

Negation in Nanti

Syntactic Evidence for Head and Dependent Negators

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1 Introduction

This paper examines and presents an analysis of negators and their interaction in Nanti [ISO 693-3 code: cox], a Kampan-branch Arawakan language spoken in Peru. We argue that Nanti uses two different negation strategies among three negators. Our work also serves as an illustration of identifying head versus dependent negators without the help of morphological distinctions. We first begin with background and motivation for the analysis, followed by the data and analysis itself, and finally typological implications.

This also is an example of hypothesis testing through grammar engineering (Bender, 2008), as we have implemented a functional, small grammar fragment for Nanti that includes the negation analysis presented here. The grammar was developed from the LinGO Grammar Matrix customization system (Bender et al., 2002, 2010), followed by manual modification and expansion by the authors. We developed a testsuite of 206 sentences, 118 grammatical and 88 ungrammatical. Of these, 33 deal with negation, and so are of immediate relevance to the current paper. Both the testsuite and the grammar are publicly available for download at <https://github.com/faiuwle/Nanti>.

2 Motivation

Michael describes the negation system in Nanti as consisting of a pair of internal negators and an external negator (Michael, 2008, 2014b). The internal negators *tera* and *hara* are described as having basic semantic negation properties, as well as forcing an alternation of verbal mood. The external negator *matsi* is semantically a metalinguistic negator (Michael, 2014b). All negators take scope over clauses, and it is possible for an internal and external negator to cooccur, but only with a particular ordering. While the distribution is well-described, the reasons for it remain elusive, at least within Michael's grammar. We propose that an HPSG analysis of the negators as auxiliaries and modifiers captures these distribution patterns.

3 Data

Nanti employs the following negation strategies: the metalinguistic negator *matsi*, the descriptive negators *tera* and *hara* (with reduced clitic forms *te* and *ha*), existential negation and exhaustive negation (Michael, 2014b). We focus on the descriptive and metalinguistic negators. The data presented in this section is all taken from Michael 2014b.

Both metalinguistic *matsi* and the descriptive negators *tera* and *hara* appear to the left of the verb and its arguments (excepting any in the initial topic position), as seen in examples (1) and (2):

(1) *Matsi nopakeri maika peremisa.*

matsi no=p-ak-e=ri maika peremisa
NEG.META 1S=give-PERF-REAL.I=3MO now permission

'It is not the case that I gave him permission at that time.' [cox] (Michael, 2014b, p.194)

(2) *Tera imporohe.*

tera i=N-poroh-e
NEG.REAL 3MS=IRREAL-clear.land-IRREAL.I

‘He is not clearing land.’ [cox] (Michael, 2014b, p.188)

The difference between *tera* and *hara* lies in their interaction with the Nanti mood system, a binary realis/irrealis system (called reality status in the literature), which is used, among other things, to distinguish future events from non-future ones (Michael, 2014a). *Tera* is used only with notionally realis (non-future) clauses, while *hara* is used only with notionally irrealis ones (Michael, 2008). However, *tera* requires its clauses to be irrealis-marked, and *hara* requires its to be realis-marked. Michael 2014b refers to these latter as “doubly irrealis” clauses, with the negation adding an extra element of irrealis.

(3) a. *Opoki.*

o=pok-Ø-i
3NMS=come-IMPF-REAL.I

‘She is coming.’ [cox] (Michael, 2014b, p.190)

b. *Tera ompoke.*

tera o=N-pok-e
NEG.REAL 3NMS=IRREAL-come-IRREAL.I

‘She did not come.’ [cox] (Michael, 2014b, p.191)

(4) a. *Ompoke.*

o=N-pok-Ø-e
3NMS=IRREAL-come-IMPF-IRREAL.I

‘She will come.’ [cox] (Michael, 2014b, p.191)

b. *Hara opoki.*

hara o=pok-i
NEG.IRREAL 3NMS=come-REAL.I

‘She will not come.’ [cox] (Michael, 2014b, p.191)

Tera and *hara* also prohibit aspect marking in Nanti, which is otherwise obligatorily marked on verbs, either as the perfective *-ak* suffix as in (5b) or as the null imperfective suffix as in (5a).

