

Common Korean surname tells tale of nationhood

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The most common surname in Korea – Kim – has been traced back 1500 years using a statistical model, providing evidence of a strong, stable culture that has remained intact to this day.

In a study published today, 28 July 2011, in the Institute of Physics and German Physical Society's *New Journal of Physics*, researchers have been able to estimate that in the year 500 AD, 50,000 people carried a Korean family name, of which there were 150 variations and 10,000 people carrying the name Kim.

The researchers state that this implies stability in the Korean culture: as the population and occupied area expanded over the past 1500 years, it basically swallowed other cultural influences without compromising a core of the Korean culture that remained intact.

The family name you are born with is very important in the Korean culture, which is reflected in the tradition that women keep their family names when married. Confucian tradition also encourages a family to record their family tree in special books.

Using a set of ten historical Korean books, each documenting the history of a Korean family tree over the past 500 years, it was shown that the trend in Korean family names could be accurately described by a statistical model called the random group formation (RGF).

The RGF model is a predictive tool that has previously been used to give

accurate descriptions of the frequency of words in novels and the trend in the populations of cities throughout a country. It works by taking objects, such as the population of [Korea](#), and dividing them into groups, in this case based on their family names.

A unique feature of the RGF model is that the largest group, in this case the family name Kim, is always proportional to the whole data set. This means that the amount of people with the family name Kim increases or decreases at exactly the same rate as the population increases or decreases.

The researchers, from Umea University, Sungkyunkwan University and the Asia Pacific Center for Theoretical Physics, found it extremely striking that the Korean family names agreed with the model; especially considering that other family names grew and shrunk in very different ways to the whole population and the vast amount of social changes that could affect this proportionality, such as wars, earthquakes, famines, plagues, fertility variations, etc.

The fact that the trend in Korean population and family names agreed with the RGF model allowed the researchers to predict the trend going back 1500 years.

If similar data to the Korean family books exists for other cultures, and the trends appear to agree with the RGF model, the model could prove to be a useful tool in gaining a deeper understanding of population growth throughout history.

One of the studies authors, Professor Petter Minnhagen, said, "What is explored in the paper is the size-dependence of the RGF-distribution. It is this feature which makes it possible to go back in time for a system which is described by the RGF-model.

"We are now looking at the family and species distributions in biology,

which also seem to follow the RGF. Take the mammals, suppose there are at present X amount of families and Y amount of species distributed according to the RGF. If we follow the record backwards and the number of families decreases, the RGF will then give a prediction of the number of species existing at the earlier times and the size distribution of the families. At least that is the idea."

More information: "The ten thousand Kims" S K Baek et al 2011
New J. Phys

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