A Geographical Study of Population Characteristics in the Province of Gipuzkoa, Spain

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Abstract: The objective of this paper is to analyze the spatial structure of population characteristics and its shift in the province of Gipuzkoa, Spain, which has a particularly high density of Basque speakers. By using data sets from the 1991 and 1996 State Census and applying factor analysis, several principal dimensions which regulate the spatial differentiation of population characteristics in Gipuzkoa were extracted. The spatial distribution and transition patterns of these dimensions were examined and certain processes of shift became obvious, such as major socio-economic change in the industrial and employment structures, rapid demographic change represented by aging and fertility decline, and an advance in reversing language shift. The dimension of social origin was the most important with regard to the spatial differentiation in Gipuzkoa. Furthermore, it is unique and noteworthy that, apart from with regard to social identity, the demo-linguistic dimensions were extracted independently at the 3rd and 4th dimensions which show relative stages of reversing language shift. As compared with the rural-urban contrast in the dimension of social identity, these demo-linguistic dimensions can be found typically in areas with a relatively low density of Basque speakers, including some urban areas. This means that the reversing language shift is making a steady advance there.

Key words: Gipuzkoa, population characteristics, factor analysis, social change, Basque language

Introduction

Gipuzkoa is one of the three provinces of Euskal Autonomi Elkartea (Autonomous Community of the Basque Country, or ACBC). Within the Autonomous Community, Gipuzkoa is remarkable for its high concentration of Basque speakers compared with the Basque Country as a whole. According to the latest research, in the entire Basque Country there are 711,400 Basque speakers, and 568,100 of these, almost 80%, live in ACBC (Viceconsejería de Política Lingüística 1995). Furthermore, more than a half of this 80% are concentrated in Gipuzkoa (Eustat 1999).

The existence of the Basque language has been so important for ACBC that the area is commonly called Euskal Herri, i.e., "the territory of the Basque language." Similarly, the residents of this region call themselves Euskaldun, i.e., "Basque speakers." Thus, the Basque language constitutes the fundamental element of definition for both the region and the local resident, and it can be understood that the Basque language is a principal component at the core of Basque identity formation.

There have been many case studies which have defined the Basque Country as a single regional unity. In spite of the existence of the Basque ethnic minority group, geographical studies of the Basque Country in recent decades have tended to emphasize functional and economic analyses (Sáez de Buruaga 1969; Ferrer and Precedo 1977; Precede and Rodriguez 1989). This trend has been due to the fact that the Basque Country was one of the most important areas of economic and industrial development in Spain from the nineteenth century, forming and developing a functional urban system within the Spanish northern coastal zone. Internal migrants moved into the Basque Country in large numbers, as well as to Cataluna and Valencia until the middle of the 1970s.

However, the situation changed drastically with the economic crisis which the Basque
Country experienced from the middle of the 1970s. The reduction of the industrial sector seriously altered employment opportunities in this region. Consequently, for the first time in the twentieth century, the Basque Country saw an increase in emigrants, reducing the net migration rate of ACBC from 18.2% in 1965 and 4.8% in 1975 to −5.1% in 1980. The figures for Gipuzkoa also fell, from 12.1% and 1.1% to −6.7% in the respective years (Diputación Foral de Gipuzkoa 2000: 63). Also, both Gipuzkoa and ACBC have experienced overall population decrease since the 1980s (Diputacion Foral de Gipuzkoa 2000: 41-42). This crisis has caused a relative decline in the status of the Basque functional region within the national functional system. Furthermore, a series of processes of deindustrialization and deurbanization have caused the collapse of the economic continuity of central places in the Basque urban system (Precedo and Rodríguez 1989: 28).

Simultaneous with this reconstruction of the functional system, a process of reinforcement of regional divisions based on administrative boundaries has occurred. This was promoted by the approval of the autonomy of the regional states in Article 2 of the new Spanish Constitution in 1978, by the recognition and rehabilitation of regional languages in Article 3, and by the consequent establishment of regional autonomy. Through this process, there has been a growing tendency to analyze the Basque regional system as a cultural region, based on the ethno-cultural and demo-linguistic aspects of the population.

In ACBC, the Autonomous State Constitution was established in 1979. The Autonomous Council approved State Law No. 10, the "Law for the normalization of Basque," in 1982. Subsequently, public education came to be accepted as an important element in the promotion of Basque normalization. In addition, the normalization movement advanced in various fields such as education, administration and the mass media. This tendency has encouraged again the tendency to analyze the Basque regional system not as a functional region but as a cultural one.

The number of ethno-cultural studies focusing on the demo-linguistic situation in the region has increased because of the introduction of items about the competence and use of Basque in the State Census since 1981. This has made it possible to observe chronologically the spatial distribution pattern of demo-linguistic indicators. In this environment, various studies about the spatial pattern and the transition process of demo-linguistic indicators have been made (Eusko Jaurlaritza 1989; Garmendia 1994; Eusko Jaurlaritza and Nafarroako Gobernua 1995; Gobierno Vasco 1997, 1998, 1999; Gobierno Vasco et al. 1997, 2000).

The reinforcement of the administrative framework of ACBC inevitably raised the importance of Basque ethnicity. Ethnicity is an important theme of examination for ethnic geography. During the second half of the last century, various research projects and studies were carried out.

Ethnic separatism and ethnicity in the political field are important subjects of study for ethnic geography. However, language shift and the assimilation or integration process of ethno-linguistic minority groups can also become main themes. Studies of demo-linguistic aspects of population studies have examined the acculturation or assimilation process by utilizing specific variables. Some previous studies have indicated certain correlations between migration and the demo-linguistic dimension. One is a study of the correlation between human flow and the socio-cultural characteristics of the French population in Ontario by Hecht (1986). Another is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension. One is a study of the correlation between migration and the demo-linguistic dimension.

Language serves as an important issue for regionalism movements and the Basque case is no exception. Therefore, for the Autonomous States at present, understanding the spatial pattern of language use and its transition process has become one of the most important issues in
determining future policy. The spatial structure of population characteristics in the existing administrative units is an indispensable subject of study. Research concerning population characteristics has been developed in recent years focusing on factorial ecology. The existence of universal dimensions, such as social rank, life cycle, and origin, has been confirmed by applying the method of factor analysis throughout different regions in Spain. For example, Leonardo and Lavía (1990) applied factor analysis to Bilbao and Vitoria-Gasteiz, and confirmed the existence of three major dimensions of residential characteristic. These three dimensions were social rank, social origin, and youth-oldness. Lavía (1995) also applied factor analysis to the entire ACBC, and four main factors were extracted. These were: rural-industrial continuity, social rank, social origin, and tertiary centrality. Lavía (1995: 363) indicated that the dimension of social origin is sufficiently coherent with the characteristics of the ecological units in a gradation “Native-Immigrant.”

All studies, including those from ethnic geography, tend to emphasize social change in the “contact zone” (in other words, in the area where both Basque and Spanish are used along-side each other) and to treat lightly the transition process in the ethno-cultural core area. In the Basque Country, two provinces, Vizkaia and Alaba, contain both “contact zones” and areas with the Spanish host culture dominant. If the whole of ACBC was an object of spatial analysis, social change in the “contact zones” within Vizkaia and Alaba would draw more attention than change in the ethno-cultural core region of Basque culture.

The objective of this paper is to explicate the spatial structure of population characteristics and its shift in the ethno-cultural core region of the Basque Country, focusing on the province of Gipuzkoa (see Figure 1), which is distinguished by the relative high profile of the autochthonous characteristics of local residents compared with other provinces in ACBC. A
factorial analysis will be applied in order to clarify certain dimensions which regulate the formation and the shift of spatial structure in Gipuzkoa.

