

Meanings of body part terms: Cross-linguistic colexifications between body parts and objects

Annika Tjuka

Max Planck Institute for the Science of Human History

12th Dubrovnik Conference on Cognitive Science –
Linguistic & Cognitive Foundations of Meaning

May 19th, 2021

Colexification



uta (Aymara)



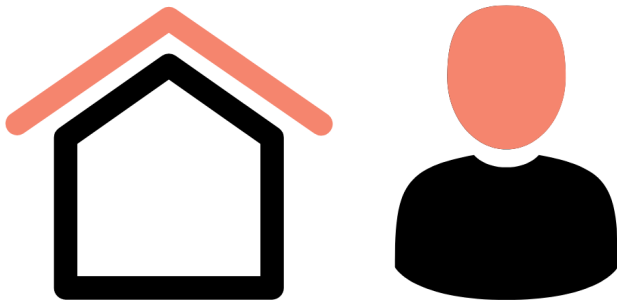
træ (Faroese)



wai (Maori)

(see François 2008)

Colexification between Body Parts and Object (Parts)



khon (Burmese)

(see Tjuka 2019)

Salience of Body Parts

- most studies focus on how the body is divided into linguistic units (e.g., Enfield et al. 2006)
- shape features such as *round* and *long* are particularly salient (Andersen 1978)
- functional significance are involved in part naming and object categorization (Tversky & Hemenway 1984; Morrison & Tversky 2005)
- visual discontinuities play a role in segmenting the body into parts (Majid & van Staden 2015)

A cross-linguistic Perspective

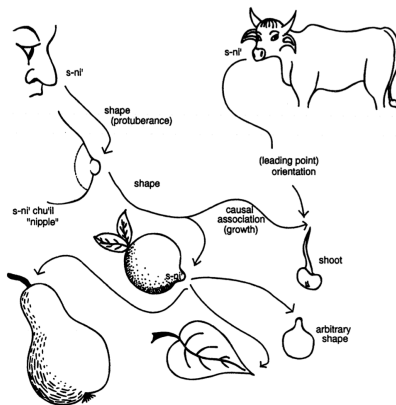


Figure 1: Body part extensions with *s-ni'* 'nose' in Tzeltal (Levinson 1994).

A cross-linguistic Perspective

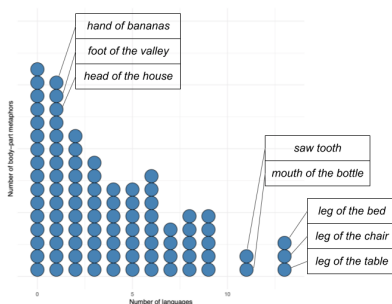


Figure 2: Body part~object (part) collexifications across 13 languages (Tjuka 2019).

Aim

- a systematic study of body part~object (part) colexifications across the languages of the world
- test hypothesis about the salience of body parts
- identify cross-linguistic patterns of colexification

Research Questions

1. Are terms for salient body parts more frequently colexified?
2. Do certain body part~object (part) colexifications have different frequencies?

Hypothesis

1. Outer body parts (e.g., head, eye, arm, and leg) are more frequently colexified than inner body parts (e.g., heart, liver).
2. Most colexifications occur in one language families, whereas only a few colexifications appear in several language families.

Database of Cross-Linguistic Colexifications

The CLICS³ database offers colexifications of 2,906 concepts across 2,940 languages (Rzymiski et al. 2019, <https://clics.clld.org/>).

- based on a reference catalogue for concepts: Concepticon (List et al. 2016)
- structured in a network
- data sets include, for example, IDS (Key & Comrie, 2016), WOLD (Haspelmath & Tadmor, 2009)

