

A SEMANTIC MAP OF NEGATION IN INDO-EUROPEAN

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1. INTRODUCTION

« In propositional logic, negation can be defined as an operator changing the truth value of a proposition p to its opposite $\neg p$. **In natural languages, things do not look quite so simple** as negation is marked in a multitude of ways and enters into **intricate interaction with various other functional domains**; this interaction may result in complicated semantic and pragmatic effects that make the analysis of the meaning of negation quite a bit harder than simply noting the difference in truth value. However, it remains the case that the **change of truth value is the semantic core of negation**, and negative constructions may be identified in languages on the basis of this semantic definition. »

Miestamo (2017: 405; emphasis mine)

2. AIM OF TODAY'S TALK

Provide a fine-grained description of negation in Indo-European languages.

(Bernini & Ramat 1996; Willis, Lucas & Breitbarth 2013; Verkerk & Shirtz 2022)

Analyze the data using the semantic map model.

(Haspelmath 2003; van der Auwera 2013; Georgakopoulos & Polis 2018)

Point towards future research in this domain.

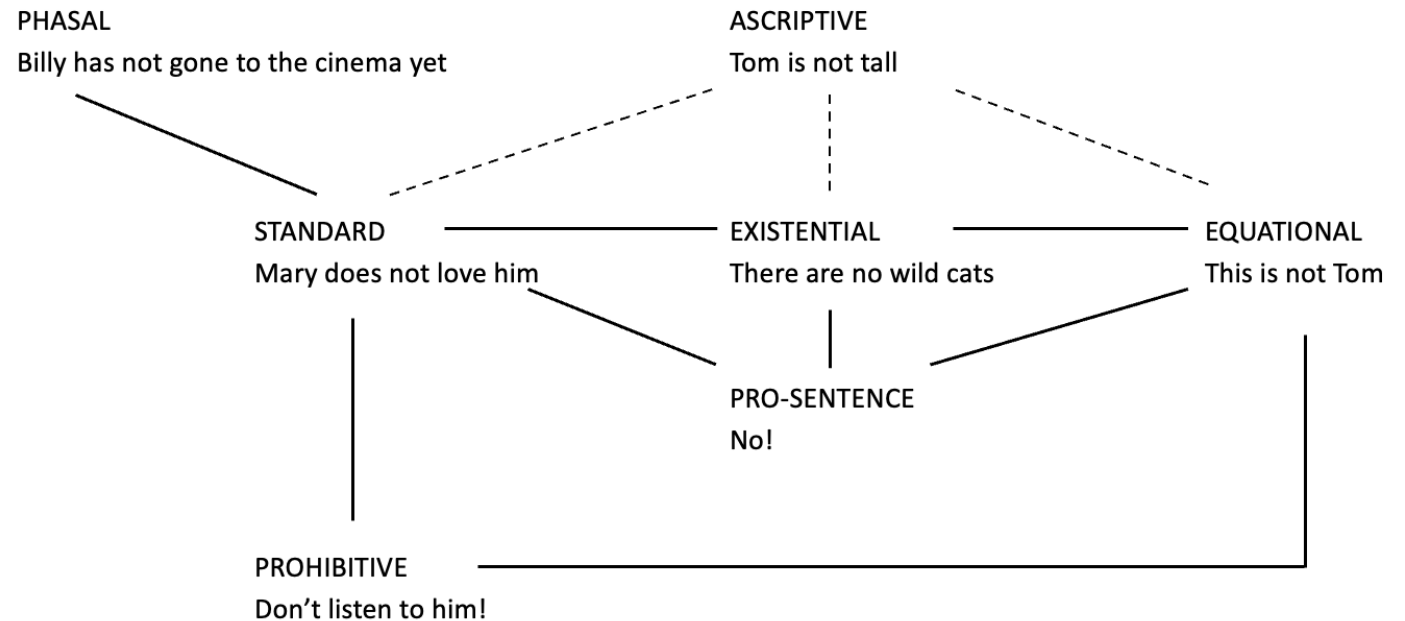
3. PREVIOUS ACCOUNTS

7 functions of negation; sample of 12 genealogically diverse languages.

The functions are represented by nodes linked together on the map by a connecting line.

The lines between each function indicate that evidence exists for shared formal representation between the two functions.

They must be arranged in such a way that all multifunctional grams can occupy a contiguous area on the map.



