

MORPHOLOGY AND LEXICON FORUM 2025

in Tsukuba, September 13-14

Morphological Process and Analogical Effects in Demonym Formation in French: Proposal of a DM Account*

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*I am grateful to Professor Kentaro Koga (Aoyama Gakuin University) and Mr. Yuki Tanaka (Graduate school of University of Tokyo) for beneficial advice. I would also like to appreciate two peer-reviewers for comments. All errors and mistakes are my own.

Demonym (*gentilé* [ʒɑ̃til] in French)

- Functions
 1. Name of inhabitants as noun
 2. Adjectival form of a place name (**toponym**)
- Examples
 - Paris* → *paris-ien, -ienne*
 - Nice* → *niç-ois, -oise*
 - Tokyo* → *tokyo-ïte*
 - Scandinavie* → *scandinave*

Affix rivalry

- Definition

- Relationship between two or more affixes that can be used to form the same semantic type of words. (Huyghe and Varvara 2023, 3)
e.g. *-ity* vs. *-ness* rivalry in English (Aronoff 1976, 38-39)
- Demonimic suffixes in French are treated as affix rivalry (Thuilier et al. 2023, Huyghe and Varvara 2023, Huygevelde et al. 2025)

Research question and aims

- Research questions
 - Computational process to create new demonym
 - ◆ How can we formulate the morphological process to form new demonyms?
 - ◆ Which analogy affects the process?
 - e.g. demonym for Tsukuba → tsukub-ien? tsukuba-ien? tsukub-ain? tsukub-ois? etc.
- Aims of this presentation
 - To propose a DM analysis as a suitable account for computational processes
 - To reveal the black box of analogy

Phonological effects

- Phonological effects play a key role in affix rivalry
 - Final segment of base determines its demonymic suffix (Plénat 2008, Roché and Plénat 2016, Huygevelde et al. 2025)
 - Phonological effects have statistically greater importance than other (non-linguistic) factors (Thuilier et al. 2023)
 - OCP effect between base and suffix
 - ◆ **Obligatory Contour Principle (OCP)**: At the melodic level, two adjacent identical elements are prohibited (McCarthy 1986, 1988)
 - ◆ Phonological elements or features dissimilate between base and suffix

Phonological effects

- OCP effect

- (1) OCP effect in Ainu (Shibatani 1999, 13)

- a. /ku-kor-rusuy/ → ku kon rusuy b. /kor-rametok/ → kon rametok

- 1.PL · NOM-have.PL want

- have bravery

- OCP effects (dissimilation) in demonym formation

- OCP_[±back] and OCP_[nasal] are proposed (Thuilier et al. 2023, Huygevelde et al. 2025)

Phonological effects

- OCP_[nasal] effect in actual example

(2) Suffix rivalry for same base found in corpus (Eggert et al. 2003, 34)

Nantes > a. nant-ais b. ?nant-ois c. *?nant-ien

[nasal] [nasal]

|

|

OCP effect

Optionality in suffix selection

- **Proposal:** Suffix selections are optional in demonym formation

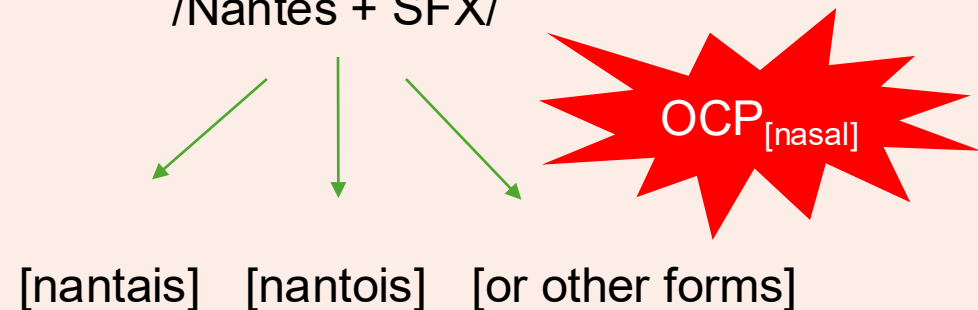
- Evidence 1: Lack of **repair strategy (RS)**

- ◆ OCP effect in Ainu in (1) has an RS as follows: /r/ → [n] / __ /r/
- ◆ There are no stable RSs in demonym formation

/kor + rusuy/



/Nantes + SFX/



Optionality in suffix selection

- Evidence 2: Demonymic forms are not fixed
 - ◆ We do not memorise each demonymic form one by one
 - ◆ However, there are actual demonym suffixes as in *-ien*, *-ois*, *-ais* etc.

Why in DM?

