.939$, $SD = 1.177$), both of which were near the midpoint of the scale (3.0).

4.2. Multiple Regression Results

Table 2 presents the results of the multiple regression analysis with satisfaction with the child-rearing environment as the dependent variable for each model. As a diagnostic for multicollinearity, the VIF values were at the most 4.22 (age 70 and over), with mean VIFs of 1.84–1.85. The VIF for the main independent variable, perceptions of community networks (NW), was extremely low at 1.03, confirming no serious multicollinearity. The coefficients of determination for each model were as follows: composite satisfaction index

$R^2 = 0.345$ (adjusted $R^2 = 0.330$); Q20 “ease of child-rearing” $R^2 = 0.158$; Q21 “environment for healthy growth” $R^2 = 0.207$; Q22 “school education” $R^2 = 0.196$; Q23 “community-wide education” $R^2 = 0.296$; and Q24 “learning opportunities” $R^2 = 0.240$. The composite index showed the highest explanatory power; among individual items, “community-wide education” was the highest and “ease of child-rearing” was the lowest.

Table 2. Multiple regression analysis results.

	Satisfaction with Child-Rearing Environment	Ease of Child- Rearing	Environment for Healthy Growth	School Education	Community- Wide Education	Learning Opportunities
Gender (ref: Male)						
Female	0.079	0.049	0.059	0.041	0.145 **	0.105
Age (ref: 20s and under)						
30s	−0.038	−0.105	−0.034	−0.078	−0.009	0.059
40s	−0.022	−0.043	−0.098	−0.080	0.155	−0.044
50s	0.001	−0.054	−0.015	−0.034	0.126	0.005
60s	0.016	0.035	0.029	−0.074	0.026	0.062
70s and over	0.104	0.009	0.053	0.008	0.126	0.229
Household type (ref: Two-generation with children)						
Single	−0.226 ***	−0.255 **	−0.424 ***	−0.181 *	−0.231 **	−0.019
Couple only	−0.112	−0.116	−0.279***	−0.068	−0.154	0.015
Two-generation household with adult children	−0.232 ***	−0.129	−0.384 ***	−0.200 *	−0.325 ***	−0.121
Three-generation	−0.170	−0.252	−0.308 *	−0.117	−0.191	0.011
Other (household)	−0.431 ***	−0.534 **	−0.935 ***	−0.328	−0.330 *	−0.194
Occupation (ref: Company employee/civil servant)						
Part-time worker	−0.032	0.118	−0.056	−0.042	−0.020	−0.117
Self-employed and family employee	0.092	0.154	0.182	0.181	0.075	−0.118
Agriculture, forestry, and fishery	−0.419 *	0.016	−0.042	−0.703 *	−0.846 *	−0.448
Homemaker	0.099	0.201	0.198 *	0.102	−0.003	−0.075
Students	0.365 **	0.157	0.345 *	0.278	0.474 **	0.576 **
Unemployed	−0.022	0.047	−0.025	0.091	−0.022	−0.114
Other (occupation)	−0.008	0.137	0.031	−0.091	0.073	−0.164
Residential area (ref: South-central)						
Western	0.026	−0.041	−0.018	−0.006	0.083	0.050
Eastern	0.011	−0.033	0.050	−0.037	0.030	0.048
Northern	0.207 *	0.005	0.274 **	0.112	0.313 **	0.255 *
Length of residence (ref: Under 10 years)						
10–19 years	−0.005	−0.053	−0.111	0.139	0.045	−0.059
20–29 years	0.021	−0.009	0.059	0.105	−0.036	0.003
30 years or more	−0.012	0.027	−0.032	0.101	−0.127	−0.037
Community network	0.412 ***	0.352 ***	0.351 ***	0.385 ***	0.477 ***	0.478 ***
_cons	2.126 ***	2.544 ***	2.812 ***	2.104 ***	1.706 ***	1.535 ***
N	1116	1129	1129	1129	1132	1130
R^2	0.345	0.158	0.207	0.196	0.296	0.240
Adjusted R^2	0.330	—	—	—	—	—
Mean VIF	1.84	1.85	1.85	1.85	1.85	1.85

Note. Robust standard errors used. Reference categories: Male (gender), 20s and under (age), two-generation household with children (household type), company employee/civil servant (occupation), south-central (residential area), under 10 years (length of residence). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Maximum VIF = 4.22 (age 70s and over); all VIF values less than 5.0, indicating no serious multicollinearity.