Adapted from Bond (2009)

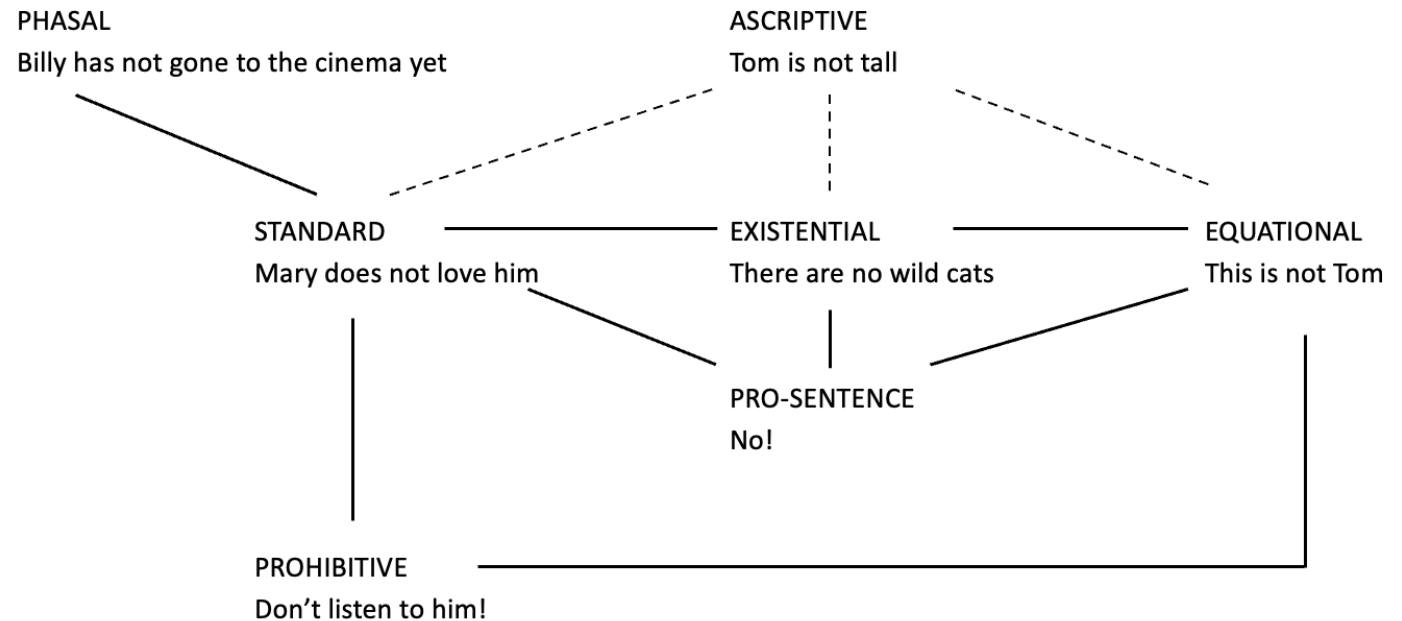
3. PREVIOUS ACCOUNTS

Bond's conclusions:

a. addition of more languages to the sample will test the robustness of the proposed conceptual space.

b. a more fine-grained approach to the functions included will enable greater depth of analysis.

c. « The fact that the strategy used for STANDARD is always multifunctional in the sample raises questions about the usefulness of analyses that do not take into account the generality of a negative construction. » (p. 59)



Adapted from Bond (2009)

3. DATA

Indo-European language family

Sources: mostly grammars

LANGUAGES / BRANCH	No.
Albanian, Modern Greek, Armenian	3
Celtic	4
Romance	5
Germanic	7
Slavic	5
Iranian	4
Indo-Aryan	9
TOTAL	37



4. FUNCTIONS / SUBDOMAINS OF NEGATION

	ABBREVIATION	FUNCTION	Example
1	SN	STANDARD	Mary does not love him.
2	EMPH	EMPHATIC	Mary does not love him at all.
3	PH	PHASAL	Mary does not love him yet.
4	SUB	SUBORDINATE	I urge you not to talk to him.
5	PROHIB	PROHIBITIVE	Don't listen to him!
6	INT	INTERROGATIVE	Doesn't she love him?
7	EX	EXISTENTIAL	There are no wild cats.
8	LOC	LOCATIVE	The cats are not in the garden.
9	POSS	POSSESSIVE	They have no money.
10	ASCR	ASCRIPTIVE	Mary is not a teacher.
11	PRO	PRO-SENTENCE	No!
12	PRV	PRIVATIVE	He was without money.
13	DER	DERIVATIONAL	Mary disagrees with me.
14	CONEG	CONNECTIVE	Neither...nor...
15	COS	CONSTITUENT	I take a salad and not a soup.
16	TAG	TAG	We're late, aren't we?

List of functions is informed by:

- a. Typological works on NEG (Miestamo 2017; van der Auwera & Krasnoukhova 2020);
- b. Functions commonly discussed in language grammars, thus taken to be salient;
- c. Volumes edited by Miestamo & Veselinova (forth.).

In bold: functions overlapping with Bond (2009)

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Negation of declarative main clauses with verbal predicates.

Best-studied subdomain of negation in typological research, both synchronically and diachronically.

(Dahl 1979; Payne 1985; Dryer 1988; Miestamo 2005)

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Negation in non-declaratives

→ Negative strategies in imperative sentences: languages tend to use a negative strategy different from standard negation.

Not found in many European languages.

(van der Auwera 2005; van der Auwera & Lejeune 2013[2005]; Aikhenvald 2010; Van Olmen & van der Auwera 2016)

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→ *Negation in non-declaratives*

Preliminary results by Miestamo (2009) show that the combination of negation and polar interrogation does not lead to any special effects.

