EVOGRAM

The role of linguistic and non-linguistic factors in the evolution of nominal classification systems

Marc ALLASSONNIÈRE-TANG

Lab Dynamics of Language UMR 5596, University Lyon2

Feel free to ask questions during the talk



M. A-Tang (DDL)

EVOGRAM

A short introduction of the background

Main research topic: Nominal classification

Main research topic: Nominal classification

■ **Gender**: the masculine/feminine in French or the **noun class** system in Bantu languages (e.g., humans, fruits, abstract/liquid objects)

Main research topic: Nominal classification

- **Gender**: the masculine/feminine in French or the **noun class** system in Bantu languages (e.g., humans, fruits, abstract/liquid objects)
- Classifier: yì kē qiú [one CLF.round ball] in Mandarin Chinese

Main research topic: Nominal classification

- Gender: the masculine/feminine in French or the noun class system in Bantu languages (e.g., humans, fruits, abstract/liquid objects)
- Classifier: yì kē qiú [one CLF.round ball] in Mandarin Chinese



3/9

A short introduction of the background

• A typology of classifiers and gender: From description to computation

- A typology of classifiers and gender: From description to computation
- Nominal classification: what, why, and how?

- A typology of classifiers and gender: From description to computation
- Nominal classification: what, why, and how?
- What is nominal classification and why do languages have it? Definition and functional analysis of languages with gender (Marathi, Croissant), classifiers (Assamese, Boading), and both (Nepali)

- A typology of classifiers and gender: From description to computation
- Nominal classification: what, why, and how?
- What is nominal classification and why do languages have it? Definition and functional analysis of languages with gender (Marathi, Croissant), classifiers (Assamese, Boading), and both (Nepali)
- How does nominal classification develop and evolve? Machine learning with individual languages (Mandarin, Mian), phylogenetics within Indo-Aryan (48), quantitative computational typology for Indo-European (22), South-East Asia (219) and worldwide languages (400)

- A typology of classifiers and gender: From description to computation
- Nominal classification: what, why, and how?
- What is nominal classification and why do languages have it? Definition and functional analysis of languages with gender (Marathi, Croissant), classifiers (Assamese, Boading), and both (Nepali)
- How does nominal classification develop and evolve? Machine learning with individual languages (Mandarin, Mian), phylogenetics within Indo-Aryan (48), quantitative computational typology for Indo-European (22), South-East Asia (219) and worldwide languages (400)
- Results: Nominal classification systems are not redundant nor arbitrary (functions, assignment, presence, evolution)

- A typology of classifiers and gender: From description to computation
- Nominal classification: what, why, and how?
- What is nominal classification and why do languages have it? Definition and functional analysis of languages with gender (Marathi, Croissant), classifiers (Assamese, Boading), and both (Nepali)
- How does nominal classification develop and evolve? Machine learning with individual languages (Mandarin, Mian), phylogenetics within Indo-Aryan (48), quantitative computational typology for Indo-European (22), South-East Asia (219) and worldwide languages (400)
- Results: Nominal classification systems are not redundant nor arbitrary (functions, assignment, presence, evolution)
- but of course, there is still much to do :-)

Which factors affect the distribution (synchronic) and evolution (diachronic) of nominal classification systems?

- Which factors affect the distribution (synchronic) and evolution (diachronic) of nominal classification systems?
- Linguistic factors: Morphology, Syntax, Phonology, Semantics, ...

- Which factors affect the distribution (synchronic) and evolution (diachronic) of nominal classification systems?
- Linguistic factors: Morphology, Syntax, Phonology, Semantics, ...
- Non-linguistic factors: Cognitive biases, population size and structure, natural environment, ...

- Which factors affect the distribution (synchronic) and evolution (diachronic) of nominal classification systems?
- Linguistic factors: Morphology, Syntax, Phonology, Semantics, ...
- Non-linguistic factors: Cognitive biases, population size and structure, natural environment, ...

