

Figurative semograms from a typological perspective

How classifier studies have advanced
our understanding of form-meaning
pairings in writing systems worldwide



Outline of the talk

- **Universals of writing systems**
 - Three levels of meaning
 - Three types of iconicity
 - Four kinds of semograms
- **Fundamental question** – Types of relations between the iconic and linguistic meanings of figurative semograms
- **Rhetoric** – From horizontal and vertical relations to synecdoches
- **Semiotics** – Modelling simple, additive and combined types of synecdoches



Three levels of meaning



Three levels of meaning

GRAPHEME

<bouchemaine>



/buʃəmɛn/



Three levels of meaning

GRAPHEME

<bouchemaine>



/buʃəmɛn/

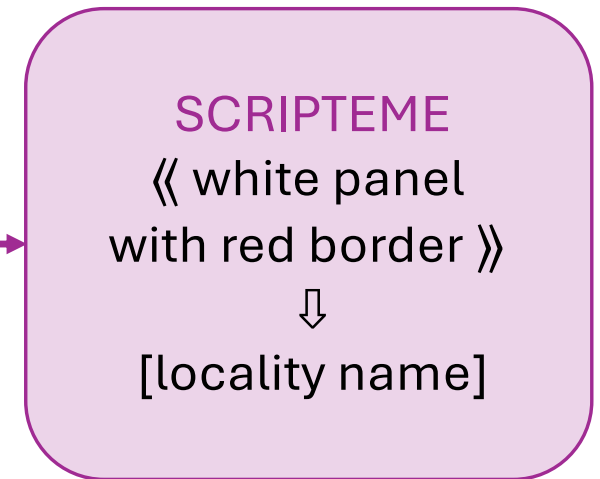
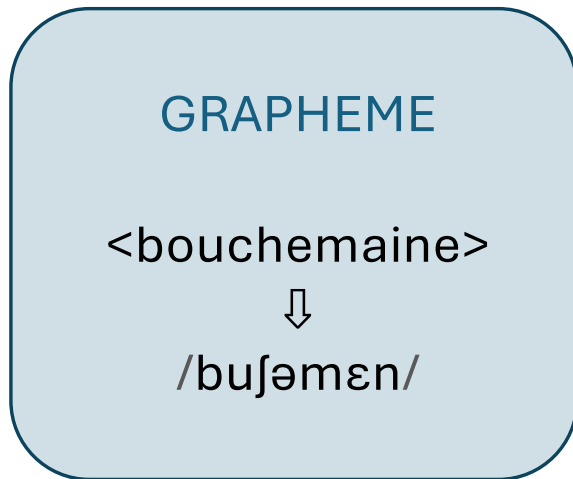


!Norms!

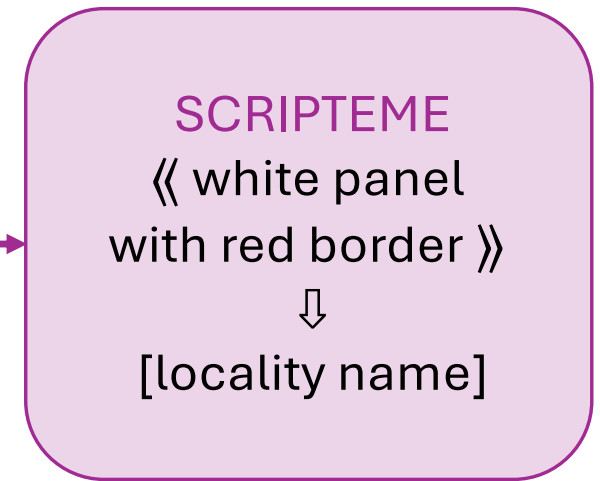
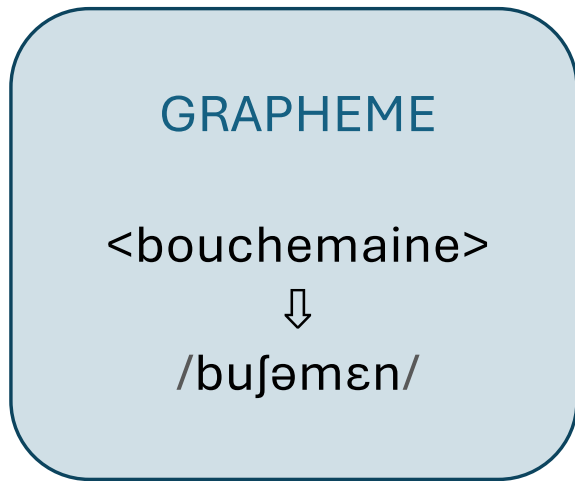
*<bushmen>

*<bouchmène>

Three levels of meaning

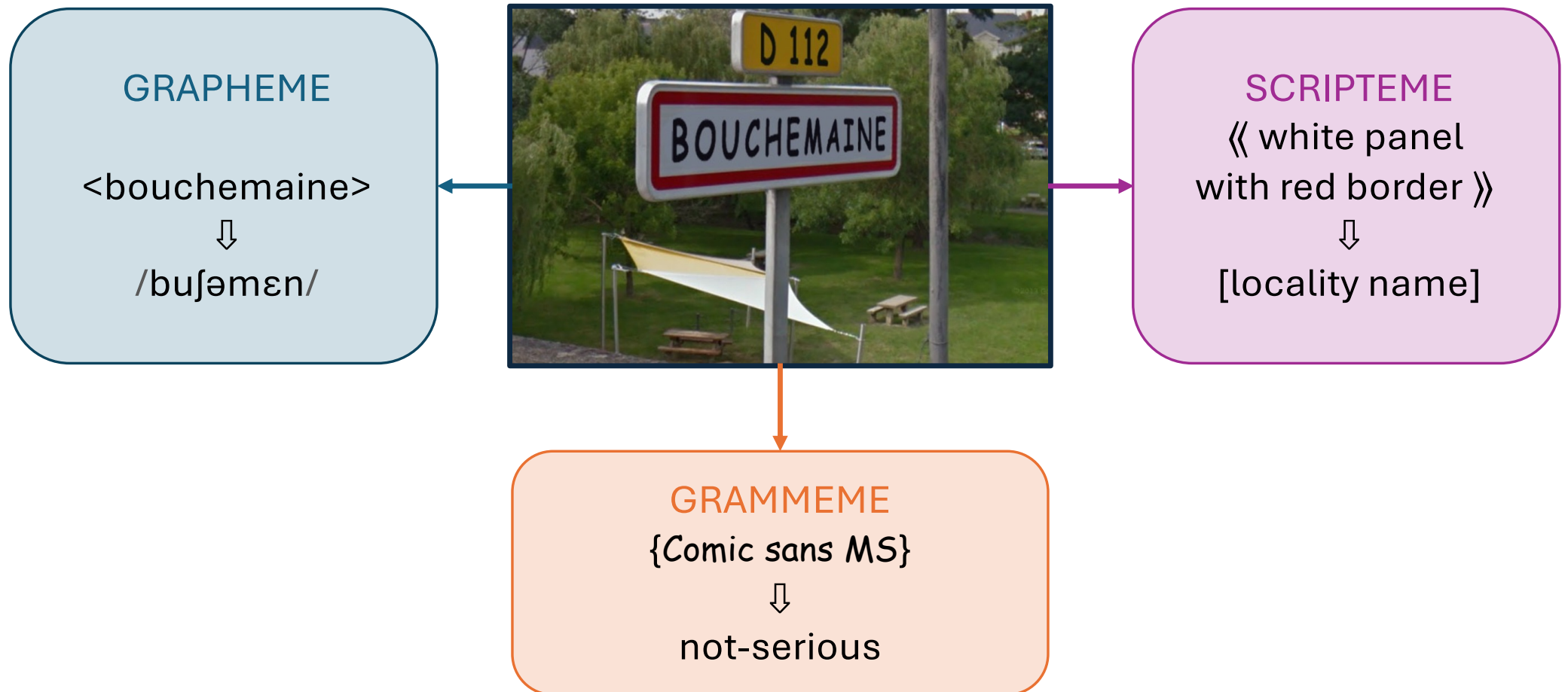


Three levels of meaning

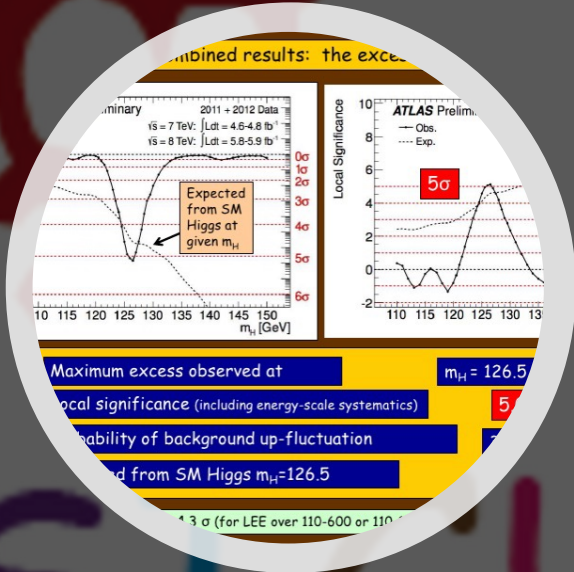


!Norms!