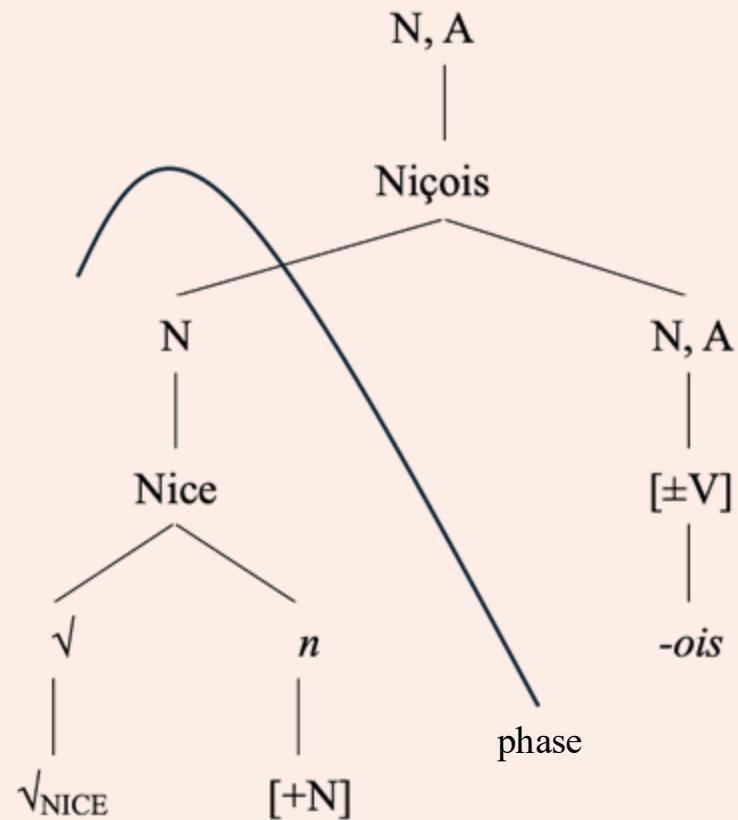
- Computational process
 - Demonym formation is a productive but irregular type of derivation
 - DM is suitable for formulating native speakers' computation
- All-in-one analysis
 - Demonym formation is a complicated process which linguistic and non-linguistic factors are combined
 - DM allows us to combine various sections (syntax, morphology, phonology...) and various factors (linguistic, non-linguistic...)

Key concepts of DM

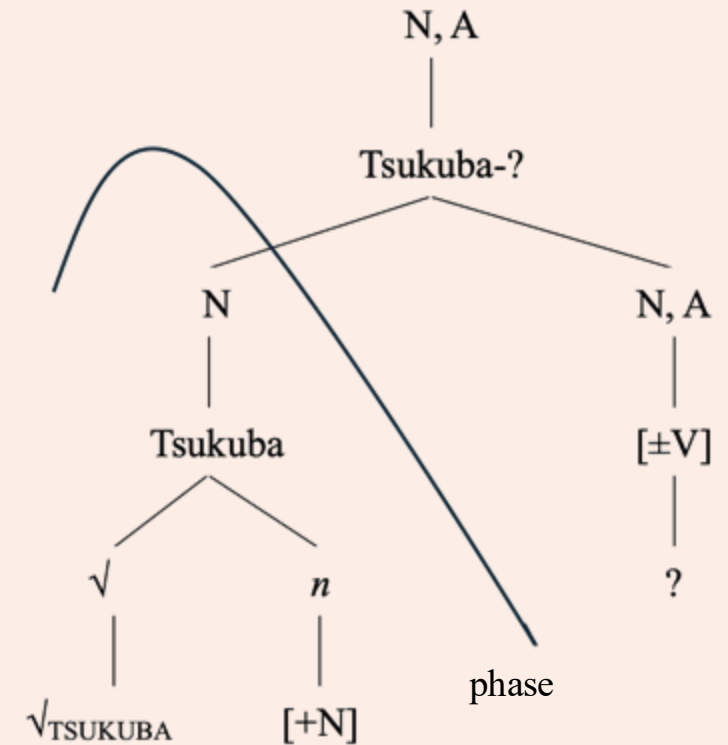
- An account used in this talk
 - **Distributed Morphology (DM)** Halle and Marantz (1993), Harley and Noyer (1999) etc.
- Basic concepts
 - Root-hypothesis
 - Late insertion
 - Underspecification
 - Syntactic Structure All the Way Down

Basic structure of demonyms

a. Existing demonyms



b. When creating demonyms



Basic structure of demonyms

- Word-derivation

- Demonym formation is regarded as a **Word-derivation**, which contrasts to **Root-derivation** (Arad 2003).
 - ◆ Rounds of Toponym formation and demonym formation are separated by **phase**. (Chomsky 2001)
 - ◆ A category-unspecified Root becomes a Word (toponym) by its Merge with categorizer n . then, demonym is formed as a Word-derivation.
 - ◆ Assuming that demonym formation is a Word-derivation, we can account for the optionality of suffix selection.

Basic structure of demonyms

- Category change

- Demonym formation requires category change

- ◆ Toponyms only function as nouns; however, demonyms function as adjectives as well as nouns

- ◆ **Toponym** → **N**, **demonym** → **N**, **A**

(3) Category of toponyms and demonyms

- | | | |
|----|---|---|
| a. | ^{OK} Un restaurant à Strasbourg | ‘A restaurant at Strasbourg’ |
| b. | *Un restaurant Strasbourg | ‘*A Strasbourg (adj) restaurant’ |
| c. | ^{OK} Un restaurant chez Strasbourgeois | ‘A restaurant at a house of Strasbourgeois’ |
| d. | ^{OK} Un restaurant strasbourgeois | ‘A strasbourgeois (adj) restaurant’ |

Basic structure of demonyms

- Category change

- Change ($\sqrt{} \rightarrow \mathbf{N} \rightarrow \mathbf{N}, \mathbf{A}$)

- ◆ There are two types of category changes, and their differences are result from whether it is Root-derivation or Word-derivation (Tagawa 2007)

hu-benkyoo ‘_{NEG}-study (A, N)’: $\sqrt{} \rightarrow \mathbf{A}, \mathbf{N}$ (**Root-derivation**)

atataka-sa ‘warm-ness’: $\sqrt{} \rightarrow \mathbf{A} \rightarrow \mathbf{N}$ (**Word-derivation**)

