Degree constructions in Ch'ol*

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1 Introduction

- The literature on the syntax and semantics of measurement is very rich, but very little is known about Mayan languages
- In this talk, our goal is to provide a theoretically informed description of degree constructions in Ch'ol, focusing on data from the Tila dialect.
- As seen in (1) Ch'ol has dedicated comparative that can occur cross-categorically, one example given in (1):[1]

(1) a. *Jiñi alob* ***ñumeñ*** *chañ kej bajche jiñi xk'äläl*
DET boy more tall that how DET girl
'The boy is taller than the girl.' *(AP comparative)*

b. ***Ñumeñ*** *tyi cha'-p'ej juñ tyi k-pejkä.*
more PREP two-CLF book PFV A1-read
'I read more than two books.' *(MP comparative)*

- *ñumeñ* is made up of the root *ñum* 'pass' and *-eñ*, which derives stative (participial) readings (Vázquez Álvarez 2011: 128) (compare: *chäm* 'die' - *chäm-eñ* 'dead').
- In addition to dedicated comparative morphology, we will show that Ch'ol has a wide range of morpho-syntactically distinct degree expressions.

Road map

§2 We introduce our framework, i.e., Beck et al. (2009)

§3 Relevant background on Ch'ol, our data sources and the relevant degree constructions

§4 Fitting Ch'ol into the degree semantics framework

§5 Conclusions and further research questions

A, B, C Dialectal variation with Tumbalá Ch'ol, interactions with Spanish-borrowed *más*, addendum on nominal degree Qs

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[1]Glosses: We follow Leipzing glossing standards with the following additons: set A = ergative/possessive; set B = absolutive; LV = light verb

2 Beck et al.'s (2009) Parametric approach

- The expression of measurement and comparison exhibits much variation (Stassen 1985).
- Beck et al.'s (2009) attempt to capture that cross-linguistic variation via a set of semantic parameters, shown in (2):

(2) a. [±Degree Semantics Parameter] (DSP)
A language {may/ may not} have gradable adjectives.

b. [±Degree Abstraction Parameter] (DAP)
A language {does/ does not} have binding of degree variables in the syntax.

c. [±Degree Phrase Parameter] (DegPP)
The degree argument position of a gradable predicate {may/ may not} be overtly filled.

- The approach relies on a traditional degree semantics framework according to which gradable adjectives denote relations between degrees and individuals (Cresswell 1976; von Stechow 1984; Heim 2000: a.o.), i.e. they are of type $\langle d, \langle e, t \rangle \rangle$.
- The underlying assumptions behind the parametric approach (based on Snyder 2007):

(3) a. Clustering: if the knowledge required for construction α is the same as the knowledge required for construction β, then α and β should pattern together.

b. Ordered (implicational) relations: if the knowledge required for construction α is a proper subset of the knowledge required for construction β, then the availability of β entails the availability of α.

2.1 [+DSP]

- Dedicated degree morphology saturates the degree argument of the gradable predicate.

(4) a. Cooper is tall**er** than Audrey. (*Comparative*)
b. Cooper is taller **than 1.75m**. (*MP comparative*)
c. Cooper is **50cm** taller than Laura. (*Differential comparative*)
d. *[Cooper is 1.80m. Bob is 1.81m]* (*Crisp judgment*)
Bob is taller than Cooper.

2.2 [+DAP]

- The degree variable introduced by the gradable predicate is bound by a degree operator, rather than saturated *in-situ*.[2]

(5) a. Ann is taller than (**what**) Bill is. (Chomsky 1977)
b. It's obviously worth less to the Orioles than **however much** money mega-beer wants to pay them.[3] (*clausal standard*)

[2]Another diagnostic for a [+DAP] setting is the availability of Negative Islands and scope. We should note that degree questions (Beck 1996; Rullmann 1995) also involve binding of a degree argument. Beck et al. (2009) cluster them with [+DegPP] constructions. Since we are adopting their framework as is, we will also assume this here.

[3]https://www.camdenchat.com/2016/2/20/11077050/oriole-park-at-camden-yards-natty-boh-cans-taken-away

2.3 [+DegPP]

- The degree argument position – *of a gradable predicate* (e.g. adjective) – is filled in the syntax with a *wh*-operator or its trace, and an overt MP.