Three levels of meaning



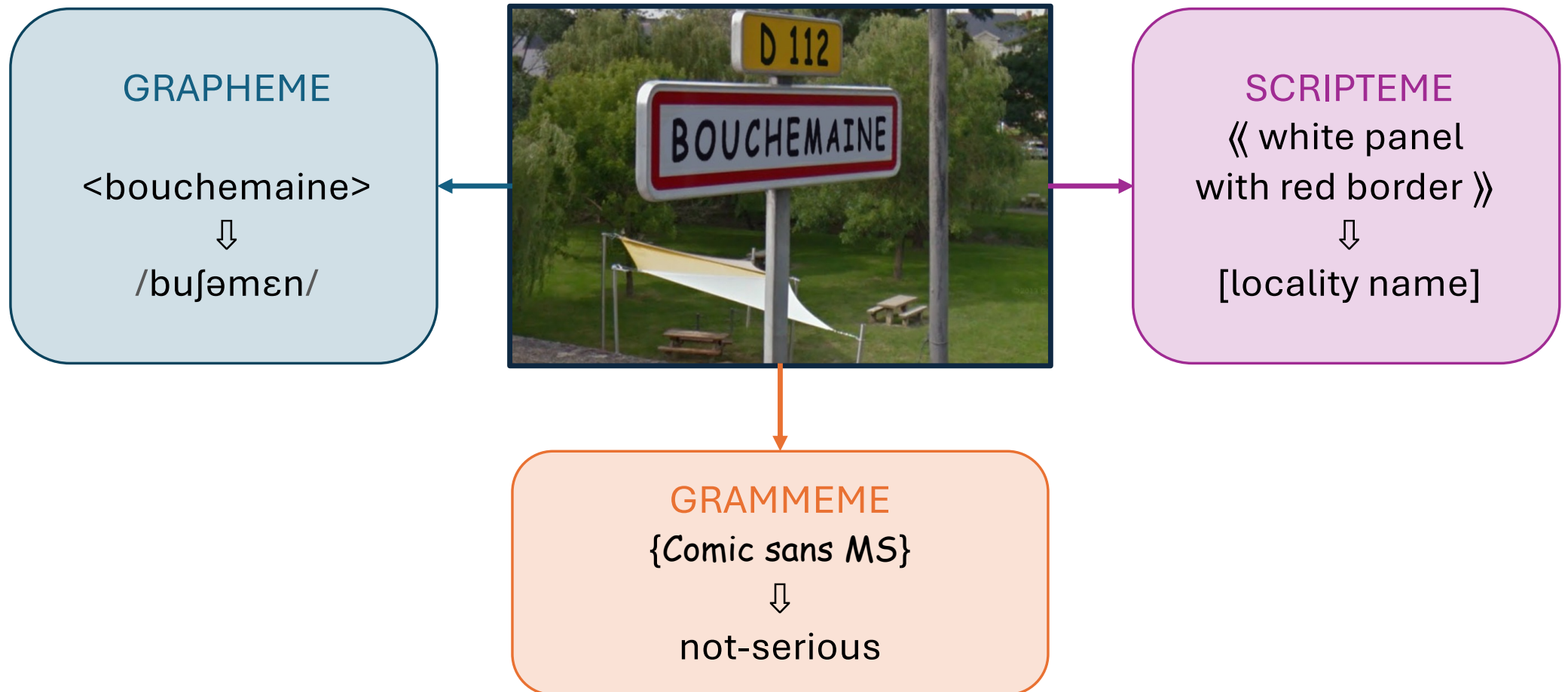
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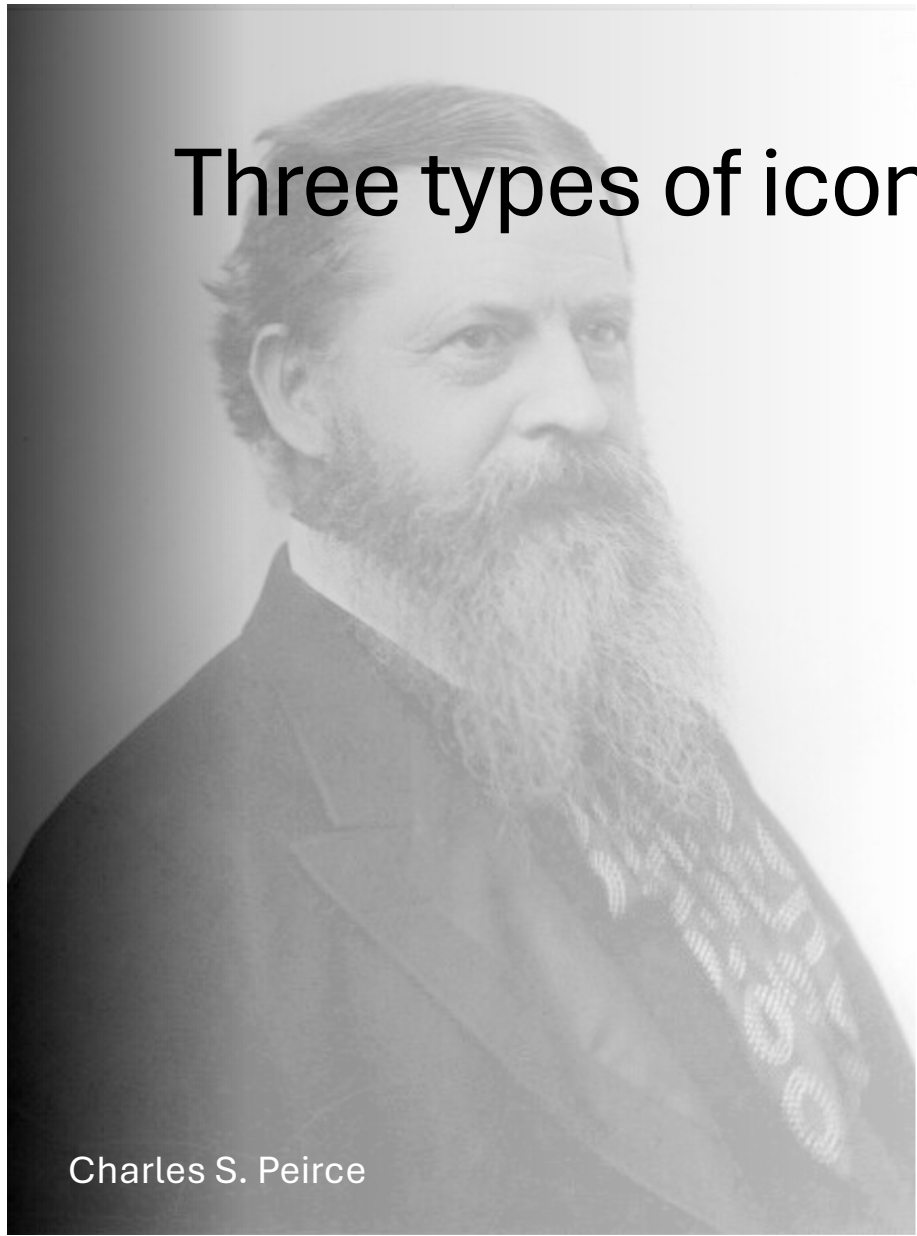
God particle ...
in Comic Sans

VORSICHT!
Gifttigitige Stoffe

Three levels of meaning

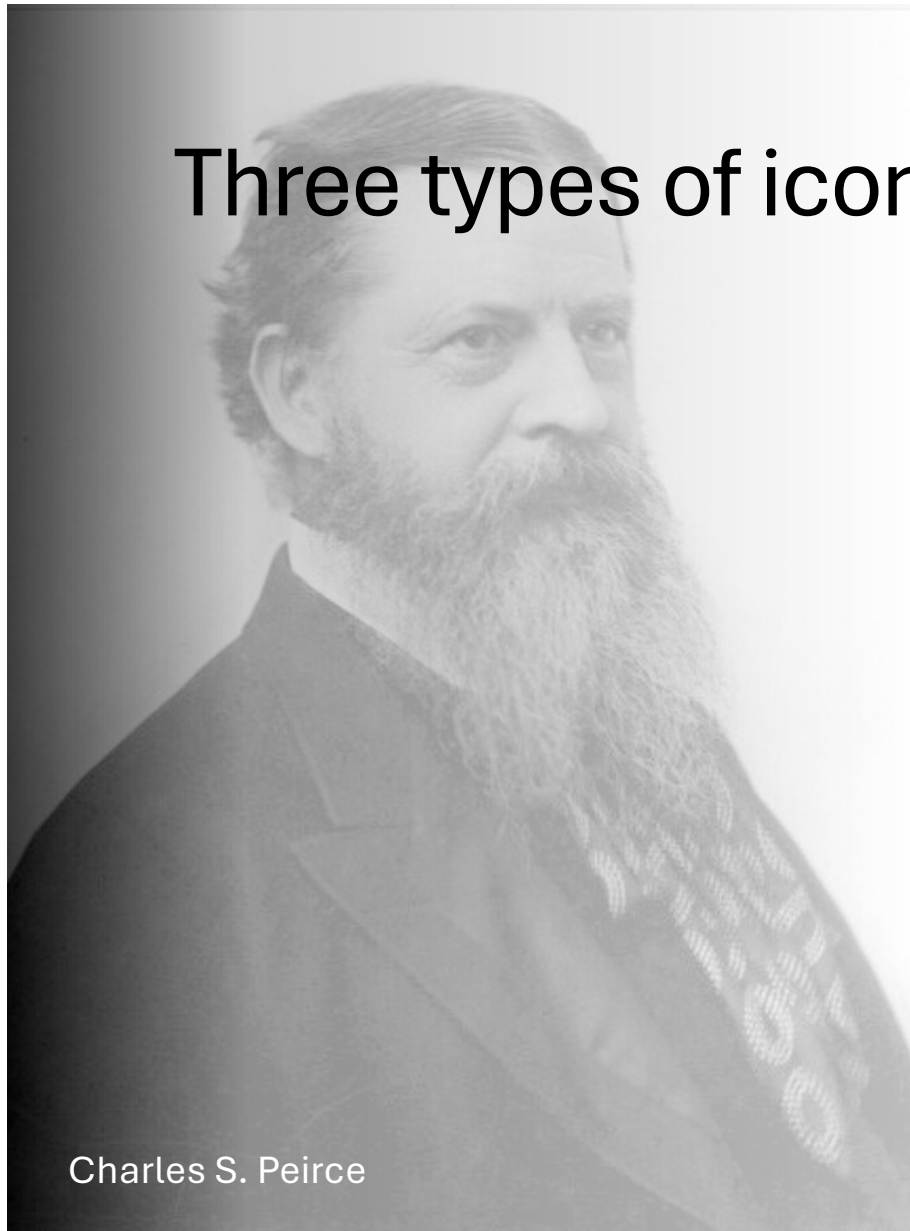


Three types of iconicity



Charles S. Peirce

Three types of iconicity



Charles S. Peirce

































	1008	1009	100A	100B	100C	100D	100E	100F
0								
1								
2								
3								

(Vernus 2016; 2020)

morphic

Three types of iconicity

Charles S. Peirce

	1008	1009	100A	100B	100C	100D	100E	100F
0								
1								
2								
3								

morphic



diagrammatic

Three types of iconicity

Charles S. Peirce

	1008	1009	100A	100B	100C	100D	100E	100F
0								
1								
2								
3								

morphic



diagrammatic



analogic

Definition of 'semogram'

	+ SEMOGRAPHIC		-SEMOGRAPHIC
AUTONOMOUS	Pictogram	Logogram	Phonogram
NON-AUTONOMOUS	Classifier	Morphogram	Interpretant
	- PHONOGRAPHIC		+PHONOGRAPHIC

(Kammerzell 1998, 2004; Polis 2018)

Definition of 'semogram'

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(Kammerzell 1998, 2004; Polis 2018)

Fundamental question

Can one model the relations between the **iconic and linguistic meanings** of figurative semograms?

