

Article

The Effects of Mobility Expectation on Community Attachment: A Multilevel Model Approach

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Abstract: According to the systemic model of community attachment, high residential stability serves as a precondition on which residents build formal and informal social ties within their communities, ultimately resulting in increased community attachment. However, previous studies have only measured residents' length of residence in the community to measure residential stability, not considering whether expectations of staying in the community in the future affect residents' community attachment. This study aims to test if mobility expectation influences residents' community attachment by employing the logistic multilevel model to analyze 31,159 householders from 31 municipalities in Gyeonggi Province, Korea. The results show that residents' mobility expectation, in addition to the length of residence, is a significant determinant of community attachment after controlling for individual and regional-level covariates. The results provide implications for urban and regional policies aiming to promote community attachment and participation among residents in the age of increasing residential mobility.

Keywords: community attachment; residential mobility; residential stability; mobility expectation; multilevel model



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1. Introduction

Many cities today are finding ways to effectively encourage community participation in urban and regional development. This planning approach is grounded on the belief that sustainable active participation from community members helps the public to allocate community resources in ways that best serve the community's interests [1–3].

Community attachment is a concept that is directly tied to community participation. People with strong community attachment are known to be more interested in community issues and cooperate more in community development efforts [4–7]. Studies have also shown that residents with higher community attachment are more likely to solve community problems themselves, reducing the need for public resources or coercive policies [5,8]. In this regard, understanding how people develop community attachment is a fundamental task to ensure sound and effective participative planning.

The literature has shown that the amount of time a resident has lived in a community is a key determinant of community attachment. Many empirical studies have suggested that the longer a resident lives in a specific community, the more likely he or she is to develop deeply rooted affections toward it. However, previous studies have overlooked the possibility that the expectation of moving to another community in the near future, or mobility expectation, could also affect how one perceives and feels about the community. Understanding how mobility expectation could affect residents' community attachment will provide meaningful insights for urban policies that seek to promote residents' interests and participation in community issues. This relationship is becoming increasingly important as more cities and communities are rapidly urbanizing, which is a process generally accompanied by an unprecedentedly higher residential mobility of the population.

This study aims to contribute to the literature by untangling the relationship between mobility expectation and community attachment of individuals. First, this study aims to build a theoretical framework explaining how mobility expectation influences community attachment. Previous research on this topic did not focus on mobility expectation as a predictor of community attachment. Much attention has been given to how the length of residence in a community is positively related to community attachment; however, having stayed in a community for a long period does not mean expecting to stay there in the future.

Second, this study aims to contribute to the existing literature on community attachment by empirically analyzing the interaction effect between mobility expectation and length of residence on community attachment. While previous studies suggested a positive relationship between the length of residence and community attachment, they assumed that this effect would be constant across all individuals. This study examines whether the effect of length of residence on community attachment differs according to one's mobility expectation. By doing so, this study aims to expand our understanding of how the length of residence affects community attachment.

Third, this study aims to analyze the relationship between mobility expectation and community development within a multilevel context using data from Gyeonggi Province in Korea. Many previous empirical studies focused on the importance of individual characteristics in explaining how community attachment is formed, without considering the possible intervention of contextual factors. Though several studies attempted to analyze whether community-level variables influence residents' community attachment, they had methodological flaws in that they employed traditional statistical methods [9]. In this regard, this study uses the multilevel model to better control for community-level characteristics that may affect residents' community attachment. In so doing, this study is expected to contribute to the literature seeking to identify contextual determinants of individual community attachment. Furthermore, this study aims to provide an understanding of how residents develop community attachment in a non-western setting, which has received relatively little scholarly attention.

2. Literature Review

2.1. Defining Community Attachment

People always belong to and live in a specific place. Here, place does not simply refer to the physical and geographic area tangible to us; rather, place can be defined, understood, and analyzed within multiple frameworks provided by different academic disciplines and traditions. Most notably, environmental psychologists see place as a "central socio-physical unit of analysis" where individuals belong [10]. From this perspective, place takes on various scales including home, neighborhoods, cities, regions, countries, and even continents [11]. Place attachment, therefore, can be understood as positive feelings and sentiments that one naturally develops towards one's community.

Community attachment and place attachment are similar concepts in that they both aim to capture the positive affections people build towards places [4,12–16]. Similar to place attachment, community attachment can be defined at different scales. In fact, Trentelman [17] pointed out that many researchers tend to use the two terms interchangeably. However, place attachment and community attachment can be distinguished in terms of how the two concepts are employed in research to understand place characteristics. While studies on place attachment center on the physical and psychological aspects of a place, community attachment is more concerned with the social aspects. Another important distinction is how the literature explains the preconditions for developing each type of attachment. Place attachment can develop not only from direct, first-hand experience with a certain place but also from indirect, second-hand descriptions of the place provided by others [18]. On the other hand, studies on community attachment focus on a specific community that the individual of interest once belonged or currently belongs to.

Previous studies have measured community attachment by taking either the cognitive approach or the behavioral approach. The cognitive approach identifies community

attachment as deep and positive feelings that individuals develop towards their communities [19–21]. For instance, Kasarda and Janowitz [21] measured community attachment by asking respondents whether they have a sense of community, whether they are interested in the community, and whether they feel at home in the community. On the other hand, the behavioral approach measures respondents' participation in community groups, interest groups, and community volunteer work [22]. One can question if the behavioral approach is appropriate, as pro-community behaviors are often products of community attachment.

This study defines community attachment as a deep and positive emotional bond that one develops with the community one lives in. This study also understands the previous discussions on place attachment as those related to community attachment, if the place scale accords with those generally understood as communities such as neighborhoods, municipalities, and cities.

2.2. Theories on Community Attachment

Kasarda and Janowitz [21] summarized the literature and presented two competing hypotheses on community attachment—the linear development model and the systemic model. The linear development model is based on the ideas of classic theorists and assumes that individuals' social ties will weaken as the community's population size and density increase [23]. Hence, the linear development model is often viewed as the “community lost” model. The model assumes that intimate social ties are bound to erode with urbanization, which opens new spaces for more dehumanized and functional relationships [21].

Meanwhile, the systemic model of community attachment understands community as a set of place-based social relations that individuals possess [21]. Therefore, the systemic model argues that individual-level characteristics that influence relationship-building in the community, such as the length of residence in the community, socioeconomic status, and life cycle, better explain how community attachment is developed [21]. Thus, the systemic model, as a “community saved” model, assumes that communities are relevant even in urbanized modern societies.