Perceptions of community networks (NW) were consistently positively associated with satisfaction across all models and remained significant for all five items even after

Bonferroni correction ($\alpha = 0.01$). The regression coefficient of the composite satisfaction index was $b = 0.412$ ($p < 0.001$). Among individual items, “learning opportunities” ($b = 0.478$, $p < 0.001$) and “community-wide education” ($b = 0.477$, $p < 0.001$) showed the strongest associations, followed by “school education” ($b = 0.385$, $p < 0.001$), “ease of child-rearing” ($b = 0.352$, $p < 0.001$), and “environment for healthy growth” ($b = 0.351$, $p < 0.001$).

Regarding household composition, compared with two-generation households with children (the reference category), the following results were obtained. For Q20 “ease of child-rearing”, single-person households ($b = -0.255$, $p < 0.01$) and “other” households ($b = -0.534$, $p < 0.01$) had significantly lower scores. For Q21 “environment for healthy growth”, significantly lower scores were observed across many household types, including single-person ($b = -0.424$, $p < 0.001$), couple-only ($b = -0.279$, $p < 0.001$), two-generation households with adult children ($b = -0.384$, $p < 0.001$), three-generation ($b = -0.308$, $p < 0.05$), and other ($b = -0.935$, $p < 0.001$). Three-generation households showed a significantly negative coefficient only for “environment for healthy growth”, with no significant differences in other items.

Regarding area of residence, Northern residents showed significantly higher evaluations for Q21 “environment for healthy growth” ($b = 0.274$, $p < 0.01$), Q23 “community-wide education” ($b = 0.313$, $p < 0.01$), and Q24 “learning opportunities” ($b = 0.255$, $p < 0.05$). For Q20 “ease of child-rearing”, no significant regional differences were found.

Among the control variables, gender (female) was significantly positively associated with Q23 “community-wide education” ($b = 0.145$, $p < 0.01$). Regarding occupation, students reported higher satisfaction on Q23 ($b = 0.474$, $p < 0.01$) and Q24 ($b = 0.576$, $p < 0.01$), while those engaged in agriculture, forestry, and fishery reported lower satisfaction on Q22 ($b = -0.703$, $p < 0.05$) and Q23 ($b = -0.846$, $p < 0.05$). Age and length of residence were not significantly associated with any of the items.

In addition, with the composite satisfaction index as the dependent variable, we estimated Model 2, which separately included interaction terms for perceptions of community networks $\times$ area of residence and for perceptions of community networks $\times$ household composition. Neither the interaction between area of residence and NW ($F(3, 1087) = 1.66$, $p = 0.173$) nor the interaction between household composition and NW ($F(5, 1085) = 1.00$, $p = 0.418$) was significant. These results indicate that the strength of the association between perceptions of community networks and satisfaction with the child-rearing environment is not significantly moderated by area of residence or household composition—no moderating effect of area of residence was observed. Therefore, the higher satisfaction in the Northern area is unlikely to emerge from a particularly strong effect of network perception, and more likely to be attributable to other area-specific characteristics.

Robustness check. Considering the ordinal nature of the dependent variables, we conducted ordered logistic regression for all five items. The direction (positive) and significance ($p < 0.001$) of the NW effect were fully consistent with the OLS results (Q20: $b = 0.736$; Q21: $b = 0.783$; Q22: $b = 0.884$; Q23: $b = 1.130$; Q24: $b = 0.998$; all $p < 0.001$). Thus, the OLS estimates are robust to the measurement level of the dependent variables.