2.2 The "Signified Elect"

The question that naturally arises here is how the choice of pictorial signifier was made, whether consciously or unconsciously.

(Goldwasser 1995: 31)

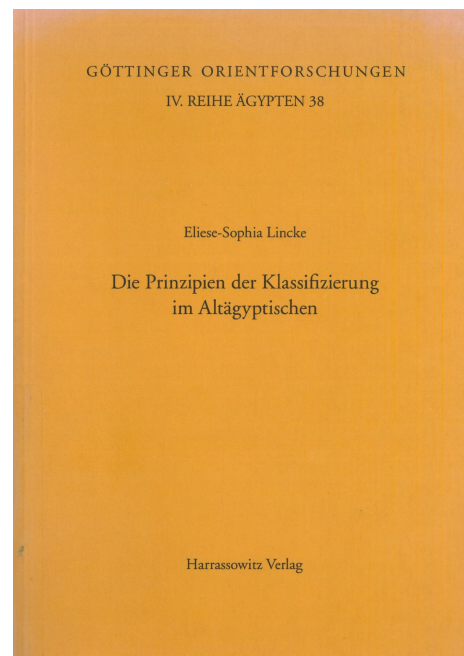
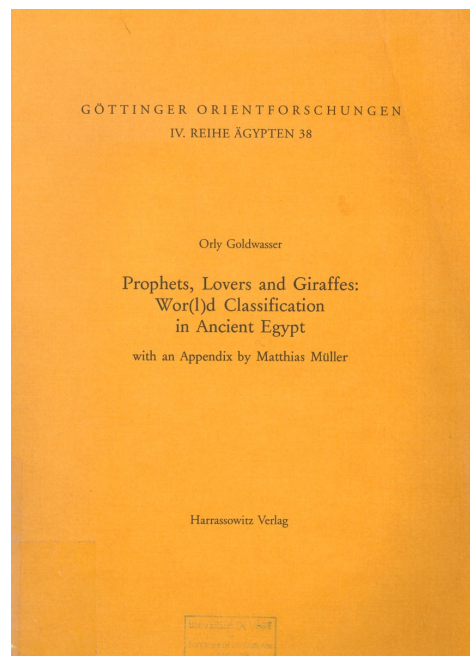
The meaning of a hieroglyph activated as a classifier in the Egyptian script is made up of two components:

1. Its iconic meaning, i.e. its pictorial value.
2. The meaning it acquires when serving in the role of classifier. The second meaning can be identical to the iconic meaning or may differ emphatically from it.

(Goldwasser 2002: 13)

Method

- 1) Taking the **horizontal** and **vertical axes** of classifier studies (Goldwasser 1995 ; 2002)
- 2) Resorting to the concept of **synecdoche** introduced by Lincke (2011) in Egyptology
- 3) Generalizing its application based on Groupe μ ' (1970) ***Rhétorique générale***



Types of synecdoches

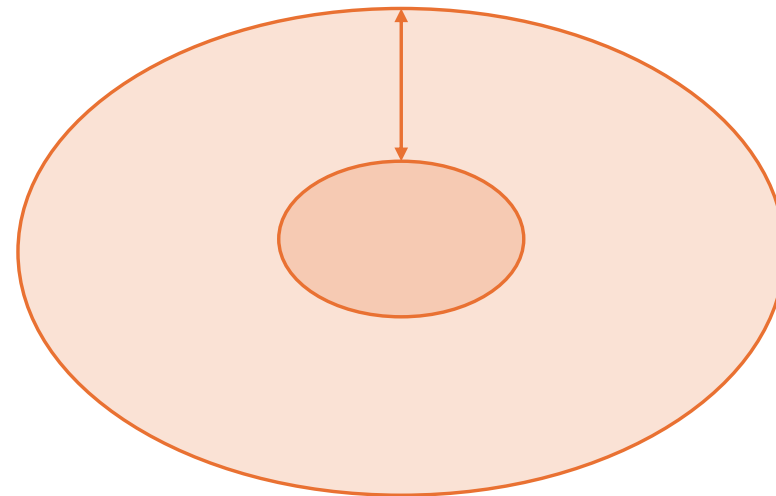
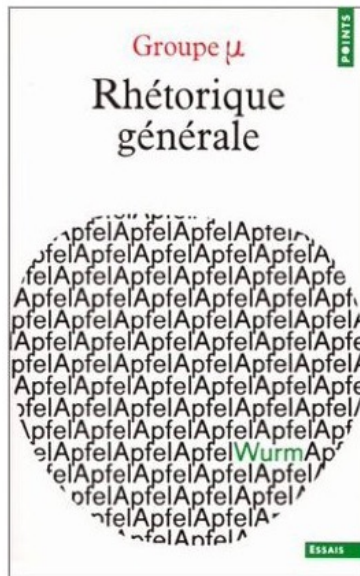
~~Synecdoche (/sɪˈnɛkdəki/ *sih-NEK-də-kee*)^[1] is a type of **metonymy**; it is a figure of speech that uses a term for a part of something to refer to the whole (*pars pro toto*), or vice versa (*totum pro parte*).^{[2][3][4]} The term is derived from **Ancient Greek** *συνεκδοχή* (*sunekdokhḗ*) 'simultaneous understanding'.^[a]~~

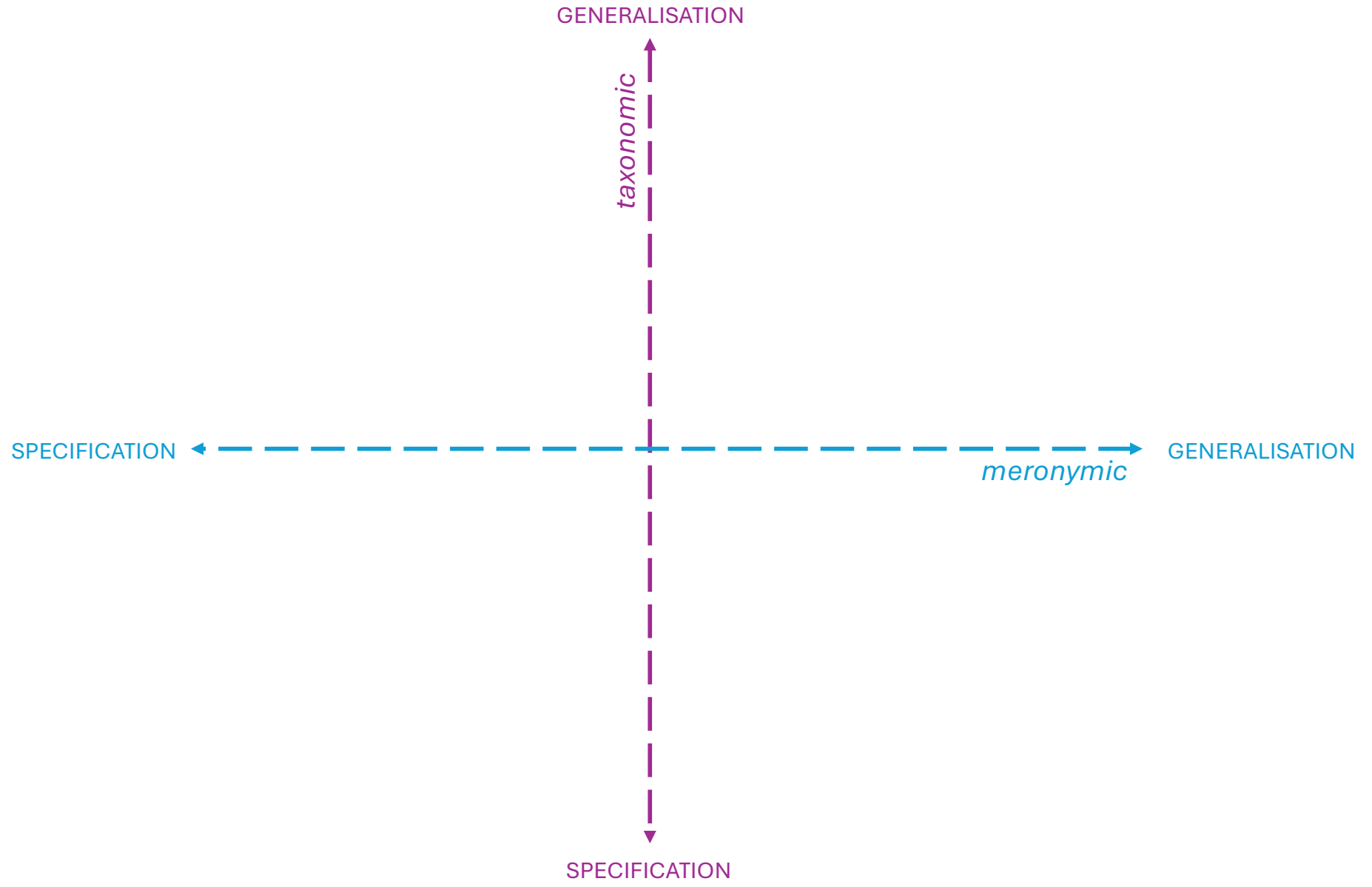


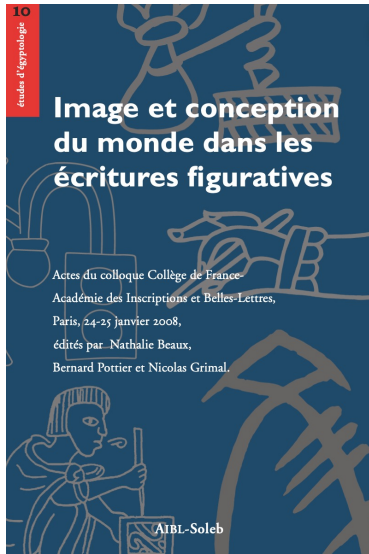
Synecdoche is a **basic stylistic figure** that substitutes one term for another, **more general** or **more specific**, along two axes: **part-whole** (meronymic) and **genre-species** (taxonomic)