Database of Cross-Linguistic Colexifications

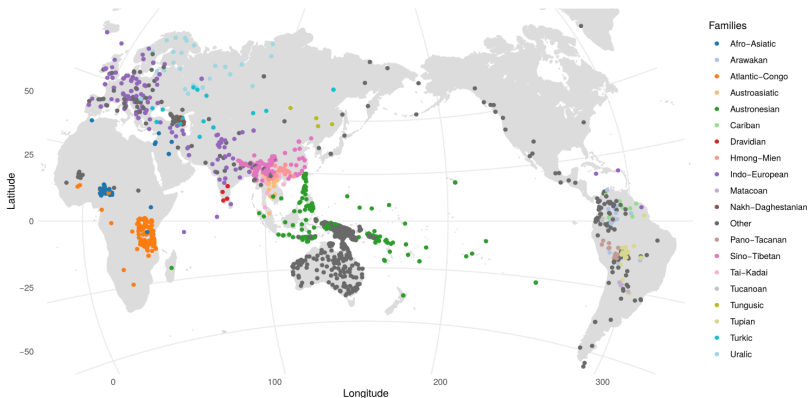


Figure 3: Distribution of languages in CLICS³ (Rzymiski et al. 2019).

Database of Cross-Linguistic Colexifications

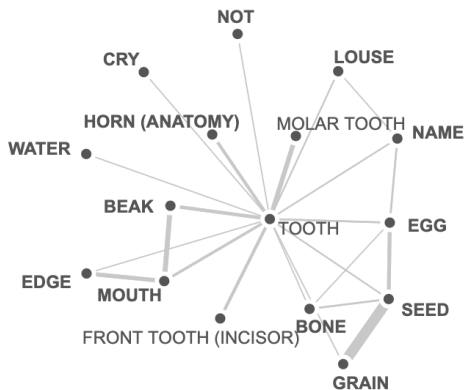


Figure 4: Subgraph of TOOTH in CLICS³

(https://clics.clld.org/graphs/subgraph_1380).

Database of Cross-Linguistic Colexifications

For the present study,

- the threshold was lowered from 3 to 1 language families.
- only a subset of colexifications were included.

Results

- 137 human body parts
- 1,071 object (parts)
 - the object concepts are comprised of items from different categories, e.g., tool, food, landscape, plants, and furniture.
- 1,719 body part~object (part) colexifications

Body Part Frequencies










Body Part	Concept	Freq. Colexification
	HEAD	56
	ARM	52
	TOOTH	52
	EYE	51
	LEG	50
	MOUTH	50
	BONE	48
	SKIN	45
	HAND	42

Figure 5: The 10 most frequently colexified body parts.

Body Part Frequencies

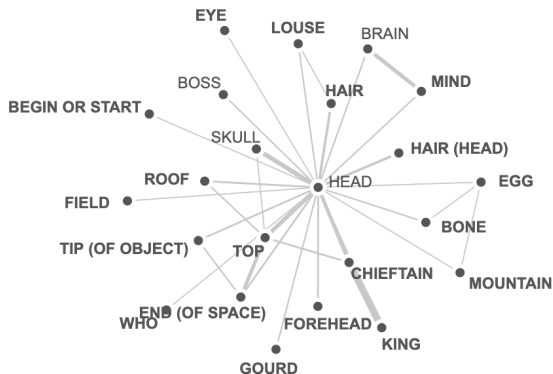


Figure 6: Subgraph of HEAD in CLICS³

(https://clics.clld.org/graphs/subgraph_1256).

Frequency of Colexifications

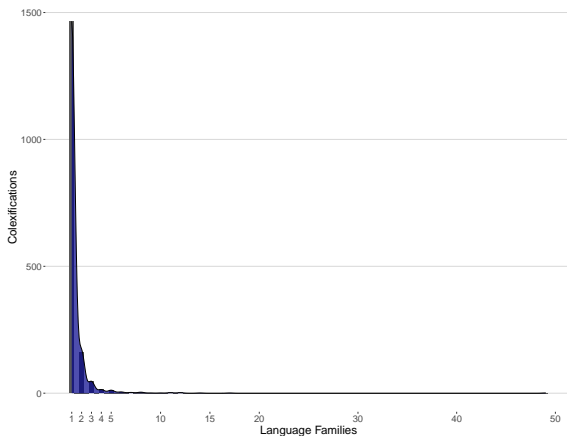


Figure 7: Frequency of colexifications across language families.