(Miestamo 2017)

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Negation in stative predications

It is typologically common that negative constructions different from SN are used in clauses with non-verbal predicates.

Not expected in Western European languages.

(Croft 1991; Veselinova 2013, 2014, 2016; Verkerk & Shirtz 2022)

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Negative lexicalizations

'not-yet' or *nondum* expressions: in many languages there is a special negation strategy to indicate that an action has not been accomplished.

Absent in Europe in the form of a single, bound or semi-bound, negative temporal marker.

(Veselinova 2015)

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Negative derivation and case marking

“privative” used to refer to categories that express the absence of an entity, as in English *-less*, or adpositions e.g., *without*.

Some languages display case categories that have negative semantics, as the abessive case in Finnish.

(Miestamo et al. 2015)

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Negative derivation

Word-level negation, also called
affixal/derivational/lexical negation
unhappy, sleepless, dislike

(Koptjevskaja-Tamm et al. 2015, 2024)

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van der Auwera p.c.



'neither...nor' elements are necessarily negative and connective

5. FIRST OVERVIEW

	ICELANDIC	OLD IRISH	ITALIAN	ALBANIAN	RUSSIAN	PASHTO	URDU
SN	ekki	ni / nicon	non	nuk / s'	ne	ná	nahīm / na
EMPH	alls ekki	ni etir	non ... mica	nuk / s'	ne	---	kuch / koi bhī nahīm
PH	ekki	---	non ... ancora	nuk / s'	ne	lā ná	---
SUB	ekki	nǎ / nǎch / nǎd	non	mos	ne	ná	na
PROHIB	ekki	nǎ / nǎch	non	mos	ne	má	mat / na
INT	ekki	nǎd	non	nuk / s'	ne	ná	nahīm
EX	engin	ni	non	nuk / s'	net / ne	ná	nahīm
LOC	ekki	ni	non	nuk / s'	net / ne	ná	nahīm
POSS	engin	ni	non	nuk / s'	net / ne	ná	nahīm
ASCR	ekki	ni	non	nuk / s'	ne	ná	nahīm
PRO	nei	na-thó / nate	no	jo	net	ná	nahīm
PRV	-laus / án	cen	senza	pa	bez	be- / be	ke bayair / bē
DER	mis- / ó- / in-	neb- / neph- / am / en- / in-	dis- / in- / non	nuk	ne-	be- / na-	nā-
CONEG	hvorki ... né	nǎ / nǎch	né ... né ...	as	ni ... ni	wə ... bə ... ná	nahīm ... bhī nahīm
COS	ikke	---	non	jo	ne	ná	nahīm
TAG	ikke / eller	---	no	jo	---	---	nā

	ICELANDIC	OLD IRISH	ITALIAN	ALBANIAN	RUSSIAN	PASHTO	URDU
SN	ekki	ni / nicon	non	nuk / s'	ne	ná	nahīm / na
EMPH	alls ekki	ni etir	non ... mica	nuk / s'	ne	---	kuch / koi bhī nahīm
PH	ekki	---	non ... ancora	nuk / s'	ne	lā ná	---
SUB	ekki	nǎ / nǎch / nǎd	non	mos	ne	ná	na
PROHIB	ekki	nǎ / nǎch	non	mos	ne	má	mat / na
INT	ekki	nǎd	non	nuk / s'	ne	ná	nahīm
EX	engin	ni	non	nuk / s'	net / ne	ná	nahīm
LOC	ekki	ni	non	nuk / s'	net / ne	ná	nahīm
POSS	engin	ni	non	nuk / s'	net / ne	ná	nahīm
ASCR	ekki	ni	non	nuk / s'	ne	ná	nahīm
PRO	nei	na-thó / nate	no	jo	net	ná	nahīm
PRV	-laus / án	cen	senza	pa	bez	be- / be	ke bayair / bē
DER	mis- / ó- / in-	neb- / neph- / am / en- / in-	dis- / in- / non	nuk	ne-	be- / na-	nā-
CONEG	hvorki ... né	nǎ / nǎch	né ... né ...	as	ni ... ni	wə ... bə ... ná	nahīm ... bhī nahīm
COS	ikke	---	non	jo	ne	ná	nahīm
TAG	ikke / eller	---	no	jo	---	---	nā