Types of synecdoches

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GENERALISATION

taxonomic

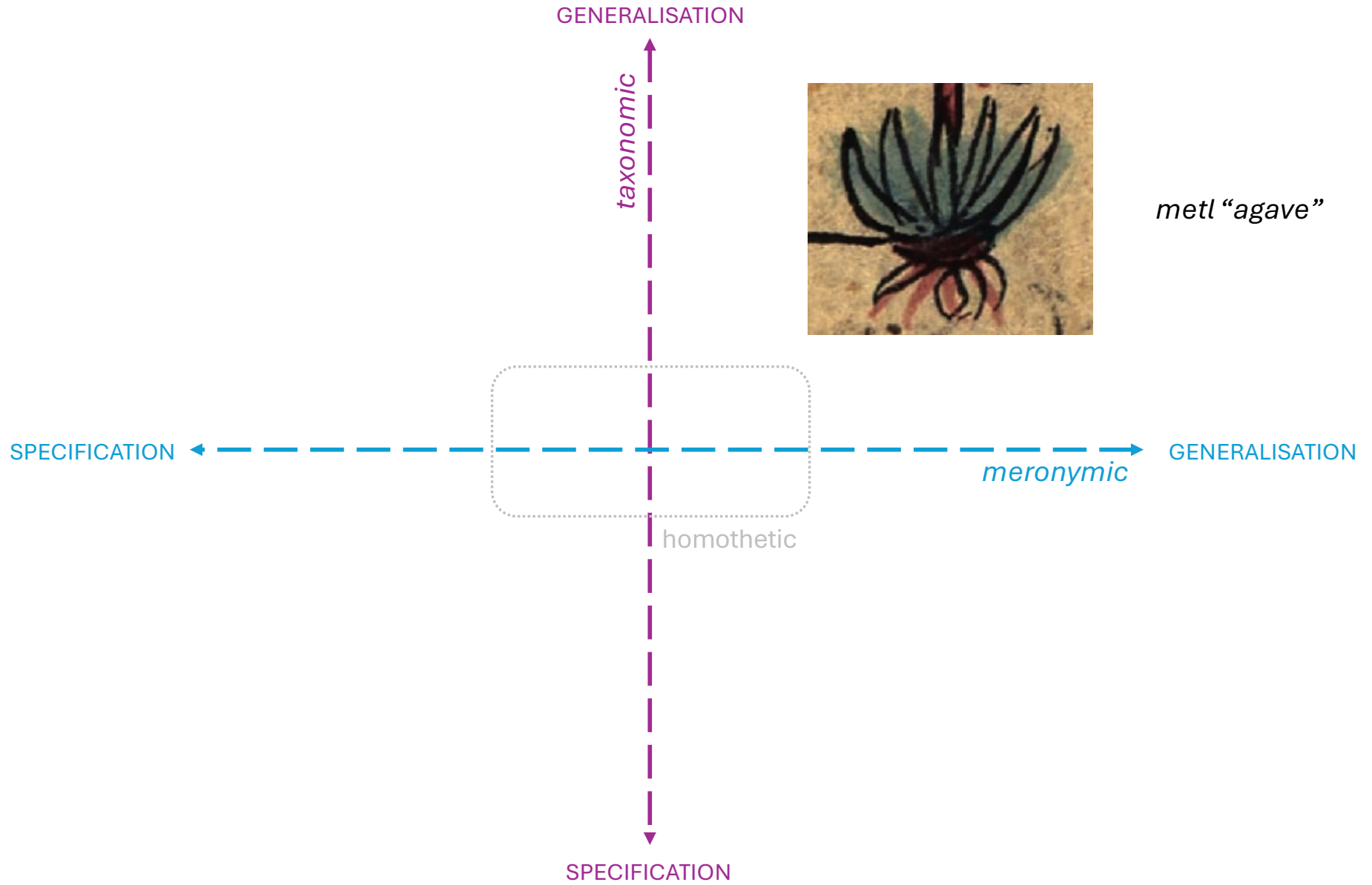


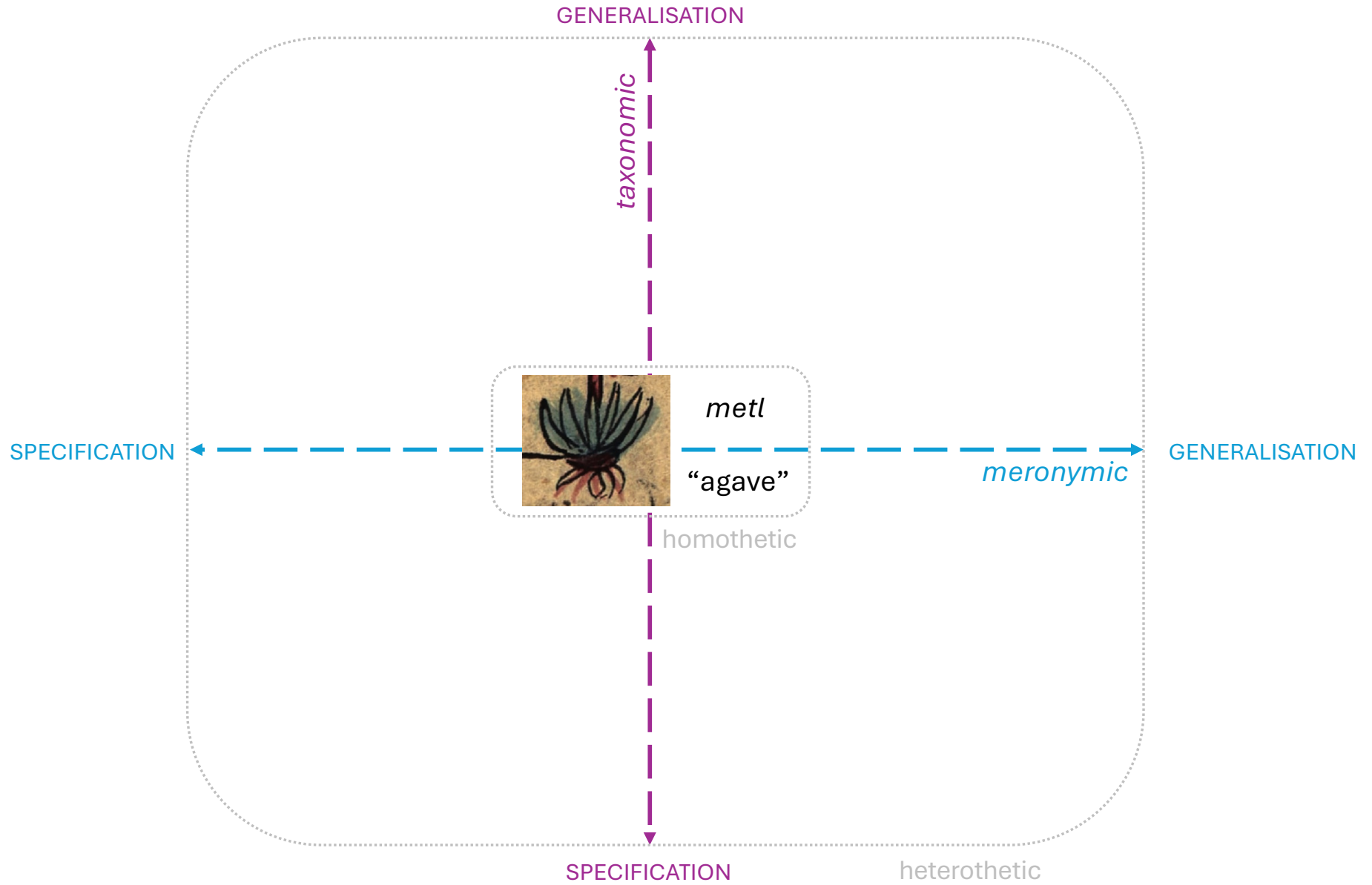
SPECIFICATION ←

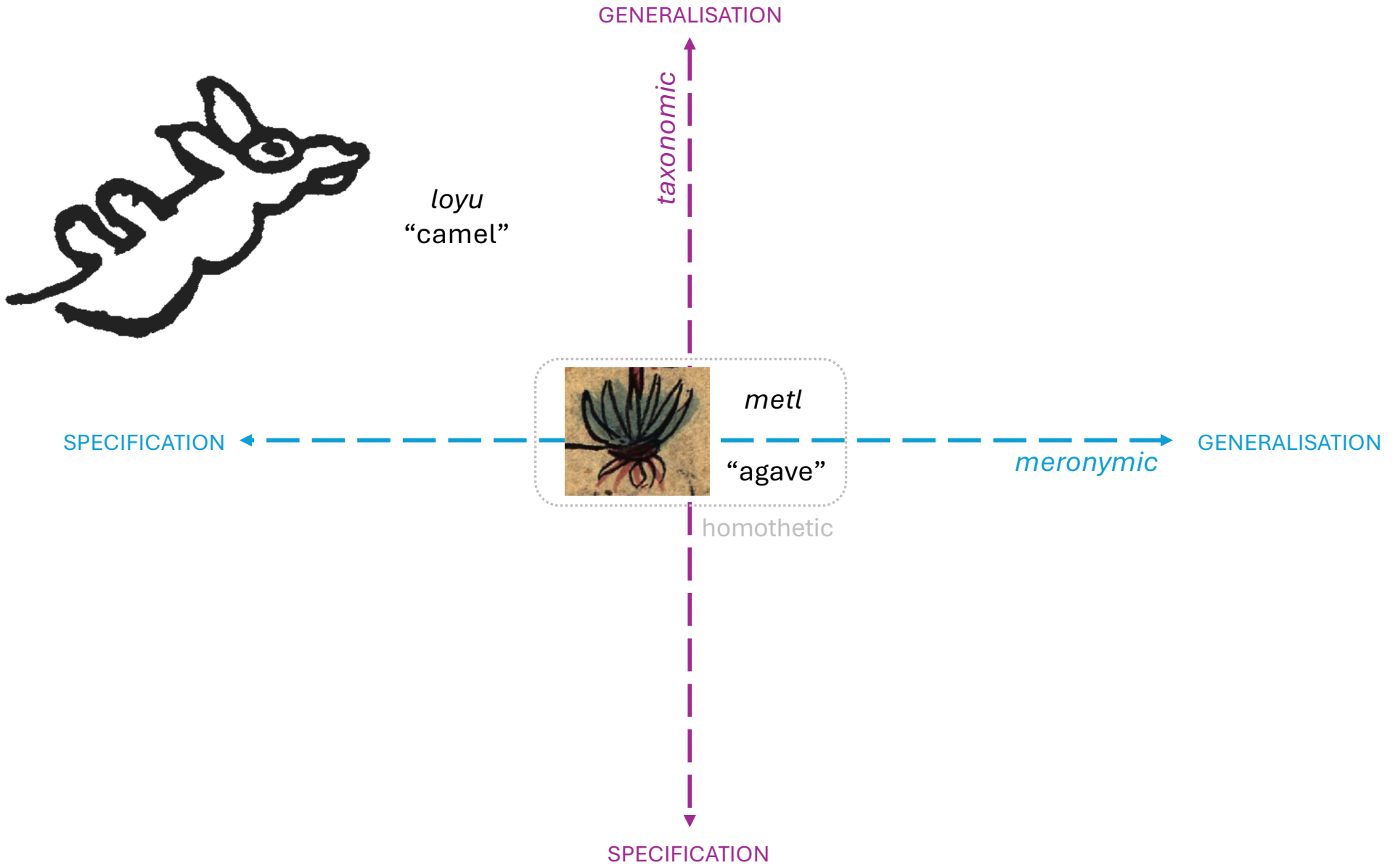
meronymic

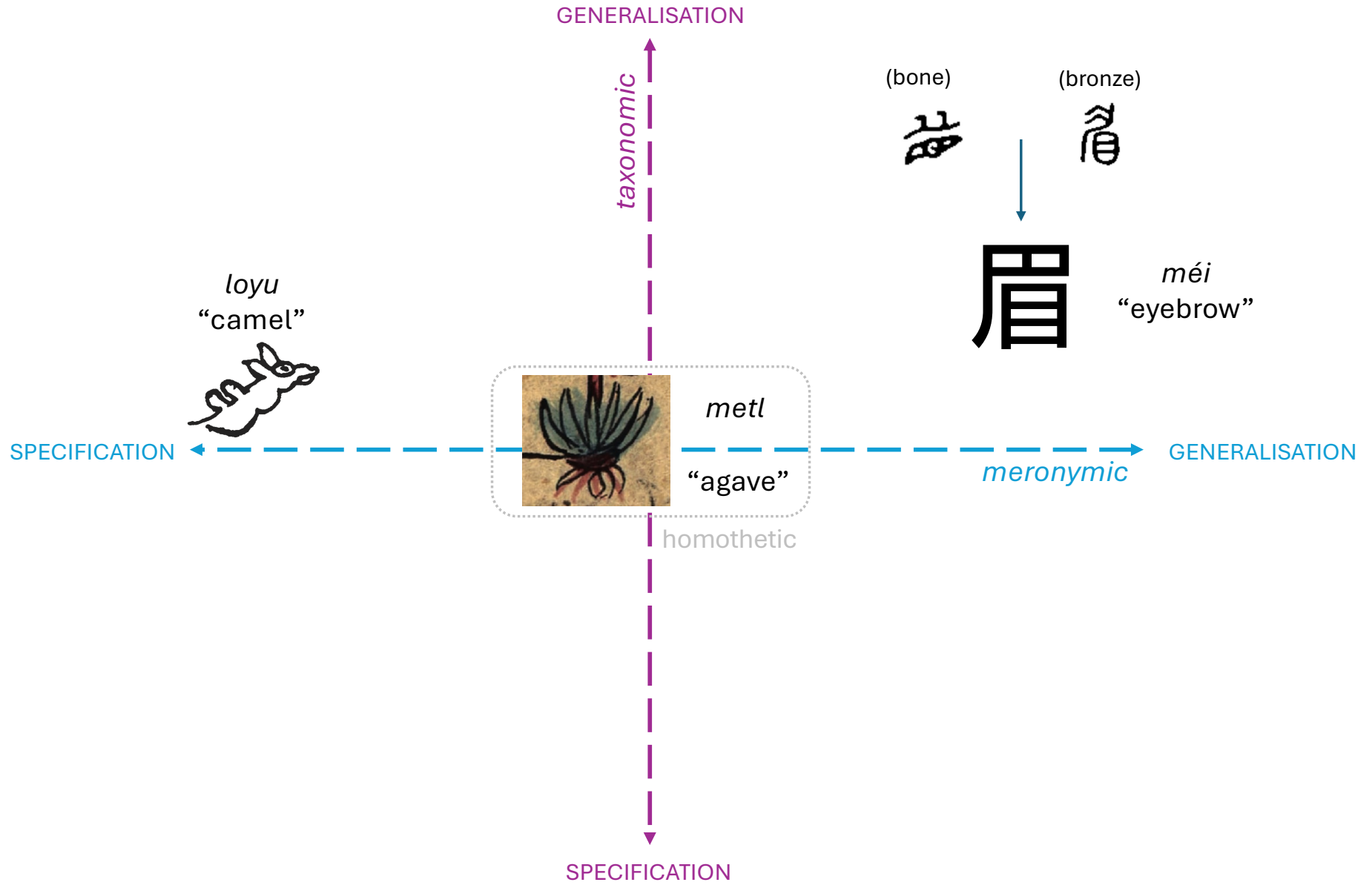
→ GENERALISATION

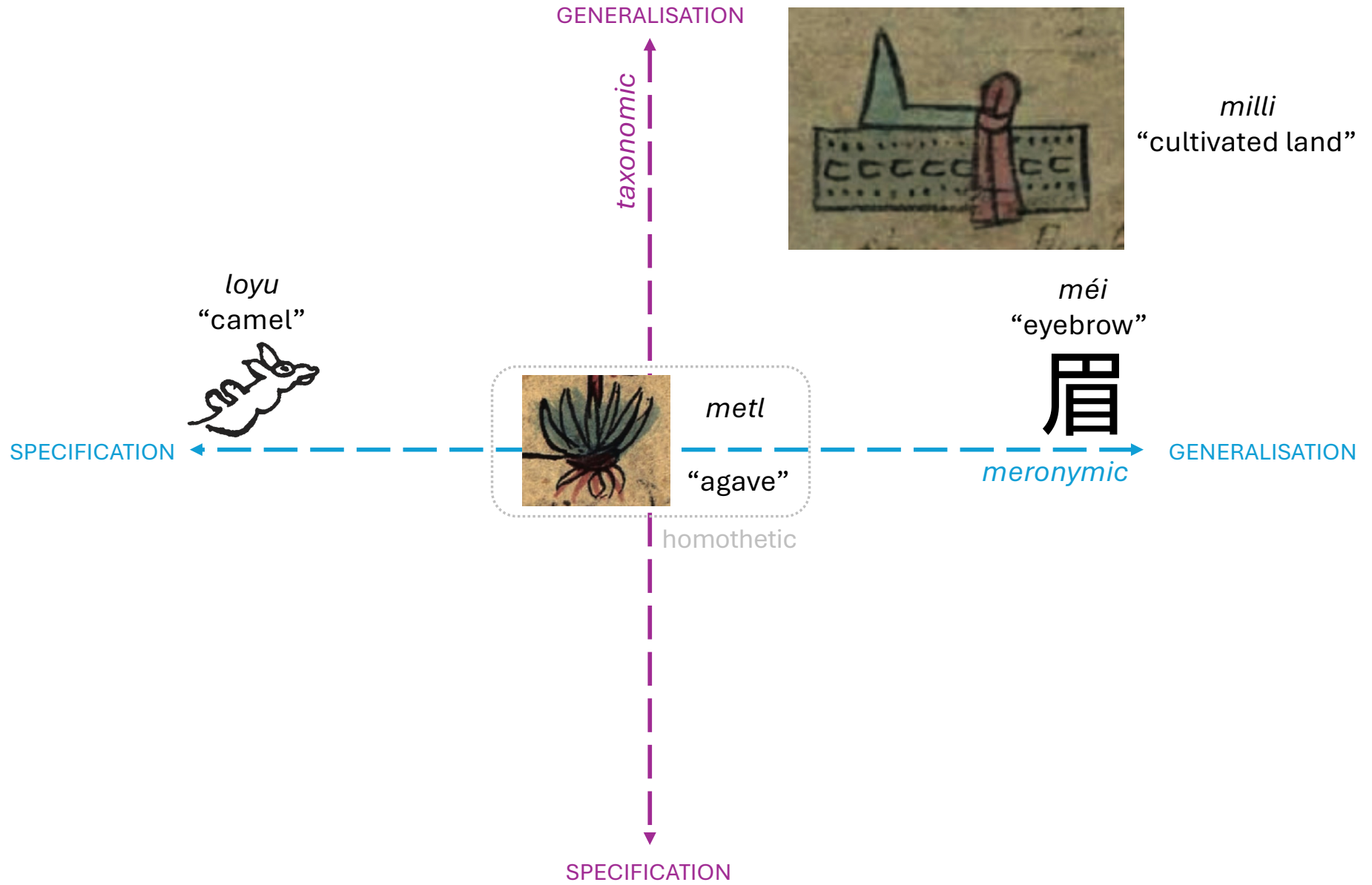
SPECIFICATION

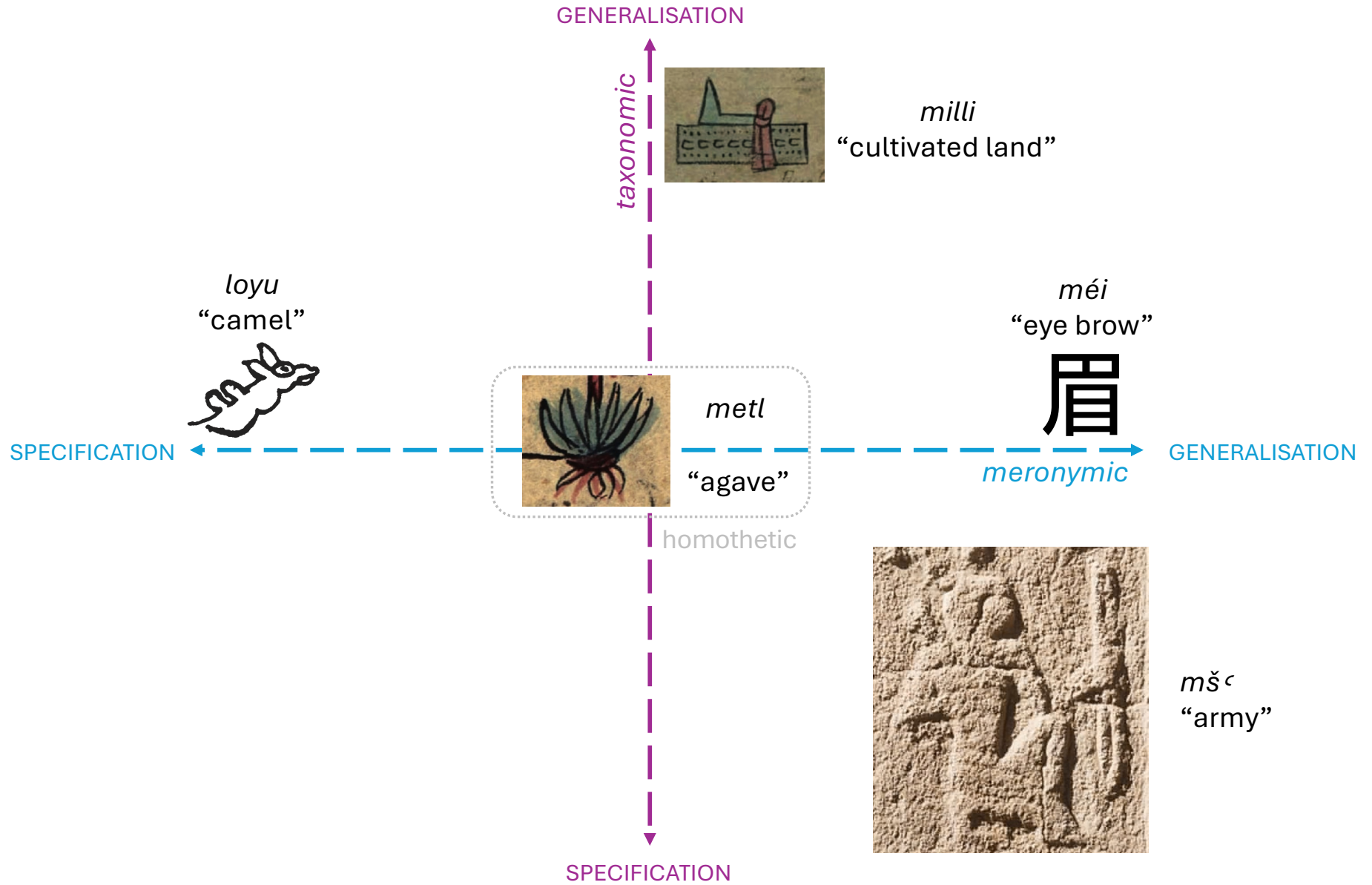


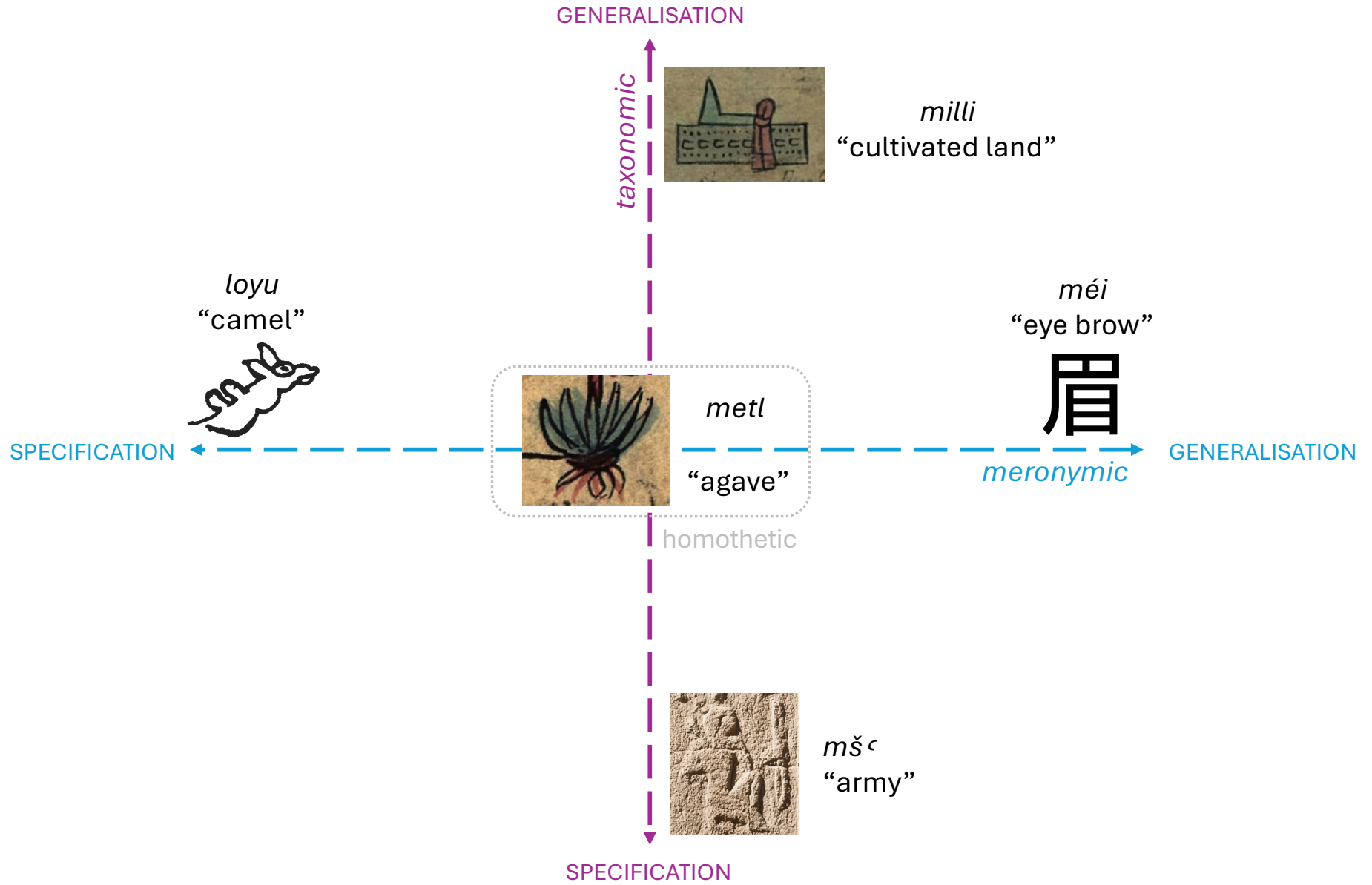


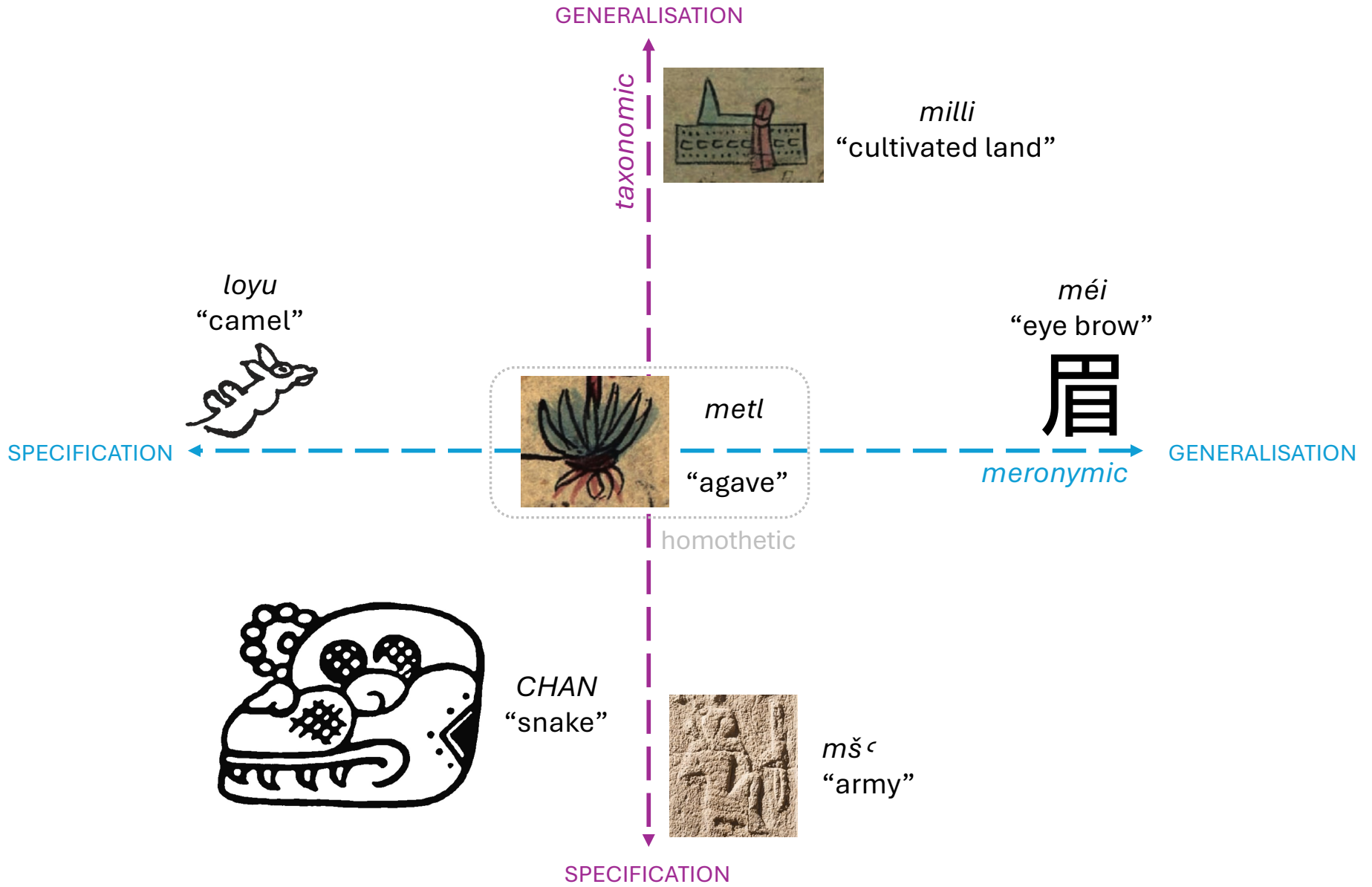


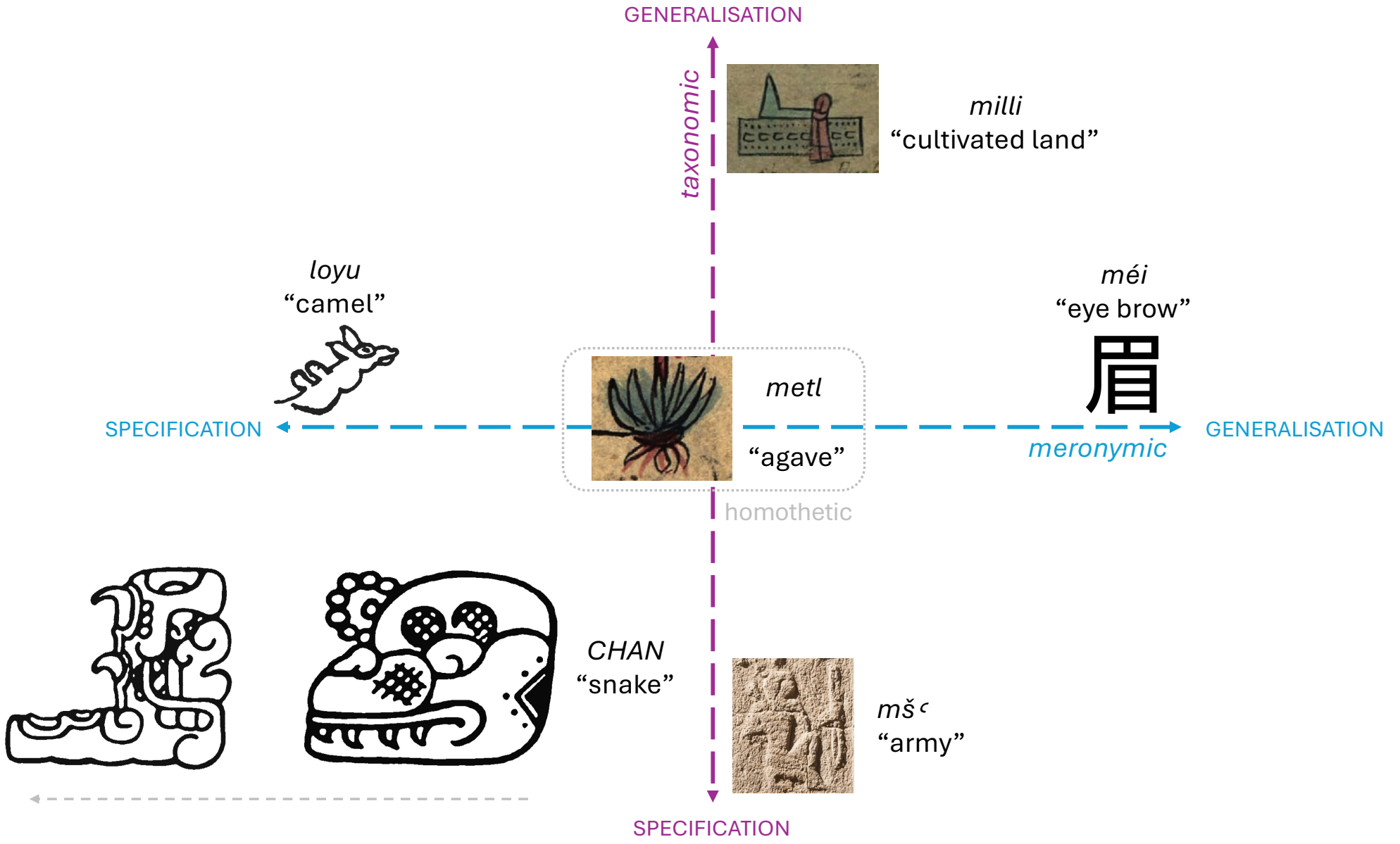


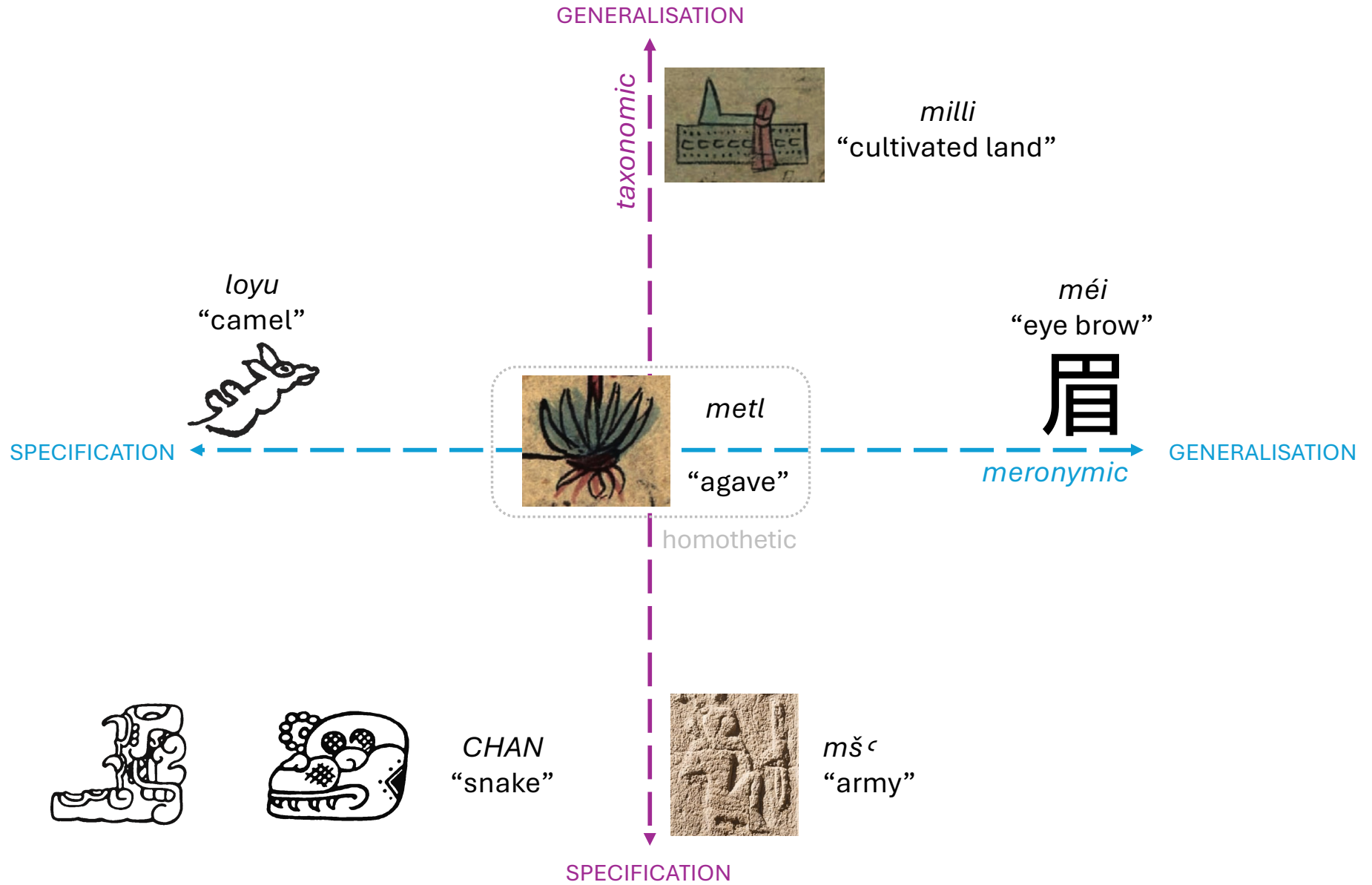


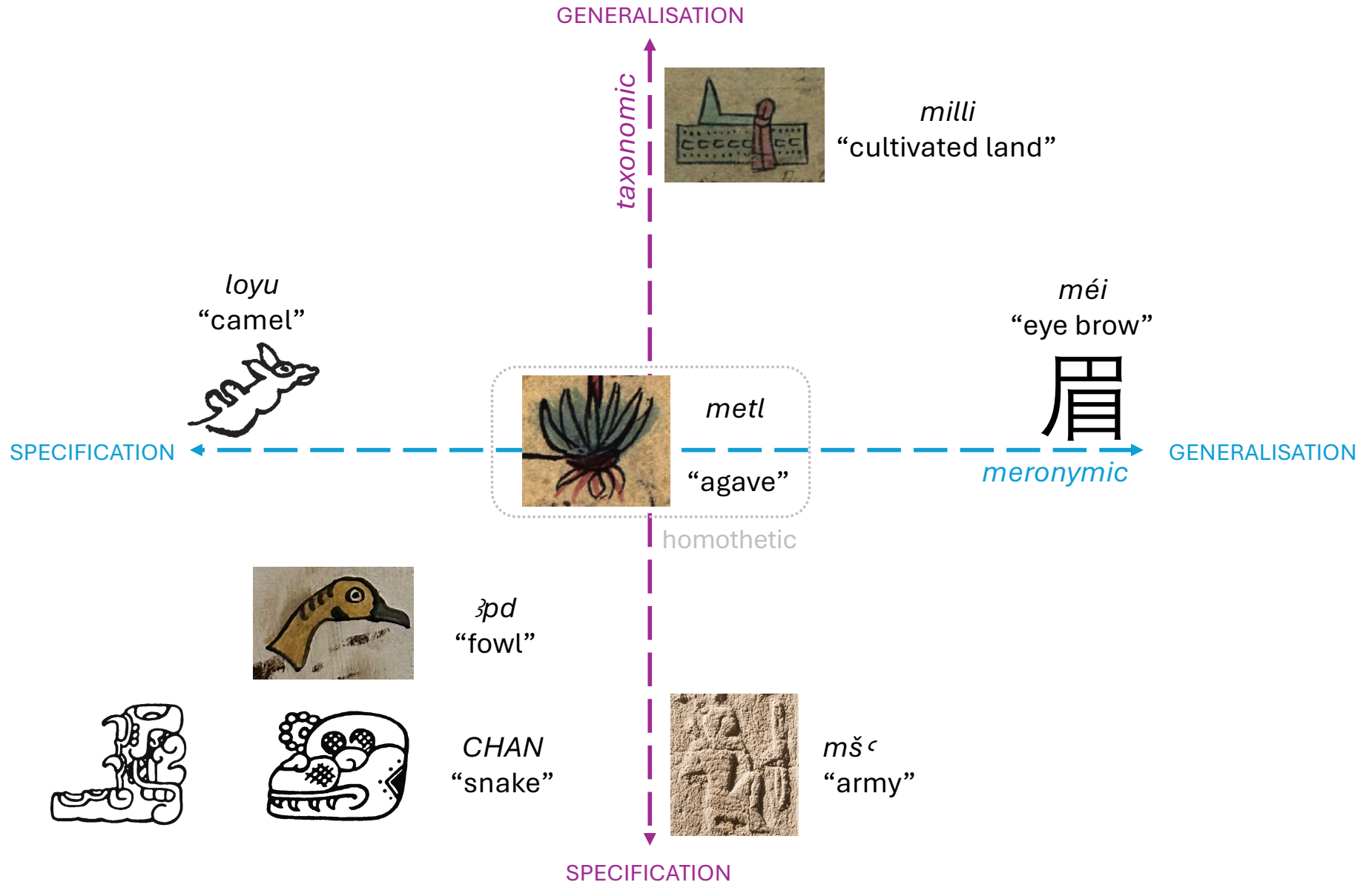






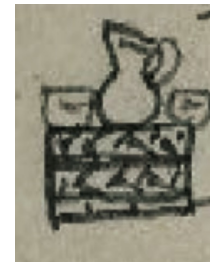
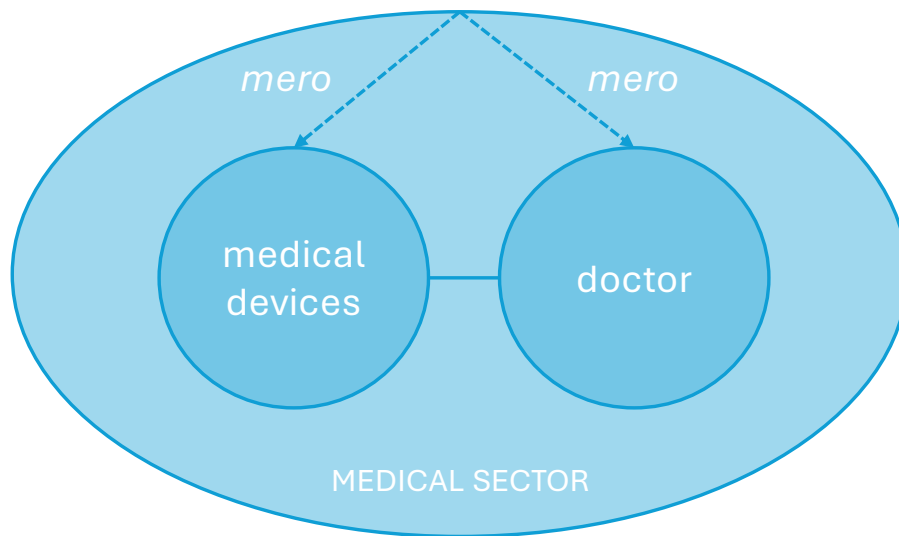






Combined synecdoche (1)

Metonymy as double (spec.) meronymic synecdoches



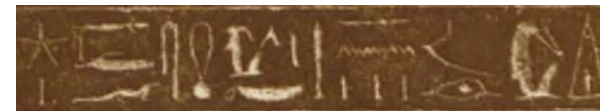
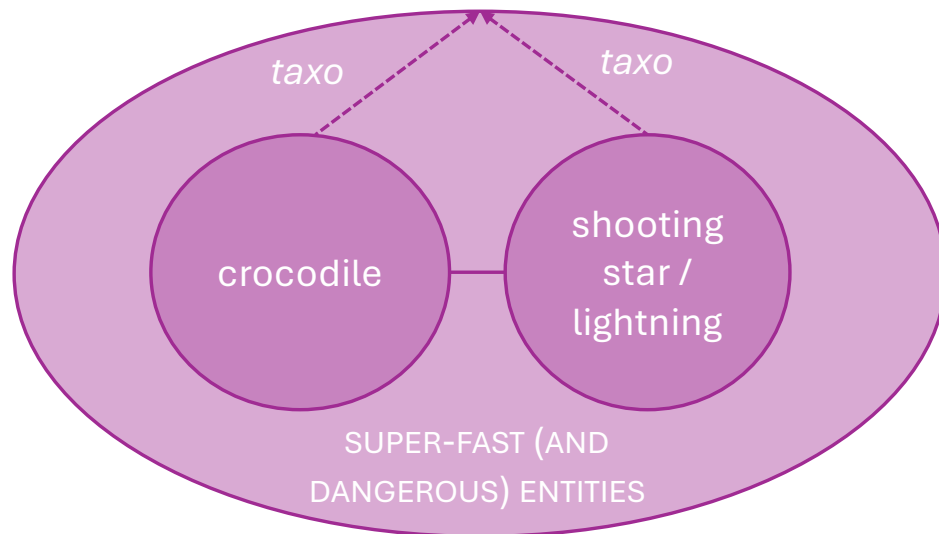
tlama
"doctor"