Basic structure of demononyms

■ [$\pm V$] Merge

- ◆ This research argues that “N to A, N change” is a consequence of [$\pm V$] **Merge**
- ◆ Chomsky (1970) argues that there are only two features: [$\pm N$] and [$\pm V$]
 - N is represented as [+N, -V]
 - A is represented as [+N, +V]
- ◆ Assuming [$\pm V$] Merge, we can account for the “N to A, N” category change
 - Semantic and phonological properties are preserved in Word-derivation (Arad 2003, 2005, Tagawa 2007)

Analogical effect

- Suffix selection
 - Speakers search for an appropriate suffix for new demonyms.
 - ◆ It is assumed that this process is determined by ***analogy***

- Analogy
 - Traditional and basic assumption

Formula: $A : B = C : X$

(4) Error taken in child English

$cat : cats = child : X$

$X = childs$

Analological effect

- Analological effect on suffixation

- Suffixoid *-gate* in English (Kulgavova 2022)

- ◆ *-gate* is a suffixoid which means “scandal”.
 - ◆ It originates from Watergate scandal: a political scandal in the U.S, from 1972 to 1974.
 - ◆ *-gate* is used as a suffix which stands for “scandal” in a variety of context.

- (5) Examples of *-gate* suffixations

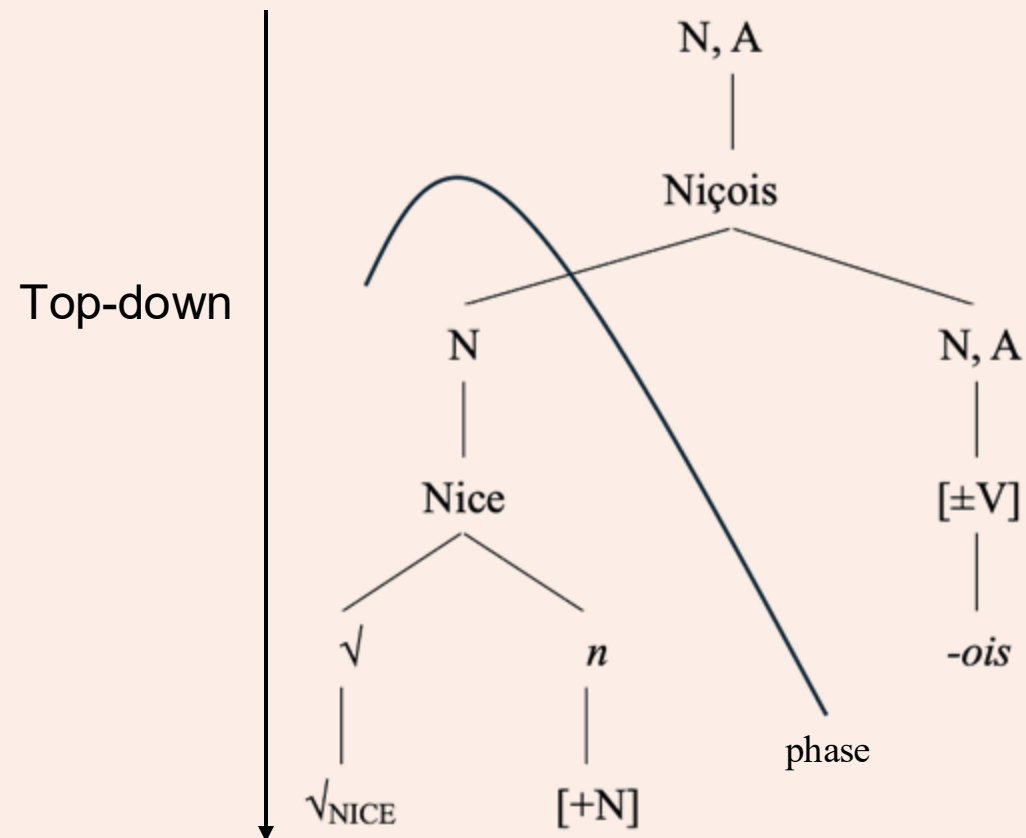
- a. Winegate (1973): the substitution of expensive French wines like Bordeaux with cheaper and lower-quality ones in France.
 - b. Crashgate (2008): A scandal in Formula 1 racing.