Frequency of Colexifications



















Body Part	Concept	Object (Part)	Concept	Families	Languages
	SKIN		BARK	49	209
	TESTICLES		EGG	17	36
	NECK		COLLAR	14	49
	HEAD		TOP	12	37
	BUTTOCKS		BOTTOM	12	18
	MOUTH		EDGE	11	19
	EYE		SEED	11	17
	HAIR		LEAF	10	33
	THROAT		COLLAR	9	11

Figure 8: The 10 most frequent body part~object (part) colexifications.

Cross-linguistic Patterns

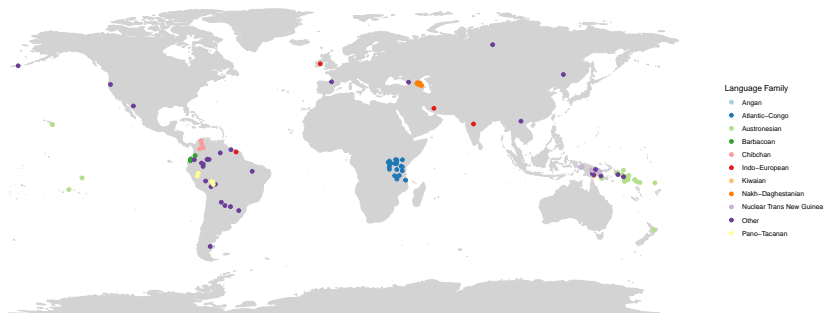


Figure 9: Distribution of languages with the colexification SKIN~BARK.

Cross-linguistic Patterns

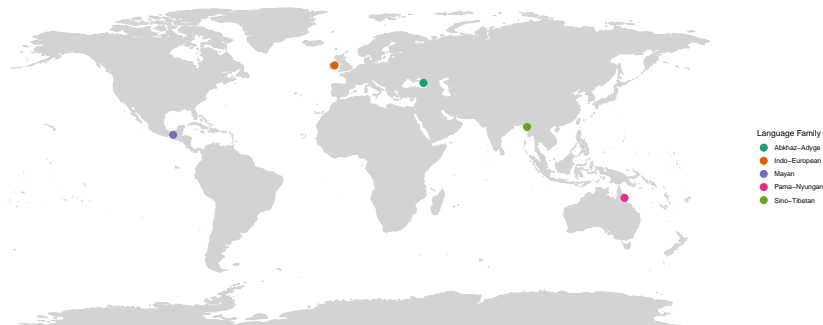


Figure 10: Distribution of languages with the colexification HEAD~ROOF.

Areal Patterns

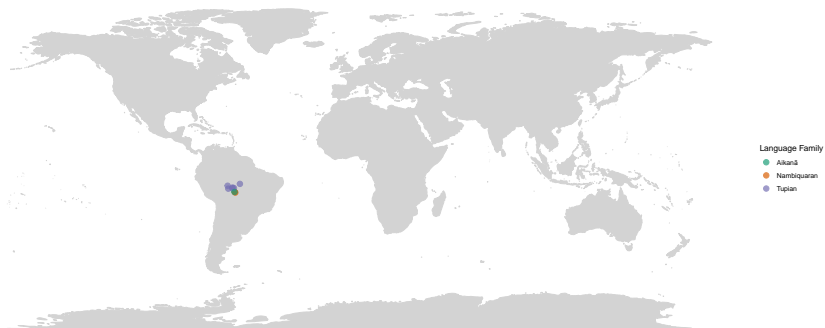


Figure 11: Distribution of languages with the colexification NOSE~ROOT.

Conclusion

- ✓ Hypothesis 1: Outer body parts are colexified more frequently.
 - There is one exception to the hypothesis, i.e. BONE.
 - Interestingly, in the literature, SKIN as a body part is neglected.
 - The results support general assumptions about common patterns of polysemy (see Andersen 1978; Brown & Witkowski 1983).

Conclusion

✓ Hypothesis 2: Most colexifications occur in one language family, whereas only a few colexifications appear in several language families.

- Most body-part~object (part) colexifications are specific to a particular language family and thus may be based on genealogical relationships between languages.
- There are only a few seemingly universal colexifications (e.g., SKIN~BARK).
- Language-independent colexification patterns can be distributed across the globe or confined to a certain areas.