In the Aztec script, the composite glyph showing a basket, jar and cups symbolises the medical toolkit and is read *tlama* "doctor"



Combined synecdoche (2)

Metaphor as double (gen.) taxonomic synecdoches



dj=j m 33=sn hm=k mj sšd

“I cause them to see thy majesty as a shooting star (...)”

(Goldwasser 1995: 60–61)

To sum up

MORPHIC ICONICITY

“agave”



Homothetic

“army”



**Simple
synecdoche**

- (1) Meronymic
 - *Specification*
 - *Generalization*
- (2) Taxonomic
 - *Specification*
 - *Generalization*

“fowl”

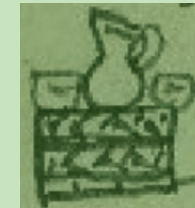


**Additive
synecdoche**

Example
Meronymic (spec.) +
taxonomic (spec.)

ANALOGIC ICONICITY

“doctor”



**Combined
Synecdoche**

- (1) Meronymic &
meronymic (spec.)
- (2) Taxonomic &
taxonomic (gen.)

DIAGRAMMATIC ICONICITY

tzatzi
“to shout”



chachalaca
“to talk a lot”



Thot Sign List Home Browse Search About Contact Registering for TSL Login

Hieroglyphic signs

Filter: Men and their occupations [Gardiner A] (All) Display Classes

A1	A2	A2A	A3	A4	A5A	A6	A6*
A6B	A7	A8	A9	A10	A11	A12	A13
A13E	A14	A14E	A15	A16	A17	A17A	A17D
A19	A20	A21	A22	A24	A25	A26	A27
A28	A29	A30	A31	A32	A32B	A34	A35
A35F	A36	A37	A38	A39	A47	A47D	A48

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The Archaeology of the Mind Lab

Prof. Orly Goldwasser

Machine learning Special Issue JCWS Research project ICE 2023 @ Leiden Congratulations

New paper: Towards automatic tagging of classifiers, using training data collected in iClassifier datasets

Nikolaev, Dmitry, Jorke Grotenhuis, Haleli Harel and Orly Goldwasser.
 2024. **Classifier identification in Ancient Egyptian as a low-resource sequence-labelling task**. ML4AL 2024 (First Machine Learning for Ancient Languages Workshop).

Classifier identification in Ancient Egyptian as a low-resource sequence-labelling task
