

APPLICATION OF GIS TECHNOLOGY TO STUDIES IN JAPANESE DIALECTOLOGY

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1. INTRODUCTION

The purpose of this paper lies in two points: to propose the possibility of applying the Geographical Information System (GIS) to dialectology, and to support the validity of how GIS is applied to dialectology through looking at some examples. The conclusions are summarized as follows: the application of GIS to the geographical distribution of dialectal forms is highly valuable, and more attempts should be made for analyzing the objective description of dialect distribution.

2. EAST AND WEST CONTRASTIVE DISTRIBUTION (EW TYPES)

The distribution pattern of EW types is twofold: east and west. The formation of this distribution is still not clear. The typical example is the distribution of the negative suffix: *-nai* in east Japan and *-n* in west Japan, as in Figure 1 using data from the *Grammar Atlas of Japanese Dialects (GAJ)*.

3. NEGATIVE SUFFIX AND ELEVATION

It is known that the boundaries of EW types come through the high mountains in the central parts of mainland Japan. The mapping of dialect distribution of the negative suffix and elevation data in GIS is made as in Figure 2.

4. 3-D VISUALIZATION OF EW TYPES

GIS can draw the 3D atlas, taking elevation as a third axis. The eastern negative suffix *-nai* can be observed at the Pacific Ocean side of the boundaries, as in Figure 3. We find that the distribution of *-nai* in west Gifu (somewhat distant from the boundaries) is found in isolation. *-nai* in east Japan is a standard Japanese negative suffix. When the use of a standard form is found in an isolated area, it is highly likely that the standardization proceeds in this area. However, close attention should be paid to assume that it is large cities and their surrounding areas where the standardization process is found easily. In Figure 3, the centre-left area is Gifu City, the capital of Gifu Prefecture. In Gifu City, as a centre of this area, *-nai* is not used. The point of the use of *-nai* is located far from Gifu City. What is more, *-nai* areas are distributed in such inconvenient places as the top of the mountains and in the deep valleys.