**Method of Study and Analysis**

In order to analyze the spatial structure of Gipuzkoan population characteristics, data sets from the demographic census released by the ACBC Statistics Institute (Euskal Estatistika Erakundea; Eustat) are utilized. In ACBC, the State Census has been conducted every five years since 1981.\(^5\)

The statistical unit area employed for this study corresponds to the udalerria, or municipality, which is the minimal statistical division in the state census.\(^6\) An analysis of multiple time phases is required in order to explicate the transitional process of spatial structure. Taking into consideration the concordance of unit area in each time phase, it was decided to employ the data sets of two phases of time, 1991 and 1996. Adjusting the boundaries for 1996 to coincide with those for the units of 1991, 87 units as shown in Figure 2 were prepared for both time phases.\(^7\)

In these two time phases, variables which represent comprehensive aspects of population characteristics in Gipuzkoa and which have common definition through both annual sections are examined from a wide range of demo-
Table 1. The input variables

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables (%)</th>
<th>No.</th>
<th>Variables (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td>Self-employed</td>
<td>26.</td>
<td>Employees</td>
</tr>
<tr>
<td>27.</td>
<td>Domestic workers</td>
<td>28.</td>
<td>Primary industry</td>
</tr>
<tr>
<td>29.</td>
<td>Manufacturing industry</td>
<td>30.</td>
<td>Construction</td>
</tr>
<tr>
<td>31.</td>
<td>Tertiary industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Education (≥10 years old)</td>
<td>33.</td>
<td>Secondary education completed</td>
</tr>
<tr>
<td>34.</td>
<td>Post-secondary education completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Original Basque speakers</td>
<td>36.</td>
<td>Original bilinguals</td>
</tr>
<tr>
<td>37.</td>
<td>People with partial loss of Basque</td>
<td>38.</td>
<td>People with total loss of Basque</td>
</tr>
<tr>
<td>39.</td>
<td>New Basque speakers</td>
<td>40.</td>
<td>New partial Basque speakers</td>
</tr>
<tr>
<td>41.</td>
<td>Original Spanish speakers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>Original Basque speakers with active Basque use</td>
<td>43.</td>
<td>Original Basque speakers with active of both languages</td>
</tr>
<tr>
<td>44.</td>
<td>Original Basque speakers with passive Basque use</td>
<td>45.</td>
<td>Original bilinguals with active of both languages</td>
</tr>
<tr>
<td>46.</td>
<td>Partial loss of Basque with active of both languages</td>
<td>47.</td>
<td>Partial loss of Basque with passive Basque use</td>
</tr>
<tr>
<td>48.</td>
<td>New Basque speakers with active of both languages</td>
<td>49.</td>
<td>New Basque speakers with passive Basque use</td>
</tr>
<tr>
<td>50.</td>
<td>New partial Basque speakers with active of both languages</td>
<td>51.</td>
<td>New partial Basque speakers with passive Basque use</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

* Definition of these categories and items depend on the classification established by the Direction of Studies and Information of the Vice-council of Language Policy of the Department of Culture, Basque Government. The definitions are given as below.

**Typology of language mobility** is established on the basis crossing of the variables of Mother tongue and Linguistic competence. The linguistic evolution of the individuals is put under analysis.

35. Original Basque speakers: whose mother tongue is Basque, and who understand and speak it “well.”
36. Original bilinguals: whose dual mother tongues are Basque and Spanish, and who understand and speak them “well.”
37. People with partial loss of Basque: whose mother tongue is Basque, or Basque and Spanish, and who speak Basque “with difficulty,” or who do not speak, understand, or read it “well.”
38. People with total loss of Basque: whose mother tongue is Basque, or Basque and Spanish, and who neither speak Basque nor understand or read it “well.”
39. New Basque speakers: whose mother tongue is Spanish or some other language apart from Basque, and who understand and speak Basque “well.”
40. New partial Basque speakers: whose mother tongue is Spanish, or some other language apart from Basque and who speak Basque “with difficulty,” or who do not speak, understand, or read it “well.”
41. Original Spanish speakers: whose mother tongue is Spanish, or some other language apart from Basque, and who neither speak Basque nor understand or read it “well.”

**Typology of language used in the home** is established on the basis crossing of the reduced typology of “Mother tongue” and the variable of “Language of use in the home.” The level of linguistic “activity” of the individuals is put under analysis.

42. Original Basque speakers with active Basque use: whose mother tongue is Basque and who understand and speak Basque “well,” and whose language use in the home is Basque.
42. Original Basque speakers with active Basque use: whose mother tongue is Basque and who understand and speak Basque "well," and whose language use in the home is Basque.

43. Original Basque speakers with active use of both languages: whose mother tongue is Basque and who understand and speak it "well" and whose language use in the home is Basque as well as Spanish.

44. Original Basque speakers with passive Basque use: whose mother tongue is Basque and who understand and speak Basque "well" but whose language use in the home is Spanish.

45. Original bilinguals with active of both languages: whose mother tongues are Basque and Spanish, who understand and speak both languages "well," and whose language of use in the home is Basque.

46. People with partial loss of Basque with active of both languages: whose mother tongue is either Basque, or Basque and Spanish, who speak Basque "with difficulty" or who do not speak, understand, or read the language "well" and whose language use in the home is Basque as well as Spanish.

47. Partial loss of Basque with passive Basque use: whose mother tongue is Basque, or Basque and Spanish, and who speak Basque "with difficulty" or who do not speak, understand, or read it "well" and whose language use in the home is Spanish.

48. New Basque speakers with active of both languages: whose mother tongue is Spanish, or some other language apart from Basque, who understand and speak Basque "well" and whose language use in the home is Basque as well as Spanish.

49. New Basque speakers with passive Basque use: whose mother tongue is Spanish, or some other language apart from Basque, who understand and speak Basque "well" and whose language use in the home is Basque as well as Spanish.

50. New partial Basque speakers with active of both languages: whose mother tongue is Spanish, or some other language apart from Basque, who speak Basque "with difficulty," or who do not speak, understand, or read it "well" and whose language use in the home is Basque as well as Spanish.

51. New partial Basque speakers with passive Basque use: whose mother tongue is Spanish, or some other language apart from Basque, who speak Basque "with difficulty," or who do not speak, understand, or read it "well" and whose language use in the home is Spanish.

In common with demolinguistic variables in almost all earlier studies, "percentage of Basque speakers" has been adopted as the single variable which represents the demo-linguistic situation of the population. However, in the state census, three major linguistic indicators exist. These are defined by Eustat as, "linguistic competence," "mother tongue," and "language spoken at home." It should be noted that in the 2nd Sociolinguistic Atlas (Gobierno Vasco 1997, 1998, 1999), newly calculated demolinguistic indicators, which show language shift between the three indicators of the State Census are presented. These data sets let us verify how the demo-linguistic characteristics acquired at infancy subsequently change. Therefore, in this study, demolinguistic variables from the 2nd Sociolinguistic Atlas are employed as well as those of the State Census.

In accordance with the procedure mentioned above, the 51 variables shown in Table 1 were prepared for analysis. Through the above procedures, a geographical data matrix of 2-time phases×87 statistical units×51 variables was created. To achieve the objective of this study, spatial structure based on population attributes was revealed by applying factor analysis to the data matrix.

Some extra procedures are required in order to compare the two distinct phases of time. In this analysis, the method employed by Taylor and Parks (1975) and Wakabayashi (1987) is adopted, in which two time phases are collected into one time-space dimension and factor analysis is performed on the data matrix which consists of time-space units and variables. In this case, it is necessary to maintain the similarity of factor structures in the two different time phases.8

A factor analysis is performed on the data matrix of 174 time-space units (2 time phases×87 spatial units)×51 variables. Through a series of procedures, a matrix of factor loadings of principal factors with eigenvalues of 1.0 or more are extracted. Furthermore, in order to make interpretation of factors easy, a direct valimax rotation is carried out on the matrix. In this way, each factor is interpreted based on the matrix of rotated factor loadings, and correlation with the factor structures which appeared in earlier studies can be verified. At this time, there are few previous studies which utilize factor analysis and examine population characteristics within an entire province, and therefore vast results of factorial ecology stud-
ies on urban areas within Spain and other regions have to be applied for interpretation. Next, a factor score matrix is calculated, and mapping factor scores according to two time sections, spatial pattern and annual transformation process, are clarified. Moreover, a cluster analysis is performed on the factor score matrix, and regional grouping based on population characteristics is attempted.

Population Characteristics and Change in Gipuzkoa

Factors and factor loadings

A principal axis factor analysis was performed on the data matrix of 174 time-space units × 51 variables. Consequently, 10 dimensions with eigenvalues above 1.0 were extracted. Furthermore, on applying a rotation according to the varimax criterion, the factor loadings shown in Table 2 were obtained. These account for 75.0% of the total variance. Furthermore, considering the scree plot of eigenvalues of these factors, there is a certain information gap between factor 6 and factor 7. Therefore, it can be interpreted that the factor structure is defined by six primary and four secondary dimensions, and the latter are of minor importance with regard to the total variance. Considering these characteristics of the structure, the objects of examination of this study can be limited to 6 primary factors.