Analological effect

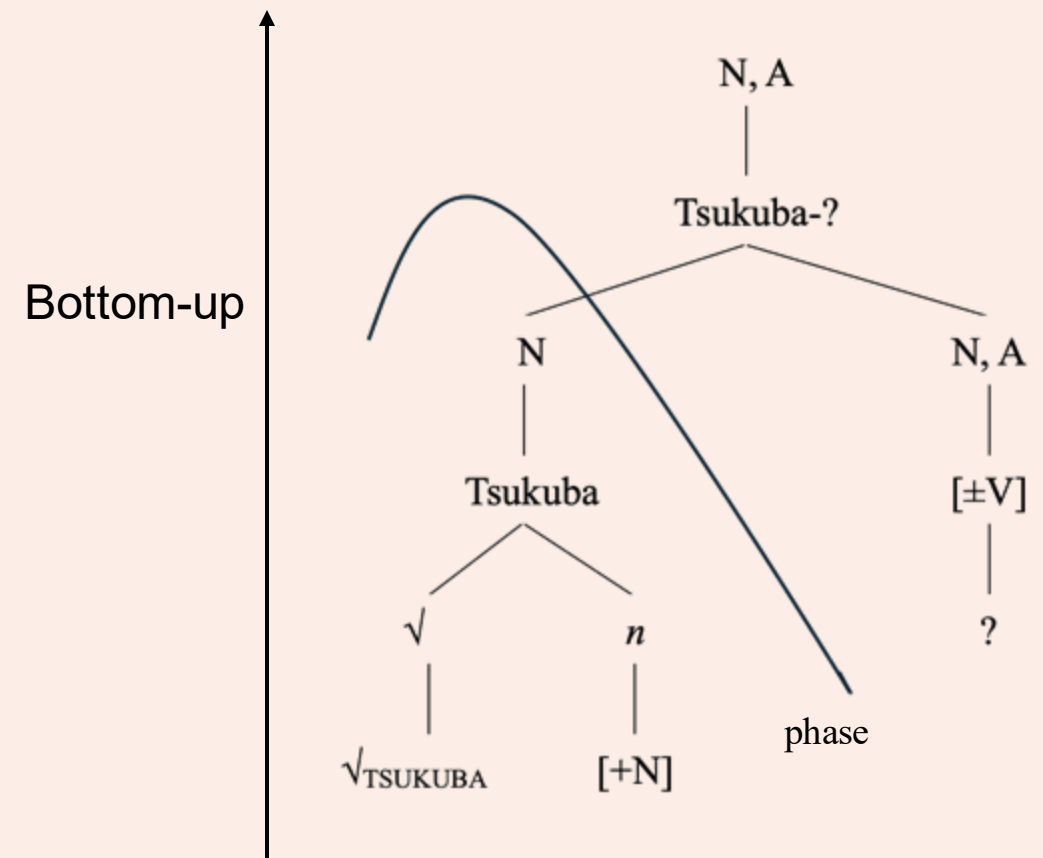
- Picking and filling a suffix
 - In our mental state, we parse the morphological structure to find a suffix
 - We can fill the “? space” with the picked suffix to create a new demonym
 - Picking is a top-down process, but filling is a bottom-up process

- Picking and filling a suffix

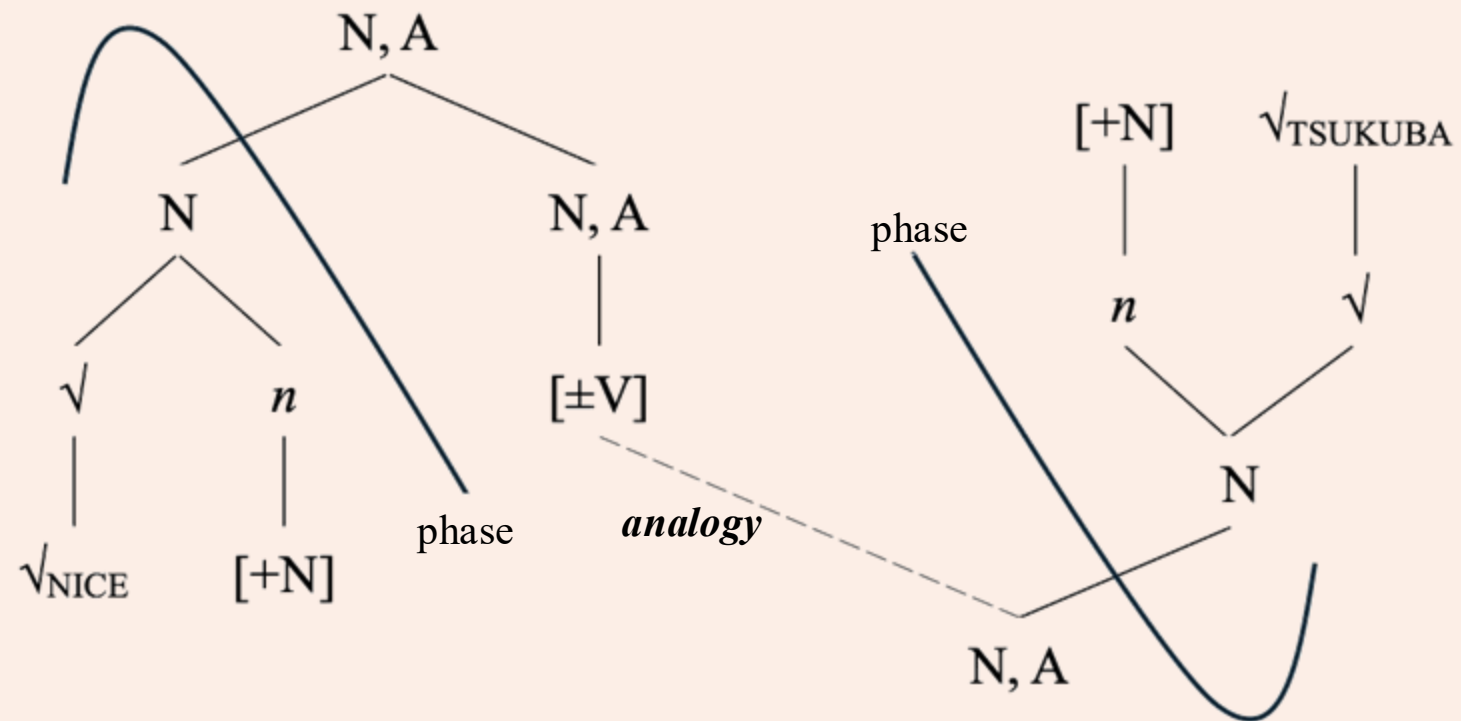
a. Existing demonyms



b. When creating demonyms



- Combined tree



Analogue effect

- Revealing black box of *analogy*

- Non-linguistic parameters in demonym formation (Thuilier et al. 2023)