Based on empirical analysis, Kasarda and Janowitz [21] concluded that the systemic model better explains how individuals develop community attachment. In particular, they reported that the respondents' length of residence in the community was the strongest predictor of community attachment because living longer in a certain community results in increased opportunities for socioeconomic transactions within that community, which in turn strengthens the emotional bond the individual develops towards the community. Subsequent studies have also reported the validity of the systemic model, showing that length of residence is a consistent and significant determinant of community attachment [9,22,23].

Several studies have recently attempted to situate the systemic model within a multi-level context. These studies aimed to identify whether contextual factors of the community also matter in how residents develop community attachment. The underlying idea is that since each community possesses unique characteristics, residents' community attachment should also differ accordingly [19]. Previous studies assumed that higher residential stability and socioeconomic status at the community-level would be related to increased community attachment since they allow residents to build positive bonding experiences with the community [9,22–25]. However, these studies face limits in that they did not consider the hierarchical nature of the data when analyzing the empirical data. Moreover, these studies have reported conflicting results, still leaving obscure the relationship between community-level contextual factors and community attachment.

Given such a backdrop, Flaherty and Brown [19] used the multilevel model to analyze the relationship between a set of community and individual-level variables and community attachment. The results indicated that the between-community variance was relatively much smaller compared to the within-community variance, implying that contextual effects on community attachment may be minute.

2.3. Mobility Expectation and Community Attachment

The fundamental assumption of the systemic model is that the more people are able to enjoy an environment for a sustained period under stable conditions, the more likely that they are to build positive experiences and memories regarding their communities [21]. The literature on homeownership supports this argument, as studies have shown that homeownership, by increasing residential stability and creating economic stakes for the resident in the neighborhood, promotes meaningful social interactions in the surrounding environment [26–28]. However, the length of residence in the community only reveals how long an individual has lived in a certain community at a given time. It thus fails to show us whether he or she is going to, or at least expects to, live in the community in the future. Suppose there is a stayer who has not lived in the community for long but does not expect to move. It would be difficult to ascertain if this stayer has weaker community attachment compared to a mover who has lived in the community longer but is expecting to move to another community shortly. In this light, studies on community attachment must address both how long one has lived in the community and whether one is expecting to move communities in the future.

Various academic disciplines understand and employ the concept of mobility in different ways. In transportation studies, mobility refers to the ability of individuals or goods to freely move or to be moved through the transportation system [29]. For instance, recent transportation studies are investigating the characteristics of shared mobility systems, such as e-scooters, and their impacts on the urban environment [30,31]. Residential mobility, on the other hand, is defined as the movement of households or the frequency with which households change their residence [32,33]. Residential mobility theory argues that residential moves often follow the expression of mobility desires and mobility expectations [34]. According to Speare [35] and Speare et al. [36], residential satisfaction is a key variable that captures the household's overall assessments of the environment. Residential satisfaction or dissatisfaction is expressed into mobility desire or desire to move, which refers to the willingness to move to a different house, neighborhood, or city [37,38]. When mobility desire is strengthened and the relevant requirements are met, individuals and households express mobility expectations or expectations of moving [39,40]. Mobility desire is understood as the relative preference for the current environment, largely independent of external constraints. On the other hand, mobility expectation is a product of both mobility desire and external real-world constraints that households or individuals face [34,40–42]. People who wish to move to another environment may not expect to move there because they have a limited budget, the housing market is unstable, or because they cannot get a new job somewhere else. Likewise, people wishing to stay in their current environment may nevertheless expect to move to another environment because of job relocations, family issues, rent hikes, and so on.

Defining mobility expectation and mobility desire as separate concepts provides several advantages in studying the relationship between residential mobility and community attachment. Mobility desire reflects the relative preferences for the environment, while mobility expectation is the product of those preferences, combined with various constraints. Using these categories, residential moves can be classified into four categories—desired and expected moves, desired and unexpected moves, undesired and expected moves, and undesired and unexpected moves [34]. This approach enables a more in-depth analysis of the relationship between mobility expectation and community attachment as researchers can separate the effects of subjective preferences for the community from the effects of mobility expectation. In particular, it allows us a detailed analysis of household motives behind residential moves. For instance, people with desired and unexpected moves will belong to the category of those who are “trapped” in their neighborhoods [43]. The gap between mobility desire and mobility expectation for these people may arise from constraints, which may range from individual factors such as location-based social networks and employment to more institutional factors such as deprived local environments and rising housing prices.

Mobility expectation may affect individuals' community attachment because it is directly related to how they perceive their environment and how they act and interact in it. People who are expecting to move to other places can close themselves off from interacting with other members of the community. They may also simply find it more difficult to develop deep emotional bonds with the community, which leads to weaker community attachment. Furthermore, mobility expectation can weaken willingness to participate in the community, as prospective movers could believe they cannot fully enjoy the fruits of their participation in the future [44]. Lastly, moving to another place means that social capital built in the current environment will be discarded, which can prevent people from engaging in social relationships with other community members [45,46]. On the other hand, people believing that they will stay in the community are likely to actively engage in social and economic activities in the community because they see their environment as stable and lasting. Given that the systemic model emphasizes the social relations and experiences built upon long-term and stable residency in the community, mobility expectation is likely to negatively affect community attachment.

While mobility expectation could have a direct negative influence on community attachment, it may also have an indirect negative influence by moderating the effects of length of residence. Literature suggests that length of residence positively influences community attachment by enabling residents to establish social relations and conduct activities within the community securely. If mobility expectation weakens community attachment by hindering residents' social activities within the community, it is also likely that residents with mobility expectations are relatively less likely to reap the benefits of staying longer in the community. In other words, mobility expectation may negatively affect community attachment by diminishing the positive effects of length of residence.

3. Research Methods

3.1. Data and Units of Analysis

This study used data from the 2017 Gyeonggi Social Survey to collect individual-level data. The Gyeonggi Social Survey is an annual survey on Gyeonggi citizens conducted by the Gyeonggi Provincial Government. Gyeonggi province, composed of 31 municipalities, geographically encircles Seoul along with Incheon to form the Seoul metropolitan area. The survey measured a range of variables, including respondents' perceptions and attitudes towards their municipalities. The 2017 Gyeonggi Social Survey was conducted from 29 August to 12 September 2017, sampling 31,160 households residing in Gyeonggi Province. The two-stage cluster sampling method was used based on the 2010 Korea Population and Housing Census Investigation Area. Twenty randomly selected households from each cluster were surveyed. For this study, 31,159 householders were chosen as the final sample, excluding one householder who did not report household income. This study also used the 2017 Gyeonggi Resident Registration Population Statistics and 2015 Population and Housing Census data to collect data on community-level variables.

