

## ELEMENTS FOR A CULTURAL EVOLUTION OF SUPERNATURAL RITUAL LANGUAGES

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I propose a characterization of ritual languages as ‘natural conlangs’, comparable to the ‘laboratory conlangs’ of iterated learning experiments. I present the Ritual Language DataBase (RLDB), which provides a typology of such languages around the world. A comparative analysis of the RLDB uncovers patterns, and the significant role of users (community size), functions, and alternate languages when shaping the grammatical structure of ritual languages.

### 1. Introduction: Speakers and communities as actors in language evolution

Formal studies of language conceive of language acquisition and language change as a dynamic process (*cf.* Andersen, 1973; Lightfoot, 1979; Yang, 2002):

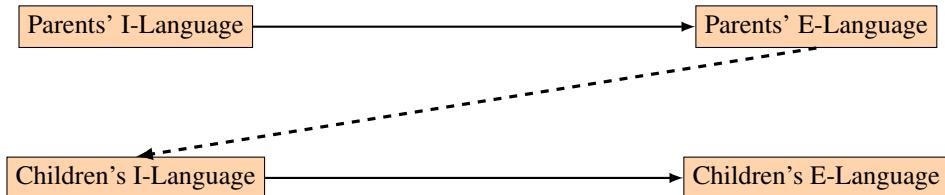


Figure 1. Dynamics of language acquisition and change (adapted from Andersen, 1973: 767).

The idea is that children (*i.e.*, the language acquirers) do not have direct access to the grammar/I(nternal)-language of their parents, but an indirect one, through the E(xternal)-language that they parse. This E-language will include some signatures or triggers that will guide the children in the choice of the ‘correct’ (compatible) target I-language. But rather than this being a deterministic system, language acquirers have an active role in shaping their language, as they have to (re)interpret the E-language of their environment (their primary linguistic data).

What is more, over the last decades intensive research on language evolution and change has uncovered some of the biases that humans act upon when acquir-

ing their languages (*cf.* Kirby, 2017; Culbertson, Smolensky, & Legendre, 2012; Biberauer & Roberts, 2017; Raviv, Meyer, & Lev-Ari, 2019).

In this talk I want to extend this research paradigm to a new area: I give the first steps towards a characterization of the typology and analysis of the cultural evolution of the linguistic practices employed for supernatural ritual functions.

## **2. Supernatural rituals and ‘natural’ conlangs**

Very often, in all sorts of cultural niches across the world, people change their language when performing supernatural ritual functions. I analyze these special languages as some sort of ‘natural’ conlangs, comparable to the ‘laboratory’ conlangs usually employed in iterated learning research on language evolution.

### **2.1. *The Ritual Language Database***

In order to analyze the nature and variability of ritual languages, I designed the Ritual Language Database (RLDB), which at the moment comprises data from 242 linguistic practices related to supernatural rituals across a wide range of different populations across the world.

The RLDB systematically documents 46 features of each ritual linguistic use such as the population (Amharas, Antakarinas, Apaches...); its function (whether it is employed for cursing, divination, fortune-seeking, healing, initiation, mourning, or order-keeping); its user (whether it is a designated practitioner individual (a shaman, a priest, etc.) or a larger community that employs it); whether it implies possession by a spirit or ghost; whether it implies an alternate language (which can be oral or gestual); whether the alternate language is an archaic variant of the local language or an independent language altogether; whether it implies glossolalia; use of ventriloquism, animal and nature sounds, etc.; and if there is no alternate language, whether the language employed has a special lexicon (which can be constituted of archaisms, borrowings, or ad hoc lexical items); whether it comprises meaning shifts (metaphors, circumlocutions); whether its segmental inventory is enriched with respect to the normal language (a larger set of consonants/vowels, lessened phonotactic restrictions) or impoverished (a more restrictive set of consonants/vowels or stronger phonotactic constraints); whether it involves alterations and syntagmatic repetitions; morpho-phonological insertions; a special prosodic pattern; morphological and syntactic differences, etc. The RLDB is a dynamic database, developed continuously with new data from ethnographies, linguistic descriptions and religion studies reports.