- ◆ Geographically close toponyms tend to share the same suffix.
 - ◆ They uncovered that there are relationships of suffixes and geographical features.
 - *-ien* tends to favour toponyms which are not cities (**areas**: e.g. Languedoc / languedoc-*ien*.
Countries: *Australie* / austral-*ien*)
 - *-ois* tends to link to the toponyms which are cities
 - ◆ There are counterexamples since it is only a tendency; however, this phenomenon is statistically significant. (Thuilier et al. 2023, 130)

Analological effect

- Demonimic suffix by its geographical type of toponym

Table 1: Distribution of the suffixes according to the geographical type of the base toponym (Thuilier et al. 2023, 130)

	<i>-ais</i>		<i>-éen</i>		<i>-ien</i>		<i>-ois</i>		Total
	#	%	#	%	#	%	#	%	
City	464	24.6	141	7.5	473	25.1	806	42.8	1,884
Area	51	27.3	13	6.9	87	46.5	36	19.3	187
Country	40	27.2	11	7.5	84	57.1	12	8.2	147
Total	555	25.0	165	7.5	644	29.0	854	38.5	2,218

Statistically significant (chi-square test: $\chi^2(6, N = 2,218) = 132.66, p < 2.2e-16$)

Analogue effect

- Suffix share by location

Figure 2: Distribution of the suffixes on French metropolitan territory (Thuilier et al. 2023, 131)

