Mapping negation in conceptual space

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1. INTRODUCTION

Semantic maps and multidimensional scaling are modes to represent the contextual and conventionalised meaning relationships underlying the multifunctionality of grammatical constructions. As such they provide a way to geometrically formalise meaning relations that are proposed to be of a universal nature. For some (e.g. Kemmer 1993, Croft 2001, Croft & Poole 2008), this geometric space is a representation of conceptual reality in so much that it is proposed to reflect the cognitive arrangement of these concepts in the speakers' mind. Increasingly, semantic maps are being used in a wide number of applications, beyond purely semantic domains. Significantly, their use has widened to address pragmatic and discourse-oriented phenomena, raising questions about what kinds of patterns such maps represent and – specifically – whether they correspond to cognitive reality (Sansò 2009). In this paper I examine the multifunctionality of strategies for expressing linguistic negation, the cover term for a concept or group of concepts encoded grammatically in every language. Using a micro-sample of discourse data from twelve genetically and areally diverse languages, I begin by delimiting a broadly construed domain of linguistic negation. I then examine variation across the sample in terms of the functional domains covered by negative strategies that meet the requirements of the broad definition. From a purely functional perspective (and thus avoiding the structural trappings associated with earlier typological work on negation), I examine which analytic primitives are important for mapping out negation systems using the classical semantic map method (Haspelmath 2003). In doing so I argue that the proposed conceptual organisation of negation systems reveals some testable hypotheses regarding potentially universal semantico-pragmatic networks.

2. SEMANTIC MAPS AND CONCEPTUAL SPACE

The creation of SEMANTIC MAPS is a method for describing and illuminating possible patterns of multifunctionality of grammatical morphemes by geometrically representing relations between meanings (Haspelmath 2003). Multifunctionality of a grammatical morpheme (or gram) is empirically identifiable when one language has a single means to encode two or more functions that are formally distinguished in at least one other language. For the purpose of map building, FUNCTIONS are conceived broadly to encompass both 'senses' (i.e. conventional meanings) and 'uses' (i.e. contextual meanings) since it

is not always easy to distinguish between the two on principled grounds (Haspelmath 2003: 212).[1]

In cases of attested multifunctionality, the various functions subsumed by a gram are each represented by nodes (i.e. values or functions) linked together on the map by a connecting line. The basic concept underlying the topography of a semantic map is that multifunctionality of a gram occurs only when the subsumed functions of the gram are conceptually similar in some way. The functions must be arranged in such a way that all multifunctional grams can occupy a contiguous area on the map. However, van der Auwera and Plungian (1998) and van der Auwera (2008) have demonstrated that a marker may cover multiple functions that are not directly connected, but are both diachronically connected to a further function, which is synchronically no longer expressed using the same marker. For this reason, van der Auwera (2008) argues that the best synchronic semantic map is a diachronic one (i.e. one that is informed by diachronic evidence).

The domain that is mapped represents a universal configuration of functions linked by connecting lines to constitute a network. The simplest type of semantic map is a one-dimensional scale or hierarchy, but a greater number of dimensions may be more appropriate. Croft (2001: 92, 2003: 134) refers to the underlying (universal) network of links between functions as a CONCEPTUAL SPACE and describes language-specific manifestations of this conceptual space as semantic maps.

Another methodological variation on the semantic map methodology involves the use of mathematical methods to establish similarity and dissimilarity between functions. A 'second generation' semantic map constructed in this way is thus a 'metric on meaning' (Cysouw 2008). Their distinguishing feature is the use of distance matrices to determine the links – and closeness – between values (in this case functions) in the conceptual domain. Unlike with a classical semantic map (e.g. Haspelmath 2003), the Euclidean distance (i.e. the shortest possible distance) between the values on a mathematically constructed semantic map (i.e. a SEMANTIC GRAPH) is significant to the geometry, with the result that similar functions are close together on the map, and dissimilar functions far apart. Multidimensional scaling (MDS) is a multivariate technique used to create a Euclidean model of conceptual space that can be statistically tested with goodness-to-fit tests (see Croft and Poole 2008 for an overview). MDS modelling predicts that language universals are revealed in spatial models with few dimensions and a very good degree of fit to the cross-linguistic data. Because of the small number of languages included in this pilot study – and the implications of this on the result quality – an MDS analysis has not been attempted here. However, an MDS analysis with a larger sample is a logical next step following this small-scale pilot.

[1] Following Haspelmath (2003: 212-3) the semantic maps proposed here do not make any commitment to whether the relationships between the functions linked in conceptual space are best understood in terms of monosomy or polysemy.

