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.

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

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

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(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)
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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).

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(5)
     a. Inihi.
         i=nih-∅-i
         3MS=speak-IMPF-REAL.I
         'He was speaking.' [cox] (Michael, 2014b, p.193)
     b. Inihake.<sup>1</sup>
         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)
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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

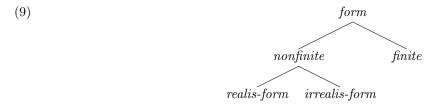
'He had no familiarity with machetes or knives at all.' [cox] (Michael, 2014b, p.198)

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 nonnegated complement. These common properties are shared in a common supertype for tera and hara, which we have termed neg-aux-lex (10).

$$\begin{bmatrix} neg\text{-}aux\text{-}lex & & & & & & \\ werb & & & & & \\ AUX & + & & & \\ NEGATED & + & & & \\ SYNSEM.LOCAL.CAT & & & & & \\ VAL.COMPS & & & & & \\ LOCAL.CAT & & & & & \\ INFLECTED & infl-satisfied & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & \\ & &$$

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:

$$(11) \quad \text{a.} \quad \begin{bmatrix} \textit{neg-notionally-realis-aux-lex} \\ \text{STEM} & \left\langle \text{"tera"} \right\rangle \\ \\ \text{SYNSEM.LOCAL.CAT.VAL.COMPS} & \left\{ \begin{bmatrix} \text{CONT.HOOK.INDEX.E.MOOD} & \text{realis} \\ \text{CAT.HEAD.FORM} & \textit{irrealis-form} \end{bmatrix} \right\} \\ \text{b.} \quad \begin{bmatrix} \textit{neg-notionally-irrealis-aux-lex} \\ \text{STEM} & \left\langle \text{"hara"} \right\rangle \\ \\ \text{SYNSEM.LOCAL.CAT.VAL.COMPS} & \left\{ \begin{bmatrix} \text{CONT.HOOK.INDEX.E.MOOD} & \text{irrealis} \\ \text{CAT.HEAD.FORM} & \textit{realis-form} \end{bmatrix} \right\} \\ \end{bmatrix}$$

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.

status or aspect in any way, we simply analyze it as a scopal adverb that takes a saturated sentence in its MOD list and only appears to the left of the head (i.e., is [POSTHEAD -]). This attaches via the usual head-modifier phrase. To allow matsi to interact with the descriptive negators, we further constrain its MOD value to be [NEGATED +]. Thus, descriptive negators cannot take as a complement any clause which matsi has modified, and te matsi fails to unify.

These combined analyses allow the descriptive negators, as auxiliaries, to take a complement verb that is of one form (realis or irrealis) while semantically/notionally indicating the opposite. We are also able to successfully reject examples with both a descriptive negator and an aspect, such as *Harainihake (6b). The HEAD.NEGATED feature and associated constraints prevent sequences of "tematsi" from parsing while allowing "matsi te", regardless of intervening adjuncts between the negators. Thus we have a well-motivated analysis of two negators tera/hara as syntactic auxiliaries, and one negator matsi as a pre-head modifier, even though neither type takes inflectional morphology, and thus there are no morphological cues to differentiate them in this case.

5 Typology

Crowgey 2012 presents a survey of predicted negation strategies from an HPSG perspective. Since we built our grammar on the Grammar Matrix, it is built on a foundation that assumes Crowgey's theoretical framework. Our analysis shows Nanti to be compatible with these theoretical predictions, although with the interesting complication of a language using multiple syntactic strategies for main-clause negation. The negators in Nanti map onto his predicted types of aux-neg and mod-neg. So far as we are aware, there is no reason to presuppose that languages will exclusively use one strategy for negating main clauses rather than several. Indeed, the (at this point dated) use of sentence-final pause and emphatic "not" in English can be analyzed as a mod-neg (13), in addition to the normal use of "not" as a comp-neg (14):

- (13) We had fun... not.
- (14) We did not have fun.

While there have been formal analyses showing distinct negation strategies for different kinds of clauses (such as Borsley and Jones 2005, which illustrated different negation strategies for finite main clauses versus non-finite subordinate clauses and imperative clauses in informal Welsh), we do not know of any that indicate multiple negation strategies simply for main clauses. However, if syntactic strategies for negation can vary with slang in the above way in English, there is no reason to assume a language cannot have more than one stable main-clause negation strategy. We have outlined the means by which we have determined the type of negation strategies presented in the data, and we believe that the interaction between different negators is a potentially fruitful area of future typological research. Within the data for field languages, one item to look for is the putative difference between external and internal negators: this may indicate different syntactic strategies.

Morphology can sometimes help determine if a negator is a head or a dependent, but in this case we used the interaction between the negators and the verbs they combine with to determine that *tera* and

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

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