 Dmitry Nikolaev¹, Jorke Grotenhuis², Haleli Harel³, Orly Goldwasser⁴
¹University of Manchester, ²Hebrew University of Jerusalem,
³MIT, ⁴Ury-@nikolav@hebrew.ac.il,
 {jorke.grotenhuis,haleli.harel,orly.goldwasser}@huji.ac.il

Abstract
 The complex Ancient Egyptian (AE) writing system was characterized by widespread use of glyphic classifiers (semantically, often the meaning or denoting the profession of the bearers). The study of classifiers has to build generalizations about the meaning of classifiers in ancient and modern languages. Thanks to the new contribution by the paper participants, it is now possible to formulate an algorithm of classifiers in AE. We use machine learning to automatically tag the classifiers in the training data. We discuss the challenges and opportunities of this task. By providing a platform, the project is expected to support the ancient Chinese writing system was built on similar principles (Goldwasser and Harel, 2018). A comprehensive dataset on the ancient Egyptian language is in effect. A comprehensive overview of studies of ancient languages utilizing machine-learning methods, prepared by Grotenhuis et al. (2023), includes only a couple of works on Egyptian, and all of them deal with individual tasks, such as optical character recognition and spectroscopy-based dating. Neither do the bases of the computational methods used in the studies of ancient languages.

At the same time, the field of classifier studies has been progressing rapidly in recent years. To a large extent this is due to the launch of iClassifier (Harel et al., 2024), a dedicated platform for analysis of classifiers in ancient and modern languages, which ensures interoperability between automated systems. By providing such a platform, the project

ML4AL 2024 [as CL], 29 Jun 2024

Thank you!