Factor 1 explains 21.7% of the total variance, and is dominant compared with other factors. As is apparent from the composition of factor loadings, this factor presents a bipolar structure. High loadings (.500 and over) in absolute value are restricted to the variables of household structure, place of birth, typology of language mobility, and typology of language used in the home, presenting at the positive extreme a population which has the exogenous characteristics of nuclear family membership, persistent use of Spanish, and immigration from outside of ACBC. This is in contrast with the negative extreme, which is characterized by the presence of autochthonous residents represented by Basque natives, people who use Basque daily, and who are members of extended households. Considering the qualitative aspect, this dimension is very similar to that of “social origin,” but some variables with high loading such as partial loss of Basque and total loss of Basque represent the population which is losing Basque competence in spite of the fact that they are native Basque speakers or original bilinguals. Moreover, the variables of original Basque speakers with passive Basque use and those of partial loss of Basque with passive Basque use suggest the existence of a population which desires to identify with the dominant Spanish area though use of the Spanish language. In the same way, the variable of new Basque speakers with passive Basque use reflects the existence of a population which desires to belong to the dominant Spanish area through use of Spanish, despite having acquired a certain level of Basque competence. Therefore, this dimension can be defined as a reflection of “social identity,” representing a sense of social belonging and social origin simultaneously.

Factor 2, which explains 9.2% of total variance, is remarkably small compared with Factor 1. The variables with high loading are limited within the categories of occupation, employment status, and industrial structure. Only one variable, unskilled workers, has a loading of over .500, in contrast with the negative high loadings of primary industry, farmers and fishermen, self-employed, and compound family. When expanding the range of discussion to the loadings of .400, negative scores can be found for the variables of stem family, children per household and domestic workers. In contrast, there are positive loadings for the variables of nuclear family, employees, and manufacturing workers. This dimension, therefore, shows the existence of employed workers engaged in the manufacturing sector in the positive extreme and self-employed laborers engaged in the primary industry sector in the negative extreme. It reflects a dimension of regional difference of employment between the agricultural sector and the manufacturing sector. Consequently this dimension can be defined as that of “agricultural worker-manufacturing worker.”

Factor 3 accounts for 8.7% of the total variance. The variables which contribute to this
<table>
<thead>
<tr>
<th>No.</th>
<th>Factors</th>
<th>Factor loading</th>
<th>No.</th>
<th>Factors</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.</td>
<td>Original Spanish speakers</td>
<td>.915</td>
<td>48.</td>
<td>New Basque speakers with active of both languages</td>
<td>.589</td>
</tr>
<tr>
<td>49.</td>
<td>New Basque speakers with passive Basque use</td>
<td>.857</td>
<td>46.</td>
<td>Partial loss of Basque with active of both languages</td>
<td>.518</td>
</tr>
<tr>
<td>13.</td>
<td>Immigrants outside from ACBC</td>
<td>.851</td>
<td>47.</td>
<td>Partial loss of Basque with passive Basque use</td>
<td>.835</td>
</tr>
<tr>
<td>38.</td>
<td>People with total loss of Basque</td>
<td>.833</td>
<td>1.</td>
<td>0–19 age group</td>
<td>.780</td>
</tr>
<tr>
<td>37.</td>
<td>People with partial loss of Basque</td>
<td>.816</td>
<td>8.</td>
<td>Nuclear family</td>
<td>.649</td>
</tr>
<tr>
<td>46.</td>
<td>Partial loss of Basque with active of both languages</td>
<td>.507</td>
<td>5.</td>
<td>Widowed &amp; divorced</td>
<td>-.628</td>
</tr>
<tr>
<td>44.</td>
<td>Original Basque speakers with passive Basque use</td>
<td>.504</td>
<td>2.</td>
<td>65-age group</td>
<td>-.727</td>
</tr>
<tr>
<td>9.</td>
<td>Stem family</td>
<td>-.531</td>
<td>12.</td>
<td>Natives of ACBC</td>
<td>-.844</td>
</tr>
<tr>
<td>42.</td>
<td>Original Basque speakers with active Basque use</td>
<td>-.853</td>
<td>31.</td>
<td>Tertiary industry</td>
<td>760</td>
</tr>
<tr>
<td>35.</td>
<td>Original Basque speakers</td>
<td>-.903</td>
<td>20.</td>
<td>Clerical workers</td>
<td>.516</td>
</tr>
<tr>
<td>29.</td>
<td>Manufacturing industry</td>
<td>(.484)</td>
<td>18.</td>
<td>Professional &amp; technical</td>
<td>(.456)</td>
</tr>
<tr>
<td>26.</td>
<td>Employees</td>
<td>(.471)</td>
<td>29.</td>
<td>Manufacturing industry</td>
<td>-.609</td>
</tr>
<tr>
<td>8.</td>
<td>Nuclear families</td>
<td>(.449)</td>
<td>23.</td>
<td>Unskilled workers</td>
<td>-.729</td>
</tr>
<tr>
<td>9.</td>
<td>Stem families</td>
<td>(.401)</td>
<td>16.</td>
<td>Recent internal immigrants</td>
<td>.949</td>
</tr>
<tr>
<td>11.</td>
<td>Children per household</td>
<td>(.416)</td>
<td>15.</td>
<td>Non-immigrants</td>
<td>-.988</td>
</tr>
<tr>
<td>27.</td>
<td>Domestic workers</td>
<td>(.428)</td>
<td>10.</td>
<td>Compound families</td>
<td>-.558</td>
</tr>
<tr>
<td>25.</td>
<td>Self-employed</td>
<td>-.645</td>
<td>28.</td>
<td>Primary industry</td>
<td>-.824</td>
</tr>
<tr>
<td>28.</td>
<td>Primary industry</td>
<td>-.824</td>
<td>30.</td>
<td>Construction</td>
<td>-.742</td>
</tr>
<tr>
<td>22.</td>
<td>Farmers and fishers</td>
<td>-.826</td>
<td>33.</td>
<td>Secondary education</td>
<td>.705</td>
</tr>
<tr>
<td>39.</td>
<td>New Basque speakers</td>
<td>.839</td>
<td>34.</td>
<td>Post-secondary education</td>
<td>.671</td>
</tr>
<tr>
<td>51.</td>
<td>New partial Basque Speakers with passive Basque use</td>
<td>.750</td>
<td>32.</td>
<td>Elementary education</td>
<td>-.778</td>
</tr>
<tr>
<td>50.</td>
<td>New partial Basque Speakers with active of both languages</td>
<td>.697</td>
<td>40.</td>
<td>New partial Basque speakers</td>
<td>.671</td>
</tr>
<tr>
<td>44.</td>
<td>Original Basque speakers with passive Basque use</td>
<td>.515</td>
<td>3.</td>
<td>Single</td>
<td>-.736</td>
</tr>
<tr>
<td>36.</td>
<td>Original bilinguals</td>
<td>.676</td>
<td>45.</td>
<td>Original bilinguals with active of both languages</td>
<td>.673</td>
</tr>
</tbody>
</table>

Total: 75.0% of the total variance
dimension are limited to those of linguistic status. The two categories considered are typology of language mobility and typology of language use in the home. The variables all have positive high loading and therefore indicate that the subjects achieve Basque competence even when their mother tongue is a language other than Basque or when they have another language and Basque as mother tongues. Simultaneously, these variables include Basque speakers whose mother tongue is Basque and who have adequate Basque competence. Synthetically, they show a population, which does not use Basque actively in the home. For this reason, this dimension can be interpreted as showing the “difference between the acquisition of Basque competence and its use,” which represents the population capable of passive Basque use in spite of having recently acquired Basque capability or native-like Basque competence.

Factor 4 explains 7.4% of the total variance, and variables which contribute to this factor are also restricted to typology of language mobility and language use in the home, as with Factor 3. The variables with positive high loading all represent the population which uses both Basque and Spanish actively in the home domain, in spite of having distinct attributes of Basque competence and mother tongue. Therefore, this dimension can be interpreted as representing those subjects with “active use of both languages.”