				Celtic				Romance						Germanic							
	[aln]	[ell]	[hye]	[bre]	[cym]	[sga]	[gle]	[ita]	[spa]	[por]	[fra]	[ron]	[isl]	[nor]	[dan]	[deu]	[eng]	[nld]	[afr]		
SN																					
EMPH														---							
PH						---	---														
SUB	Red	Red		Red	Green	Red	Green	Dark Blue			Dark Blue										
PROHIB	Red	Red	Red	Red	Red	Red	Green	Red											Red		
INT		Red				Dark Blue	Dark Blue														
EX							Light Blue						Purple	Purple	Purple	Light Blue	Yellow	Light Blue	Dark Blue		
LOC							Light Blue														
POSS							Light Blue						Purple	Purple		Light Blue	Yellow	Light Blue	Dark Blue		
ASCR																Dark Blue	Light Blue	Dark Blue	Dark Blue		
PRO	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow			Yellow		Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow		
PRV	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green	---		
DER	Blue	---	Grey	---	Grey	Grey	---	Grey	Blue	Blue	Light Green	Grey	---	Grey	---	Grey	Blue	Grey	Blue	Red	Grey
CONEG	Yellow	Yellow	Orange	Yellow	Yellow	Green	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	
COS	Orange	Orange	Orange	---	Blue	---	---	Blue	Blue	Blue	Light Blue	Blue	Blue	Blue	Blue	Blue	Blue	Light Blue	Blue	Blue	
TAG	Orange	Blue	Blue	---	---	---	---	Orange	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Blue	Red	Blue	Dark Blue	Blue	Red

6. TOWARDS A SEMANTIC MAP OF NEGATION

Turning the list of negative forms associated with functions into a binary matrix:

Form	SN	EMPH	PH	SUB	PROHIB	INT	EX	LOC	POSS	ASCR	PRO	PRV	DER	CONEG	COS	TAG
[aln] nuk	1	1	1	0	0	1	1	1	1	1	0	0	1	0	0	0
[aln] mos	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
[aln] jo	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
[aln] pa	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
[aln] as...as...	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
[ell] den	1	1	1	1	0	1	1	1	1	1	0	0	NA	0	0	1
[ell] min	0	0	0	1	1	1	0	0	0	0	0	0	NA	0	0	0
[ell] óchi	0	0	0	0	0	0	0	0	0	0	1	0	NA	0	1	0

In this matrix, '1' indicates that a form is attested in a given function, and '0' that it is not.

For example, it shows that Albanian *mos* is attested as a subordinate and prohibitive negator, but not in any other function.

7. INTRODUCING MDS

Statistical scaling techniques—especially MDS— were introduced by several scholars as alternative or complementary visualization method to the classical semantic map.

MDS is a means of visualizing spatially similarities and dissimilarities between pairs of items.

Proximity map: functions are points, distributed in a 2-dimensional space using multivariate statistical techniques (MDS).

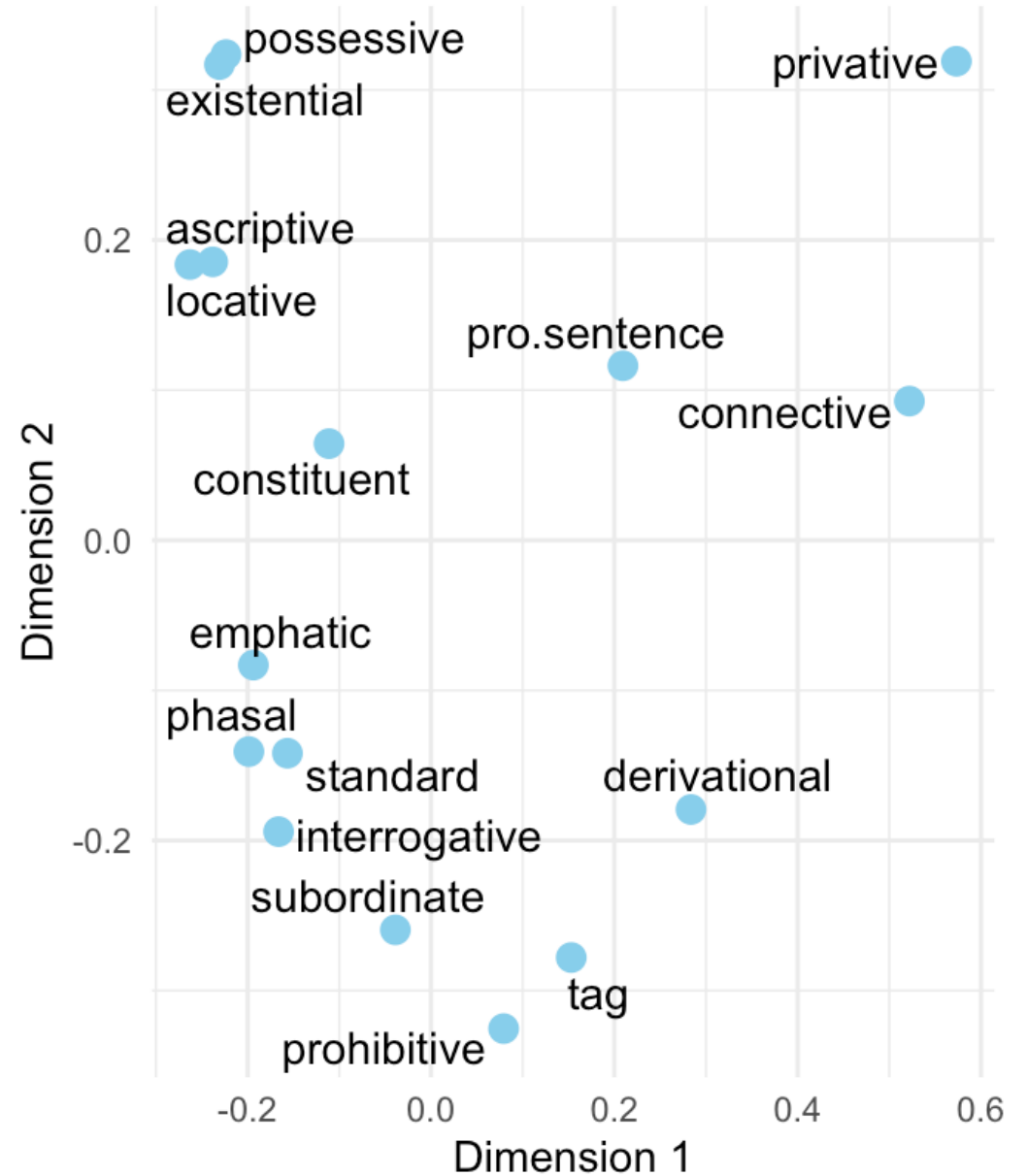
The distance between two points is indicative of their dissimilarities.