(6) a. The table is longer than the door is wide. (*Subcomparative*)
LF: [than how$_1$ [$_{TP}$ the door is [$_{AP}$ t$_1$ wide]]]
b. [$_{AP}$ How long]$_1$ is the table t$_1$? (*Degree Question*)
c. The table is [$_{AP}$ [$_{MP}$ 2 meters] long]. (*MP*)

2.4 Summary & Predictions of Beck et al.'s parametric approach

- The parametric approach just outlined can be summarized in 2.[4]

Table 1: Parameter settings and predictions (adapted from Hochaus et al. 2014)

Langs.	**[DSP]**			**[DAP]**	**[DegPP]**		
	DegMorph	**DiffCompr**	**Crisp**	***than*$_{CL}$**	**DegQ**	**Subcompr**	**MP**
Washo	*	*	*	*	*	*	*
Nez Perce	✓	*	✓	*	*	*	*
Japanese	✓	✓	✓	*	*	*	*
Russian	✓	✓	✓	✓	*	*	*
English	✓	✓	✓	✓	✓	✓	✓

- If, as Beck et al. (2009) argue, these are reliable diagnostics to probe the grammar of measurement and comparison, we should be able to use them in other languages.
- We will apply them to Ch'ol with two goals:

1. to probe where Ch'ol fits in the typology.
2. to provide a preliminary analysis of the constructions in the language.

- Enlarging the typology of languages is of special importance given the finer-grained microvariation that has been recently reported (Deal & Hochaus 2019).[5]

[4] Abbreviations are as follows: DegMorph = 'Degree Morphology'; DiffCompr = 'Differential Comparatives'; Crisp = 'Crisp Judgments'; DegQ = 'Degree Questions'; Subcompr = 'Subcomparatives'. We have swapped Motu from Beck et al. (2009) for Washo, as described in Bochnak (2015)

[5] For example, Deal & Hochaus (2019) have argued, in the light of Nez Perce data, that even if a language has a dedicated comparative morpheme and crisp judgments but no differentials, this does not suffice for a positive setting of [DSP].

3 Core data

3.1 General background

- A Mayan language
  - Mayan > Ch'olan-Tseltalan > Ch'olan-Chontal > Ch'ol
- In southern Mexico in communities in the states of Chiapas, Tabasco and Campeche, Chiapas being the state with the largest Ch'ol-speaking population
  - 254,000 speakers (INEGI 2020)
  - Still being learned by multiple generations, though it is being replaced by Spanish in many contexts
- Data comes from original fieldwork over the summer 2022, which includes elicited data, naturally occurring data and data from two production tasks that were transcribed and translated by native speakers; other sources are cited
- Mayan languages are verb-initial, head-marking and ergative-absolutive (England 1991; Aissen et al. 2017)
  - Agreement for internal and external arguments indexed on verb
- Terminology: We use Mayanist labels for person markers
  - **Set A** = possessive and ergative
  - **Set B** = absolutive

(7) a. *Tyi majli-**yety**.*
PFV go-B2
'You left.'

b. *Tyi **j**-k'ele-**yety**.*
PFV A1-see-B2
'I saw you.'

- As far as we can tell there is little to no work on degree constructions in Ch'ol (and Mayan for that matter)
  - Vázquez Álvarez (2011) (the grammar of Ch'ol) does not mention degree constructions
  - Martínez Cruz (2007) discusses adjectives but not degree constructions
- Otherwise, a paper on *más* 'more' in Q'eqchi, a distantly related Mayan language, argues that the Spanish-borrowed *más* functions as a degree modifier (≈ 'very') and not like a comparative (Kockelman 2019)
  - (We have more in the appendix of the status of *más*, which was also borrowed into Ch'ol from Spanish)

3.2 Degree constructions

- Comparative constructions in Tila Ch'ol are marked by the morpheme *ñumeñ* 'more'
- *ñumeñ* occurs cross-categorically (AP, NPs, VPs):

(8) *Jiñi alob* ***ñumeñ*** *chañ* { *kej bajche* } / { *y-ik'oty* } *jiñi xk'äläl*
DET boy more tall that how A3-with DET girl
'The boy is taller than the girl' *(AP comparative)*