The unit of analysis for this research was defined at two levels. The level-1 unit consisted of individuals and the level-2 unit consisted of communities. In defining level-2 units as communities, the geographical scale and boundaries of each community must be defined. This research defines respondents' communities as the 31 municipalities in Gyeonggi Province. A municipality in Korea encompasses a considerably bigger geographical area compared to many units used to indicate a community in other countries. However, municipalities are the lowest administrative units where spatial planning is managed in Korea and thus fit into the definition of community as a geographically defined social group having a common interest among its members [47,48]. Moreover, municipalities were the most microscopic geographical unit presented in the 2017 Gyeonggi Province Social Survey.

3.2. Variables

The variables included in the empirical model for this study include mobility expectation, mobility desire, indicators of community attachment, and other individual and community-level control variables. This study referred to the literature in selecting the variables and coming up with the appropriate measurement for them.

Community attachment was measured using the two variables *S_BELONG* and *S_HOME*. *S_BELONG* measured the respondents' sense of belonging to their community by asking them "Do you feel as if you belong to your community (municipality)?" Respondents answered with a four-point Likert scale with 1 indicating "not at all" and 4 indicating "very much". *S_HOME* measured the respondents' sense of home towards the community by asking them the question "Living in your community (municipality), do you feel comfortable as if you are living in your hometown?" The response was measured using a binary dummy variable with 0 indicating "no" and 1 indicating "yes".

MOB_EXPECT measured respondents' mobility expectations by asking them whether they were planning to move to another community (municipality) within five years from the date of the survey. The response was organized into a binary dummy variable with 0 indicating "no" and 1 indicating "yes". *MOB_DESIRE* measured respondents' mobility desire to disentangle the influence of individual preferences from the relationship between mobility expectation and community attachment. *MOB_DESIRE* was measured by asking respondents if they wanted to live in their current municipality even after 10 years after the date of the survey.

This study included a set of individual-level control variables to account for individual differences in community attachment. Respondents' sociodemographic characteristics were captured by their sex, age, marriage status, and whether their current municipality was their hometown. *MALE* is a binary dummy variable with 0 indicating female and 1 indicating male. *AGE* is a continuous variable measured in years. *MARRIED* is a binary dummy variable with 1 indicating currently married and 0 indicating all other marital statuses. *HOMETOWN* is a binary dummy variable with 1 indicating that the current municipality was the respondent's hometown and 1 indicating it was not.

Respondents' socioeconomic status was measured by their educational attainment, household income, and employment status. The 2017 Gyeonggi Province Social Survey measured respondents' educational attainment and household income using different categories. This study converted these data to create continuous variables. *EDUCATION* was measured by the respondents' educational attainment received in formal schooling institutions in years. *INCOME* was measured by the respondents' equalized household income in natural log. As household income data was collected on an ordinal scale in the survey, this study converted the data into a continuous variable before calculating the equalized household income. Lastly, *EMPLOYED* is a binary dummy variable with 0 indicating unemployed and 1 indicating employed.

Variables related to respondents' housing conditions included their length of residence in the community and housing tenure type. *LENGTH_R* was measured by the percentage of years the respondent had spent in the municipality. More specifically, the number of years one had lived in the current municipality was divided by one's age in years. Using this percentage measurement offers several advantages. It allows more accurate comparisons of how much the respondents had lived in their communities throughout their lifetime. It also prevents multicollinearity between respondents' length of residence and age [19].

This study also controlled community-level variables which were discussed in the literature as possible determinants of community attachment. *POP_DENSITY* measured the population density of the municipality by the number of people living in 1000 km² for each municipality. *C_SES* measured the municipality's overall community socioeconomic status by calculating the average educational attainment of the population aged 30 to 64 for each municipality. Lastly, *C_STABILITY* measured the residential stability of the

municipality by calculating the percentage of the households in the municipality who had lived there for over 15 years.

3.3. Model Specification

This study used the two-level logistic multilevel model to analyze the relationship between mobility expectation and community attachment while controlling individual and community-level characteristics. Since people living in the same community are likely to share similar characteristics with each other, the response from each respondent is unlikely independent of those of other community residents, violating the assumption of independence required in traditional statistical models. Thus, traditional statistical models that do not consider the nature of the hierarchical data produce biased results and ecological fallacy. The multilevel model considers level-1 and level-2 variables within a multilevel framework to explain more variance in the dependent variable and enable better estimation of parameters [49]. Since this study measured the dependent variable on an ordinal scale, the general multilevel model cannot be applied because it assumes linearity in the dependent variable. This study thus used the logit link function to transform the distribution of the dependent variable and analyzed the relationship between both individual and community-level characteristics.

The two-level multilevel model analyzes the relationship between independent and dependent variables by specifying models at both level-1 and level-2. In this study, the level-1 model specifies the relationship between individual-level independent variables and the dependent variable. Meanwhile, the level-2 model sets parameters from the level-1 model as the dependent variables and analyzes the relationship between the community level independent variable and level-1 parameters.

First, the unconditional model was used to identify if there exists any significant difference in respondents' level of perceived social mobility across different communities. The unconditional model does not specify any independent variables in the model and provides basic information on the data. The unconditional model is defined at two levels. The level-1 model is defined as:

$$\eta_{kij} = \ln(Y_{kij}) = \ln\left(\frac{P(R_{ij} \leq k)}{P(R_{ij} > k)}\right) = \beta_{0j} + \sum_{k=2}^{K-1} D_{kij}\delta_k \quad (1)$$

where η_{kij} is the logit prediction of the k -th cumulative category for the i -th individual living in the j -th community, Y_{kij} is the odds of the i -th individual in the j -th community answering the k -th category, β_{0j} is the model intercept, and δ_k is the vector of residuals. There were four cumulative categories for the variable S_BELONG and two categories for the variable S_HOME.

The level-2 model is defined as:

$$\beta_{0j} = \gamma_{00} + u_{0j} \quad (2)$$

where γ_{00} is the average level of the dependent variable of the sample, and u_{0j} is the random effect for the intercept. Here, u_{0j} indicates the difference in the dependent variables across the districts. If the effects of u_{0j} are found to be significant in the unconditional model, it can be concluded that there exist between-community differences in established residents' opposition levels.