### **2.2. *Association between linguistic features***

The linguistic phenomena of supernatural rituals at the RLDB show different degrees of association. These are summarized in Figs. 2 and 3 below. Fig. 2 displays the association between features in ritual practices not involving an alternate language, whereas Fig. 3 is devoted to those practices that do involve an alternate

language. Numbers report the uncertainty coefficient (Theil's  $U$ ), a measure of conditional entropy between variables (ranging from 0 to 1, where there is no possible negative association). As such, this is an asymmetric measure, and thus we can obtain an estimate about the nature of variable B, given our knowledge of variable A, which is more informative than a simple (symmetric) correlation. For instance, Fig. 2 shows that knowing the function of the ritual can be more informative regarding the user ( $U = .31$ ) than the other way around ( $U = .11$ ).<sup>1</sup>

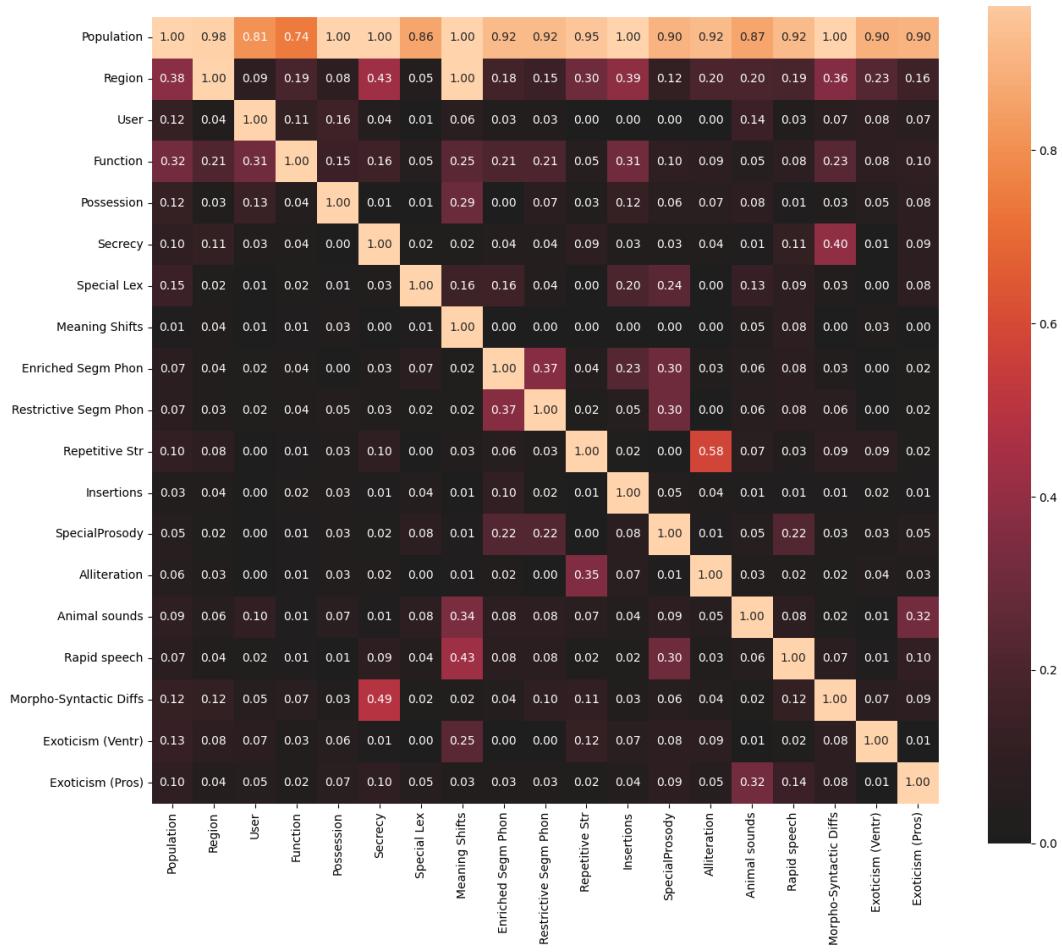


Figure 2. Heatmap of the association between features in the RLDB for ritual practices that do not involve an alternate language.

<sup>1</sup>For comparison, the symmetrical measure Cramér's  $V$  associates the two variables at  $V = .50$ .