(Croft & Poole 2008; Croft & Timm 2013; Levshina 2015; van der Klis & Tellings 2022)

8. MDS

The distance between points is meaningful: points that are closer to each other are to be considered more similar.

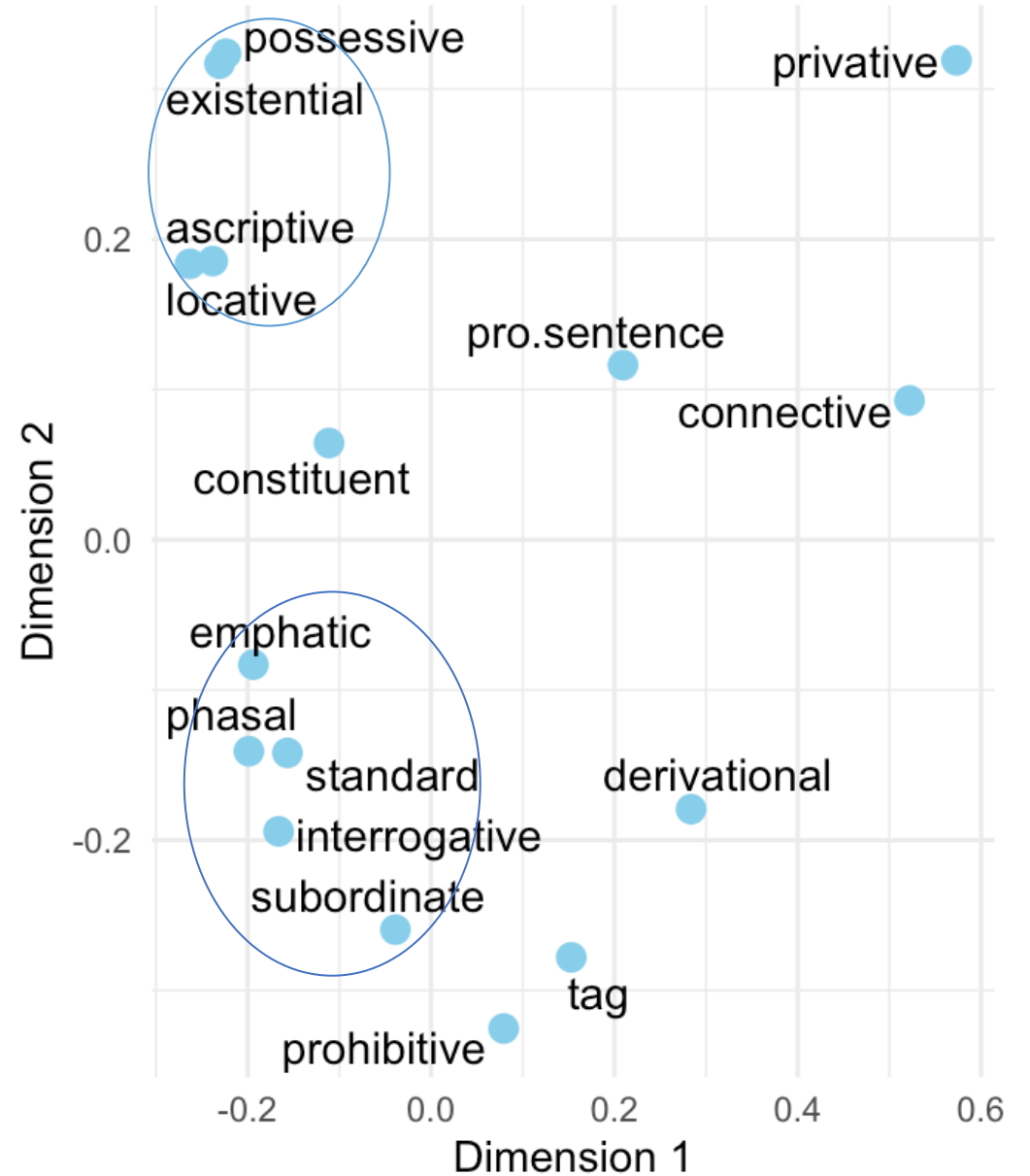
Dimensions have numerical values, but these do not have a direct linguistic interpretation.