(9) *Ñumeñ tyi k-choño papas tyi lunes kej bajche tyi k-choño wajtyañ tyi martes.*
more PFV A1-sell potatoes PREP Mon that how PFV A1-sell corn PREP Tues
'I sold more potatoes on Monday than I sold corn on Tuesday.' *(NP comparative)*

(10) *Ñumeñ mi a-cha'leñ ajñel kej bajche aj-Héctor.*
more IPFV A2-LV run that how NC-Hector
'You run more than Héctor.' *(VP comparative)*

- (8) is felicitous in contexts where the boy is 10cm taller as well as 1 cm, showing that crisp judgements are possible
- *ñumeñ* is also compatible with differentials: (11).

(11) *Aj-Juana,* ***ñumeñ*** *ts'äkä cha'-p'ej juñ tyi i-pejkä kej bajche' aj-María.*
NC-Juana more exactly two-CLF book PFV A3-read that how NC-Maria
'As for Juana, she read exactly two more books than Maria.' *(Differential comparative)*

- The standard can be introduced by either *kej* 'than' or by the preposition *tyi*.
  - The *kej*-standard in (8) and (11) contains an overt *wh*-element *bajche'* 'how'.
  - Alternatively, *kej bajche'* can be swapped with *yik'oty* 'with'
- Ch'ol can use *bajche'* + vague quantifier *oñ* 'much/many' to form a degree question (12-a) or *jay-p'ej* + nominalized *chañ* 'tall'

(12) a. *Bajche' y-oñ-lel papa tyi y-otsä aj-Maria tyi sopa?*
how A3-much-NML potato PFV A3-put NC-Maria PREP soup
'What amount of potato did Maria put in the soup?'
b. *Jay-p'ej i-chañ-lel aj-Juan?*
how-CLF A3-tall-NMZ NC-Juan
'How tall is Juan?' *(Degree question)*

- *tyi*-standards, however, are incompatible with *bajche'* and are only acceptable iff their complement is a Measure Phrase (MP), including numerals, (13).
  - Thus, they resemble MP-comparatives in other languages (Pancheva 2006).

(13) *Aj-Juana,* ***ñumeñ*** *tyi cha'-p'ej juñ tyi i-pejkä.*
NC-Juana more PREP two-CLF book PFV A3-read
'As for Juana, she read more than two books.' *(MP comparative)*

- Tila Ch'ol has also overt MPs outside of comparatives: *cha'p'ej metro* 'two meters' can modify nominalized gradable predicates like *ichañlel* 'its height' in (14).

(14) *Jiñ wits cha'-p'ej metro i-p'isol i-chañ-lel.*
DET mountain two-CLF meter A3-size A3-tall-NML
'The mountain is two meters high'. *(MP+gradable predicate)*

- However, subcomparatives (*the lake is wider than the river is long*) seem to be unavailable in the language.

3.3 Summary

Table 2: Parameter settings and predictions (adapted from Hochaus et al. 2014)

Langs.	**[DSP]**			**[DAP]**	**[DegPP]**		
	DegMorph	**DiffCompr**	**Crisp**	***than*$_{\mathbf{CL}}$**	**DegQ**	**Subcompr**	**MP**
Washo	*	*	*	*	*	*	*
Nez Perce	✓	*	✓	*	*	*	*
Japanese	✓	✓	✓	*	*	*	*
Russian	✓	✓	✓	✓	*	*	*
English	✓	✓	✓	✓	✓	✓	✓
Ch'ol	✓	✓	✓	✓	✓	*	✓

4 Fitting Ch'ol into the degree semantics framework

- We take differentials as evidence that Ch'ol has degrees: [+DSP]
  - differentials require the notion of addition, degrees form scales that enable addition (von Stechow 1984; Deal & Hochaus 2019) .
- The overt *wh*-morpheme inside the *kej*-standard is evidence for degree abstraction: [+DAP].
- *ñumeñ* then encodes the ordering relation (i.e. 'at least as great as') between sets of degrees. We assume the denotation in (15) from Heim (2000).