Based on the results of the unconditional model, this study used the random intercept model to analyze the relationship between regional deprivation and perceived social mobility, holding the effects of both individual and community-level variables constant. The random intercept model assumes that the average level of the dependent variable

varies according to the level-2 group. The random intercept model is also defined at two levels. The level-1 model takes the form:

$$\eta_{kij} = \ln(Y_{kij}) = \ln\left(\frac{P(R_{ij} \leq k)}{P(R_{ij} > k)}\right) = \beta_{0j} + \sum_{q=1}^Q \beta_{qj} X_{qij} + \sum_{k=2}^{K-1} D_{kij} \delta_k \quad (3)$$

where η_{kij} is the logit prediction of the k -th cumulative category for the i -th individual living in the j -th community, Y_{kij} is the odds of the i -th individual in the j -th community answering the k -th category, β_{0j} is the model intercept, β_{qj} is the vector of regression coefficients, X is the vector of level-1 independent variables, and δ_k is the vector of residuals.

The level-2 model is defined as:

$$\beta_{0j} = \gamma_{00} + \sum_{s=1}^S \gamma_{0s} W_{sj} + u_{0j} \quad (4)$$

where γ_{00} is the average level of the dependent variable of the sample, γ_{0s} is the vector of regression coefficients, W_{sj} is the vector of level-2 variables, and u_{0j} is the intercept residual or the level-2 random effect. This study set the level-2 variables POP_DENSITY, C_SES, and C_MOBILITY as determinants of the level-1 intercept. This study used HLM 6.01 software and the penalized quasi-likelihood approach to estimate the multilevel models while using robust standard errors to deal with the potential heteroskedasticity of data. The minimum level of statistical significance was set at 10%.

4. Empirical Results

4.1. Descriptive Analysis

Table 1 shows the descriptive statistics for the research data used in this study. According to descriptive statistics, the average level of sense of belonging respondents felt towards their community was 2.784. Also, 72.9% of the respondents reported that they felt comfortable with their municipality as if they were living in their hometown. Moreover, 87.5% of the respondents were expecting to live in their current community in the next five years and 86.6% of the respondents responded that they wished to live in their community even after 10 years. In other words, most respondents were attached to their communities and expected to stay there, at least in the short run.

Table 1. Descriptive statistics.

| Variable | N | Mean | Min | Max | Std. Dev. |
|---------------|--------|--------|--------|---------|-----------|
| S_BELONG | 31,159 | 2.784 | 1.000 | 4.000 | 0.727 |
| S_HOME | 31,159 | 0.729 | 0.000 | 1.000 | 0.444 |
| MOB_EXPECT | 31,159 | 0.125 | 0.000 | 1.000 | 0.331 |
| MOB_DESIRE | 31,159 | 0.134 | 0.000 | 1.000 | 0.340 |
| MALE | 31,159 | 0.765 | 0.000 | 1.000 | 0.424 |
| AGE | 31,159 | 53.784 | 15.000 | 98.000 | 14.821 |
| MARRIED | 31,159 | 0.692 | 0.000 | 1.000 | 0.462 |
| HOMETOWN | 31,159 | 0.139 | 0.000 | 1.000 | 0.346 |
| EDUCATION | 31,159 | 12.215 | 0.000 | 1.000 | 4.048 |
| INCOME | 31,159 | 5.098 | 2.813 | 6.908 | 0.904 |
| EMPLOYED | 31,159 | 0.736 | 0.000 | 1.000 | 0.441 |
| LENGTH_R | 31,159 | 30.956 | 0.000 | 100.000 | 27.756 |
| HOMEOWNERSHIP | 31,159 | 0.588 | 0.000 | 1.000 | 0.492 |
| POP_DENSITY | 31 | 7.346 | 4.229 | 9.700 | 1.506 |
| C_SES | 31 | 13.011 | 11.774 | 14.993 | 0.718 |
| C_STABILITY | 31 | 17.437 | 7.570 | 43.693 | 9.143 |

One reason this study stressed the importance of analyzing the influence of mobility expectation in community attachment was its correlation with residents' length of residence. If the respondents' mobility expectation and length of residence were correlated, excluding

either variable could result in a biased estimation of the other variable's parameter. The box-and-whisker plot in Figure 1 shows the relationship between MOB_EXPECT and LENGTH_R. As expected, respondents without mobility expectations were found to have lived in their current community for a longer period of time than their counterparts with mobility expectations. This suggests that both MOB_EXPECT and LENGTH_R need to be included in the research model to better analyze the effects of each variable on community attachment.

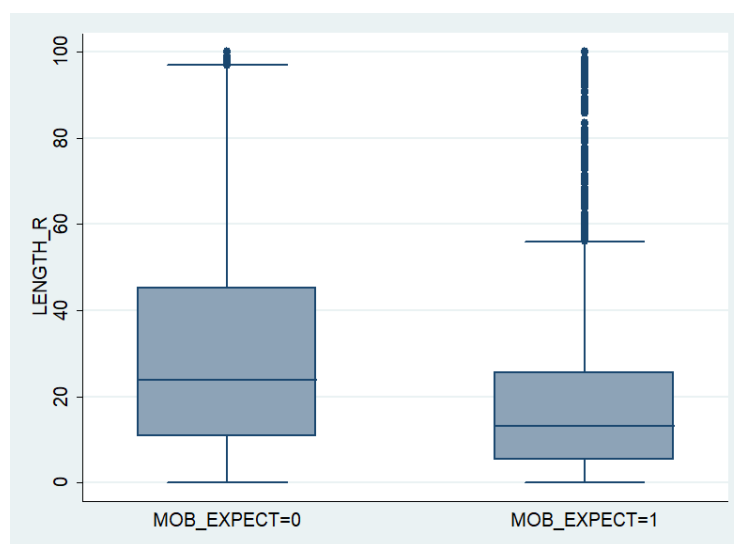


Figure 1. Box-and-whisker plot for MOB_EXPECT and LENGTH_R.

Table 2 shows the contingency table for the variables MOB_DESIRE and MOB_EXPECT. Of the 4161 respondents who reported that they had mobility desire, only 51.02% of the respondents developed expectations of moving. In other words, 48.98% of the respondents wanted to move to another community but did not expect to move in the short future, possibly due to their difficulties. Similarly, of the 26,998 respondents who reported that they did not have mobility desire, 6.93% of the respondents said that they had mobility expectations. In other words, mobility expectation should be understood and analyzed separately from mobility desire.