(5) a. *Inihi.*

i=nih-Ø-i
3MS=speak-IMPF-REAL.I

‘He was speaking.’ [cox] (Michael, 2014b, p.193)

b. *Inihake.*¹

i=nih-ak-i
3MS=speak-PERF-REAL.I

‘He spoke.’ [cox] (Michael, 2014b, p.193)

(6) a. *Hara inihi.*

hara i=nih-i
NEG.IRREAL 3MS=speak-REAL.I

‘He will not speak.’ [cox] (Michael, 2014b, p.193)

b. **Hara inihake.*

hara i=nih-ak-i
NEG.IRREAL 3MS=speak-PERF-REAL.I

*‘He will not speak.’ [cox] (Michael, 2014b, p.193)

¹As noted in Michael 2014b, the realis and irrealis suffixes for *-i* verbs are neutralized after perfective *-ak*.

It is also possible for *tera* or *hara* to follow *matsi* to create a doubly negated clause as in (7), but it is not possible for any negator to follow *tera* or *hara*.

(7) *Matsi te pishinetemparo oka.*

matsi te pi=N-shine-eNpa=ro o-oka
 NEG.META NEG.REAL 2S=IRREAL-like-IRREAL.A=3NMO 3NM-this

‘It is not the case that you don’t like this.’ [cox] (Michael, 2014b, p.195)

Another negator, which we were not aware of during our initial analysis, is the “exhaustive” negator *mameri*, used to indicate that the state of the clause is not realized even to the smallest degree, as in (8). Like *tera*, *mameri* applies only to notionally realis clauses, results in a clause with irrealis marking, and does not allow the verb to take aspect marking (Michael, 2014b). Because of these commonalities, our analysis for *tera* also works for *mameri*.

(8) *Mameri inehakotero saburi, kotsiro.*

mameri i=N-nehako-e=ro saburi kotsiro
 NEG.EX 3MS=IRREAL-be.familiar.with-IRREAL.I=3NMO machete knife

‘He had no familiarity with machetes or knives at all.’ [cox] (Michael, 2014b, p.198)

In summary, *tera* takes notionally realis clauses while *hara* takes notionally irrealis ones, and *matsi* can take either. The descriptive negators *tera* and *hara* require clauses to take on the opposite reality status marking to their notional/semantic value, and while *matsi* can be followed by a descriptive negator, the descriptive negators cannot be followed by other negators. Additionally, there is an exhaustive negator *mameri*, which behaves like *tera*.

4 Analysis

The challenge for the analysis is to represent the phenomena described above in the Grammar Matrix system (Bender et al., 2002, 2010) in order to successfully parse positive examples of negation while rejecting negative ones.² The two chief phenomena to address are: the TAM restrictions for dependent clauses of the descriptive negators *tera* and *hara* (examples 3 - 6); and the ordering restriction that *matsi* must precede *tera* or *hara* (example 7).

The clauses following the descriptive negators *tera* and *hara* exhibit two restrictions: they cannot take aspect marking (6b), and they exhibit mood-marking inversion (that is, their syntactic mood-marking is the opposite of their semantic mood). In order to allow the descriptive negators to specify such constraints, we analyze them as heads, and we analyze their aspectless, mood-inverted complements as nonfinite. We accordingly define nonfinite FORMS for these verbs, in the following type hierarchy:

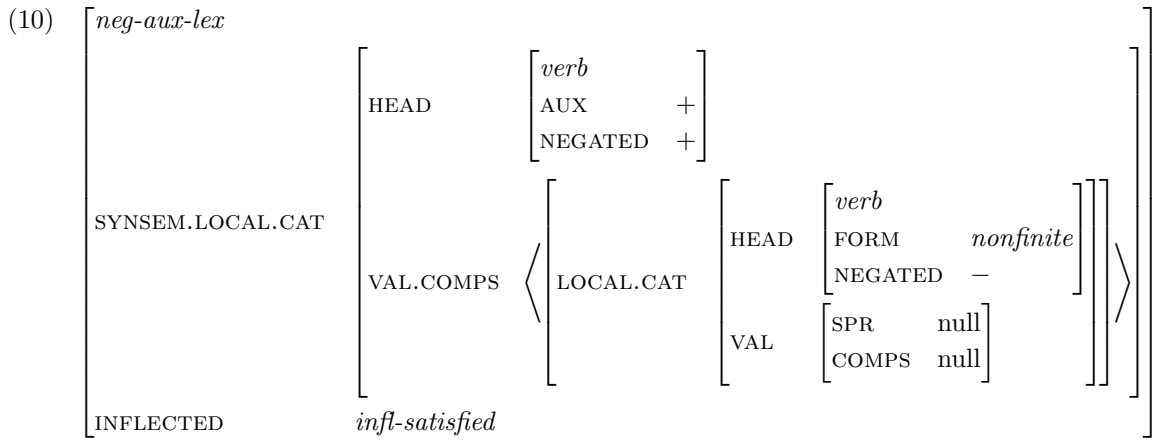


Form serves as a general type for the FORM value on HEAD, with daughters *finite* and *nonfinite*, and *nonfinite* leaves *realis-form* and *irrealis-form* representing nonfinite verb forms with the respective (syntactic) realis or irrealis marking. We require [FORM *finite*] for the root node, ensuring that all main sentential verbs go through an appropriate aspect-marking lexical rule and obtain proper mood marking. We then define lexical rules such that verb roots may either go through aspectual marking and be [FORM *finite*], with syntactic mood morphemes matching the semantic value in E.MOOD (realis with realis, irrealis with irrealis); or verb roots may go through a separate path of lexical rules and be either

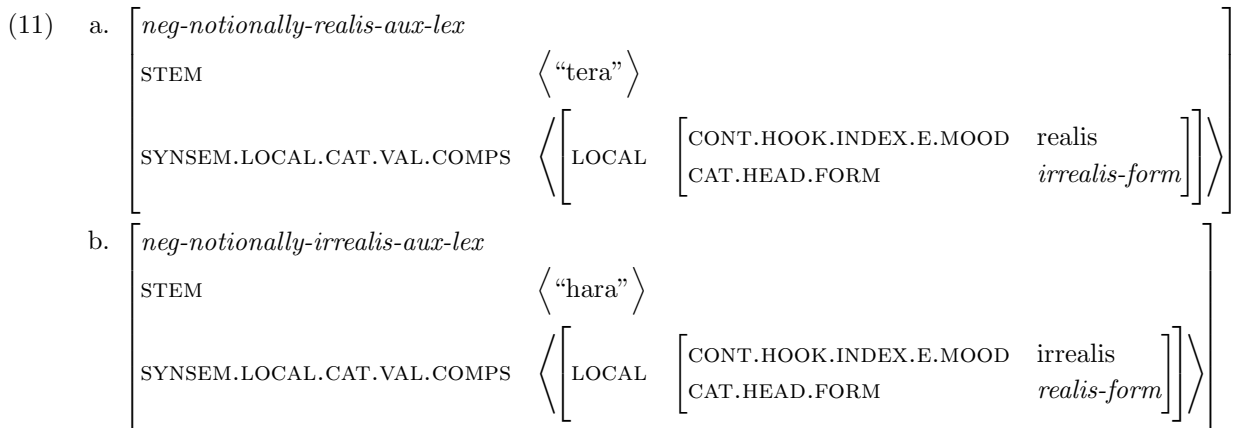
²The feature geometry shown here is that of the implemented grammar, which is based on the Grammar Matrix.

realis-form or *irrealis-form*, skipping aspect marking and obtaining a mood morpheme opposite from the semantic value of E.MOOD (*realis-form* with [E.MOOD *irrealis*], *irrealis-form* with [E.MOOD *realis*]). In this way we have verbs with the correct syntactic and semantic behavior associated with the appropriate *nonfinite* and *finite* forms.