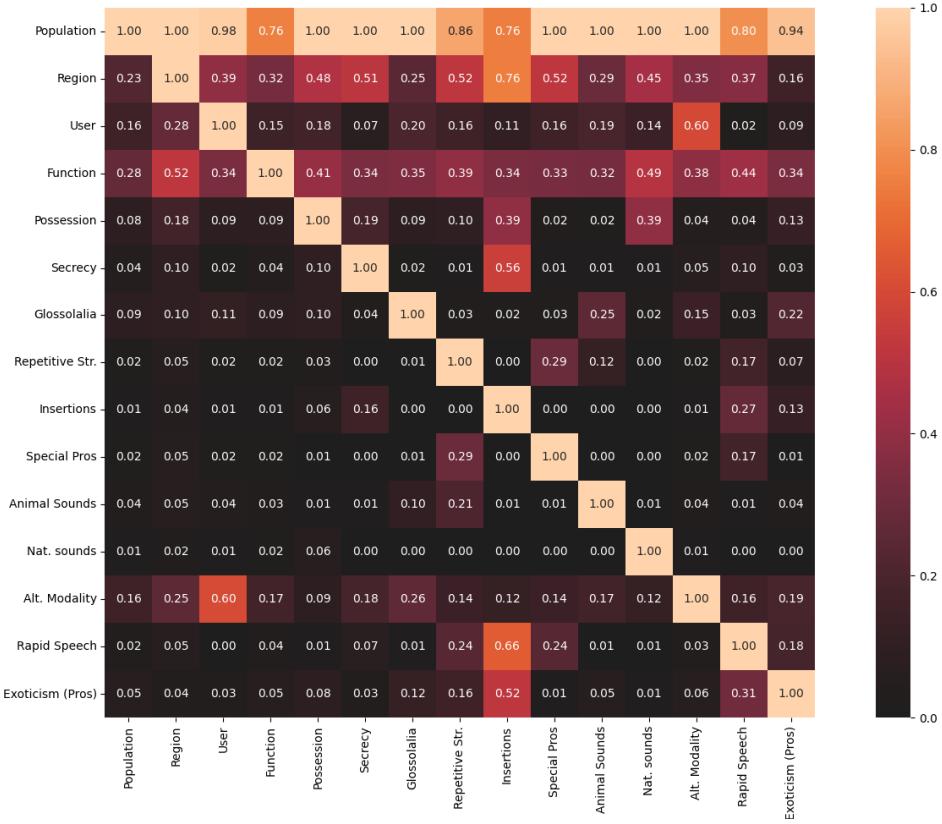


Figure 3. Heatmap of the association between features in the RLDB for ritual practices that do involve an alternate language.

An overview of the data shows that the linguistic features of ritual languages are not distributed at random but tend to cluster in patterned ways, which suggests the effect of universal biases. This is a remarkable fact, given the fragmentary and uneven evidence reported in the ethnographic and linguistic records from populations around the world.<sup>2</sup>

Due to space restrictions here I can only comment a couple of them. Concentrating on function, we can observe that there are sharp differences *vis-à-vis* the employment of an alternate language ( $X^2(6, N = 217) = 38.584; p < .001$ ):

<sup>2</sup>The RLDB comprises references as varied as the recent and scholarly Jorgensen (2020) on the sign language of the Balgo or Hall (2019) on the incantations of Hup shamans, as well as ancient ethnographic reports such as Gabb (1875) on the Talamancans, or Martin (1817) on the Tongans.

Table 1. Function ~ alt. language

Function	Alternate language		Total
	not available	available	
cursing	1	3	4
divination	12	8	20
fortune	21	6	27
healing	25	18	43
initiation	25	30	55
keep order	10	5	15
mourning	8	45	53
TOTAL	102	115	217

For instance, it is more likely for people to employ an alternate language in mourning than in fortune-seeking rituals ( $X^2(2, N = 80) = 8.2573; p < .004$ ). Not only that, within the set of practices that do employ an alternate language, use of an alternate modality (a sign language like Marumpu Wangka employed by the Balgo Aboriginals (Jorgensen, 2020)) is also non-randomly distributed across functions ( $X^2(6, N = 107) = 45.752; p < .001$ ):

Table 2. Function ~ alt. modality in [+alt. langs]

Function	Alternate modality		Total
	not available	available	
cursing	3	0	3
divination	7	0	7
fortune	5	1	6
healing	16	0	16
initiation	9	18	27
keep order	3	1	4
mourning	10	34	44
TOTAL	53	54	107

Last, in the populations that do not employ an alternate language but resort to a variant of their language (a natural conlang), we can observe sharp differences in the grammatical devices employed ( $X^2(4, N = 650) = 36.463; p < .001$ ):

Table 3. Grammatical strategies in [-alt. langs]

Strategy	Availability		Total
	not available	available	
meaning shifts	92	38	130
morphosyntactic effects	122	8	130
special prosody	106	24	130
segmental effects	120	10	130
special lexicon	99	31	130
TOTAL	539	111	650

### 3. Elements for a cultural evolution of ritual languages

From this, a hierarchy of ritual languages can be established as a tension between the search for Strangeness (the more the language employed departs from the normal human ‘norm’, the more plausible the magical powers of the user look to the community) and Learnability (the more systematic and predictable a language is, the easier its replication by a next generation of speakers):