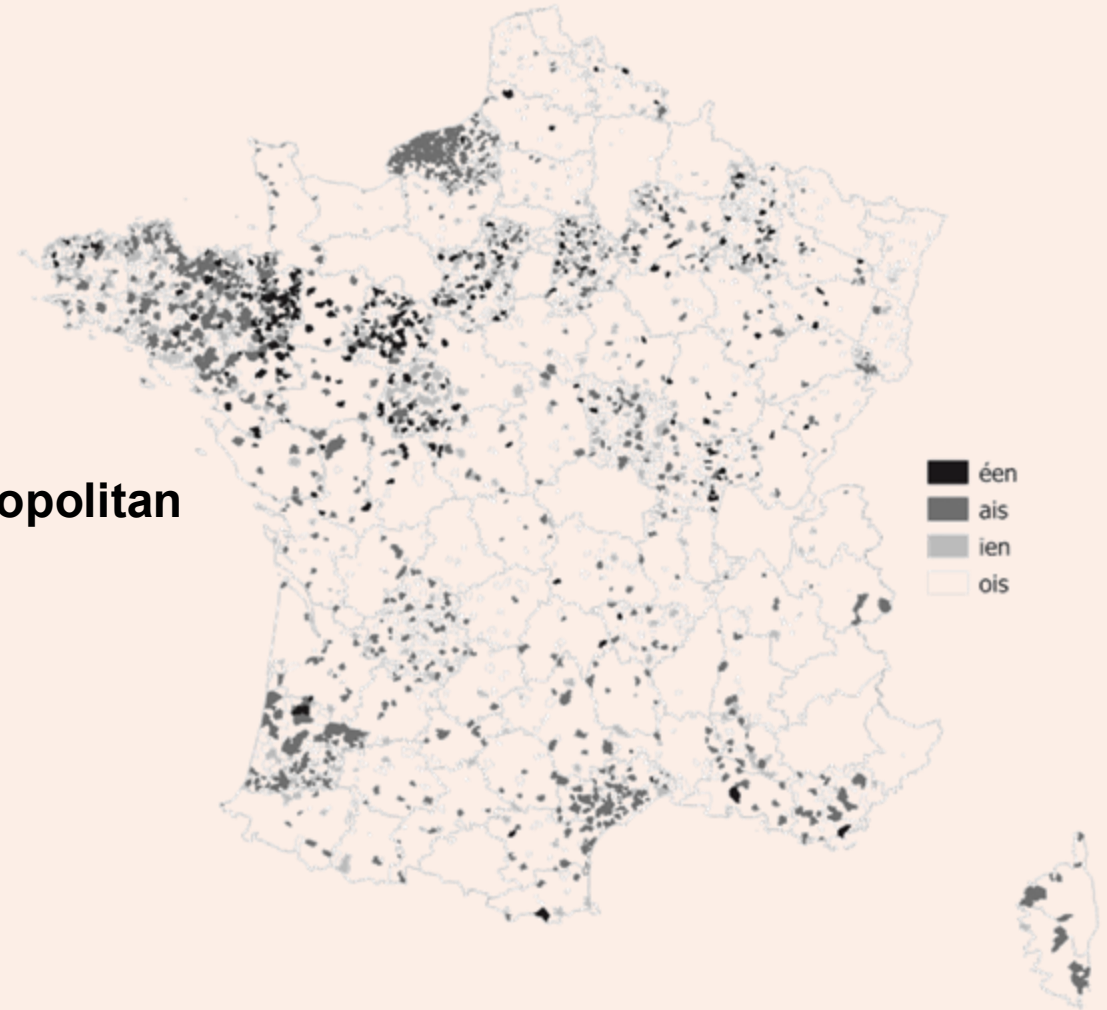
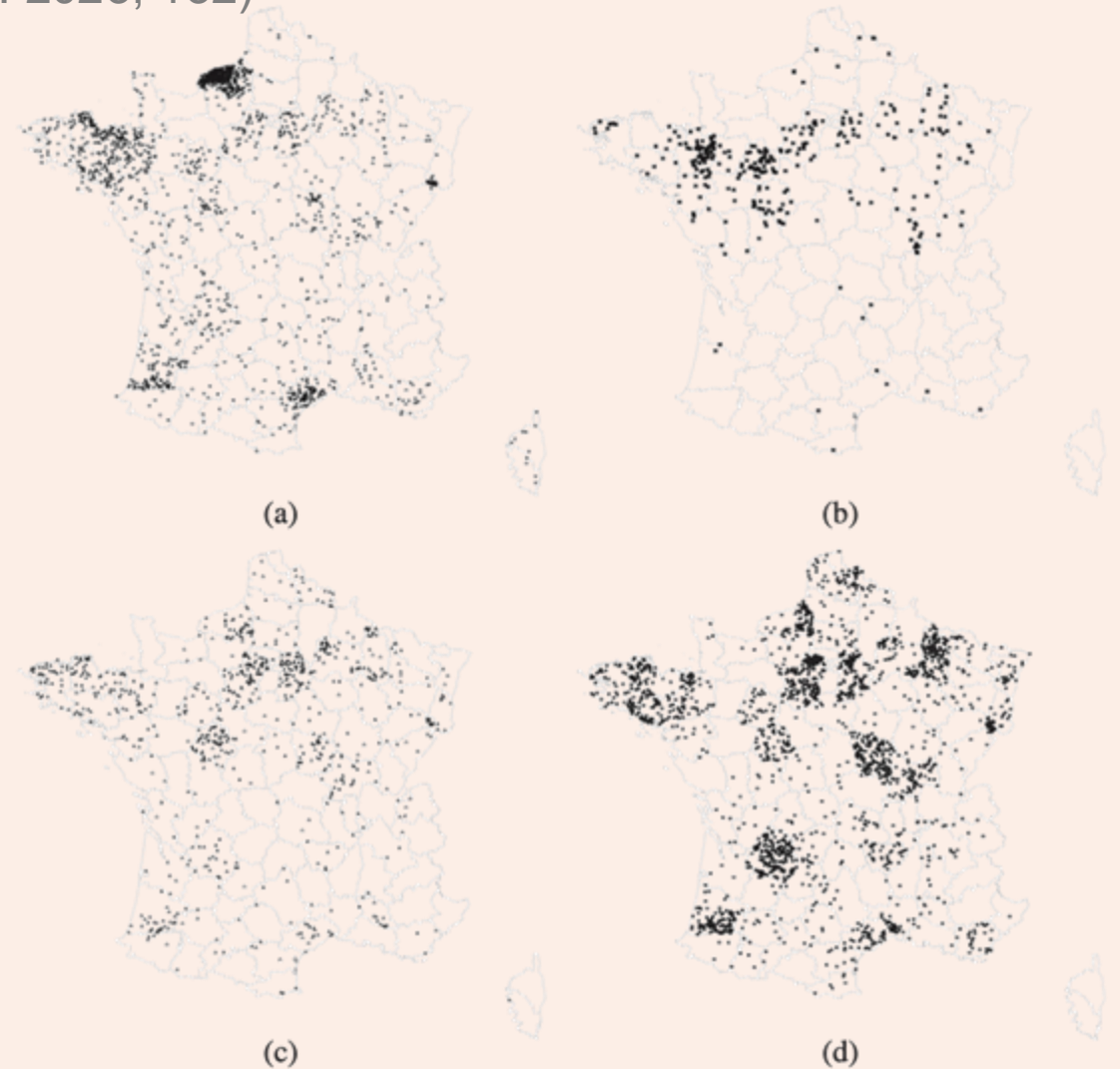


Figure 3: Distribution of *-ais* (a), *-éen* (b), *-ien* (c), and *-ois* (d)
(Thuilier et al. 2023, 132)

Analogical effect

- Suffix share by location
 - Neighboring toponyms tend to share the same suffix
- Statistically significant (Kruskal-Wallis tests:
- ais*** ($H(3) = 74.7$, $p < 0.00001$, $N = 1,435$),
 - éen*** ($H(3) = 63.77$, $p < 0.00001$, $N = 1,435$)
 - ien*** ($H(3) = 26.51$, $p < 0.0001$, $N = 1,435$)
 - ois*** ($H(3) = 84.67$, $p < 0.00001$, $N = 1,435$))



Analogical effect

- Suggested other analogies (not deeply surveyed yet)
 - Add *-ïte* to express foreignness or exoticism
 - ◆ e.g. *Tokyo-ïte*, *Moscov-ïte* (Moscow)
 - ◆ *-ïte* was completely not found in a corpus (Eggert 2005) of demonyms in France.
 - Analogy from similar impression
 - ◆ *Okinawa-ïen* <analogy– *Hawa-ïen* (cf. *Osak-ien* for *Osaka*, not *Osaka-ïen*)