Limitations

- We still need to explain language variation. For example, some languages refer to the same object part with two different body parts (NOSE/HEAD~TIP OF THE OBJECT), possibly due to preferences for perceptual or functional similarity based on areal or genealogical relationship.
- CLICS³ contains only a few partial colexifications (e.g., *table leg* is not included).

Next Steps

1. create sub-CLICS⁴ with only body part~object (part) colexifications
 - CLICS⁴ will include more data sets, refinements, and Glottolog 4.4
2. extract clusters from sub-CLICS⁴
3. possibly extend the data with partial colexifications (i.e., CLIPS)

Thank you!

If there are any open questions, you can find me here:

annikatjuka.com

tjuka@shh.mpg.de

@AnnikaTjuka



References

- Andersen, E. S. (1978). Lexical universals of body-part terminology. In J. H. Greenberg (Ed.), *Universals of Human Language: Word Structure* (Vol. 3, pp. 333–368). Stanford University Press.
- Brown, C. H., & Witkowski, S. R. (1983). Polysemy, lexical change and cultural importance. *Man*, 18(1), 72–89. <https://doi.org/10.2307/2801765>
- Enfield, N. J., Majid, A., & van Staden, M. (2006). Cross-linguistic categorisation of the body: Introduction. *Language Sciences*, 28(2), 137–147. <https://doi.org/10.1016/j.langsci.2005.11.001>
- François, A. (2008). Semantic maps and the typology of colexification. From polysemy to semantic change: Towards a typology of lexical semantic associations, 106, 163.
- Hammarström, H., Forkel, R., Haspelmath, M., & Bank, S. (2021). Glottolog 4.4. Max Planck Institute for Evolutionary Anthropology. <https://doi.org/10.5281/zenodo.4761960>
- Haspelmath, M., & Tadmor, U. (2009). *Loanwords in the world's languages. A comparative handbook.* Walter de Gruyter.
- Key, M. R., & Comrie, B. (2016). *The Intercontinental Dictionary Series.* Max Planck Institute for Evolutionary Anthropology. <http://ids.cllld.org>
- Levinson, S. C. (1994). Vision, shape, and linguistic description: Tzeltal body-part terminology and object description. *Linguistics*, 32(4–5), 791–855. <https://doi.org/10.1515/ling.1994.32.4-5.791>
- List, J.-M., Cysouw, M., & Forkel, R. (2016). Concepticon: A resource for the linking of concept lists. In N. Calzolari, K. Choukri, T. Declerck, M. Grobelnik, B. Maegaard, J. Mariani, A. Moreno, J. Odiijk, & S. Piperidis (Eds.), *Proceedings of the Tenth International Conference on Language Resources and Evaluation* (pp. 2393–2400). European Language Resources Association (ELRA).

References

- Majid, A., & van Staden, M. (2015). Can nomenclature for the body be explained by embodiment theories? *Topics in Cognitive Science*, 7(4), 570–594. <https://doi.org/10.1111/tops.12159>
- Morrison, J. B., & Tversky, B. (2005). Bodies and their parts. *Memory & Cognition*, 33(4), 696–709. <https://doi.org/10.3758/BF03195336>
- Rzymiski, C., Tresoldi, T., Greenhill, S. J., Wu, M.-S., Schweikhard, N. E., Koptjevskaja-Tamm, M., Gast, V., Bodt, T. A., Hantgan, A., Kaiping, G. A., Chang, S., Lai, Y., Morozova, N., Arjava, H., Hübner, N., Koile, E., Pepper, S., Proos, M., Van Epps, B., ... List, J.-M. (2020). The Database of Cross-Linguistic Colexifications, reproducible analysis of cross-linguistic polysemies. *Scientific Data*, 7(1), 1–12. <https://doi.org/10.1038/s41597-019-0341-x>
- Tjuka, A. (2019). Body-part metaphors as a window to cognition: A cross-linguistic study of object and landscape terms (Master's thesis, Humboldt-Universität zu Berlin). <http://dx.doi.org/10.17613/j95n-c998>
- Tversky, B., & Hemenway, K. (1984). Objects, parts, and categories. *Journal of Experimental Psychology: General*, 113(2), 169–193. <https://doi.org/10.1037/0096-3445.113.2.169>