Common method bias and discriminant validity. Harman’s single-factor test indicated that the first unrotated factor accounted for 52.5% of the variance. A confirmatory factor analysis showed that the hypothesized two-factor model ($CFI = 0.929$, $RMSEA = 0.118$, $SRMR = 0.046$) fit better than a single-factor model ($CFI = 0.896$, $RMSEA = 0.138$, $SRMR = 0.058$); $\Delta\chi^2(1) = 104.8$, $p < 0.001$. The RMSEA of both models exceeded conventional cutoffs, although this index should not be interpreted in isolation [36]; the comparative indices consistently favored the two-factor model. All standardized loadings were high on their designated factors (satisfaction items 0.69–0.73; network items 0.68–0.74), and the two latent factors correlated at $\varphi = 0.75$, below the conventional 0.85 threshold

for distinguishability. The correlation between “community-wide education” and “community vitality” ($r = 0.46$) was the highest among predictor–outcome item pairs (others $r = 0.30$ – 0.43) but was comparable to the correlations among the satisfaction items themselves ($r = 0.42$ – 0.64), and the standardized loading of “community-wide education” on the satisfaction factor was as high as those of the other satisfaction items (0.73). The positive network–satisfaction association was essentially unchanged when “community-wide education” was excluded from the composite ($b = 0.395$, $p < 0.001$) and when only the “mutual support” item was used as the predictor ($b = 0.322$, $p < 0.001$).

4.3. Latent Class Analysis Results

Table 3 presents the model fit indices for the two- and three-class LCA models. The four-class model failed to converge and was excluded from the candidate models.

Table 3. Model fit.

Number of Classes	AIC	BIC	Entropy Value
2	15,114.25	15,325.34	0.878
3	14,161.50	14,480.70	0.870
4	(did not converge)	—	—

Note. The 4-class model did not converge; that is, the data did not support more than three classes.

The rationale for adopting the three-class model is as follows: The information criteria (AIC, BIC) improved substantially from the two-class to the three-class model ($\Delta AIC = -952.75$, $\Delta BIC = -844.64$), and the four-class model failed to converge, suggesting that the model became overly complex relative to the information content of the data. The entropy of the three-class model was 0.870, satisfying an acceptable level of classification clarity. Note that classification in LCA inherently involves uncertainty. The mean posterior assignment probabilities for the classes were 0.956 for the Evaluation-Pending group, 0.940 for the Low-Evaluation group, and 0.923 for the High-Evaluation group, all of which exceeded the recommended thresholds. The overall mean of the maximum posterior probability was 0.941 ($SD = 0.123$), indicating good classification confidence.

The three classes extracted were characterized as follows (Table 4). The first class is the Evaluation-Pending group ($n = 564$, 43.62%), with a composite satisfaction index of $M = 3.128$ ($SD = 0.357$). In this group, all five items received intermediate evaluations, while “don’t know” responses were particularly concentrated on the items “school education”, “community-wide education”, and “learning opportunities” (514/562, 497/562, and 392/562, respectively). As some items contain missing values, the within-class counts differ slightly across items. The second class is the Low-Evaluation group ($n = 276$, 21.35%), with a composite satisfaction index of $M = 2.476$ ($SD = 0.691$). All items received negative evaluations, with particularly low values for “learning opportunities” ($M = 2.000$) and “community-wide education” ($M = 2.172$). The third class is the High-Evaluation group ($n = 453$, 35.03%), with a composite satisfaction index of $M = 4.107$ ($SD = 0.404$). All items received positive evaluations, with “environment for healthy growth” showing the highest value ($M = 4.363$).