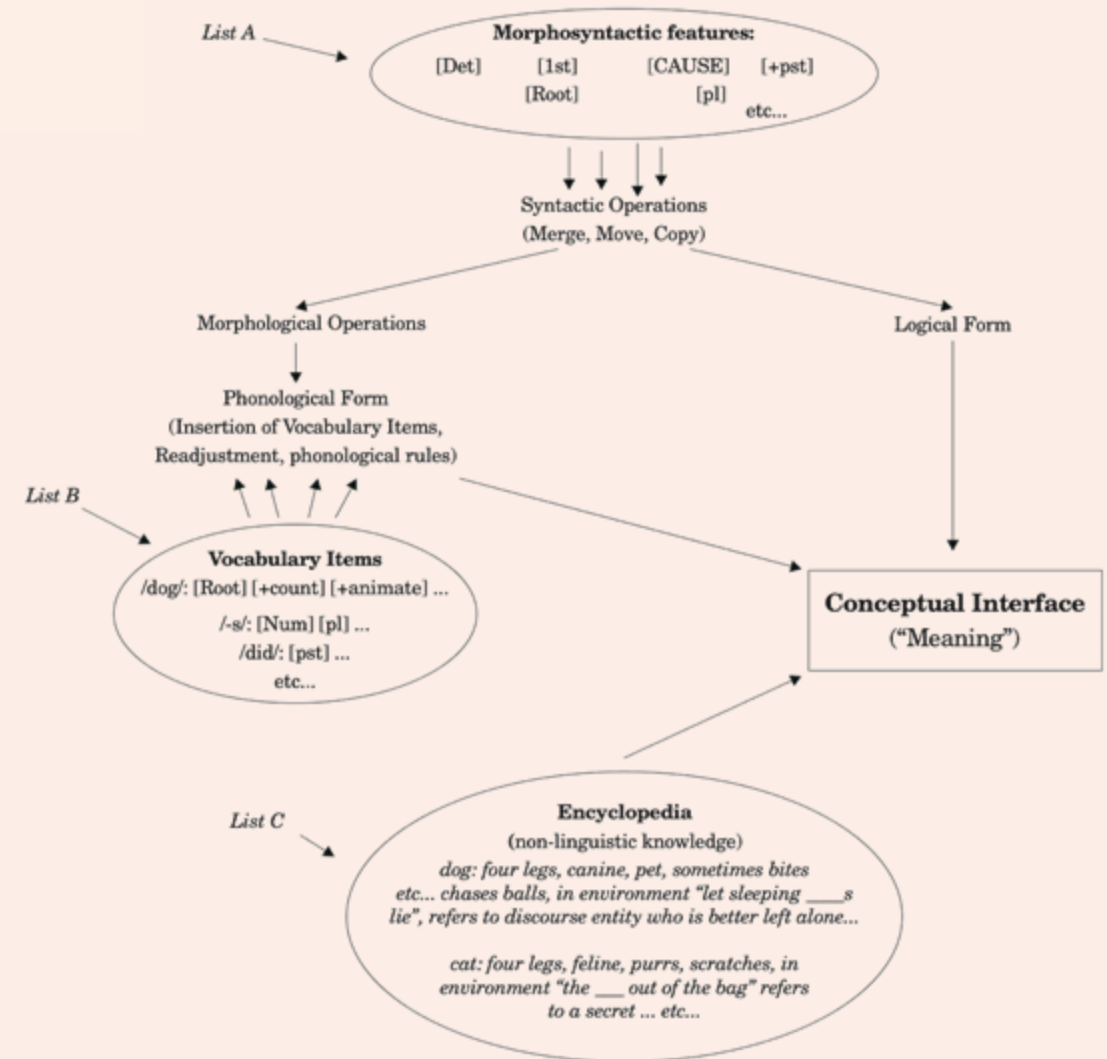
Analogy in DM account

- Proposal 1: Non-linguistic parameters are registered in ***Encyclopedia***.
- Proposal 2: Non-linguistic parameters and linguistic ones are divided.
 - Phonologically or morphologically ill-formed forms are filtered out in morpho-syntactic operations or Spell-out processes.
 - Non-linguistic parameters as geographical ones are determined by *Encyclopedia* reference.

Analogy in DM account

- Structure of grammar in DM

- As shown in the figure at the right-hand side (Harley and Noyer 1999, 3)
- After a morpho-syntactic operation, a form is spelled out to Logical form (LF) and a morphological operation.
 - ◆ Vocabulary items are inserted in Morphology.
 - ◆ After Morphology, there comes PF spell-out (phonetic realization).
- After those operations, the form is sent to *Encyclopedia* to refer social or non-compositional knowledge



Analogy in DM account

- Morphological operations
 - At this level, **optional suffix** through suppletion selection is added to [Word] (toponym).
- *Encyclopedia* reference
 - After the morphological operation, each candidate is checked for naturalness with respect to speaker's social knowledge.
 - ◆ Unnatural candidates are filtered out at this level.

Analogy in DM account

- PF spell-out
 - Phonological constraints such as OCP are grounded.
 - Through constraint interaction, ill-formed candidates are filtered out.
- Remarks on this account
 - Number of Inputs is infinite
 - ◆ Many candidates are checked.
 - ◆ This hypothesis is called **Richness of the base** as an OT-style terminology.
 - Optionality of suffix can be accounted for by this theory.

Accounting for contradiction to the theory

- Problem

- As can be seen, there are counterexamples for the tendency or theory.