Factor 5 accounts for 6.8% of the total variance. In the negative extreme, this dimension illustrates the existence of an elderly population whose members have lost a spouse and become single householders. In the positive extreme, it represents a youthful population whose members belong to nuclear family households. Therefore, this dimension can be interpreted as that of “youth-old age stage.” In earlier studies, similar dimensions represented by family status have been extracted as principal factors.

Factor 6 accounts for 6.1% of the total variance. This dimension can be interpreted as that of “occupational status,” and is expressed in the positive extreme by the presence of high status white-collar workers belonging to the tertiary industry sector, and in the negative extreme by the existence of blue-collar workers. The first factor extracted by Leonardo and Lavía (1990) in the cases of Bilbao and Vitoria-Gasteiz, and the second factor extracted by Lavía (1995), were denominated as “social rank,” and it was claimed that they represented the dimension of socio-economic status.

Verification of factor structure

By comparing the factor structure described above with those of previous studies, the characteristics of the factor structure extracted in this analysis can be understood.

Factor 1 extracted in this analysis corresponds to the dimension of social identity, which is similar to the dimension of “social origin” mentioned in former factorial ecology studies focusing on urban areas (Diaz 1989; Leonardo and Lavía 1990). At question is whether the dimension of social origin should be extracted independently or whether it should be included in other dimensions. According to Leonardo and Lavía (1990: 105), the dimension of social origin “reflects the importance of the native/immigrant characteristic of the population, and of the set of socio-cultural variables assigned to this basic dimension.” Therefore, the dimension of “social origin” can be defined as a combined form of “ethnic status” and “migration status” which has been extracted in factorial ecology studies in North America (Berry 1971; Rees 1971).

In factor analyses for some regions within the Basque Country, social origin has been extracted as an important dimension (Leonardo and Lavía 1990; Lavía 1995). In a factorial analysis of ACBC by Lavía (1995), the dimension of social origin was extracted as the third factor. In a comparative analysis of Bilbao and Vitoria-Gasteiz by Leonard and Lavía (1990), social origin was extracted as the second dimension in Bilbao. In a city such as Bilbao, large numbers of immigrants are concentrated seeking employment opportunities. The importance of variables regarding birthplace inside and outside the region and related cultural and social origin indicators are reflected in this dimension (Leonardo and Lavía 1990: 105).

Arrival year, or immigration stage, has been
identified as an important component of the social origin dimension in various cases (Leonardo and Lavía 1990; Lavía 1995). Occasionally, however, a dimension of immigration stage is extracted independently, such as in the cases of Madrid (Castelles 1986), and Malaga (Ocaña 1985).

In other cases, variables related to "origin" contribute to the dimension of socio-economic status. For example, in the analysis of Vitoria-Gasteiz excluding the variables of immigration stage by Leonardo and Lavía (1990), social rank was extracted as the first dimension. This dimension showed high loadings for some variables related to "origin" besides those of socio-economic status. Such a dimension, which joins together the dimensions socio-economic status and social origin, has also been reported in the cases of Sant Adrià de Besos (Sola-Morales 1970) and of Barcelona (Ferras 1977), where immigrants have been concentrated mainly for economic reasons.

The dimension of "origin" does not necessarily correlate only with socio-economic status. The phenomenon in which variables related to origin correlated with multiple dimensions in a complex mode was reported in the factor analysis of Alcalá de Henares by Díaz (1988). Díaz notes a dimension which includes the multiple dimensions of life-cycle, social origin and immigration stage and which was extracted as a first factor. A dimension of socio-economic status was also noted independently as a second factor. Both of these factors accounted for almost the same percentage of total variance. Díaz interpreted the first factor as a dimension of "immigration," and considered that the first factor illustrates an urban development stage which represents the residential differentiation between traditional areas, where non-immigrant and old age groups dominate, and new areas, where immigrants and the younger age groups are concentrated.

Considering these results of previous studies with regard to household structure, it can be stated that Factor 1 of this analysis reflects the variety of dominant household types of non-immigrants and immigrants, placing stem families in the negative extreme and married couple families in the positive extreme. That is to say, the immigrant population from outside the state correlates with the small-scale household structure based on a nuclear unit of wife and husband, while in contrast the non-immigrant population correlates with the traditional Basque extended household structure, typically represented by multiple family nuclei and with a traditional residential style in basseri, or caserío.

Factor 2 represents the dimension of difference of employment between the agricultural sector and the manufacturing sector. This dimension is similar to the first dimension of rural-industrial socio-demographic continuity extracted by Lavía (1995). In the case of Lavía (1995), in addition to the variables of certain socio-economic aspects such as occupation, employment status and industry, the contribution of the variables of age group and household structure is observed. Furthermore, in the case of Lavía (1995), the dimension of social rank was extracted independently as a second dimension. Also, with regard to the first dimension of rural-industrial socio-demographic continuity, two types of unskilled blue-collar workers were considered in the bipolar structure. These were employed unskilled workers in the manufacturing sector and self-employed farmers in the primary industry sector. These two are generally located in the same rank in axes, and this dimension was not included in occupational rank (Lavía 1995: 323). In the same way, in this analysis, the dimension represented by Factor 2 is employment status, using criteria from within the primary industry sector and the secondary industry sector, which were extracted independently from the sixth dimension of social rank. When analyzing on the provincial scale, the spatial difference based on employment status in the primary and secondary industry sectors becomes more important than occupational rank. Therefore, this second dimension can be interpreted as having extracted employment status within primary and secondary industries, compared with the sixth dimension, which is concerned with occupational rank.

Factor 3 and Factor 4 represent demolinguistic dimensions because they are limited to the contribution of variables related to two
demo-linguistic categories: typology of language mobility and typology of language use in the home. Demo-linguistic variables have been used as indicators of social origin or human mobility until now. In this analysis, however, several variables related to the demo-linguistic situation contribute to the first dimension of social origin. The variables which contribute to Factor 1 indicate a tendency toward devotion to either the Basque or the Spanish cultural domain. These variables could serve as an indicator not only of the dimension of social origin but also of membership of autochthonous population groups and immigrant groups. Furthermore, the variables which contribute to the third and the fourth dimensions illustrate transmovement between the specific indicators of the Basque and Spanish languages, and represent the dimension of diversity in population characteristics based on language.

One possible reason behind the figures obtained in the extraction of Factor 3 is a certain growth tendency in recent years of the population which is classified within the category of "new Basque speakers," who have acquired Basque competence recently. According to the 2nd Sociolinguistic Atlas, "new Basque speakers" are those who have sufficient competence to understand and hold conversations in Basque, although their mother tongue is not Basque. "Partial new Basque speakers" are those who understand and speak Basque to a certain extent and whose mother tongue is not Basque. In Gipuzkoa, new Basque speakers numbered 3.6% of the population of 5 years or over in 1986, and increased rapidly to 9.3% in 1996 (Gobierno Vasco 1999: 82).

The principal reason for such an increase is the advance in the normalization of Basque in the education sector. The Basque language was introduced into public education after the establishment of regional autonomy. At the beginning stage, when three models of language oriented education were introduced in the 1982/83 academic year, 23.41% of the students in compulsory education in Gipuzkoa learned according to "Model D," which utilizes Basque as a language of material description and instruction, and accompanies Spanish language instruction. The students registered in Model D increased rapidly to 46.53% in 1996/97. Consequently, the phenomenon of a concentration of new Basque speakers within the younger generation of 20 years and under was observed (Gobierno Vasco 1997: 60). This section of the younger generation has acquired competence in Basque as a second language at school. As for their parents' generation, it is common to use Spanish at home. Consequently, in spite of the increased acquisition of Basque competence, the status of the Basque language has come to be reduced in the home (Gobierno Vasco 1999: 53).

Not only age structure, but also Basque population density in the home could have an effect on domestic language use (Gobierno Vasco 1997: 60). In Gipuzkoa, regional differences in Basque population density are noticeable, and there are differences between the areas with a high concentration of home units containing Basque speakers and those with a low density. To such a spatial demo-linguistic difference, the recent demo-linguistic element of the increase in the number of new Basque speakers has been added, and consequently a complicated linguistic environment has been generated.