(15) $[\![\tilde{n}umeñ]\!] = \lambda P_{\langle dt\rangle}.\lambda Q_{\langle dt\rangle}.[\textsc{max}(Q) \geq \textsc{max}(P)]$
'The maximal degree in Q exceeds the maximal degree in P'

- Syntactically the complement of *ñumeñ* can be a CP introduced by *kej* or a PP, headed by *tyi*.
- Both *kej* and *tyi* are functions from sets of degrees to sets of degrees and saturate *ñumeñ*'s first argument, but differ with respect to *syntactic*-selection. This is shown in (16) and (17):

(16) a. *kej*: [• T •]
b. $[\![kej\ \text{TP}]\!] = \lambda d.[\textsc{max}([\![\text{TP}]\!]) \geq d]$
'The maximal degree denoted by the TP exceeds the degree d'

(17) a. *tyi*: [• M •]
b. $[\![tyi\ \text{MP}]\!] = \lambda d.[\textsc{max}([\![\text{MP}]\!]) \geq d]$
'The maximal degree denoted by the MP exceeds the degree d'

- A sentence like (8) has the LF in (18), following Bhatt & Pancheva (2004).
  - As with any other *wh*-element in the language, *bajche'* must move to Spec,CP binding a degree variable in the base position.

(18) *jiñi alob* λx[$_{\text{TP}}$ [$_{\text{DegP}}$ *ñumeñ* [$_{\text{CP}}$ *kej* $\lambda d'$[*bajche jiñi xk'äläl d'-chañ*]]] λd[$_{\text{VP}}$ *x d-chañ*]]

a. $[\![\text{TP}]\!] = \lambda x.[\text{MAX}(\lambda d.x \textit{ is d-tall}) \geq \text{MAX}(\lambda d.\textit{how-much the girl is d-tall})]$

b. 'the maximal degree of *x*'s (i.e. the boy) height is bigger than the maximal degree of the girl's height'

- This is consistent with a clausal status of the standard involving degree abstraction and comparative ellipsis under identity with the matrix clause (Heim 2000; Pancheva 2006).
- In addition to the trace of the degree quantifier, MPs and DegQs can saturate a gradable predicate's degree argument: [+DegPP]
- Interestingly, gradable predicates need not be 'bare adjectives': they can also be nominalized with the suffix *-lel* + a possessor when used predicatively.

(19) *i-chañ-lel* *i-tyam-lel*
A3-tall-NMZ A3-deep-NMZ
'height, depth,'

- We propose, following Menon & Pancheva (2014), that the base forms *chañ/tyam* should not be treated as 'pure adjectives', but as acategorial Property Concept Lexemes (PCLs).
  - PCLs denote abstract mass substances of type Π.
  - The category head, *a* or *n*, will map that property to an individual, and in the relevant case it will also introduce degrees.
  - The adjectival categorizer, *a*, is null; whereas the nominalizer is spelled-out as *-lel*.

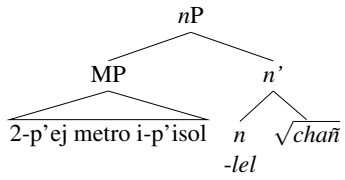
(20) $[\![\sqrt{\textit{chañ}}]\!] =$ `'the property of tallness'`

(21) $[\![\emptyset_a]\!] = \lambda\Pi.\lambda d.\lambda x.\exists y[y \textit{ is an instance of } \Pi \wedge x \textit{ has } y \wedge \mu(y) \geq d]$
'*a* denotes a relation between property-theoretic individuals Π, degrees *d*, and individuals *x*, that holds iff there is some *y* such that *y* is an instance of Π and *x* has *y* and *y*'s amount is as big as a degree *d*.'

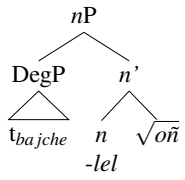
(22) $[\![\textit{-lel}_n]\!] = \lambda\Pi.\lambda d.\lambda x.[x \textit{ is an instance of } \Pi \wedge \mu(x) \geq d]$
' $\textit{-lel}_n$ denotes a relation between property-theoretic individuals Π, degrees *d*, and individuals *x* that holds iff *x* is an instance of Π and *x*'s amount is as big as a degree *d*'

- The MP saturates the *d*-argument of [$_n$ $\sqrt{\textit{chañ}}$-(*l*)*el*], and so does the trace of the *wh*-operator in DegQs.

