

# SUPERIMPOSING LINGUISTIC MAPS TO TRACE LINGUISTIC CHANGES

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## 1. INTRODUCTION

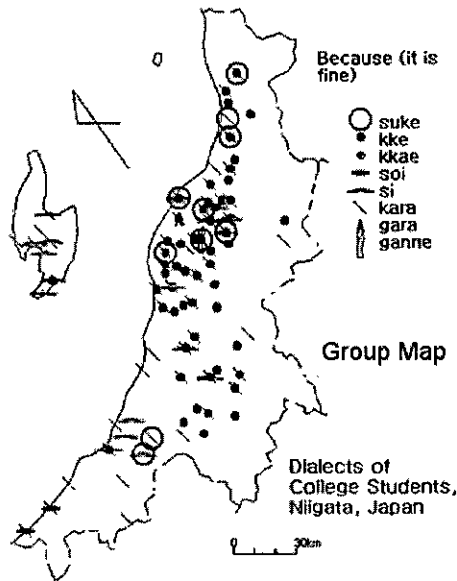
Linguistic maps can be combined to obtain more information necessary for constructing the linguistic history of the surveyed area. The author has been involved in the development of the SEAL system, a software system for personal computers to process data in linguistic geography and make linguistic maps. There are ways of integrating linguistic maps using the system which will be introduced, including new features in the program, which entail literally superimposing linguistic maps on the screen.

## 2. INTEGRATING LINGUISTIC MAPS

The SEAL system has had two original functions since 1983 when it was first developed and published; one is to make simple linguistic maps based on respective linguistic data files, and another is to integrate more than one linguistic map into a new linguistic map (Fukushima 2000). The focus has been on groups of linguistic maps that show similar distributions and/or have common linguistic features. The similarity of distributions is often caused by internal reasons such as common linguistic features (semantic, phonological, morphological, and syntactic) as well as external reasons such as the areal boundary or the prestige of a certain dialect or word-forms. Taking advantage of a computer-assisted approach, what we call "diffusion maps" and "contrast maps" are made after counting the frequency of assigned word-forms at each locality through linguistic maps and plotting the figures as symbols with different sizes, shapes, and colours in a linguistic map. One of its applications is the analysis of the CLAE data (Fukushima 1997). Both Japanese and English versions of SEAL, published for academic use on the web page (in the bibliography), have these functions (Fukushima and Fukushima 2002).

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College Students in 1994-2002

FIGURE 1

Example of a group map

### 3. NEW FEATURE IN SEAL 7.0J: GROUP MAPS

Recently, new functions have been added to the Japanese version SEAL 7.0J to combine linguistic maps in different ways. “Group maps” are made by literally superimposing linguistic maps from different linguistic data files on each other, including files from different surveys. Linguistic maps from different surveys can be superimposed as long as the same area has been surveyed and the same blank map can be used. Symbols are plotted repeatedly on the same blank map. The examples are taken from *Dialects of College Students, Niigata, Japan* (Fukushima 2002). The informants are young female college students aged 18–19.

In this case, surveys were conducted from 1994 to 2002; thus they were repeated more than once, based on the same questionnaire, and the localities of each survey were different. It was found that the integration of those data was workable after simple linguistic maps were made and analyzed. Thus, linguistic maps were drawn repeatedly on the screen using the same symbols, which resulted in a synthesized linguistic map showing the data from combined localities. Figure 1 is an example of group maps. The Figure 1 data ‘because’ from the 1994–2002 surveys were integrated into a linguistic map.

There is another example of group maps: “integrated group maps.” When there are group maps which are the results of related questions, these group maps can

be further integrated and made into an integrated group map. For example, ‘have <someone> come’ <someone> *ni/kara kitemorau* has four related items such as: 1. Have the teacher come, 2. Have the teacher’s son come, 3. Have my son come, and 4. Have my mother come. As the distributions of the dialectal particle *kara* in these maps are not so different, the data of four linguistic items from the 1994–2002 surveys can be integrated into a linguistic map to show the maximum area of *kara*.

#### 4. SUPERIMPOSING LINGUISTIC MAPS ON ONE ANOTHER WITH DIFFERENT COLOURS

SEAL 7.0J has another new feature: making a “file-list.” When we file-list two linguistic maps, we can superimpose them on each other on the screen, providing two layers of maps, one in gray and another in colour. This is applicable when we compare linguistic maps from surveys at different times in the same area. For example, when surveys have been conducted with intervals of a decade or more, we may want to compare the distributions in one map. After making linguistic maps from each survey, we save the information to redraw the same maps and register them in a file-list. Then they are drawn with different tones of colours.

The maps from *Dialects of College Students, Niigata, Japan* are compared with the maps from older surveys, *GAJ* and *LAN*. The survey for the *Grammatical Atlas of Japanese Dialects (GAJ)* was conducted by the National Institute for Japanese Language and its research area covered all of Japan. The data of *GAJ* are published on the web page by Onishi. The data of 29 localities in Niigata Prefecture, cut from the original file, are used as the data for SEAL. The survey of the *Linguistic Atlas of Niigata Prefecture (LAN)* was conducted by Ohashi and his students. The *LAN* data of 139 localities were obtained by directly reading the atlas and were made into linguistic data by hand. The *GAJ* survey was conducted in 1979–1982, and the *LAN* survey in 1980–1985; the informants in both surveys were in their sixties or seventies. Thus there is a 50–70-year gap between the *GAJ/LAN* informants and college students. The examples are shown below: Figure 1 (a group map from *Dialects of College Students, Niigata, Japan*) and a single linguistic map from *GAJ* are superimposed on each other, and the result is Figure 2. The superimposed map shows that the older form *suke* and its related forms, shown by big circles, used to occupy a wider area but was replaced by a new form *kke*, shown by small grey circles.