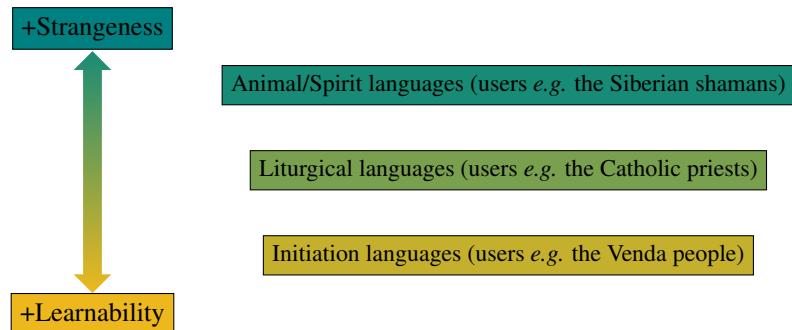


Figure 4. Hierarchy of ritual languages.

On one extreme of the hierarchy we have the shamanic practices, archetypically represented by the Siberian shamans and their idiosyncratic speech which constitutes a ‘theatre of strangeness’ (Eliade, 1951; Kürti, 1994; Singh, 2018). They do not show clear patterns of grammaticalization, but are full of extreme renderings with high pitch, falsettos, ventriloquism, animal sounds, cries, mumblings, etc., and the particularities of each linguistic practice typically die with the shaman. Such practices are not transmitted to the next generation, and therefore are not subject to cultural evolution pressures and dynamics (see, *e.g.* Tamariz & Kirby, 2016). At the other extreme we have community-wide practices which alter the local language with special lexicons which rather than idiosyncratic, are derived *via* transformation rules (*e.g.* the semantic and phonological antonymic patterns in Tenda ritual languages (Ferry, 1981)). As a matter of fact, ritual languages show again that ‘larger communities create more systematic languages’ (Raviv et al., 2019). Last, in a middle point would be the liturgical languages employed by designated individuals (and collectives) of established religious societies (priests, etc.). These are typically languages like Latin, Old Church Slavonic, Sanskrit, Pali, or Ge‘ez (Bennett, 2017) which require explicit teaching, and where adherence to the (archaic) norm is taken as an index of efficacy in the ritual.

Then, the grammatical devices employed for the generation of ritual variants of languages show a restricted variation: regarding meaning, they recur to the exploitation of the arbitrariness of the sign (often, with metaphors or antonymic

patterns), but no new semantic composition rules are invented. Special lexicons are also employed, but they are generated by extending the meaning strategy; an exploitation of the arbitrariness of the sign. As a consequence, obscuring the message with new morpho-phonological labels for usual concepts is a very common strategy that blatantly gives the user the image of an ability that others do not possess, for he/she understands the meaning encoded by the new lexical item. The prosodic means involve generally an exploitation of what Gussenhoven (2004) terms the ‘three biological codes’ (the frequency code, the effort code, and the production code), but no typological shift is attested (*i.e.*, no turning a stress-accent language into a tonal language for ritual purposes). Last, segmental phonological effects also seem to be mostly restricted to the inventory (the introduction of new segments, or segment substitutions), but no new vowel harmony operations. Last, the few morpho-syntactic strategies observed are circumscribed to externalization simplifications (such as the unavailability of functional elements in the ritual language, or a more productive *pro-drop*). Again, no new agreement operations or new pied-piping domains.

All in all, when humans seek a non-human pattern in their language, the ‘strangeness’ or ‘out-of-this-world-ness’ seems to be circumscribed to the lexicon and to morpho-phonology, and the patterns attested are within the limits predicted by theoretical work on natural language design (*e.g.* there are no syntactic rules that make reference to the  $n^{th}$  word (Smith & Tsimpli, 1995; Musso et al., 2003), no invention of nonconservative quantifiers (Pietroski, 2005), and no syntactic rules that take as input phonological or semantic value-assignment processes (Irurtzun, 2009)). This bears testimony to the robustness of the syntactic component of human language, which in turn suggests that a large part of the variability observed across languages may be due to externalization factors (Berwick & Chomsky, 2011; Boeckx, 2014).

Even if ritual languages are intended as ‘supernatural’, they are canalized by natural language constraints and the biases of speakers and their communities.

### Acknowledgements

This work has received financial support from the CNRS-MITI 80|PRIME grants - 2021 PALEOSIGNES, and from the ANR ANR-21-CE27-0005 - MIND2WALL.

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