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Press Release

What's in a name?

University of Tübingen-led team discovers parallels in the information structure of naming systems, with repercussions for those with Asian names

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First names in Western countries today are more diverse than they were before early modern states evolved. This difference started to emerge in the 17th century in response to a change that took place in the naming system in large parts of Europe and the English-speaking world. Societies moved away from attributive last names – based on occupation or appearance like John (the) Short – to inherited surnames. Researchers at the University of Tübingen, the Massachusetts Institute of Technology (MIT), the University of California at Irvine, and the University of Texas at Austin say the fixing of last names meant a loss of information within the naming system, which had to be compensated for – which is why first names now convey more and more information. The study has been published in the latest *Nature Communications.*

The researchers used an approach based on information theory, which allows the information in words to be mathematically measured. "We measure information content in terms of the extent to which each part of a name helps to eliminate uncertainty about the identity of a given person," said Michael Ramscar from the University of Tübingen and lead author of the study. A common name that is shared by many people is less suitable to identify individuals but reduces the number of names, making the system easier to learn – and vice versa for uncommon names. "Common and therefore predictable first names such as John convey less information, while unusual and therefore unpredictable first names such as Bartholomew convey more information," says Richard Futrell from the University of California at Irvine.

According to the researchers there are two key constraints in global naming systems, both past and present. Naming systems must allow for the separate identification of a large number of people, while keeping the total number of words required by the system manageable so that they don't overtax people's brains as they process them. Societies around the world construct names from small sets of first name words such as John

or Charles, in combination with common everyday last name words such as Miller, Smith, or Short. By combining first names and last names, information can be distributed across both names. This allows a vast number of combinations to be generated for identifying individuals, while avoiding having to invent similar numbers of new words. For example, before inherited surnames were introduced, the same John might be John (the) Smith or John (the) Short depending on the context. Thus historically, and across cultures, first names served as the primary historical means for referring to individuals and had a low-information profile.

In South Korea, half the population share six first names

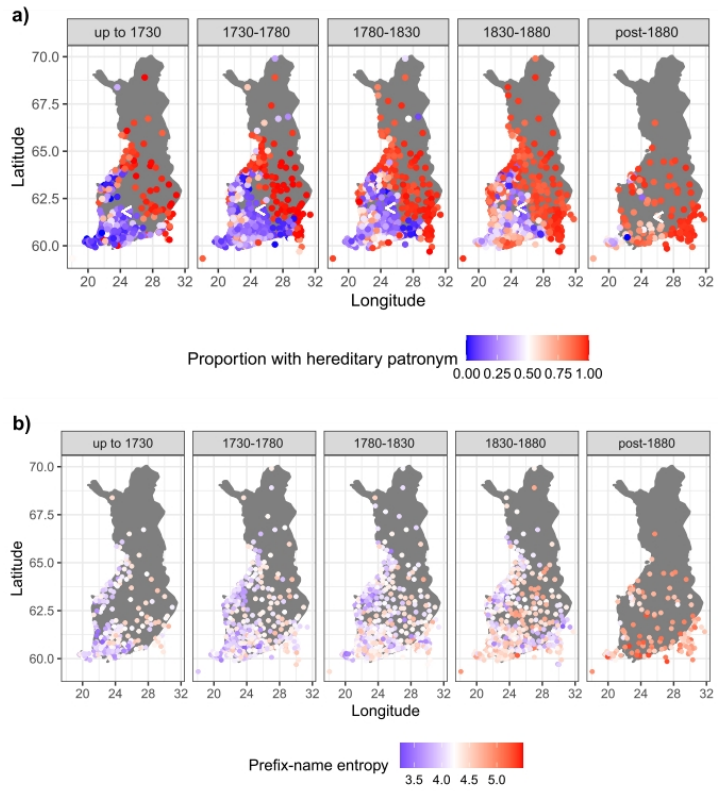
To a Western observer, it may seem strange that in South Korea for instance, half of today's population has one of only six first names. Although in this context it should be noted that in the East Asian cultural sphere, the first part of the name with its low-information profile is inherited and has become fixed. In Western countries, last names were transformed into inherited, fixed surnames. The study shows how historically the distribution of low-information first names in Western countries and today's distribution of low-information "first" names in the East Asian culture sphere were far more similar than they are today. In England, in every 50-year period between 1550 and 1880, half of the male population was given the first names John, William, or Thomas, and half the female population Ann, Mary, or Elizabeth, a very similar ratio to modern South Korea. The historical distribution of the remaining first names in England also corresponded to that in South Korea today.

As populations in the West grew and state structures developed, there was a need to be able to officially identify people, and so flexible last names were turned into fixed, inherited surnames. Thus first names had to convey more information than before. This could only be achieved by adding more first names, which led to more diversity. The researchers traced this development in the West using a dataset of church records from 1600 to 1900 in Finland with almost five million birth records which showed that it progressed asymmetrically across the country. "It began in the east and then spread to the west," says Kyle Mahowald from the University of Texas, Austin. "The diversity of first names in the Western world today is therefore less an expression of individuality and more a consequence of the limited information content of inherited surnames," said Michael Ramscar.

As if Charles Darwin and Charles Dickens had to publish as Charles D.

The researchers also found that transferring the names of East Asian researchers into Western naming systems undermines their communicative function. In East Asian countries, while first names are inherited, they convey less information than given last names. The problem is that because of the focus on inherited names in the Western system, the order of names of researchers from East Asian countries is reversed for publication. For Asian researchers, this means that the part of the name that conveys more information is initialized, and the part that conveys less is written out in full. "For researchers from China today, it is as if Charles Darwin, Charles Dickens, and Charles Dodgson had all been forced to publish their works under the name Charles D.," said Sihan Chen of MIT. However, if the original order of names within each culture is respected, the study shows that East Asian and Western names convey the same amount of information when first names are initialized and last names given in full.

“This study illustrates the complexity of naming systems worldwide and highlights the need to be more sensitive to the customs of other cultures,” said the University of Tübingen’s president, Professor Dr. Karla Pollmann.



The top panel (a) shows the proportion of birth records in each Finnish parish containing a hereditary surname across 50 year time periods from 1650 – 1800 (blue = less hereditary surnames; red = more). The bottom panel (b) then plots inferred prefix-name per parish over the same time periods (blue = lower information; red = higher). As can be seen, Finnish prefix-name entropy increased as a proportion of the increased use of hereditary bynames, with both being reflected in an east/west gradient of change. Illustration: Kyle Mahowald

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