Next, we examined the relationship between the extracted classes and household composition (Table 5). The cross-tabulation of household composition and class distribution was significant in the χ^2 test ($\chi^2(10) = 105.57$, $p < 0.001$). Among two-generation households with children, 50.36% belonged to the High-Evaluation group, whereas 59.64% of single-person households and 45.48% of couple-only households were classified into the Evaluation-Pending group. The proportion of the Low-Evaluation group was relatively

high in two-generation households with children (28.10%) and three-generation households (30.43%).

Table 4. Characteristics of each class.

	Class 1		Class 2		Class 3	
	(Evaluation-Pending Group)		(Low-Evaluation Group)		(High-Evaluation Group)	
	Mean	SD	Mean	SD	Mean	SD
Satisfaction with child-rearing Environment	3.128	0.357	2.476	0.691	4.107	0.404
Ease of child-rearing Environment for healthy growth	3.310	0.761	2.777	1.185	4.273	0.575
School education	3.412	0.765	2.953	1.172	4.363	0.519
Community-wide education	3.020	0.379	2.476	1.135	4.090	0.699
Learning opportunities	2.964	0.476	2.172	1.034	3.965	0.754
	2.929	0.723	2.000	0.951	3.845	0.843

Note. Mean posterior assignment probabilities: Class 1 = 0.956, Class 2 = 0.940, Class 3 = 0.923 (all >0.70 threshold). Overall mean maximum posterior probability = 0.941 (SD = 0.123). Indicators were modeled as ordinal; the means and SDs shown are descriptive summaries of observed responses within each class.

Table 5. Cross-tabulation of household composition and class.

Class	Single	Couple Only	Two-Generation Household with Children	Two-Generation Household with Adult Children	Three-Generation Household	Other	Total
Evaluation Pending	167 (59.64%)	161 (45.48%)	59 (21.53%)	86 (51.19%)	23 (33.33%)	23 (65.71%)	519 (43.98%)
Low Evaluation	43 (15.36%)	64 (18.08%)	77 (28.10%)	37 (22.02%)	21 (30.43%)	8 (22.86%)	250 (21.19%)
High Evaluation	70 (25.00%)	129 (36.44%)	138 (50.36%)	45 (26.79%)	25 (36.23%)	4 (11.43%)	411 (34.83%)
Total	280 (100%)	354 (100%)	274 (100%)	168 (100%)	69 (100%)	35 (100%)	1180 (100%)

Note. Pearson $\chi^2(10) = 105.57$, $p < 0.001$. Column percentages shown in parentheses.

A clear difference was observed in the relationship between the classes and perceptions of community networks (Table 6). The proportion of the High-Evaluation group increased as the NW score rose: at NW = 3.5, it was only 26.39%, but it reached 61.56% at NW = 4.0 and 88.89% at NW = 5.0. Conversely, the proportion of the Low-Evaluation group was higher at lower NW scores, accounting for 48.75% at NW = 1.0. Furthermore, in an analysis restricted to two-generation households with children, the mean NW score of the High-Evaluation group ($M = 3.552$) exceeded that of the Low-Evaluation group ($M = 2.757$) and the Evaluation-Pending group ($M = 2.853$) (Table 7).

Table 6. Cross-tabulation of community network score and class membership.

Class	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	Total
Evaluation Pending	32 (40.00%)	39 (47.56%)	72 (48.00%)	58 (50.00%)	180 (61.02%)	88 (61.11%)	73 (23.78%)	15 (22.39%)	3 (11.11%)	560 (44.16%)
Low Evaluation	39 (48.75%)	33 (40.24%)	62 (41.33%)	32 (27.59%)	42 (14.24%)	18 (12.50%)	45 (14.66%)	4 (5.97%)	0 (0.00%)	275 (21.69%)
High Evaluation	9 (11.25%)	10 (12.20%)	16 (10.67%)	26 (22.41%)	73 (24.75%)	38 (26.39%)	189 (61.56%)	48 (71.64%)	24 (88.89%)	433 (34.15%)
Total	80 (100%)	82 (100%)	150 (100%)	116 (100%)	295 (100%)	144 (100%)	307 (100%)	67 (100%)	27 (100%)	1268 (100%)

Note. Column percentages are shown in parentheses. Pearson $\chi^2(16) = 357.02$, $p < 0.001$.