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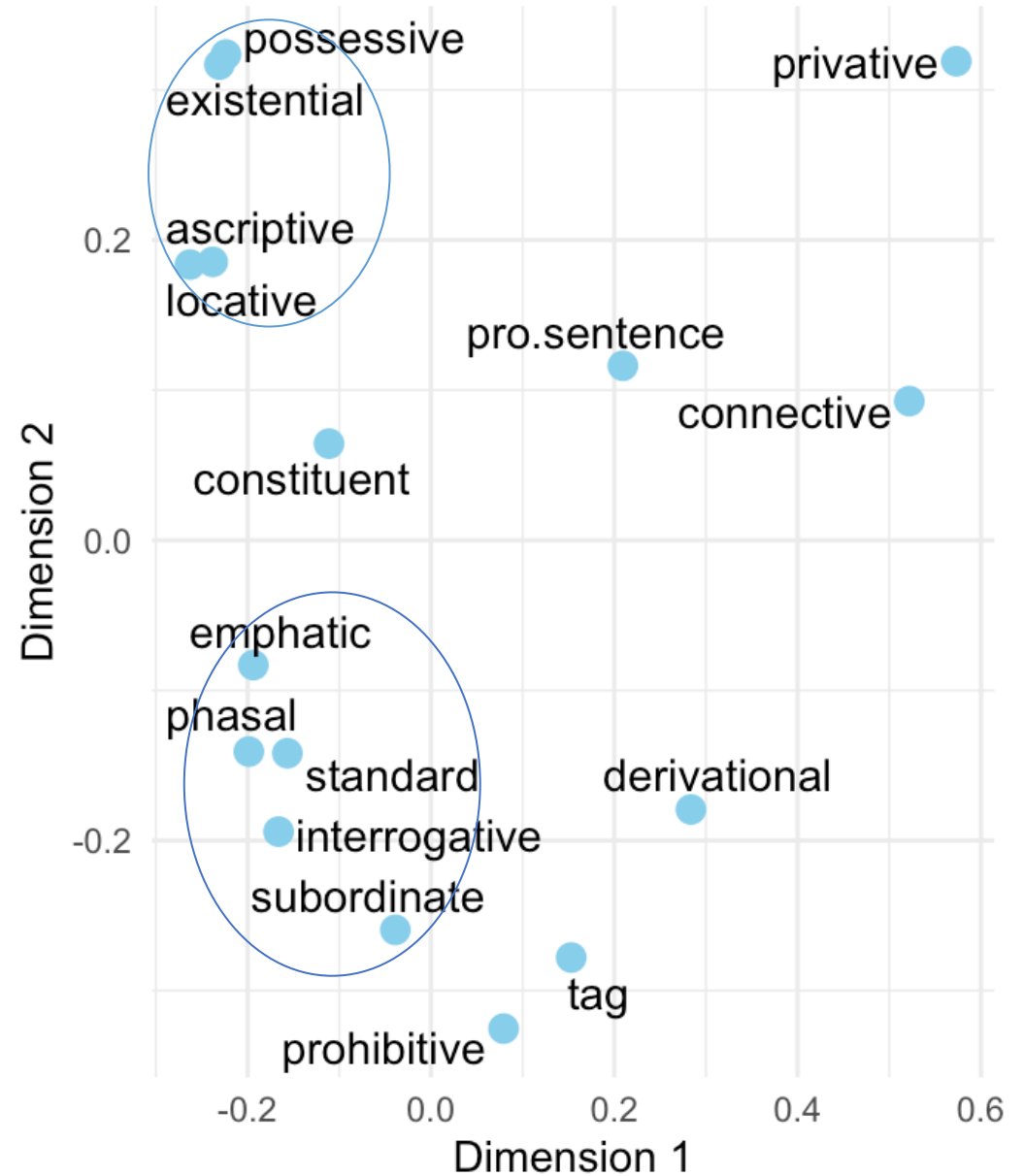
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The distance between points is meaningful: points that are closer to each other are to be considered more similar.

Dimensions have numerical values, but these do not have a direct linguistic interpretation.