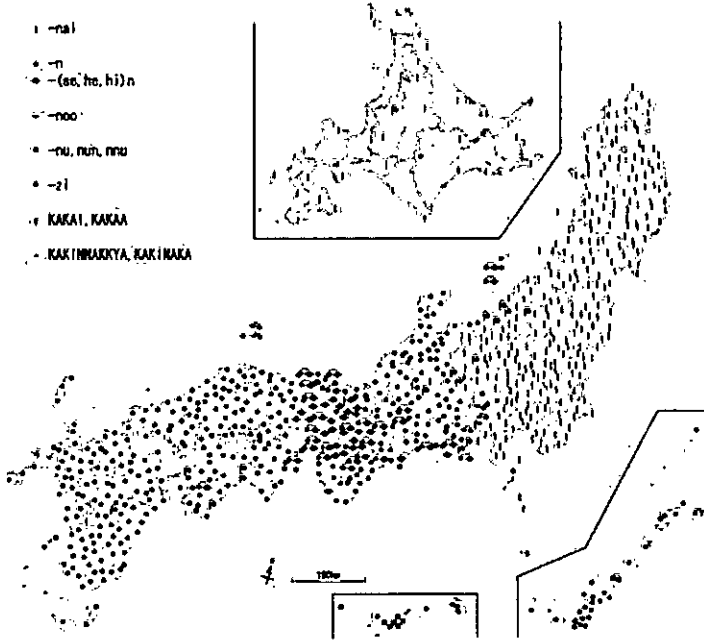


FIGURE 1
Negative suffix of verbs

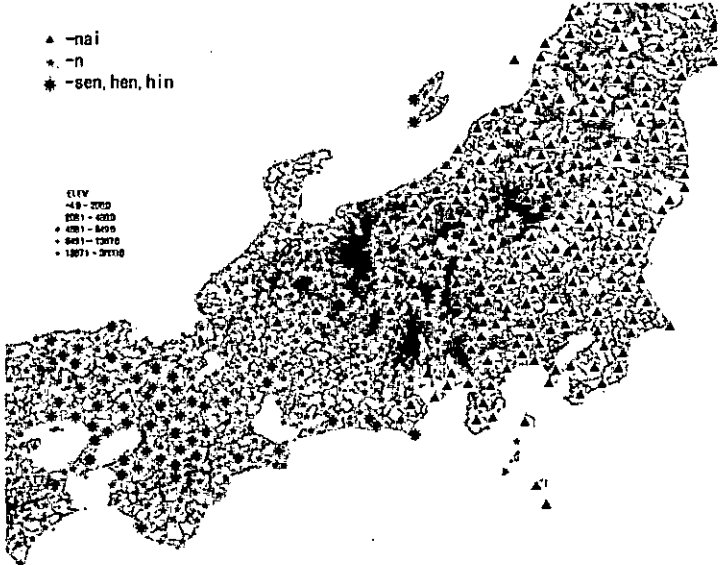


FIGURE 2
Negative suffix and elevation



FIGURE 3

Eastern negative suffix *-nai* from the Pacific Ocean side

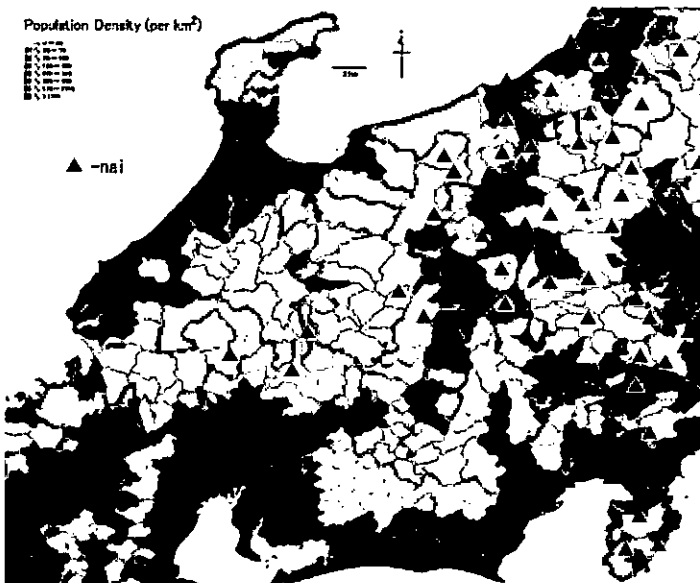


FIGURE 4

Population density and *-nai*

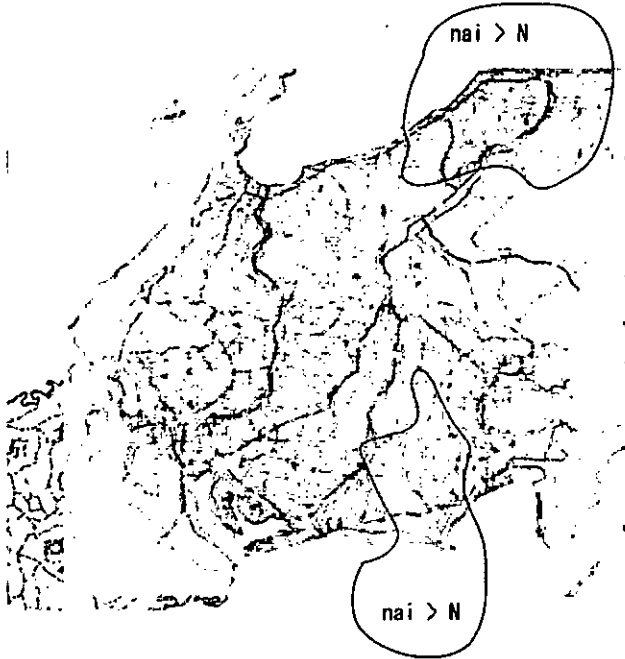


FIGURE 5
Comparison of *GDA* and *UB*

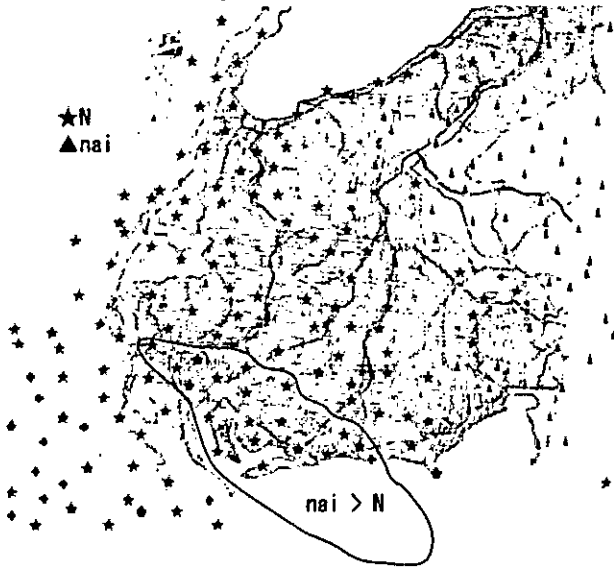


FIGURE 6
Comparison of *UB* and *GAJ*

5. DISTRIBUTION OF NEGATIVE SUFFIX AND POPULATION DENSITY

The relationship with population density is raised here to consider in detail the relation between standardization and the isolated distribution of *-nai*. In Figure 4, the attempt was made to overlay the result of the national population census of 1985 and the distribution of *-nai*. The isolated distribution of *-nai* in Gifu is found in less densely populated areas. In this respect, it is unlikely that this *-nai* is a result of standardization.

6. OVERLAY OF DATA FROM SEVERAL LINGUISTIC ATLASES

There are three types of linguistic atlas covering the distribution of the negative suffix. The first one is the *Grammatical Dialect Atlas (GDA)* researched around 1900. The second one is Ushiyama Hatsuo's work *The boundaries between Eastern and Western dialects (UB)*, researched around 1950. The third one is *GAJ* researched around 1980. There are 30- or 50-year intervals between each survey. GIS can overlay these different atlases. When a comparison is made between *GDA* and *UB* (see Figure 5), *-n* in west Japan is expanding its distribution towards the east. When *UB* is compared with *GAJ* (Figure 6), *-n* in west Japan is, as is found in *GAJ*, expanding its territory to the east. By layering linguistic atlases, it is evident that there is a west-to-east movement of the western form *-n*.

7. THE RESULT OF ANALYSIS OF NEGATIVE SUFFIX BY GIS

Based upon the analysis, it is clear that the boundary of EW type in negative suffix moves from west to east in the course of history. Let us now move back to *-nai* in Gifu Prefecture. It was expected that this type of *-nai* is less likely to be a result of standardization in relation to the shape of the land and the density of population. It is possible to assume that the isolated *-nai* in Gifu, based on the movement of the boundaries, is evidence which is left behind the movement. A long time ago, *-nai* might have been dominant in this area. The spread of *-n* from the west resulted in the movement of the boundary to the east. However, unique geographical conditions, such as high mountains, deep valleys and marginal areas, with less populated areas lead *-nai* to remain in this area.

8. CONCLUSION

GIS is an intriguing technique, and it is rather easy to get the results. This paper clearly shows that GIS is an effective tool in dialectology. Therefore, from now on dialectologists should take this system into their studies.

REFERENCES

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