Finally, we examined the relationship between class and area of residence (Table 8). The cross-tabulation of area of residence and class distribution was not significant in the χ^2

test ($\chi^2(6) = 8.62, p = 0.196$). The Northern area showed a slightly higher proportion of the High-Evaluation group (44.44%) and a slightly lower proportion of the Low-Evaluation group (13.58%), but no statistically significant regional difference was confirmed.

Table 7. Comparison of community networks by class in two-generation households with children.

Class	Q34 (Mutual Support)	Q37 (Community Vitality)	NW (Composite)
Evaluation Pending	2.932 0.980	2.741 1.085	2.853 0.879
Low Evaluation	2.711 1.141	2.779 1.231	2.757 1.025
High Evaluation	3.627 0.963	3.481 1.158	3.552 0.872
Total	3.216 1.099	3.122 1.215	3.175 0.991

Note. Upper row = Mean, Lower row = SD.

Table 8. Cross-tabulation of residential areas.

Class	South-Central	Western	Eastern	Northern	Total
Evaluation Pending	238 (42.42%)	137 (48.07%)	155 (42.35%)	34 (41.98%)	564 (43.62%)
Low Evaluation	132 (23.53%)	55 (19.30%)	78 (21.31%)	11 (13.58%)	276 (21.35%)
High Evaluation	191 (34.05%)	93 (32.63%)	133 (36.34%)	36 (44.44%)	453 (35.03%)
Total	561 (100%)	285 (100%)	366 (100%)	81 (100%)	1293 (100%)

Note. Pearson $\chi^2(6) = 8.62, p = 0.196$ (not statistically significant). Column percentages are in parentheses.

5. Discussion

This study used municipal survey data from Ube City to examine the relationship between perceptions of community networks and satisfaction with the child-rearing environment, with attention to household composition and area of residence. The multiple regression analysis showed that perceptions of community networks were positively associated with satisfaction with the child-rearing environment for all five items, although the strength of this association differed across items. Three-generation households did not uniformly report higher satisfaction than nuclear-family households, and no moderating effect of area of residence on the network–satisfaction relationship was confirmed. The exploratory LCA revealed the existence of an “Evaluation-Pending group” comprising more than 40% of respondents. Next, we interpret these findings in line with the research questions and discuss their implications and limitations.

5.1. RQ1: Community Networks and Satisfaction with the Child-Rearing Environment

The first research question asked how residents’ perceptions of community networks are associated with their satisfaction with the child-rearing environment, net of household composition and area of residence. Perceptions of community networks were positively associated with satisfaction with the child-rearing environment for all five items. Small [8] argued that the networks mothers unintentionally acquire through organizational settings such as childcare centers function as routes of access to information and resources related to child-rearing, and Cochran and Niego [7] systematized the pathways through which parental social networks support the performance of the parenting role. Our results support the notion that this resource-mediating function of networks is suggested in a different data context—a municipal citizens’ attitude survey. However, the strength of the

association differed across items. “Learning opportunities” and “community-wide education” showed the strongest associations with perceptions of community networks, whereas “ease of child-rearing” and “environment for healthy growth” were weaker. Within the broader pattern of positive associations across all items, this difference likely reflects the extent to which each item depends on information access mediated by networks. Child-rearing-related learning programs and community educational activities depend heavily on the local circulation of information, both for becoming aware of their existence and for actually participating in them. By contrast, “ease of child-rearing” and “environment for healthy growth” are also constrained by the location of childcare facilities and physical infrastructure such as parks and playgrounds, so a relatively larger share of these evaluations is not explained by perceptions of community networks alone.