Computing goodness of fit helps assess how well the MDS solution represents the original distances:

0.468466 = poorly

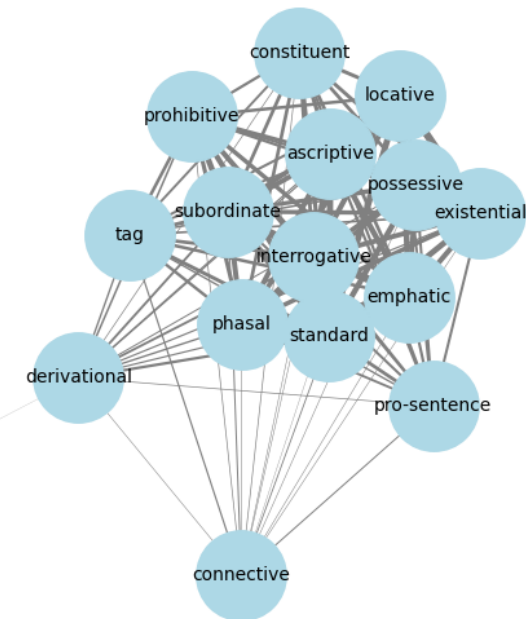


9. A SEMANTIC MAP OF NEG IN I.E. 16 FUNCTIONS

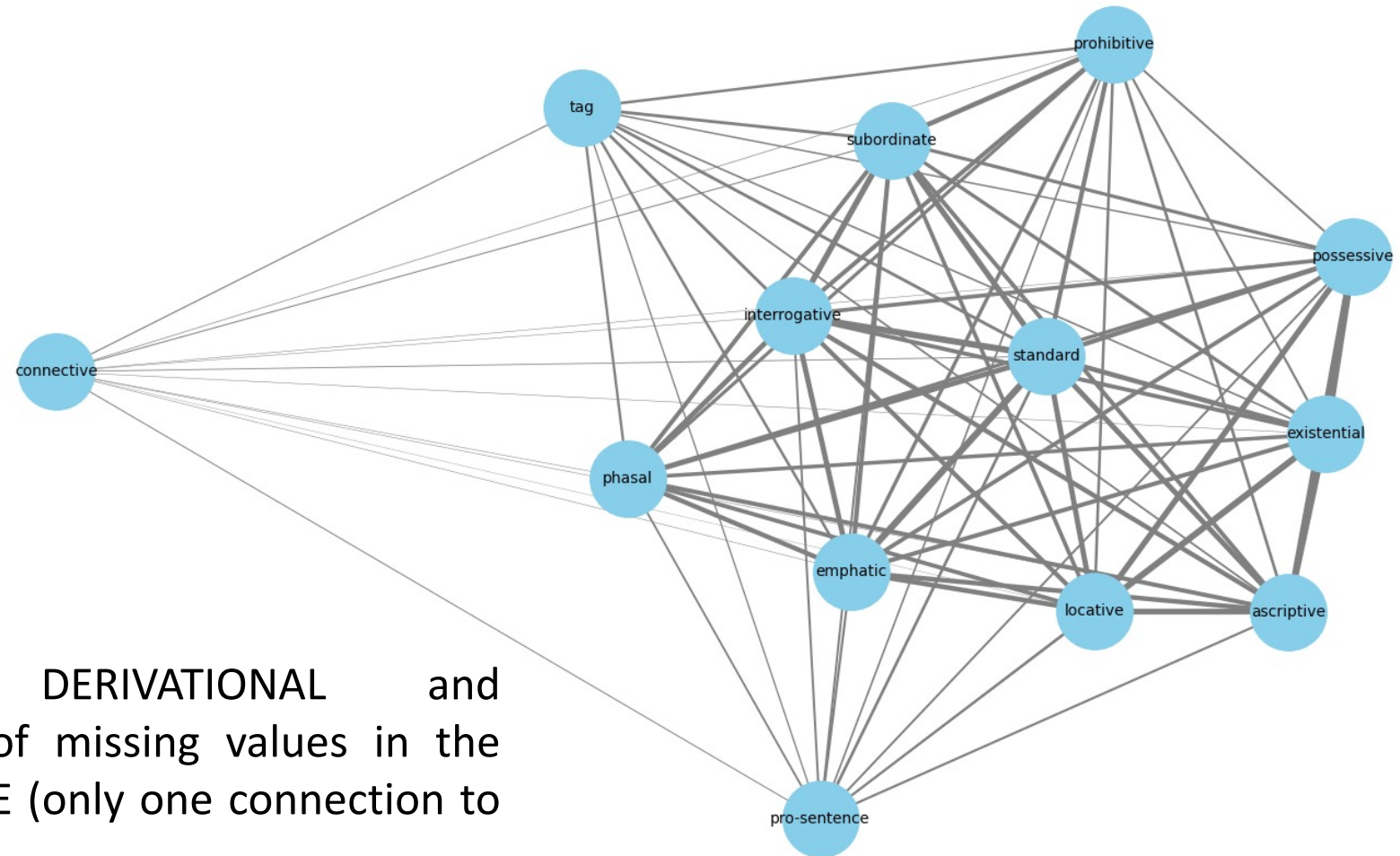
Given a set of nodes (here functions) and a set of constraints (forms), edges are introduced one by one between the nodes to represent when two functions co-occur in the same form across all languages.

Weighted graph: the graph takes into account the frequency of co-occurrence of forms. Strongly connected nodes are closer, weakly connected ones float farther away.