3. NEGATION DOMAIN AND NEGATION FUNCTIONS

Conceptual space intuitively involves some form of conceptual domain. In this section, I examine which analytic primitives are important for mapping out systems found within the negation domain using the classical semantic map method (Haspelmath 2003). This approach differs from much earlier typological work on negation which has mainly concentrated on the structural characteristics of negation (Dahl 1979, Dryer 1989) and formal and pragmatic asymmetries between affirmative and negative sentences (Givón 1978, Miestamo 2005). The following broad conception of negation is used in this study to establish the conceptual domain being investigated (see Bond 2009, for justification of this definition):[2]

> Negation is a superordinate category that models a bilateral contrast between a state of affairs in some alternate reality (the concept(s) expressed by a counterpart possibility) in relation to the real world or a different alternate reality, projected as a perception or belief of the speaker, such that it delimits (rather than identifies) properties of the projected reality.

Within the negation domain of a particular language, language-specific constructions encode (language-specific) subtypes of negation that may well show some consistency with other language-specific categories when compared cross-linguistically. Underlying this potential similarity is the idea that different subtypes of negation are used to express a number of different functions that may be identified across languages. The identification of appropriate functions rests on the assumption that speakers of every language try to communicate similar types of information with similar communicative goals. However, while the basis for determining functions rests on analytical and theoretical assumptions about which meanings in particular are important for a domain, there is no assumption in the semantic map method about how these meanings/functions relate to one another (cf. Zwarts 2008). Table 1 lists seven functions commonly discussed in language grammars, and thus taken to be salient in the conceptual space for negation. The labels given to these functions have been chosen to avoid English-centric (although still Latinate) terminology. The prefix NON- (rather than NEG-) has been used to avoid confusion with other terms that may be used in the literature. The English examples are not exhaustive, only exemplary of possible variation across functions.

[2] An earlier version of this definition, together with some justification, can be found in Bond (2007).

Table 1
Common negative functions

Function label	Description	English example
DELIMITATION	Answers an identificational polar question through delimitation of a salient alternate reality.	no: No. nope (colloquial): Nope.
PROHIBITION	Exhorts a SoA through delimitation of an alternate specific SoA.	n't: Don't go! not: Do not run! no: No running!
NON-EQUATIVE	Ascribes the absence of a relation of equation between entities.	n't: Billy isn't my brother not: Billy is not a unicorn. no: Billy is no fool
NON-EXISTENCE	Ascribes the absence of an entity to a reality.	n't: There aren't any unicorns. not: Unicorns do not exist. no: There are no unicorns.
NON-PROPERTY	Ascribes the absence of a property to an entity.	n't: The boy isn't big. not: Unicorns are not black.
NON-OCCURRENCE	Expresses the non-occurrence of a specific, unmediated SoA.	n't: Billy didn't go to the cinema on Wednesday. not: The unicorn did not eat all day.
NON-OCCURRENCE (ANTERIOR)	Expresses the non-occurrence of an anticipated SoA during an extended temporal interval anterior to a reference point.	n't: Billy hasn't yet gone to the cinema. not: Billy has not gone to the cinema yet.

4. SAMPLE

Haspelmath (2003: 217) suggests that it is generally sufficient to look at a dozen genealogically diverse languages to arrive at a stable semantic map that does not undergo significant changes as more languages are considered. The suspected stability of a map of course varies both on the number of languages considered and the depth of variation investigated, so this number is treated with some scepticism here. However, with Haspelmath's observation in mind, Table 2 lists the 12 languages included in this pilot study, including their genetic affiliation and macro-area (cf. Dryer 1992). [3] Although the languages in the sample were not

[3] Tentative semantic maps for negation in some New Georgia languages of the Solomon Islands were first proposed in Bond & Chambers (2009), but the networks were built on data from closely

randomly selected (i.e. they are subject to a bibliographical bias due to the quality of description needed to be included in this study), they were genetically and areally stratified and were not selected on the basis of their negation systems.

Table 2
Genetic affiliation of the 12 languages in the sample

Language	Genetic affiliation	Primary location	Macro-area
Eleme	Benue-Congo, Niger-Congo	Nigeria	Afr
Khwe	Central Khoisan, Khoisan	Namibia	Afr
Lezgian	Lezgic, Nakh-Daghestanian	Azerbaijan, Daghestan	EurA
Udihe	Tungusic, Altaic	Russia	EurA
Semelai	Aslian, Mon-Khmer	Malaysia	SEOc
Kubokota	Oceanic, Austronesian	Solomon Islands	SEOc
Korafe	Binandere, Papuan	Papua New Guinea	A-NG
Kayardild	Tangkic, Australian	Australia	A-NG
Hup	Vaupés-Japurá	Colombia, Brazil	SAm
Cavineña	Tacanan	Bolivia	SAm
Slave	Athapaskan, Na-Dene	Canada	NAm
Chalcatongo Mixtec	Mixtecan, Oto-Manguean	Mexico	NAm