With respect to household composition, three-generation households did not uniformly report higher satisfaction than nuclear-family households. On the composite index, no significant difference was found from two-generation households with children, and on “environment for healthy growth”, three-generation households actually reported significantly lower evaluations. This result indicates that the form of three-generation co-residence does not directly translate into a positive evaluation of the child-rearing environment. The lower evaluation of “environment for healthy growth” among three-generation households may reflect tensions inherent in co-residence, such as differences in values across generations [25]. In the United States, the share of three-generation households has recently been increasing [26], whereas in East Asia, co-residence rates between elderly parents and adult children have been declining [37,38], and households that choose to co-reside may include cases driven by some form of necessity. This point, however, cannot be verified from the present data. Single-person households and two-generation households with adult children also reported lower evaluations on several items. Because these households are not direct users of child-rearing services, their evaluations may rely on general impressions rather than direct experience.

Regarding area of residence, evaluations of the child-rearing environment were significantly higher on several items in the Northern area. This higher evaluation persisted even after controlling for perceptions of community networks and thus cannot be explained solely by higher perceptions of community networks among Northern residents. Furthermore, the interaction model showed no regional differences in the strength of the network-satisfaction association. These results suggest that the higher evaluations in the Northern area may stem from area characteristics not measured in the present study. These interpretations are all subject to constraints imposed by the cross-sectional design and the measurement.

5.2. RQ2: Latent Patterns in Residents’ Evaluations

The second research question asked what latent patterns exist in residents’ evaluations of the child-rearing environment and what characterizes each. Among the three classes exploratorily identified by LCA, the “Evaluation-Pending group”, which accounted for 43.62% of respondents, was characterized by intermediate evaluation values and a large number of “don’t know” responses. As many as 59.64% of single-person households and 45.48% of couple-only households were classified into this group, indicating that residents who are not direct users of child-rearing services are heavily represented. This group is qualitatively distinct from the “Low-Evaluation group”, which actively gives negative evaluations. Whereas the Low-Evaluation group may be making negative evaluations based on actual service-use experience, the Evaluation-Pending group may lack the cognitive basis for evaluation in the first place. As Krosnick’s [29] satisficing theory suggests, respondents with low involvement in the object of evaluation tend to omit cognitive effort

and select “don’t know” responses, and Krosnick et al. [30] empirically demonstrated that this tendency is more pronounced among respondents with lower educational attainment or weaker response motivation. It is plausible that a similar response pattern arises when non-parents are asked about the child-rearing environment.

This finding has implications for both methodology and policy. When average satisfaction scores for the child-rearing environment are calculated and used for policy evaluation in municipal citizens’ attitude surveys, respondents who do and do not have a basis for evaluation are aggregated together. Given that more than 40% of respondents exhibit this evaluation structure, average satisfaction scores may distort the lived experiences of those directly engaged in child-rearing—whether by understating or overstating them. However, the present data cannot distinguish whether the responses of the Evaluation-Pending group reflect a lack of cognitive basis, satisficing arising from low involvement, or genuinely unformed attitudes. Distinguishing among these possibilities would require qualitative research that asks respondents about their reasons for answering, or analyses that control for experience in using child-rearing services.

5.3. Implications

Several implications follow from the findings; these should not be regarded as claims based on causal evidence, but they are nonetheless suggestive in important ways.

This study confirmed a positive association between perceptions of community networks and satisfaction with the child-rearing environment using municipal survey data from a regional Japanese city. Research has shown that networks shape parents’ child-rearing experiences through the circulation of child-rearing information and informal mutual support [8,15]. In Japan, too, related evidence exists—for example, on the structure of childcare networks and mothers’ well-being [6], and on community-level social capital and child maltreatment [12]—but this work has centered on individual-level network structure or on specific outcomes such as maltreatment, and has rarely examined how residents themselves evaluate the local child-rearing environment. The present results add evidence that the positive association between residents’ perceptions of community networks and satisfaction with the child-rearing environment is also observable in a regional city in East Asia—an institutional context that Saraceno [9] describes as involving a high level of “familialism by default” in the case of children under the age of three, where public services are limited and child-rearing responsibilities tend to be left to families. However, the measurement based on two items of subjective perception does not capture the structural properties of networks, and the underlying mechanism of this association cannot be identified. Accordingly, this study should be positioned not as a test of social capital theory but as a descriptive study confirming that some predictions derived from the theory are also observable in a particular context.