Table 2. Contingency table for MOB_DESIRE and MOB_EXPECT.

| | | MOB_EXPECT | | Total |
|------------|----------|--------------|----------------|--------|
| | | Yes (=1) | No (=0) | |
| MOB_DESIRE | Yes (=1) | 2123 (51.02) | 2038 (48.98) | 4161 |
| | No (=0) | 1870 (6.93) | 25,128 (93.07) | 26,998 |
| Total | | 3993 | 27,166 | 31,159 |

Figure 2 shows the geographical visualization of the level-2 variables POP_DENSITY, C_SES, and C_STABILITY for the research area. This figure reveals that community-level characteristics show spatial convergence. Population density was lowest in the periphery areas which were farthest away from Seoul, the capital city of Korea. These areas also showed the lowest levels of average community educational attainment and highest levels of community residential stability. These results thus suggest that the study should consider the three community-level variables in relation to each other when analyzing the research data in order to better examine their impacts on community attachment.

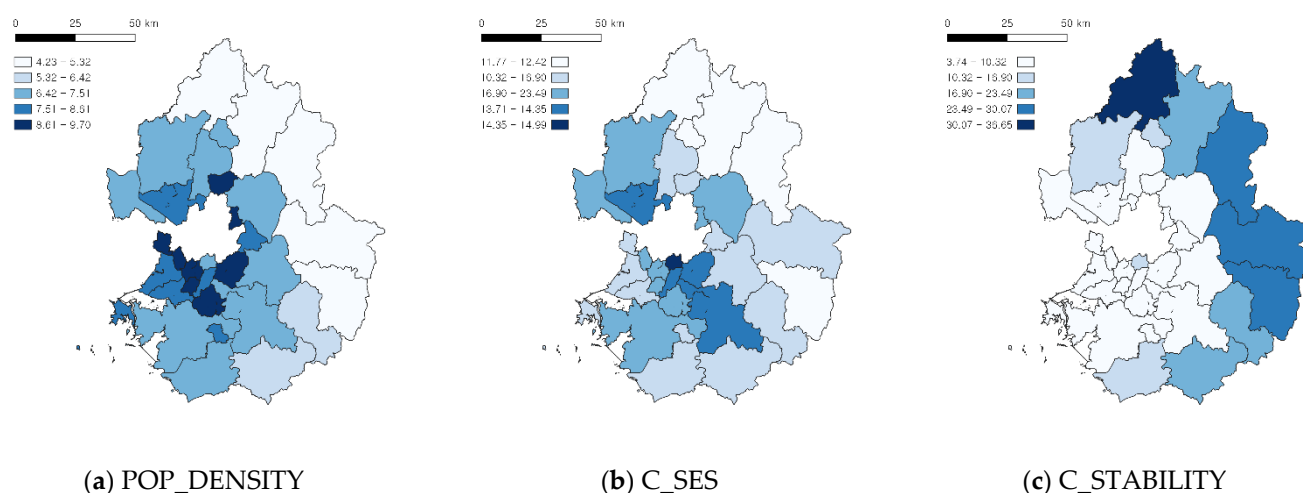


Figure 2. Geographical distributions of level-2 variables.

4.2. Multilevel Model Results

Table 3 shows the results for the unconditional model. The variance component was 0.102 for S_BELONG and 0.121 for S_HOME. Both values were statistically significant. This implies that respondents' community attachment significantly differed according to the community they lived in. Multilevel model studies often refer to the intraclass coefficient (ICC) to identify the proportion of unexplained variance at each level of the model. The ICC is defined as the ratio of the level-2 variance component over the sum of level-1 and level-2 variance. However, the correlation between the responses of two units of the same level-2 group will depend on the covariates for ordinal logistic multilevel models, which makes ICC not an exhaustive indicator of the degree of correlation [50]. Thus, this study employed a multilevel model to analyze the research data based on the statistical significance of the between-group variance for the two dependent variables.

Table 3. Unconditional model results.

| Level-2 Random Effect (u_0) | Std. Dev. | Variance Component | Chi-Square | <i>p</i> -Value |
|---------------------------------|-----------|--------------------|------------|-----------------|
| S_BELONG | 0.319 | 0.102 | 761.894 | 0.000 |
| S_HOME | 0.347 | 0.121 | 593.432 | 0.000 |

Table 4 shows the results for the random intercept model with the dependent variable S_BELONG. The results show that MOB_EXPECT has a negative influence on both indicators of community attachment. This effect was statistically significant at the 1% significance level, implying that it is very likely that people with higher mobility expectations are less likely to develop S_BELONG and S_HOME towards their community. LENGTH_R was a significant predictor of both indicators of community attachment, even after including respondents' MOB_EXPECT in the model. This study included respondents' MOB_DESIRE in the empirical model in order to control for respondents' preferences of their community. MOB_DESIRE was negatively related to both indicators of community attachment. This relationship was also statistically significant at the 1% significance level.

Table 4. Random intercept model results for S_BELONG.

| | Coefficient | Std. Err. | Odds Ratio | p-Value |
|---------------------------------|-------------|------------|------------|---------|
| Level-1 variables | | | | |
| MOB_EXPECT | −0.327 | 0.050 | 0.721 | 0.000 |
| MOB_DESIRE | −0.693 | 0.037 | 0.500 | 0.000 |
| MALE | −0.159 | 0.032 | 0.853 | 0.000 |
| AGE | 0.022 | 0.001 | 1.021 | 0.000 |
| MARRIED | 0.227 | 0.031 | 1.255 | 0.000 |
| HOMETOWN | −0.001 | 0.033 | 0.999 | 0.977 |
| EDUCATION | 0.025 | 0.004 | 1.026 | 0.000 |
| INCOME | 0.117 | 0.017 | 1.125 | 0.000 |
| EMPLOYED | 0.091 | 0.032 | 1.095 | 0.006 |
| LENGTH_R | 0.020 | 0.000 | 1.021 | 0.000 |
| HOMEOWNERSHIP | 0.219 | 0.025 | 1.245 | 0.000 |
| MOB_EXP*LENGTH_R | −0.001 | 0.003 | 0.999 | 0.463 |
| Level-2 variables | | | | |
| POP_DENSITY | −0.004 | −0.051 | 0.996 | 0.936 |
| C_SES | 0.240 | 0.088 | 1.271 | 0.012 |
| C_STABILITY | 0.008 | 0.009 | 1.008 | 0.383 |
| Additional information | Std. dev. | Var. comp. | Chi-square | p-value |
| Level-2 random effect (u_0) | 0.065 | 0.256 | 443.468 | 0.000 |

Many individual-level control variables were also found to be significantly related to respondents' S_BELONG towards their communities. All sociodemographic variables included in the model showed statistically significant relationships with community attachment. Female respondents, older respondents, and married respondents were more likely to feel a sense of belonging toward their community. The results are in agreement with previous findings, as these characteristics are all known to be related to increased community participation and social interactions. Interestingly, HOMETOWN was not a significant predictor of S_BELONG. High socioeconomic status was also related to a greater sense of belonging. EDUCATION, INCOME, and EMPLOYED were all shown to have a positive influence on S_BELONG. In addition, LENGTH_R and HOMEOWNERSHIP were also positively related to S_BELONG. These variables all showed significant relationships with S_BELONG at the 1% significance level. However, the interaction term between MOB_EXPECT and LENGTH_R did not show a significant effect.