Factor 4 indicates that language use in the home is influenced principally, at first, by Basque speaker density in the language network, and secondarily, by relative linguistic competence (Gobierno Vasco 1997: 40). It is also mentioned in this study that the frequency of Basque use in the home declines drastically as Basque population density drops, compared to the cases of Basque use between friends and within the workplace. This dimension reflects the recent increase in the number of Basque speakers, and the subsequent rise in communication network density.

Factor 5 and Factor 6 in this analysis correspond to two universal dimensions, namely family status and socio-economic status, which have been commonly extracted in earlier factorial ecological studies for a variety of urban areas in Spain or in ACBC. Furthermore, a tendency for family status to be particularly significant in its contribution to variables related to age structure corresponds to the findings of former studies about regions in ACBC or...
Spatial differentiation of population characteristics

It becomes possible to examine the spatial distribution patterns and transition processes of population characteristics in Gipuzkoa by mapping the factor scores for the six factors according to two annual phases as shown in Figure 3 and Figure 4.

In the case of Factor 1, high score units appear frequently for both years in urban areas and the surrounding zone. In Donostia-San Sebastián and the surrounding zone, high scores of over 1.0 σ appear. Donostia-San Sebastián developed as a center for tourism and related tertiary industry. At the same time it has been the administrative center of the province. There has been a concentration of immigration, from both inside and outside the province, of people in search of employment opportunities in the tourism service sector and related industries. This could be a principal cause of the appearance of high scores in the provincial capital and the surrounding commuter zone.

High score units are also found in inland industrial zones, such as the Urola Valley which
extends from Zumárraga to Legazpi, and also in Beasain, Arrasate, and other places where industrial polygons are located. There is a certain degree of concentration of immigrants from outside ACBC. High scores are observed also in regional centers, such as Irun, the border city, Eibar, the second largest city in Gipuzkoa, and their surrounding areas. In contrast, some local urban centers such as Tolosa and Azpeitia show low scores below 0 \( \sigma \). Formerly, Tolosa was the capital city of Gipuzkoa, and the history of its development as an industrial center of the area since the medieval era is reflected in the sense of identity of the population and the low score. In the case of Azpeitia, which has prospered since the medieval era as a commercial center of the Urola-Kostaldea region, its low score reflects the attributes of the autochthonous population which has lived there.

Relatively low score units below \(-1.0 \sigma\) are concentrated in mountainous rural areas extending from Tolosaldea to Goierri. In addition, many low score units below \(-0.5 \sigma\) can be found in the region of Urola-Kostaldea, where mountains and highlands extend close to the shore of the Cantabirian sea. This area, extending from the regions of Tolosaldea and Goierri to Urola-Kostaldea, is called the "cradle of the Gipuzkoan dialect of the Basque language," where the physical feature of undulating mountains has restricted population mobility within the sub-regions since early times, and a unique dialect has been conserved until today.

When comparing the factor scores of the two annual phases, a remarkably noticeable rising score is observed in areas where low scores were dominant in 1991. Such areas are the peripheral zone of Donostia-San Sebastián, Arrasate, a newly industrialized urban center in the western part of the province, Tolosaldea (mainly in Tolosa), and Goierri. In the case of the surrounding zone of Donostia-San Sebastián, the rise in the score is caused by the increasing influence of the central place and the subsequent enforcement of endogenous characteristics. In Arrasate, an improvement of the highway network in recent years connecting the area to the state capital, Vitoria-Gasteiz, had the effect of raising the score. In the case of the area extending from Goierri to Tolosaldea, throughout the central axis of this area from north to south, improvement and double-tracking work on National Road 1 is under way. This principal and important national route connects this area to the north (Donostia-San Sebastián and the French border), and to the south (the state capital, Vitoria-Gasteiz and the national capital, Madrid). In these areas, undulating physical features have been an obstacle and have delayed road network improvements. Improvements of the main road network and the accompanying activation of interchange with external regions influence the loss of traditional attributes of origin and identity in this area. Consequently, such an environment raises factor scores in the area.

A clear spatial distribution pattern cannot be observed in the case of Factor 2, which represents the dimension of employment in primary and secondary industry. This may be because secondary industry employment in Gipuzkoa is decentralized and exists throughout the whole region (Ferrer and Precedo 1977: 56). Therefore, high score and low score units are mingled.

High scores do not appear generally in urban areas where employment in the secondary industry sector is concentrated, although high scores are rather more common in urban peripheral zones. This could be because employment clusters of workers who live in the surrounding commuter belts are reflected in the high scores of the urban periphery rather than in urban centers, where a variety of employment clusters exist. High scores appear in the mountainous municipalities of eastern Tolosaldea in both 1991 and 1996. In eastern Tolosaldea, Berastegi and Amezketa show scores over 1.0 \( \sigma \), and in the northern part, Aduna shows over 0.5 \( \sigma \). In all of these mountainous rural settlements, paper mill factories are commonly located, and the employment of local residents is reflected in the high scores.

On the other hand, low scores appear in Aia, Errezil, and Beizama within Urola-Kostaldea. Those municipalities specialize in forestry and cattle raising. There are also low scores in Getaria and Hondarribia, which are fishery bases. The rising scores from 1991 to 1996 in Tolosaldea and Goierri are particularly remark-
able. In this area, a series of shifting processes within the industrial structure from primary to secondary industry, and within the employment structure from self-managed to employed, are under way.

The spatial distribution of the factor scores of the third dimension in 1991 is characterized by the high scores in large urban centers such as Donostia-San Sebastián and Eibar and their peripheral zone. This spatial pattern reflects the existence of a population, which acquired Basque competence with the advancing process of the normalization of Basque within schools in large urban centers and in suburbs where exogenous characteristics are dominant.

High scores are also found in the inland urban center Tolosa and its surroundings. Although it is an area in which autochthonous attributes are dominant, the high scores reflect a process of Basque speaker revival accompanied by the popularization of Basque education since the 1980s in an urban center where the inclination to the Spanish realm had formally been dominant because of active interchange with the external zone. Simultaneously, high scores are observed in the rural municipalities within the regions of Deba Behera and Deba Garaia. This is because these regions have a relatively low density of Basque speakers, and the effect of Basque education has been noticeable compared with the high density zone.

By contrast, low scores are found in the mountainous rural areas within the regions of Tolosaldea, Goierri, and Urola-Kostaldea. In these regions, active Basque use is observed within an environment with a high density of Basque speakers, and the existence of actual Basque speakers is reflected in the low score.

In a time series, the tendency toward score decline at a wider, provincial level is remarkable. High scores of over 1.0σ can be observed only in a few urban centers such as Donostia-San Sebastián, Hondarribia, Eibar and Tolosa. Two causal points should be considered. Firstly, originally, Gipuzkoa had already arrived at a maximum level of Basque identification because of the existence of a high density of Basque speakers. Second, the population with active Basque use in the home has increased in response to ongoing Basque normalization in the mass media, administration, and education. These phenomena act to reduce the differences between Basque competence and Basque use in the home. Furthermore, it is possible to interpret that the results show a qualitative transformation of peoples' negative perceptions of the Basque language, which had been considered a "low language" formerly. Recent change in the linguistic situation was reflected at the time of the State Census, and the data value of Basque use rose.

With regard to Factor 4, low scores appear in urban centers such as Donostia-San Sebastián, Eibar, Irun, and its periphery. Furthermore, there are low scores also in mountainous municipalities within the regions of Tolosaldea, Goierri and Urola-Kostaldea. Since low scores reflect a low incidence of bilingualism, the low scores in urban centers reveal Spanish monolingual use, and in mountainous regions, Basque monolingual use. With regard to urban centers, high scores are found in some traditional cities, such as Tolosa and Onati. This could be because the existence of a population with exogenous attributes appears in bilingual use in spite of the fact that it is situated within the Basque influenced zone.

In the time series, there was a noteworthy rising score in the western part of the province, especially in the regions of Deba Behera and Deba Garaia. A rising score is in fact observed also almost all over the province except for in the mountain municipalities within the regions of Tolosaldea and Goierri.