A more distinctive contribution lies in describing heterogeneity in residents’ evaluations through LCA. The finding that more than 40% of respondents exhibit an “evaluation-pending” structure raises questions about the implicit assumption—shared by conventional analytic frameworks that summarize satisfaction as a continuous indicator and as an average—that residents hold a definite attitude regarding the child-rearing environment. This finding is also directly relevant when municipalities use the results of citizens’ attitude surveys for policy evaluation. To judge the extent to which average satisfaction scores reflect the lived experiences of those directly engaged in child-rearing, it would be useful to incorporate mechanisms that distinguish whether respondents have a basis for evaluation—for example, by adding items that ask about experience in using child-rearing services or about the reasons for selecting “don’t know.”

In practical terms, the cross-item differences discussed in Section 5.1 are also informative. Learning programs and community educational activities show the strongest associations with perceptions of community networks; such activities can simultaneously serve as routes for the circulation of child-rearing information and as venues for network formation. This suggests the importance of jointly considering the function of providing information and the function of forming connections among participants in designing local child-rearing-related programs.

5.4. Limitations and Future Research

This study has several limitations. First, it is based on cross-sectional data from a single time point and cannot support causal inference. Because perception-based measures are used for both the independent and dependent variables, the influence of common method bias cannot be ruled out [39]. It is possible that residents who are satisfied with the child-rearing environment perceive community networks more positively, or that general life satisfaction inflates both evaluations. Future research should verify causal relationships through longitudinal designs or panel data. The diagnostics reported in Section 4.2 suggest that the observed association is not merely an artifact of shared method: a two-factor model fit the data better than a single-factor model, and the association remained after excluding the most conceptually proximate item. The two constructs were nonetheless moderately to strongly correlated ($\phi = 0.75$), which is to be expected given their conceptual relatedness.

Second, the response rate of the survey was 43.1%, a standard level for a mail-based municipal survey. However, because residents with stronger social ties may be more inclined to cooperate with the survey, the possibility of some bias in the distribution of perceptions of community networks cannot be ruled out.

Measurement limitations exist as well. The measurement of perceptions of community networks is based on two items of subjective evaluation and does not capture structural properties of networks (e.g., density, diversity) or broader aspects of the community environment such as trust and norms of reciprocity. As shown by the main effect for the Northern area, discussed in Section 5.1, these measurement limitations also affect the interpretation of the results. Future research should employ measures that include structural indicators, such as the frequency and type of network participation and the density of relationships.

Finally, regarding external validity, this study is based on data from a single city, and the findings cannot be directly generalized to other regions. Comparative studies that conduct similar analyses in multiple municipalities and verify the reproducibility of the results are needed. Note also the exploratory nature of LCA; the identification of classes depends on the indicators and sample used, and whether the identified classes represent stable social types must be confirmed through replication in different samples and through external validation.

6. Conclusions

This study examined the association between residents' perceptions of community networks and satisfaction with the child-rearing environment in a regional Japanese city. Perceptions of community networks were consistently positively associated with satisfaction across all five items, with "learning opportunities" and "community-wide education" showing the strongest associations. This suggests that, even in regional Japanese cities, where family-based support is weakening, community networks function as resources underlying residents' evaluation of the child-rearing environment. The exploratory LCA further identified three qualitatively distinct evaluation patterns, including an "evaluation-

pending” group comprising over 40% of respondents, suggesting that the cognitive basis of respondents’ evaluations warrants attention when municipalities interpret citizens’ survey data.

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