Regarding community-level variables, C_SES was the only variable shown to be significantly related to respondents' sense of belonging toward their communities. As the average educational attainment of the community residents increased by a year, respondents were 1.271 times more likely to report a greater sense of belonging towards their community.

Table 5 shows the results of the random intercept model with S_HOME as the dependent variable. Again, MOB_EXPECT was negatively related to the dependent variable. People expecting to move to another community were 0.701 times as likely to feel a sense of home towards their community as those who were not expecting to move. This relationship was statistically significant at the 1% significance level, even after controlling for different individual and community-level characteristics.

Table 5. Random intercept model results for S_HOME.

| | Coefficient | Std. Err. | Odds Ratio | p-Value |
|---------------------------------|-------------|------------|------------|---------|
| Level-1 variables | | | | |
| MOB_EXPECT | −0.356 | 0.060 | 0.701 | 0.000 |
| MOB_DESIRE | −0.879 | 0.041 | 0.415 | 0.000 |
| MALE | −0.117 | 0.041 | 0.890 | 0.005 |
| AGE | 0.023 | 0.001 | 1.024 | 0.000 |
| MARRIED | 0.084 | 0.040 | 1.088 | 0.034 |
| HOMETOWN | −0.003 | 0.043 | 0.997 | 0.938 |
| EDUCATION | −0.010 | 0.005 | 0.990 | 0.044 |
| INCOME | 0.054 | 0.022 | 1.056 | 0.016 |
| EMPLOYED | 0.044 | 0.076 | 1.079 | 0.091 |
| LENGTH_R | 0.045 | 0.001 | 1.046 | 0.000 |
| HOMEOWNERSHIP | 0.127 | 0.032 | 1.136 | 0.000 |
| MOB_EXP*LENGTH_R | −0.010 | 0.002 | 0.990 | 0.000 |
| Level-2 variables | | | | |
| POP_DENSITY | 0.065 | 0.046 | 1.067 | 0.172 |
| C_SES | 0.275 | 0.080 | 1.316 | 0.002 |
| C_STABILITY | 0.023 | 0.008 | 1.024 | 0.008 |
| Additional information | Std. dev. | Var. comp. | Chi-square | p-value |
| Level-2 random effect (u_0) | 0.223 | 0.050 | 198.015 | 0.000 |

The random intercept model with S_HOME as the dependent variable showed generally similar results with the model with S_BELONG as the dependent variable. MOB_EXPECT and MOB_DESIRE were both negatively related to S_HOME at a statistically significant level. In addition, MALE, AGE, and MARRIED all showed a significant relationship with S_HOME, in the same direction of influence with model 1, albeit with some differences in the magnitude of parameter values and statistical significance. The same relationship was found in socioeconomic status variables, with the exception of EDUCATION. EDUCATION was found to be negatively associated with S_BELONG. Although the relationship between socioeconomic status and community attachment was not the central focus of this study, perhaps we may understand the results as additional support for the systematic model of community attachment. People who have higher income levels and jobs are known to be more mobile and have more resources to participate in meaningful local social interactions [51–53]. LENGTH_R and HOMEOWNERSHIP were positively related to S_HOME at a statistically significant level. Moreover, the interaction term between MOB_EXPECT and LENGTH_R was shown to have a significant negative relationship with S_HOME. In other words, the negative influence of MOB_EXP on S_HOME intensified as years spent in the community increased.

Lastly, C_SES and C_STABILITY were positively associated with S_HOME. As the average educational attainment of the community increased by a year, respondents were 1.316 times more likely to have a sense of home towards their community. Again, this effect was stronger than the effect of education at the individual level.

The results of the random intercept models, therefore, suggest that mobility expectation does have a negative influence on individuals' community attachment at a statistically significant level. The results also show that mobility expectation and length of residence have a negative interaction effect on community attachment, although this effect was statistically significant only in the case of respondents' sense of home. The results also imply that community contextual characteristics, including community socioeconomic status and community residential stability, could affect residents' attachment levels.

5. Discussion and Conclusions

This study aimed to analyze how mobility expectations influence residents' community attachment based on an understanding of the systemic model of community attachment. Using a logistic multilevel model, this study aimed to control for community-level contextual effects on residents' community attachment to enhance the methodological

validity of the research. Since this study analyzed data collected from Gyeonggi Province in Korea, we should be careful in applying our findings to other environmental contexts. However, it nevertheless provides important implications regarding the relationship between mobility expectations and community attachment.

First, the results of this study showed that mobility expectation has a negative influence on community attachment, even after controlling for individual and community-level characteristics known to be related to community attachment. While previous community attachment studies have stressed the importance of residential mobility in shaping residents' community attachment, they have nevertheless only examined the effects of length of residence [9,21,22,24]. However, the findings of this study imply that not only how long one has lived in a community at a given point, but whether one expects to live there in the future could also influence community attachment. In other words, this study argues the need for community attachment studies to explore the effects of how individuals perceive their future residential mobility.

In addition, mobility expectation and length of residence had a negative interaction effect on the feeling of home, an indicator of community attachment. We tested this effect to further investigate how ignoring mobility expectations in community attachment research can result in a limited understanding of the effects of length of residence. This implies that mobility expectation could have adversely affected community attachment of long-term residents in Gyeonggi Province, suggesting the need for more detailed investigations of the relationship between the length of residence and community attachment found in the literature [21,22]. One explanation is that long-term residents have more grounded feelings in their environment and could be more negatively impacted by the recognition that they will move, while short-term residents have developed less attachment in their communities in the first place for mobility expectations to reduce their attachment substantially. In this regard, the empirical findings of this study suggest the need for further research on the interaction between mobility expectation length of residence. In particular, the results point to the possibility that this interaction may vary according to whether residents' mobility expectations are voluntary (with mobility desire) or involuntary (without mobility desire).