The wide variety of demo-linguistic environments cannot be explained simply in terms of human mobility. The advance of the Basque normalization process (particularly in the field of public education) since 1982 has produced a steady increase in the number of Basque speakers in the younger generation. The percentage of Basque speakers of two years and over in Gipuzkoa increased from 21.5% in 1981, to 24.6% in 1986, 26.3% in 1991, and finally to 30.9% in 1996 (Eustat 1999: 162). According to this data, the recovery of Basque language development can be interpreted optimistically. Nevertheless, the rate of Basque use for conversation in the home domain is declining slightly; from 13.8% in 1991 to 13.6% in 1996 (Eustat
These data represent the relationship between Basque and Spanish within present Basque society. In Gipuzkoa, where Basque speakers are mostly concentrated among the three provinces of ACBC, the rate of Basque speakers with active Basque use in the home has declined as far as 23.6% for the 25–29 age group, compared with 32.6% for the 5–9 age group or 34.4% of the 2–4 age group. These data reflect the ongoing phenomenon of the relinquishing of Basque use in some age groups. This occurs when Basque users leave the public education system and become independent of family. In spite of having used Basque in the home domain in childhood, for these people Spanish has become the high language of the workplace and Basque the low language.

Although linguistic competence increases with education, everyday language use is influenced by the status of languages in society. Improvements in the status of Basque and the establishment of the Basque-based educational model have achieved steady success. This is also true within the administrative scene. Furthermore, the Basque government is promoting a plan for the normalization of Basque use in the workplace environment in order to improve the low status of the language. The binary linguistic situation which currently exists is known as diglossia, and the validation of Basque status through public education has yet to appear.

The principal characteristic of the distribution of the Factor 5 score is in time series transformation. In 1991, low scores of $-1.0$ below are found only in inland mountainous units, and scores of $-1.0 - 0.5$ appear both in mountainous units and also in large urban centers such as Donostia-San Sebastián and Elbar. Conversely, high scores are found notably in peripheral zones of Donostia-San Sebastián, and this could be a result of the emigration from the urban area of the younger generation which desires housing space which is both economical and large. High scores are observed also in the inland municipalities within the industrial polygons and their surroundings. This is a reflection of the presence of a younger generation who find employment in those areas.

Factor scores decline remarkably in the whole province in 1996. This decline could be caused by the transformation of family structure which Gipuzkoa has experienced in recent years. The recent transformation of household structure is characterized by a decrease in the number of nuclear family households with children, stem family households, and compound family households, in contrast to an increase in the number of nuclear family households without children, single parent households, and single householders (Eustat 1999: 132). It is obvious that, behind this structural change, there is a series of demographic transitions represented by fertility decline, aging and an increasing divorce rate. The provincial scale of this change exceeds the national level and also the whole EU level. Especially, in the mountainous rural area within Tolosaldea and Góierri, low scores of $-1.0$ and below appear because depopulation and aging in this area accelerate the transition process of age structure composition.

The spatial distribution of the scores for Factor 6 is characterized by high scores in Donostia-San Sebastián and its suburbs. High scores are also found in some traditional commercial centers such as Azpeitia and Tolosa, and their surroundings. In any case, high scores commonly appear in central places and their surroundings, where the population continues to increase as a result of the occupational characteristics of the upper socio-economic class who specialize in tertiary industry and reside in the inner-cities and their suburbs. In coastal areas, luxury seashore resorts, such as Hondarriba and Zarautz, show high scores, reflecting the occupational status of the upper class who have residences or second houses in these resort areas. Low scores are found in the units with small populations in the mountainous areas within Deba Garaia, Tolosaldea, and Góierri. The rural characteristic of these areas is reflected in the low scores. Although a similar pattern of spatial differentiation is maintained throughout the time series, an overall increase is observed in the province as a whole. This is a result of the shift of industrial structure to tertiary industry which is ongoing throughout Gipuzkoa.
Regional Typology Based on Population Characteristics

Cluster analysis

Utilizing the results of the factor analysis, integration and categorization of each dimension was attempted in order to clarify regional typology. A cluster analysis was adopted as the method to categorize regional groups. Specifically, by using a factor score matrix of 174 time-space units (2 time phases × 87 spatial units) × 6 dimensions, the Ward's Method cluster analysis was performed, in which proximity is calculated and categorized and statistical units were combined together one after another hierarchically depending on proximity. At the stage where there was a sharp change in information loss, a dendrogram was cut. Consequently, nine regional groups were identified as shown in Figure 5.

Cluster A has low mean scores for Factor 1 (−.697) and extremely low for Factor 2 (−2.505), as shown in Table 3. The cluster is characterized by identification with the autochthonous society, and contains self-managed employees in the primary industry sector, a sedentary population, and Basque speakers. This cluster is heavily represented in the authentic rural municipalities such as Aia, or in fishing industry villages such as Getaria, within a high concentration area of Basque speakers extending from Tolosaldea, Goierri, to Urola-Kostaldea. If the spatial distribution of Cluster A in 1991 is compared with that of 1996, the number of units belonging to this regional group decreased from 8 to 5 as a result of shift of industrial activity from primary to other sectors.

Cluster B is distinguished by low mean scores in Factor 1 (−.632) and Factor 3 (−.596), and by a high score in Factor 2 (.947). Therefore, this is a group of units with strong identification with the Basque autochthonous realm, and a sparse population with Basque recognition in spite of a
Table 3. Mean scores of factors in each cluster

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster A</td>
<td>-.697</td>
<td>2.505</td>
<td>-.184</td>
<td>-.242</td>
<td>.187</td>
<td>.057</td>
</tr>
<tr>
<td>Cluster B</td>
<td>-.632</td>
<td>.947</td>
<td>-.596</td>
<td>-.195</td>
<td>-.251</td>
<td>.282</td>
</tr>
<tr>
<td>Cluster C</td>
<td>.073</td>
<td>.197</td>
<td>-.096</td>
<td>.445</td>
<td>1.025</td>
<td>-.456</td>
</tr>
<tr>
<td>Cluster D</td>
<td>-.667</td>
<td>-.267</td>
<td>-.274</td>
<td>-.886</td>
<td>-.844</td>
<td>-.338</td>
</tr>
<tr>
<td>Cluster E</td>
<td>1.304</td>
<td>.220</td>
<td>.746</td>
<td>1.1099</td>
<td>.553</td>
<td>-.703</td>
</tr>
<tr>
<td>Cluster F</td>
<td>-.366</td>
<td>.166</td>
<td>1.767</td>
<td>.790</td>
<td>-.560</td>
<td>-.236</td>
</tr>
<tr>
<td>Cluster G</td>
<td>2.081</td>
<td>.257</td>
<td>.902</td>
<td>-.895</td>
<td>1.181</td>
<td>1.828</td>
</tr>
<tr>
<td>Cluster H</td>
<td>-.204</td>
<td>-.223</td>
<td>.037</td>
<td>.537</td>
<td>.534</td>
<td>1.755</td>
</tr>
<tr>
<td>Cluster I</td>
<td>1.346</td>
<td>-.054</td>
<td>-.764</td>
<td>.811</td>
<td>-.438</td>
<td>-.235</td>
</tr>
</tbody>
</table>

Note: Figures in bold are .500 and over in absolute value.

recent acquisition of Basque competence. There is a high rate of employment in the manufacturing sector. Although this group is found mainly in the municipalities within Tolosaldea, Goierri, and Urola-Kostaldea (similar to Cluster A), it includes principally inland units within the industrial polygon and its surroundings. Components of Cluster B increased notably from 10 in 1991 to 21 in 1996. This is a reflection of changing employment patterns in the population, which have shifted from the primary industry sector.

In Cluster C, a high mean score appears in Factor 5 (1.025) and a relatively high one in Factor 4 (.445). In contrast, Factor 6 (−.456) shows a relatively low mean score. Therefore, this is a group of regional units where the younger generation is relatively prevalent, bilingualism in the home is widespread and in which relatively low status workers exist. In this category are included small-scale local urban units such as Villabona, Azcoitia and Onati, and also Tolosa’s surrounding municipalities. The number of components decreased considerably from 27 districts in 1991 to 7 in 1996. This is obviously a reflection of decline in fertility which has been notable in the whole province.