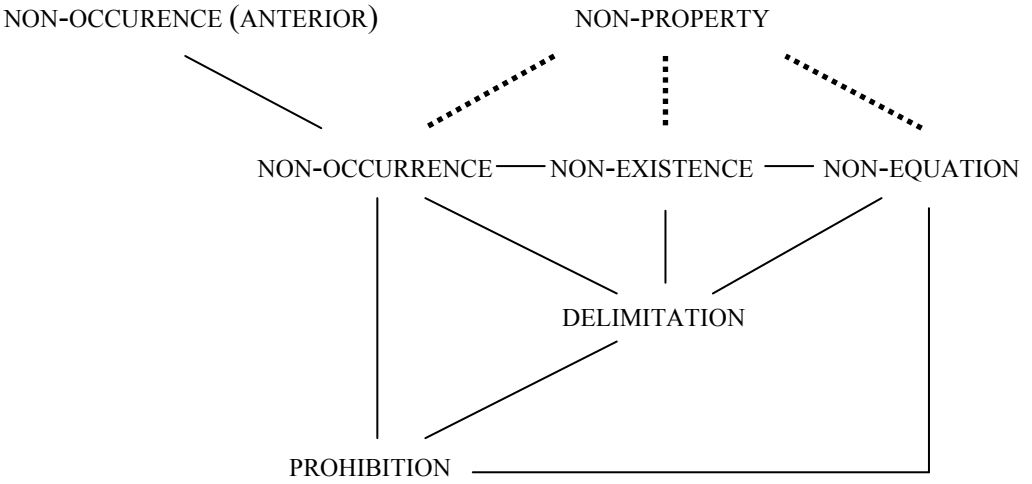
5. THE CONCEPTUAL SPACE FOR NEGATION

Based on data from the micro-sample, I propose the following first approximation of a conceptual space for negation built around the seven core functions identified in Table 1. With the exception of NON-PROPERTY and NON-OCCURENCE, each of the functions identified in Table 1 can be expressed by a unique strategy in at least one of the languages in the micro-sample: DELIMITATION = Eleme *ḿm̀* (own data), PROHIBITION = Lezgian *–mir* (Haspelmath 1993), NON-EQUATIVE = Hup *ʔăp* (Epps 2008), NON-EXISTENCE = Khwe *hámbe* (Kilian-Hatz 2008), NON-OCCURRENCE (ANTERIOR) = Chalcatongo Mixtec *čą́ʔą̃=* (Macaulay 1996). The negation systems of all languages in the micro-sample adhere to the network identified in Figure 1.[4]

related languages and therefore were not presented as being universal. However, the data from these languages, together with the English data in Table 1, corroborate Figure 1.

[4] Other negative functions (not encoded on the map) that commonly have unique formal strategies in languages include NON-OCCURRENCE (CHARACTERISTIC) which expresses the characteristic non-occurrence of a SoA quantified over an extended temporal interval, NON-OCCURRENCE (ABSOLUTE) which expresses the exceptionless non-occurrence of a SoA quantified over an extended temporal interval, and NON-VOLITION which expresses the absence of volition (of somebody) towards a specific SoA.

Figure 1
Conceptual space for negation (Version 1)



The lines between each function indicate that evidence exists for shared formal representation between the two functions. For instance, in Eleme, the negative morpheme *-rí* is shared across two different strategies, one for expressing PROHIBITION and one that indicates NON-EQUATION.

(1) Eleme: PROHIBITION = NON-EQUATION

(a) *ka-ʤɔ́-í-rí* *ɔ̀ʤɔ* (b) *ǹna-nɔ̀ni* *sĩ* *m̀gbau-rí*
HORT-swim-2PL-NEG swim(O) animal-DEM NEG.COP dog-NEG
'Don't swim!' (PL) 'This animal is not a dog.'
(own data)

Based on the functions investigated here, a (synchronically motivated) direct link between PROHIBITION and NON-EQUATION is necessary because *-rí* is not attested with the function of DELIMITATION (or NON-OCCURRENCE and NON-EXISTENCE, or NON-OCCURRENCE and NON-PROPERTY).[5] In contrast to *-rí*, the negative copula *sĩ* is only used in expressions of NON-EQUATION and therefore does not provide evidence for a link between functions.