The negators *tera* and *hara* themselves we analyze as defective auxiliary verbs which specify the FORM values *realis-form* or *irrealis-form* on their complements as described above. We introduce the boolean value HEAD.AUX to distinguish these negators from other verbs, and also to prohibit auxiliaries from taking verbal morphology. The Grammar Matrix customization system introduces a structure called INFLECTED with a number of flags to indicate which lexical rules a lexeme has gone through, and a type [INFLECTED *infl-satisfied*] to indicate a fully-inflected form.³ We give the descriptive negators an INFLECTED value of *infl-satisfied* (to permit them to enter into the syntax as fully-formed words), and specify [AUX –] on all lexical rules in the verbal morphology (to prevent these negators from acquiring verbal morphology). Finally we introduce a boolean feature HEAD.NEGATED to keep track of negation in the syntax. The NEGATED feature allows the syntax to distinguish between the grammatical negation “*matsi te*” and ungrammatical “*te matsi*”, by specifying that the descriptive negators must take a non-negated complement. These common properties are shared in a common supertype for *tera* and *hara*, which we have termed *neg-aux-lex* (10).



The individual negators *tera* and *hara* inherit from the constraints specified in (10), with the following additions defining their particular types of mood-marking inversion:



As mentioned earlier, exhaustive negator *mameri* functions in exactly the same way as the descriptive negators: *mameri* is captured with identical structure to *tera*, but with a different pred value representing exhaustive negation.

The analysis for metalinguistic negator *matsi* is somewhat simpler. Due to the fact that Michael 2008 describes *matsi* as being ‘external’ to the clause structure, and that it does not interact with reality

³See Goodman 2013 for a discussion of INFLECTED and *infl-satisfied*.

hara are heads. This approach can be applied cross-linguistically to distinguish negators in languages that employ multiple strategies.

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References

- Bender, Emily M. 2008. Grammar Engineering for Linguistic Hypothesis Testing. In *Proceedings of the Texas Linguistics Society X Conference: Computational Linguistics for Less-Studied Languages*, 16–36. Stanford, CA.
- Bender, Emily M., Scott Drellishak, Antske Fokkens, Michael Wayne Goodman, Daniel P. Mills, Laurie Poulson, and Safiyah Saleem. 2010. Grammar prototyping and testing with the lingo grammar matrix customization system. In *Proceedings of the ACL 2010 System Demonstrations*, 1–6. Uppsala, Sweden: Association for Computational Linguistics. URL <http://www.aclweb.org/anthology/P10-4001>.
- Bender, Emily M., Dan Flickinger, and Stephan Oepen. 2002. The Grammar Matrix: An Open-Source Starter-Kit for the Rapid Development of Cross-Linguistically Consistent Broad-Coverage Precision Grammars. In *Proceedings of the Workshop on Grammar Engineering and Evaluation at the 19th International Conference on Computational Linguistics*, 8–14. Taipei, Taiwan.
- Borsley, Robert D., and Bob Morris Jones. 2005. *Welsh Negation and Grammatical Theory*. University of Wales Press.
- Crowgey, Joshua. 2012. An a priori Typology of Sentential Negation from an HPSG Perspective. Master’s thesis, University of Washington.
- Goodman, Michael. 2013. Generation of Machine-Readable Morphological Rules from Human-Readable Input. Master’s thesis, University of Washington.
- Michael, Lev. 2008. Nanti evidential practice: Language, knowledge, and social action in an Amazonian society. Doctoral Dissertation, University of Texas.
- Michael, Lev. 2014a. The Nanti reality status system: Implications for the typological validity of the realis/irrealis contrast. *Linguistic Typology* .
- Michael, Lev. 2014b. *Negation in Arawak Languages*, chapter 9. Leiden, The Netherlands: Brill.