(23)



(24)



5 Conclusion

- We have presented novel data from degree constructions in Tila Ch'ol.
- Ch'ol has dedicated degree morphology and also allows complex degree expressions.
  - It is [+DSP, +DAP]
- A positive setting of [DegPP] has been tied to the clustering of MPs, degree questions and subcomparatives, but the Ch'ol data highlights that this conclusion is not fully accurate:
  - The *d*-argument position of a gradable predicate can be filled overtly.
  - Thus, Ch'ol must be [+DegPP] too.
- We suggest that while the availability of subcomparatives entails [+DegPP], their unavailability is not indicative of the opposite.
  - Subcomparatives might be ruled out independently: the elided constituent must be strictly identical to the antecedent of the ellipsis?
- Our findings, thus, foreground previously unnoticed variation within and the diversity of [+DegPP] languages.
- This is a preliminary analysis and several questions are still unanswered:

i. Micro-variation with other Ch'ol varieties? Appendix A

ii. The interaction of native Ch'ol *ñumeñ* and Spanish borrowed *más*. Appendix B

iii. Scope interactions TBD

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A Dialectal differences

- While *ñumeñ* in Tila Ch'ol occurred cross-categorically, Tumbalá Ch'ol speakers provided the A-not-A strategy in many instances (but *ñumeñ* was also possible)

(25) [Context: you read 4 books, I read three] Tumbala

a. *Oñ ta' a-pejka juñ*
much PFV A2-read book
You read a lot/more of books.

b. *Mach oñ=ik ta' k-pejka juñ*
NEG much-IRR PFV A1-read book
I read not many/less books.

- The same strategy is shown with adjectives, as shown below; (a) can be followed up with (b)

(26) [Context: Alice is 3 months older than Celia. Both are 3 years old] Tumbalá

a. *Ñox aj-Alice, mach ñox-ik aj-Celia*
old NC-A NEG old-NEG NC-C
'Alice is older than Celia.' (Lit. Alice is old, Celia is not old.)

b. *...pe max=tyo ñox-ik aj-Alice.*
but NEG=yet old-NEG NC-A
'But Alice isn't old/that old.'

- In Tumbalá Ch'ol, *ñumeñ* was always used with MP comparatives and differential MP comparatives

- Crisp judgements are possible as in the following where *ñumel* 'surpass' is used

(27) a. *Añ i-**ñumel** cha'-p'ej cm aj-Alice.*
EXT A3-pass two-CLF cm NC-Alice
'Alice is two cm taller.' Both dialects

b. *Añ i-**ñumel** cha'-k'ejl ta' k-pejka juñ* { *k-ik'oty-ety* } / { *bajche jatyety* }.
EXT A3-pass two-CLF PFV A1-read book A1-with-B2 how you
'I read two more books than you.' Both dialects

B Spanish-borrowed *más*

- *más* is also used, but notably it can co-occur with *ñumeñ*
  - We speculate that is has been borrowed as an intensifier, much like the analysis in Kockelman (2019)

(28) a. *ñoj mas chañ*
very mas tall
'a lot taller'

b. *mas **ñumeñ** chañ*
mas more chañ
'a lot taller' (mucho más alto)

C Nominal degree Qs

- In nominal DegQs, there is a degree-like quantifier *oñ* that is also nominalized with -lel. Given the idiomatic paraphrase and the morpho-syntax, we can speculate that *oñ* is also a PCL:
  - $[\![\sqrt{oñ}]\!] =$ `'the property of quantity'`.
  - So, *-lel* would introduce the measure function to denote (29-a); and when *oñlel* modifies an NP, like *papa* 'potato', the meaning in (29-b) would arise.

(29) a. $[\![\sqrt{oñ}\text{-}lel]\!] = \lambda x.\exists d[x \textit{ is an instance of } \texttt{the property of quantity} \wedge \mu(x) \geq d]$
b. $[\![\sqrt{oñ}\text{-}lel\ papa]\!] = \lambda x.\exists d[x \textit{ is a potato} \wedge x \textit{ is an instance of } \texttt{the property of quantity} \wedge \mu(x) \geq d]$