Lastly, average educational attainment and residential stability of the municipality were positively associated with indicators of individual community attachment. Unlike Flaherty and Brown [19], the findings of this study suggest that the environment an individual lives in could significantly impact one's community attachment. In fact, there is a possibility that the effects of environmental contexts could be more substantial than what our model estimates. This study measured environmental characteristics at the level of municipalities, which is broader in geographic scope compared to what is normally understood as a neighborhood or a community. As a result, the model may have underestimated the neighborhood effects of community-level variables, given the high level of aggregation. One explanation for the discrepancy between our findings and those of Flaherty and Brown [19] is socio-cultural differences. Recent studies have attempted to explain community attachment in different cultural settings [54,55]. Nevertheless, empirical studies on the systematic model of community attachment have mostly focused on the Anglo-Saxon world. The findings of our research suggest the need to expand our understanding of community attachment to incorporate evidence from diverse settings.

The findings of this study support the systemic model of community attachment, which insists that the positive functions of the community can be preserved by promoting geographically-based social networks and relationships that people possess within their communities. This study found that residential stability can play an important role in shaping residents' community attachment. According to the results, respondents who lived longer in a community and expected to stay there longer had a stronger attachment toward their communities. Moreover, at the community level, community residential stability was positively associated with the sense of home the respondents had felt toward their communities. In other words, this study suggests that community attachment does not inevitably decline as communities become more urbanized—promoting sustained and

long-term social interactions and transactions in the community, by promoting residential stability, for instance, could enhance residents' attachment levels.

In this regard, this study also suggests that housing policies that promote residential stability may facilitate residents' community attachment. More specifically, this study alludes that promoting homeownership may not be the only option available to planners when finding ways to build strong and positive relationships between communities and their residents. Housing policies that promote homeownership are based on the idea that homeownership has various benefits for individuals and communities. In terms of community development, homeowners are known to participate more actively in community issues [28]. Although the findings show that homeownership is indeed a significant predictor of community attachment, they also indicate that higher residential stability is related to higher levels of community attachment. Perhaps it may be possible to encourage a positive relationship between people and their communities by providing people with other stable housing options and reinforcing the rights of tenants. However, this does not simply mean that providing stable and long-term housing opportunities should be the sole policy objective. Rather, community development should fundamentally focus on building an attractive environment where people would wish to stay and live. For instance, residents with mobility desires but no mobility expectations may feel like they are trapped in their unwanted neighborhoods. For these people, a longer length of residence may result in less community attachment. Future research may investigate how the mismatch between residents' mobility desires and mobility expectations mediate the effects of length of residence on community attachment.

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References

1. Lee, S.; Park, D.-H. Community attachment formation and its influence on sustainable participation in a digitalized community: Focusing on content and social capital of an online community. *Sustainability* **2019**, *11*, 2935. [\[CrossRef\]](#)
2. Sanoff, H. *Community Participation Methods in Design and Planning*; John Wiley and Sons: New York, NY, USA, 2000.
3. Zhang, H.; Matsuoka, R.H.; Huand, Y.-J. How do community planning features affect the place relationship of residents? An investigation of place attachment, social interaction, and community participation. *Sustainability* **2018**, *10*, 2726. [\[CrossRef\]](#)
4. Brown, B.; Perkins, D.D.; Brown, G. Place attachment in a revitalizing neighborhood: Individual and block levels of analysis. *J. Environ. Psychol.* **2003**, *23*, 259–271. [\[CrossRef\]](#)
5. Chavis, D.M.; Wandersman, A. Sense of community in the urban environment: A catalyst for participation and community development. *Am. J. Commun. Psychol.* **1990**, *18*, 55–81. [\[CrossRef\]](#)
6. Hummon, D.M. Community attachment. In *Place Attachment*; Altman, I., Low, S.M., Eds.; Springer: Boston, MA, USA, 1992; pp. 253–278.
7. Low, S.M.; Altman, I. Place attachment. In *Place Attachment*; Altman, I., Low, S.M., Eds.; Springer: Boston, MA, USA, 1992; pp. 1–12.
8. Frug, G.E. *City Making: Building Communities without Building Walls*; Princeton University Press: Princeton, NJ, USA, 2001.
9. Sampson, R.J. Local friendship ties and community attachment in mass society: A multilevel systemic model. *Am. Sociol. Rev.* **1988**, *53*, 766–779. [\[CrossRef\]](#)
10. Bonnes, M.; Lee, T.; Bonaiuto, M. *Psychological Theories for Environmental Issues*; Ashgate: Burlington, VT, USA, 2003.
11. Lewicka, M. Place attachment: How far have we come in the last 40 Years? *J. Environ. Psychol.* **2011**, *31*, 207–230. [\[CrossRef\]](#)