A distinction is made on the map between straight lines and dotted lines. Dotted lines indicate that while two functions may share the same means of representation, there is no evidence in the sample to suggest that an independent strategy is possible for one of the pair. For instance, while expressions of NON-EXISTENCE and (certain instances of) NON-PROPERTY in Eleme both involve the

[5] The abbreviations used in this paper are: 1 = first-person, 2 = second-person, 3 = third-person, COP = copula, DEM= demonstrative, DET= determiner, HORT = hortative, IN.PRP = inanimate preposition, NEG = negative, OBJ/O = object, PL = plural, R = realis, SG = singular, SoA = state-of-affairs.

negative verb *ǹʤɛ*, predicates with the NON-PROPERTY function in the sample are never encoded with negative formatives used only for the NON-PROPERTY function (see Stassen (1997) for a view of this pattern – in the affirmative – in terms of strategy takeovers).

Figures 2 and 3 represent semantic maps for Hup and Kubokota respectively. The domain of each negative formative is represented by a polygon superimposed over the conceptual space from Figure 1. For the sake of visual clarity, the lines that connect functions in conceptual space have only been retained in the semantic maps if the connection is warranted by the language specific data.

Figure 2
Semantic map for Hup negation (data from Epps 2008)

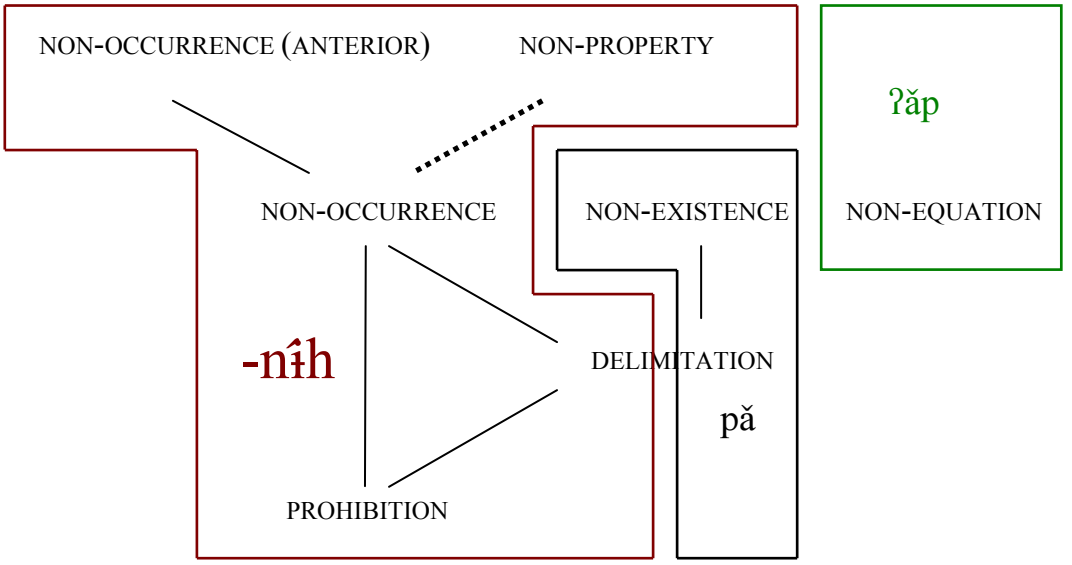


Figure 2 indicates that Hup has three core negative formatives that are used to fulfil the seven core functions identified on the map. The multifunctionality of the negative suffix *-nɨ̂h* in Hup demonstrates that the same form can be used as part of strategies to express PROHIBITION, NON-OCCURRENCE, NON-OCCURRENCE (ANTERIOR), NON-PROPERTY and DELIMITATION. In contrast, *ʔăp* is used only for NON-EQUATION, while *pă* is used for NON-EXISTENCE and DELIMITATION.

Kubokota (Figure 3) has a slightly more complex negation system in that it exhibits four different negative formatives across the functions identified here and additional variation in terms of the multifunctionality of these forms. For instance, NON-OCCURRENCE (ANTERIOR) can be indicated by the particle *oqoro* alone, as in (2a) together with the more general non-occurrence form *=ke*, as in (2b). Such cases appear to occur when a negative formative used in one negative construction broadens its domain (i.e. is used to express functions that are otherwise encoded differently) by co-occurring with the existing negative form.