- Solution -from a case of *Rendaku*

- Allomorph analysis (Tanaka 2025b)

- ◆ Allomorph analysis is a solution for over- and under-application of Lyman's law.

humi-sibaru 'step on-bind' vs. *hun-zibaru* **hun-sibaru* (under-application)

踏み縛る vs. 踏ん縛る

saka-toŋe **saka-doŋe* 'reverse-thorn' (over-application)

逆とげ

Accounting for contradiction to the theory

- Applying Tanaka (2025b)'s proposal to demonym formation
 - **Suppletion analysis** (extension of allomorph analysis)
 - ◆ Demonymic suffixes are **suppletion**, not allomorphy since phonetic similarity is not confirmed.

Accounting for contradiction to the theory

- Psychological reality vs. morphological reality

- Case of *Rendaku* (again)

- ◆ Identity avoidance (OCP(CV)) in *Rendaku* (Sato 1989)

tobi-hi ‘flew-fire’ *kizu-tukeru* ‘wound-put: to hurt’

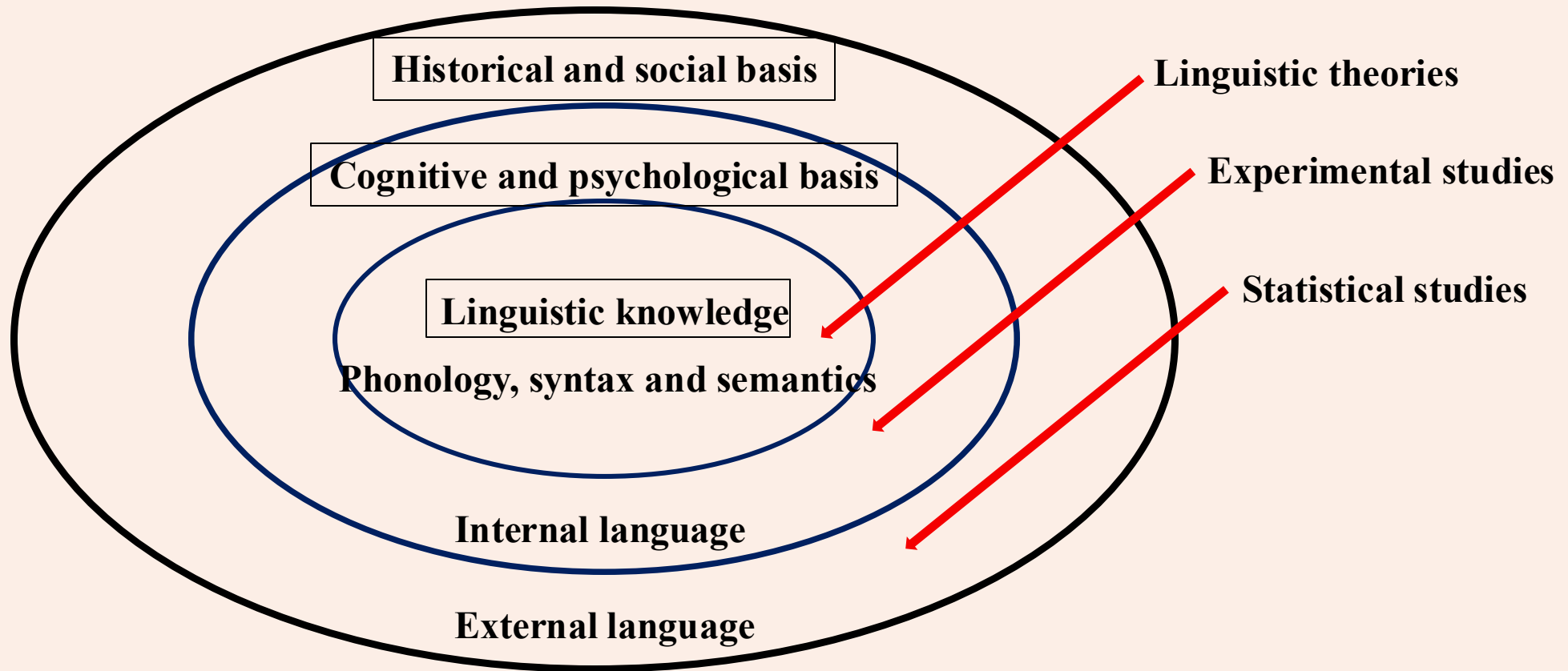
- Corpus study on identity avoidance (Irwin 2014) → **Identity avoidance is NOT confirmed.**

- Experimental study on it using nonce-words (Kawahara and Sano 2014)
→ **Identity avoidance IS confirmed.**

Accounting for contradiction to theory














- Psychological reality vs. morphological reality
 - Conclusion from Tanaka (2025a, 2025b)
 - ◆ It is not surprising that different methods conclude different results.
 - ◆ There is a layered structure of languages. (see figure 4)
 - It is impossible to conclude based only on experimental results.
 - ◆ We must combine psychological, theoretical and even non-linguistic factors.











Figure 4: Layered structure of languages (Tanaka 2025a, 2025b): modified by the presenter



Conclusion

- Suffix selection is optional
 - It should be accounted for by suppletion analysis.
- Analogy is a consequence of interactions with each operation in DM
 - *Encyclopedia* reference plays a key role.
- Number of candidates is infinite (Rich)
- Phonologically ill-formed candidates are filtered out at PF spell-out
- It is natural that forms which theory do not account for exist
 - Such forms are strongly supported by other factors as in social and historical basis.

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