12. Kim, B.; Park, J. Effects of commercial activities by type on social bonding and place attachment in neighborhoods. *Sustainability* **2018**, *10*, 1771. [CrossRef]
13. Shumaker, S.A.; Taylor, R.B. Toward a clarification of people-place relationships: A model of attachment to place. *Environ. Psychol. Dir. Perspect.* **1983**, *2*, 19–25.
14. Taylor, R.B. Neighborhood responses to disorder and local attachments: The systemic model of attachment, social disorganization, and neighborhood use value. *Sociol. Forum* **1996**, *11*, 41–74. [CrossRef]
15. Xu, Y.; Matarrita-Cascante, D.; Lee, J.H.; Luloff, A.E. Incorporating physical environment-related factors in an assessment of community attachment: Understanding urban park contributions. *Sustainability* **2019**, *11*, 5603. [CrossRef]
16. Zhu, Y.; Ding, J.; Zhu, Q.; Cheng, Y.; Ma, Q.; Ji, X. The impact of green open space on community attachment: A case study of three communities in Beijing. *Sustainability* **2017**, *9*, 560. [CrossRef]
17. Trentelman, C.K. Place attachment and community attachment: A primer grounded in the lived experience of a community sociologist. *Soc. Nat. Resour.* **2009**, *22*, 191–210. [CrossRef]
18. Backlund, E.A.; Williams, D.R. A quantitative synthesis of place attachment research: Investigating past experience and place attachment. In *Proceedings of the 2003 Northeastern Recreation Research Symposium*; Murdy, J., Ed.; US Department of Agriculture, Forest Service, Northeastern Research Station: Newtown Square, PA, USA, 2004; pp. 320–325.
19. Flaherty, J.; Brown, R.B. A multilevel systemic model of community attachment: Assessing the relative importance of the community and individual levels. *Am. J. Sociol.* **2010**, *116*, 503–542. [CrossRef]
20. Goudy, W.J. Further consideration of indicators of community attachment. *Soc. Indic. Res.* **1982**, *11*, 181–192. [CrossRef]
21. Kasarda, J.D.; Janowitz, M. Community attachment in mass society. *Am. Sociol. Rev.* **1974**, *39*, 328–339. [CrossRef]
22. Beggs, J.J.; Hurlbert, J.S.; Haines, V.A. Community attachment in a rural setting: A refinement and empirical test of the systemic model. *Rural Sociol.* **1996**, *61*, 407–426. [CrossRef]
23. Wirth, L. Urbanism as a way of life. *Am. J. Sociol.* **1938**, *44*, 1–24. [CrossRef]
24. Theodori, G.L. Exploring the association between length of residence and community attachment: A research note. *South. Rural Sociol.* **2004**, *20*, 107–122.
25. Theodori, G.L.; Luloff, A.E. Urbanization and community attachment in rural areas. *Soc. Nat. Resour.* **2000**, *13*, 399–420.
26. Aaronson, D. A note on the benefits of homeownership. *J. Urban Econ.* **2000**, *47*, 356–369. [CrossRef]
27. Blum, T.C.; Kingston, P.W. Homeownership and social attachment. *Sociol. Perspect.* **1984**, *27*, 159–180. [CrossRef]
28. McCabe, B.J. Are homeowners better citizens? Homeownership and community participation in the United States. *Soc. Forces* **2013**, *91*, 929–954. [CrossRef]
29. Levine, J. Getting There: From Mobility to Accessibility in Transportation Planning. Resources for the Future, RFF Policy Commentary Series. 2011. Available online: <https://www.resources.org/common-resources/getting-there-from-mobility-to-accessibility-in-transportation-planning/> (accessed on 20 June 2011).
30. Bieliński, T.; Wazna, A. Electric scooter sharing and bike sharing user behaviour and characteristics. *Sustainability* **2020**, *12*, 9640. [CrossRef]
31. Turoń, K.; Kubik, A.; Chen, F.; Wang, H.; Łazarz, B. A holistic approach to electric shared mobility systems development: Modelling and optimization aspects. *Energies* **2020**, *13*, 5810. [CrossRef]
32. Oishi, S. The psychology of residential mobility: Implications for the self, social relationships, and well-being. *Perspect. Psychol. Sci.* **2010**, *5*, 5–21. [CrossRef] [PubMed]
33. Short, J.R. Residential mobility. *Prog. Hum. Geogr.* **1978**, *2*, 419–447. [CrossRef]
34. Coulter, R.; Van Ham, M.; Feijten, P. A longitudinal analysis of moving desires, expectations and actual moving behaviour. *Environ. Plan. A* **2011**, *43*, 2742–2760. [CrossRef]
35. Speare, A. Residential satisfaction as an intervening variable in residential mobility. *Demography* **1974**, *11*, 173–188. [CrossRef]
36. Speare, A.; Goldstein, S.; Frey, W.H. *Residential Mobility Migration, and Metropolitan Change*; Ballinger: Cambridge, MA, USA, 1975.
37. Kasl, S.V.; Harburg, E. Perceptions of the neighborhood and the desire to move out. *J. Am. Inst. Plan.* **1972**, *38*, 318–324. [CrossRef]
38. McNeeley, S.; Stutzenberger, A. Victimization, risk perception, and the desire to move. *Vict. Offenders* **2013**, *8*, 446–464. [CrossRef]
39. Rossi, P.H. *Why Families Move: A Study in the Social Psychology of Urban Residential Mobility*; Free Press: Glencoe, IL, USA, 1955.
40. Sell, R.R.; De Jong, G.F. Deciding whether to move: Mobility, wishful thinking and adjustment. *Sociol. Soc. Res.* **1983**, *67*, 146–165.
41. De Jong, G.F. Expectations, gender, and norms in migration decision-making. *Popul. Stud.* **2001**, *54*, 307–319. [CrossRef]
42. Sheeran, P. Intention-behavior relations: A conceptual and empirical review. *Eur. Rev. Soc. Psychol.* **2002**, *12*, 1–36. [CrossRef]
43. Quillian, L. How long are exposures to poor neighborhoods? The long-term dynamics of entry and exit from poor neighborhoods. *Popul. Res. Policy Rev.* **2003**, *22*, 221–249. [CrossRef]
44. Manturuk, K.R. Urban homeownership and mental health: Mediating effect of perceived sense of control. *City Commun.* **2012**, *11*, 409–430. [CrossRef]
45. Berry, B.J.L.; Kasarda, J.D. *Contemporary Urban Ecology*; Macmillan: New York, NY, USA, 1977.
46. Oishi, S.; Miao, F.F.; Koo, M.; Kisling, J.; Ratliff, K.A. Residential mobility breeds familiarity-seeking. *J. Pers. Soc. Psychol.* **2012**, *102*, 149–162. [CrossRef]
47. Lee, J. Strengthening local government's right for urban plans: Focused on urban management plan. *J. Local Gov. Stud.* **2004**, *16*, 115–133.
48. Kim, B. A study on the autonomy of planning in local government. *J. Local Gov. Stud.* **2017**, *29*, 1–22.

-
49. Bryk, A.S.; Raudenbush, S.W. *Hierarchical Linear Models: Applications and Data Analysis Methods*; Sage: Thousand Oaks, CA, USA, 1992.
 50. Grilli, L.; Rampichini, C. Multilevel models for ordinal data. In *Modern Analysis of Customer Surveys: With Applications Using R*; Kennett, R.S., Salini, S., Eds.; Wiley: Hoboken, NJ, USA, 2011.
 51. Bocarejo, S.J.P.; Oviedo, H.D.R. Transport accessibility and social inequities: A tool for identification of mobility needs and evaluation of transport investments. *J. Transp. Geogr.* **2012**, *24*, 142–154. [[CrossRef](#)]
 52. Hays, R.A.; Kogl, A.M. Neighborhood attachment, social capital building, and political participation: A case study of low-and moderate-income residents of Waterloo, Iowa. *J. Urban Aff.* **2007**, *29*, 181–205. [[CrossRef](#)]
 53. Iglesias, V.; Giraldez, F.; Tiznado-Aitken, I.; Muñoz, J.C. How uneven is the urban mobility playing field? Inequalities among socioeconomic groups in Santiago De Chile. *Transp. Res. Rec.* **2019**, *2673*, 59–70. [[CrossRef](#)]
 54. Irlbeck, D. Latino police officers: Patterns of ethnic self-identity and Latino community attachment. *Police Q.* **2008**, *11*, 468–495. [[CrossRef](#)]
 55. Ramkissoon, H. Authenticity, satisfaction, and place attachment: A conceptual framework for cultural tourism in African island economies. *Dev. S. Afr.* **2015**, *32*, 292–302. [[CrossRef](#)]