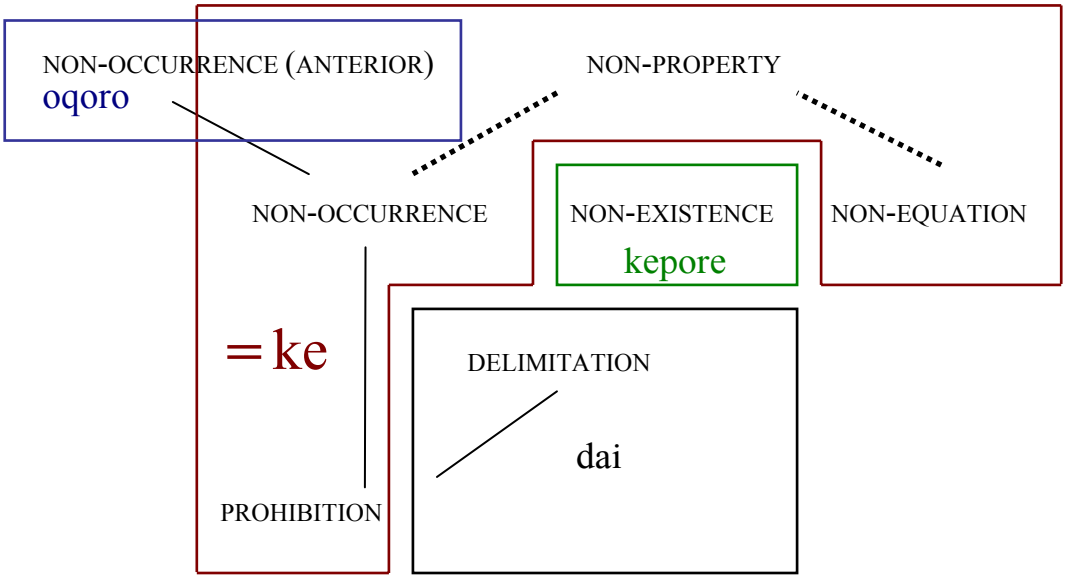
(2) Kubokota: NON-OCCURRENCE (ANTERIOR)

(a) *Oqoro kamu=a ara pa Pienuna*
not.yet arrive=3SG.OBJ 1SG IN.PRP Pienuna
'I haven't been to Pienuna yet.'

(b) *Za=ke oqoro zale pa=na ivere*
3SG.R=NEG not.yet come.up IN.PRP=DET sea
'(The moon) hasn't yet come up from the sea.'
(Chambers 2009: 77, 144)

The use of two negative formatives together that could otherwise be used alone for the same or a different function (e.g. *=ke* and *oqoro*) is indicated on the map through the use of overlapping domains.

Figure 3
Semantic map for Kubokota negation (data from Chambers 2009)



6. CONCLUSION

In this paper I have considered which analytical primitives are required to map out a tentative conceptual space for linguistic negation using data from 12 genetically and areally diverse languages. I have proposed that with the exception of negative clausal constructions expressing NON-PROPERTY and NON-OCCURRENCE, all of the functions identified in the proposed conceptual space can be expressed by distinct encoding strategies in at least one of the languages in the sample. The NON-PROPERTY function appears to be a 'no-mans-land' of conceptual space, subject to strategy take-over from competing constructions used for NON-EQUATION, NON-EXISTENCE and NON-OCCURENCE. The fact that the strategy used for NON-

OCCURENCE itself 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/formative.

While each semantic map shows the language specific arrangement of a negation system, the underlying conceptual space is proposed to reveal the universal properties of the domain. As such there are several testable hypotheses resulting from the map, which when applied to a larger sample could turn out to be language universals or statistically significant implicational statements:

> (i) The strategy used for NON-OCCURRENCE (ANTERIOR) negation will not be used for any of the other functions in conceptual space unless it is also used to express NON-OCCURRENCE.
> (ii) The strategy used for NON-PROPERTY negation must be shared with (at least) NON-OCCURRENCE, NON-EXISTENCE or NON-EQUATION.
> (iii) The strategy used for PROHIBITION will not be used to express NON-EXISTENCE unless it is also used for NON-OCCURRENCE, NON-EQUATION or DELIMITATION.

Further work in this domain will allow more sophisticated analysis of the variation occurring in negation systems by tackling three main issues that remain problematic in the current study. Firstly, the addition of more languages to the sample will test the robustness of the proposed conceptual space. Secondly, a more fine-grained approach to the functions included in each map will enable greater depth of analysis. In doing so, the third goal – to establish which dimensions are important in the conceptual space for negation – will also be tackled. It remains to be seen how many dimensions are appropriate in constructing a conceptual space for negation, or whether multiple conceptual spaces are required to deal with such complex phenomena. However, the data presented in this paper demonstrate that multifunctionality of negative morphemes is the norm rather than the exception in negation systems and that the use of semantic maps in trying to understand this multifunctionality may provide a greater understanding of semantic and pragmatic networks universally available in human language.

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