Cluster D has low scores in Factor 1 (−.667), Factor 4 (−.886) and Factor 5 (−.844). This is a group of regional units in which a population showing remarkable identification with autochthonous Basque society is dominant and in which aging and depopulation is underway. The importance of bilingual use is relatively low because of the dominance of Basque monolingual use in the home domain. Examples are mountainous rural districts where aging is proceeding quickly and where Basque speakers are dominant, such as some municipalities within Tolosaldea and Goierri.

Cluster E is characterized by high mean scores in Factor 1 (1.304), Factor 3 (.746) and Factor 4 (.553), and by low scores in Factor 4 (−1.099) and Factor 6 (−.703). Therefore, this can be defined as a group of regional units distinguished by a population which is characterized by exogenous identity. In this cluster there are large number of Spanish speakers and immigrants, and Spanish monolingual use in the home domain is common, in spite of a tendency toward recent acquisition of Basque competence. The cluster is, moreover, distinguished by the existence of a younger age group and lower occupational status. In 1991, Cluster E contains Irun, inland industrial centers such as Arrasate, Legazpi, and Renteria, and the zone surrounding Donostia-San Sebastian. The number of components decreases from 11 in 1991 to 3 in 1996.

Cluster F has an extremely high mean score in Factor 3 (1.767), and also a high mean score in Factor 4 (.790). There is a low mean score in Factor 5 (−.560). This indicates a regional group in which passive Basque users are dominant in spite of the existence of a population with recent acquisition of competence in the language. In contrast, bilingual language use is observed in the home domain because of the relatively high density of Basque speakers, and the cluster is distinguished by the presence of an aging population. Traditional urban centers
such as Tolosa, Eibar and their surrounding municipalities belong to this cluster.

Cluster G shows extremely high mean scores in Factor 1 (2.081) and Factor 6 (1.828), and also a high mean score in Factor 3 (.902). Simultaneously it shows low mean scores in Factor 4 (−.895) and Factor 5 (−1.181). Therefore, this is a group of regional units which contains a population who identify with exogenous attributes and who have high occupational status represented by employment in the service sector. Furthermore, it contains an aging population, new Basque speakers with passive Basque use and passive bilingual use in the home domain as a result of the low density of Basque speakers in the area. In other words Spanish monolinguals are dominant. This cluster has an extremely restricted composition, containing in 1991 only one unit, Donostia-San Sebastián, and in 1996 four units, including Donostia-San Sebastián and its surrounding municipalities. It is indicated that, in this small number of units, in other words in the primate city of the province and its periphery, the number of new Basque speakers has increased steadily although the Basque population is small. Simultaneously there exists a dominant identification with the Spanish realm and dependency on the tertiary industry sector.

Cluster H has an extremely high mean score in Factor 6 (1.755), and relatively high scores in Factor 4 (.537) and Factor 5 (.534). Therefore, this is a regional group distinguished by the existence of a population with a higher occupational achievement in tertiary sector employment, and a tendency toward bilingual use in the home domain. The population is also dominated by the younger age group. Some coastal resort municipalities such as Hondarribia and Zarautz, and suburbs of Donostia-San Sebastián are included in this cluster. This regional group reflects dependency on the tertiary industry sector such as tourism within such resorts, the existence of an economically active population in suburbs of the largest urban center, and a relatively high density of the Basque population network.

Cluster I has high mean scores in Factor 1 (1.346) and Factor 4 (.811). This is in contrast to a low mean score in Factor 3 (−.764) and a relatively low score in Factor 5 (−.438). Therefore, the cluster contains the regional units distinguished by identification with the Spanish dominant realm. It reflects an absence of new Basque speakers with passive Basque use and at the same time the existence of the importance of bilingual use in the home. An aged population group also predominates in this cluster. A further characteristic of this regional group is its complete absence in 1991, and the new appearance of 20 units in 1996. Units which belonged to Clusters C and E in 1991 moved to this category. This shift can be interpreted as a reflection of recent fertility decline and aging, both of which are in rapid progress.

Examination of regional typology formation

The characteristics and distribution patterns of these 9 clusters thus became clear, and it now subsequently became possible to examine the regional structure of Gipuzkoa based on these regional groups.

In all clusters apart from C, F, and H, the certain contribution of Factor 1, i.e., the dimension of social identity, is observed. Of these 6 clusters, E, G, and I all have an extremely high mean score for Factor 1. The set of Cluster E, G and I could be defined as a superior group with exogenous social identity dominant. There are 12 units belonging to Cluster E in 1991. Of these, 3 units shifted to Cluster G and 6 units to Cluster I in 1996. The shift from Cluster E to Cluster G can be explained as a result of the process of industrial shift to the tertiary sector, and fertility decline. The shift to Cluster I can be understood by a recent advance in reversing language shift.

Cluster I did not exist in 1991, and 20 components appeared in 1996. Compared with Clusters E and G, the mean scores of Factor 3 and Factor 4 in Cluster I are inverted. Therefore, Cluster I is marked by the absence of new Basque speakers with passive Basque use, and by the importance of bilingual use in the home. The appearance of such a regional group, showing a dimension of the demo-linguistic environment in which Basque competence is newly acquired and bilingual use in the home is dominant, is a reflection of recent advances in the Basque normalization process, or reversing lan-
guage shift, mainly in the home domain. The units belonging to Cluster I are found in the industrial areas in the west and south of the province, such as Deba Beherea, Deba Garaia and Goierri. In Deba Beherea and Deba Garaia, the density of Basque speakers has been relatively low, and the same can be said of some municipalities specializing in manufacturing activities in Goierri. In the same way, units of Cluster I are also found in the southern suburbs of Donostia-San Sebastián. The shift of this area to Cluster I reflects the recent advance in reversing language shift in this area, which is strongly influenced by identification with the exogenous realm. Although in these areas, the density of Basque speakers is relatively low for Gipuzkoa, the rapid shift to Cluster I is caused by the existence of an adequate Basque speaker network in the home domain to allow a certain degree of reversing language shift from dominant Spanish use to active bilingual use.

Regional groups in areas where industrial activity is dominant reflect the regional characteristics of each municipality in spite of being correlated in a complex way with several other dimensions such as life cycle, social origin, and occupational status. With regard to the kind of industrial activity, Cluster A specializes in the primary industry sector, Clusters B, C, and E specialize in the secondary industry sector, and Clusters G and H are strong in the tertiary industry sector.

Moreover, the transformation of employment structure can be understood by examining the shift process between typologies from 1991 to 1996. A shift from Cluster C and E dominance, with high secondary industry sector employment, to Cluster G and H dominance, with high tertiary industry sector employment is especially notable. In particular, Irun, Pasaia and Renteria, which shift from Cluster E to Cluster H, are satellite cities of Donostia-San Sebastián, and are influenced strongly by the industrial structure of the province.

Conclusion

This paper has aimed to analyze the spatial structure of population characteristics and its shift in the province of Gipuzkoa, which has a particularly high density of Basque speakers. The results can be summarized as follows.

At first, in order to resolve the pattern of residential differentiation based on the population characteristics in Gipuzkoa, State Census data for 1991 and 1996 were used, and geographical matrixes of 87 units × 51 variables were prepared for each time phase. Simultaneously, in order to resolve simultaneously the spatial transition pattern form 1991 to 1996, the geographical matrixes of each time phase were combined, transforming to a single data matrix composed of rows of 174 time-space units (2 time phases × 87 units) and columns of 51 variables.

Secondly, as a result of applying a factor analysis to the geographical matrix, 10 factors were extracted. These accounted for 75.0% of the total variance. The principal 6 factors represent dimensions of, sequentially from Factor 1, social identity, agricultural-manufacturing workers, difference between acquisition of Basque competence and its use, active bilingual use, youth-old age cycle, and occupational status.

Factor 1 represents the dimension of social identity, which shows the ethno-cultural divergence of the Gipuzkoan population. Factor 5 and Factor 6 correspond respectively to the dimensions of family status and socio-economic status extracted commonly in earlier factor analyses. The contribution of demo-linguistic variables to the dimension of social origin has been discussed in previous studies. However, in this paper, variables representing demo-linguistic characteristics also contributed independently to Factor 3 and Factor 4, reflecting respectively the demo- and socio-linguistic situations in Gipuzkoa.

Next, by mapping factor scores, examination and comparison of the principal dimensions of 1991 and 1996 were attempted, in order to verify the spatial patterns and the time-series shift of each dimension.