	Linguistic	non-linguistic
	factors	factors
Distribution	Path 1.1	Path 2.1
(synchronic)		
Evolution	Path 1.2	Path 2.2
(diachronic)		

A short introduction of the project EVOGRAM

Starting to answer this question with a project

Junior Researcher Grant from the French National Research Agency



Junior Researcher Grant from the French National Research Agency

2-year project: 2021-2023 (will probably get extended)



- Junior Researcher Grant from the French National Research Agency
- 2-year project: 2021-2023 (will probably get extended)
- Funding = 167 000 euros



- Junior Researcher Grant from the French National Research Agency
- 2-year project: 2021-2023 (will probably get extended)
- Funding = 167 000 euros
- Hire a postdoctoral researcher, four interns, and a graphist



- Junior Researcher Grant from the French National Research Agency
- 2-year project: 2021-2023 (will probably get extended)
- Funding = 167 000 euros
- Hire a postdoctoral researcher, four interns, and a graphist
- Aim 1: Identify the factors that should be further studied



M. A-Tang (DDL)

6/9

- Junior Researcher Grant from the French National Research Agency
- 2-year project: 2021-2023 (will probably get extended)
- Funding = 167 000 euros
- Hire a postdoctoral researcher, four interns, and a graphist
- Aim 1: Identify the factors that should be further studied
- Aim 2: Publish the results as a database with the CLDF standard https://clld.org/



- Junior Researcher Grant from the French National Research Agency
- 2-year project: 2021-2023 (will probably get extended)
- Funding = 167 000 euros
- Hire a postdoctoral researcher, four interns, and a graphist
- Aim 1: Identify the factors that should be further studied
- Aim 2: Publish the results as a database with the CLDF standard https://clld.org/
- Aim 3: More funding? e.g., already applied for another funding to hire a postdoc + a PhD student to work on population structure



A short introduction of the project EVOGRAM

Main methods and some examples

 For distribution (synchronic): GLMM (Generalized Linear Mixed Models), decision tree based computational classifiers (e.g., random forests), among others



An example of predicting if it rains or not with decision tree based computational classifiers

- For distribution (synchronic): GLMM (Generalized Linear Mixed Models), decision tree based computational classifiers (e.g., random forests), among others
- For evolution (diachronic): Phylogenetic methods such as phylogenetic regression and correlated evolution (Dunn et al 2011)



Dunn, Michael, Simon Greenhill, Stephen, Levinson and Russel Gray. 2011. Evolved structure of language shows lineage-specific trends in word-order universals. *Nature*, 473: 79–82. doi: 10.1038/nature09923

M. A-Tang (DDL) EVOGRAM 7/9 Feel free to ask questions during the talk

An example of linguistic factors: morphosyntactic plural and classifiers

- An example of linguistic factors: morphosyntactic plural and classifiers
- An analysis of their distribution (synchronic)



Tang, Marc and One-Soon Her. 2019. Insights on the Greenberg-Sanches-Slobin Generalization: Quantitative typological data on classifiers and plural markers. Folia Linguistica, 53(2): 297-331. doi.org/10.1515/filin-2019-2013

- An example of linguistic factors: morphosyntactic plural and classifiers
- An analysis of their distribution (synchronic)



Tang, Marc and One-Soon Her. 2019. Insights on the Greenberg-Sanches-Slobin Generalization: Quantitative typological data on classifiers and plural markers. Folia Linguistica, 53(2): 297-331. doi.org/10.1515/filin-2019-2013

- An example of linguistic factors: morphosyntactic plural and classifiers
- An analysis of their distribution (synchronic)
- An analysis of their evolution (diachronic)



Cathcart, Chundra, Andreas Hölzl, Gerhard Jäger, Paul Widmer, Balthazar Bickel. 2020. Numeral classifiers and number marking in Indo-Iranian. Language Dynamics and Change, Advance articles, 1-53. doi.org/10.1163/22105832-bja10013

Take-away message

Potential collaborations? https://marctang.info

Potential collaborations? https://marctang.info

Project aim: Identify the factors that should be further studied

Potential collaborations? https://marctang.info

- Project aim: Identify the factors that should be further studied
- The project is flexible :-)

Potential collaborations? https://marctang.info

- Project aim: Identify the factors that should be further studied
- The project is flexible :-)
- Feel free to suggest specific factors or languages or areas