(Georgakopoulos & Polis 2018, 2021, implementing Regier et al. 2013)

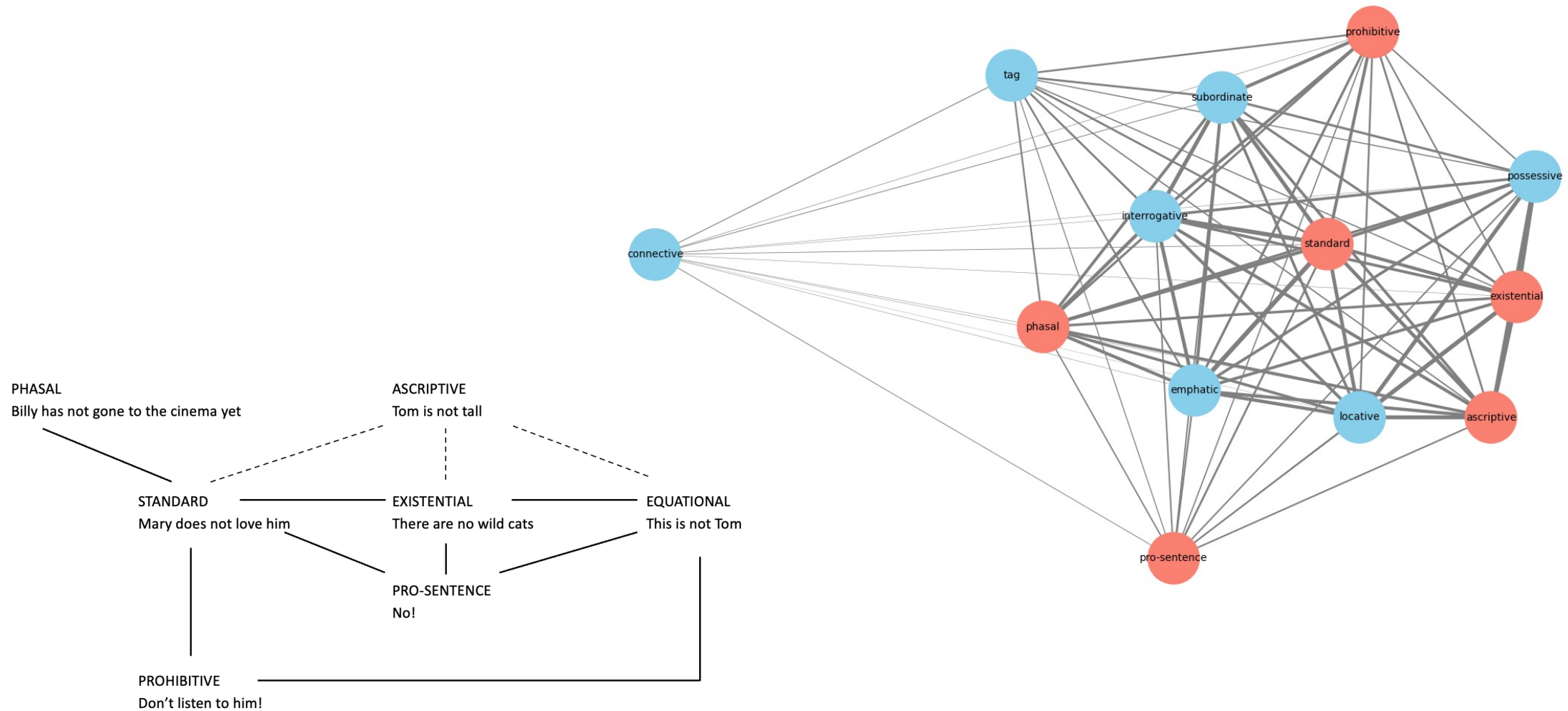


10. A SEMANTIC MAP OF NEG IN I.E. 13 FUNCTIONS



Version without DERIVATIONAL and CONSTITUENT (>30% of missing values in the dataset), and PRIVATIVE (only one connection to DERIVATIONAL)

11. BACK TO BOND'S MAP



12. SUMMING UP...

Bond's map also holds for the data I presented.

A more fine-grained representation of the interconnections among negation subdomains provides a clearer picture of the negation system in the languages considered.

The model proposed by Georgakopoulos & Polis (2021) for automatically visualizing classical semantic maps performs better on negation data compared to MDS.

This model also points to the potential integration of diachrony into classical semantic maps...

... FUTURE STEPS

Expand the number of languages and refine data collection across all negation subdomains.

Incorporate diachrony into the analysis. Focusing on a single language family enables the integration of diachronic dimensions. As Georgakopoulos & Polis (2018) noted:

« Adding information about diachrony in a map is known as “dynamicizing” a map (Narrog & van der Auwera, 2011, pp. 323–327). Drawing from the terminology of graph theory, we define a dynamic semantic map (a *dysemap*) as a set of vertices connected by edges that are allocated a direction. »

Given the extensive typological research on the diachrony of negation—including well-known Negative Cycles such as the Jespersen Cycle (JC) and the Negative Existential Cycle (NEC)—a major goal for future research is to pursue this diachronic perspective.

THANK YOU!

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