#### 5. INTERPRETING A SET OF LINGUISTIC MAPS

It is useful to draw maps from different surveys using the same symbols. Here are examples. There are special names for ‘two days after tomorrow’ and ‘three days after tomorrow’ in standard Japanese. These linguistic items make a small lexical system and are related to each other. The maps of these data from *Dialects of College Students, Niigata, Japan* and *LAN* are drawn using the same symbols (Figure 3). The change that happened in this dialect is expressed in Table 1.

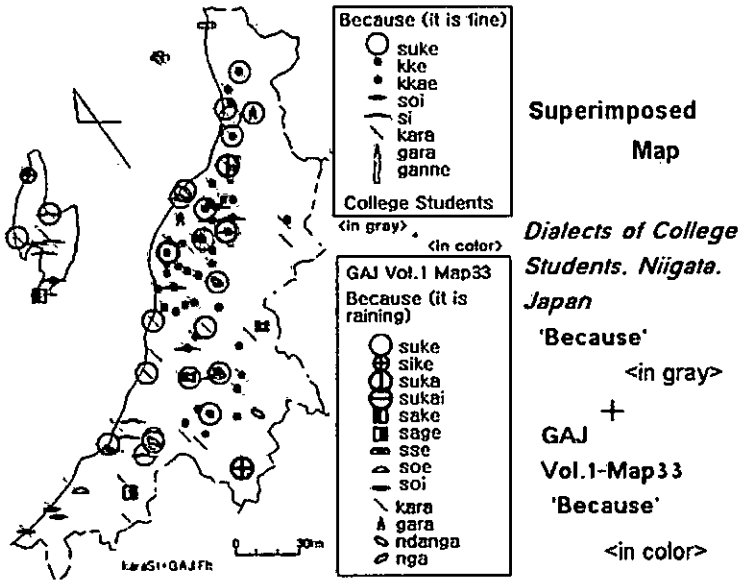


FIGURE 2

Example of a superimposed map

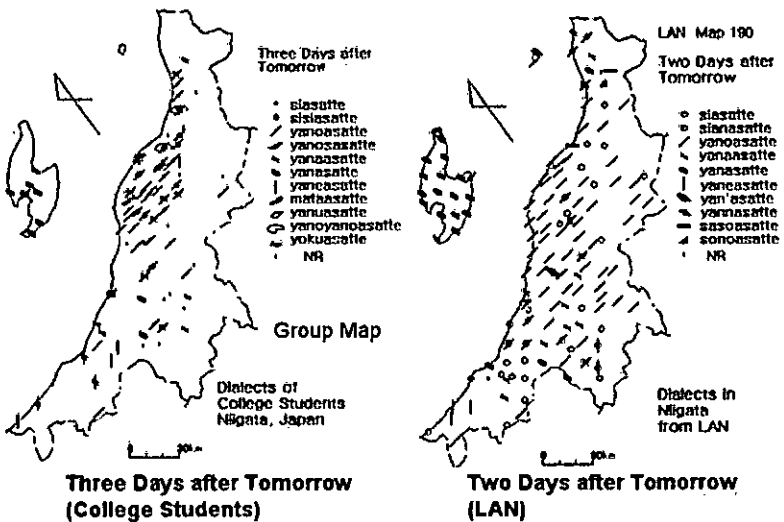


FIGURE 3

Comparison of different surveys using the same symbols

**TABLE 1**  
 “\_\_\_\_\_ days after tomorrow”

<b>Traditional dialect</b>	
Two days after tomorrow	yanaasatte/-asatte/-easatte
Three days after tomorrow	no response
<b>LAN</b>	
Two days after tomorrow	yanoasatte, yanaasatte/-asatte/-easatte
Three days after tomorrow	(not surveyed)
<b>Standard Japanese</b>	
Two days after tomorrow	siasatte
Three days after tomorrow	yanoasatte
<b>College Students</b>	
Two days after tomorrow	siasatte
Three days after tomorrow	yanoasatte, yanaasatte/-asatte/-easatte

In the traditional Niigata dialect, there used to be no names for ‘three days after tomorrow’. This is shown in older linguistic maps from *Linguistic Atlas of Japan (LAJ)*, whose survey was conducted in 1960s. But in the dialect of the young generation, the dialectal forms for ‘two days after tomorrow’, starting with *yan-* (*yanaasatte*, *yanasatte*, and *yaneasatte*), have been transferred to the names for ‘three days after tomorrow’. This is the change affected by standard Japanese. The standard form *siasatte* was borrowed as the form for ‘two days after tomorrow’, and that drove the original dialectal forms, similar to the standard form *yanoasatte*, to change their meaning to ‘three days after tomorrow’. The dialect of the generation in between is shown in the map of *LAN*. Figure 3 clearly shows this situation.

## 6. CONCLUSION

The use of multiple linguistic maps provides more data. To make the most of linguistic data, integration or superimposition is effective in the process of interpretation. Making use of GIS software and related web sites is expected.

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Ohashi, K. 1998. *Niigata-ken gengo chizu*. [*The linguistic atlas of Niigata Prefecture.*] Tokyo: Koshi-Shoin.

### URLs

*The Room for Linguistic Geography: A site for announcements and downloading the SEAL System* by C. Fukushima.

[www.nicol.ac.jp/~fukushima/english/](http://www.nicol.ac.jp/~fukushima/english/)

*Hogen-kenkyu no heya*. [*The Room for the Dialectological Study*] by T. Onishi.

[www2.kokken.go.jp/henkai/](http://www2.kokken.go.jp/henkai/)