Finally, in order to clarify regional characteristics, clustering of regional typology was attempted in accordance with the similarity of factor scores. A cluster analysis was performed on six principal factors. Consequently, nine regional types based on the population charac-
teristics of Gipuzkoa were drawn out.

Throughout this analysis, certain shift processes became obvious, such as socio-economic changes to industrial and employment structure, demographic change represented by aging and fertility decline, and a certain degree of advance in reversing language shift.

As mentioned above, the dimension of social origin was the most important for spatial differentiation based on the population attribution in Gipuzkoa. Furthermore, it is unique and noteworthy that the demo-linguistic dimensions were extracted independently as the 3rd and 4th dimensions. However, the presence of demo-linguistic dimensions is considered to be natural rather than exceptional.

In Gipuzkoa, as in ACBC and Catalonia in general, an enthusiastic regionalism movement can be observed and a revival of regional language is taking place. Formerly, in the Basque country, many nationalist leaders had insisted on the special nature of the racial status of the Basque ethnic group, and a movement emphasizing the pureness of racial blood was prevalent. However, currently in ACBC, including Gipuzkoa, the State Government is the primary force in Basque language normalization and promotion politics. The principal political goal is to give the Basque language higher status in various aspects of the demo-linguistic environment.

Within the dimension of social identity, this study has identified a situation of cultural pluralism which supports the typical dualistic environment of a bipolar structure of Basque autochthonism and exogenous non-autochthonism. However, the contributions of birthplace and linguistic competence do not mean an exact correlation between migration status and demo-linguistic status. Indeed, in this analysis, recent migration does not contribute to either the dimension of origin, or to the demo-linguistic dimensions; therefore, an interpretation which does not depend on migration is required. The importance of an institutional framework in ACBC, such as the support and the promotion of the Basque language in public education and in public administrative organizations, must be recognized.

Moreover, the two dimensions of language whose presence and characteristics have become evident in this analysis cannot be explained simply in terms of a bipolar structure. These two dimensions, showing a level of passive domestic use of Basque in spite of the acquisition of Basque competence, and another level of active use of both languages in the home, correlate with important stages of reversing language shift between two extreme poles.

Acknowledgments

This research was partially supported by the Ministry of Education, Culture, Science, Sports and Technology, Grant-in-Aid for Encouragement of Young Scientists, 12780065, 2001. I would like to express my sincere gratitude to the professors of the Institute of Geoscience of the University of Tuskuba, especially to Professor Nobuo Takahashi, for their worthwhile advice. I am also grateful to the staffs of Eustat and the Department of Culture of the Basque Government, who offered me precious data sets and information.

(Received 8 August 2001)
(Accepted 3 April 2002)

Notes

1. In this paper, names used for the regional units within ACBC reflect the official denomination of the municipalities by Eustat on 3 May 1996.
2. The territory of the Basque Country in the broad sense is situated partly in France but mainly in Spain, extending across the international border. In France, the Basque Country is situated in the Département du Pyrénées-Atlantiques and traditionally divided into three provinces, Lapurdi, Behe-Nafarro and Zuberoa. In Spain, the Basque Country consists of two autonomous communities, Nafarroako Doru Kommunitatea (Charter Community of Navarre) and ACBC. The latter is subdivided into three provinces, Araba, Bizkaia and Gipuzkoa.
3. In contrast, in France only 59,500 Basque speakers exist. In Navarre there are 70,500. In the French Basque Country, although the number of Basque speakers is small, the rate reaches 41.20% of the total population of this area. In Navarre, the rate of Basque speakers is only 14.13% of the State population.
4. There are also many sociolinguistic studies on the assimilation process of ethnic minorities. Bills et al. (1995) analyzed the correlation between the distribution of the population whose
mother tongue is Spanish and the distance from the border in the southwest zone of the United States, and referred to the phenomenon of assimilation to the dominant group in proportion to the distance from the border. Stolzenberg (1990) indicated that the employment status of the Hispanic population in the United States correlates not with their geographical distribution but with competence in English, and referred to the phenomenon of occupational assimilation depending on competence in English. Similarly, Hidalgo (1995) indicated the existence of the same process of assimilation to dominant society, apart from in some traditional communities where the reversing language shift, i.e., a shift to Spanish, can be observed, and pointed out the importance of the geographical and historical environment.

5. Actually, in Spain, seven Autonomous States (Asturias, Galicia, Canarias, Catalonia, Madrid, Navarre and ACBC) conduct an original State Census. In ACBC, since 1981, Zenitsu (the Census) has been conducted in the first year of each decade, and Errolda (the Population Register) has been conducted in the 6th year of each decade. Each Autonomous State conducted Census research in parallel with the National Census till 1991, under the collaboration of the National Statistics Institute (Instituto Nacional de Estadística: I.N.E.). However, in 1996, it became difficult to get the collaboration of I.N.E., because I.N.E. limited the items of the Population Register which are considered necessary for the elaboration of electoral roll by the revision of the Census Law in 1990. Under this situation, seven Autonomous States conducted in 1996 their own Population Register research on the same scale as the previous Census or Population Register. Therefore, although the character of the 1996 Population Register differs from the previous researches, there is no difference in the statistical contents because exactly the same statistical method was employed. In this study, in order to avoid confusion, the State Census and the Population Register conducted every five years from 1981 to 1996 by Eustat are both referred to as “State Census.”

6. In the State Census, a minimal statistical unit is the udalerria, which corresponds to the most basic administrative unit. Apart from the municipality, Eustat releases statistical figures of larger regional scales. The largest regional scale is the lurralde historiko, or province. In ACBC, there are three provinces, Alava, Vizcaya and Gipuzkoa. The next is the eskualdea, or region, which composes each province. There are 20 regions in ACBC, 7 of them in Gipuzkoa. The next level is the municipality. As of May 1 1996, there were 250 municipalities in ACBC and 88 municipalities in Gipuzkoa. There is a sub-unit of municipality, the azpidea, or barrio; however, it does not cover all municipalities but partly some urban areas.

7. Modification of statistical boundary of municipalities within the 5 years only happened in Gaztelu, which was subdivided into Leaburu-Gaztelu and Gaztelu.

8. Applying the same procedure, a factor analysis was applied to each geographical matrix of 87 units×51 variables of 1991 and 1996, and 11 factors were extracted in both years. At this time, coincidence coefficients of each factor loading of 1991 and 1996 were examined. From factor 1 to factor 9, although there is some exchange of order, high values of coincidence coefficients of 0.750 and over are observed. Therefore, the factor structures of both years are sufficiently equivalent mutually, and it can be said that almost the same factor structures were extracted in both years. Consequently, it is possible to apply a factor analysis to the data matrix composed of 174 time-space units (2 time-phases×87 units)×51 variables.

9. Besides Model D, there are Model A and Model B. In Model A, Spanish is utilized as a language of material description and instruction accompanying Basque language instruction. In Model B, both Basque and Spanish are used for education activity. In Gipuzkoa, in the 1982/83 academic year, 61.23% of students learned in Model A. However, the students registered in Model A decreased drastically to 28.93% in 1996/97. At the first stage of introducing these models in public education, there was another type, Model X, which neither used nor taught Basque. However, actually, this model has practically disappeared. In 1996/97 year, only 0.63% of total students were registered in Model X.

10. In ACBC, when the density of Basque use in the home is 80% or over, the rate of Basque speakers overall reaches 69.7% in spite of the fact that there are 12.3% Spanish speakers. By contrast, if the density of Basque use is 25% or below, the rate of Basque speakers overall is merely 0.0% and that of Spanish speakers reach 98.6% (Gobierno Vasco 1999: 51).

11. The Basque dialects are classified into 8 dialects (Intxausti 1992).

12. The percentage of the population whose mother tongue is Basque reaches 64.5% in Tolosaldea, 72.4% in Urola-Kostaldea, and 47.4% in Goierri, compared with 20.3% in ACBC as a whole, and 38.6% in the province of Gipuzkoa (Eustat 1999: 246).

13. In the same period, at the national level, the rate for the age group of 20 years or below
declined from 28.5% to 24.3%, and the rate for the age group of 65 years and over increased from 13.2% to 15.4%, and furthermore in the EU, the figures changed from 25.5% to 23.7%, and from 13.2% to 14.4% respectively (Eustat 1999).

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