Noun classifiers and the composition of DP in Chuj[*]

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1 Introduction & Puzzle

- Chuj is a Q'anjob'alan Mayan language spoken by 45,000 to 70,000 speakers in Guatemala and Mexico (Piedrasanta 2009).
- Like other Q'anjob'alan languages, Chuj has a rich system of nominal classification, including 16 *noun* classifiers (CLF), not to confuse with *numeral* classifiers (Maxwell 1981; Buenrostro et al. 1989):[1]

(1) Ix-w-il [*(**ix**) presidente].
PFV-A1S-see CLF president
'I saw the (female) president.'

(2) Saksak [*(**k'en**) uj].
white CLF moon
'The moon is white.'

QUESTION: What is the role of noun classifiers in the composition of DP?

- When appearing alone with a noun, CLFs seem to pattern like definite articles.
- This has led previous researchers to describe them as such (e.g. Buenrostro et al. 1989; García Pablo & Domingo Pascual 2007).
- But CLFs appear in a wide array of semantic and syntactic environments.

(3) CLF *as pronoun*
Saksak [*(**nok'**)].
white CLF
'It (the animal) is white.'

(4) CLF *with demonstrative*:
Saksak [*(**nok'**) tz'i' *chi*].
white CLF dog DEM
'That/the dog is white.'

(5) CLF *indefinite:*
Ix-ja [*jun* (**winh**) winak].
PFV-arrive INDF CLF man
'A man arrived.'

(6) CLF ∃ *construction:*
Ay [*jun* (**winh**) winak] t'atik.
EXT INDF CLF man here
'There's a man here.'

- Note that (5) and (6) are not partitive, since:
  - i Partitives are cross-linguistically disallowed in existential constructions like (6) (Milsark 1974; Enç 1991).
  - ii Partitives require a plural marker, expected since partitives select for pluralities (de Hoop 1997):

(7) Ix-ja [jun #(**heb'**) winh winak].
PFV-arrive one PL CLF man
'One of the men arrived.'

GOAL

To argue for a unified analysis of Chuj CLFs by maintaining their analysis as definite determiners, despite their surprisingly wide distribution,.

Specifically, noun classifier exhibit the semantics of (unique) definite determiners:

(8) *Denotation of classifier* (e.g. Heim & Kratzer 1998)
$[\![\text{CLF}]\!] = \lambda f\colon \exists!x \in C\,[f(x)].\ \iota y \in C\,[f(y)]$

- I further propose that (3)–(6) are derived compositionally from the semantics of the unique definite.
  - ▶ I propose that NP-deletion accounts for pronominal cases of CLFs, e.g. (3) (following Elbourne 2001, 2005, 2013).
  - ▶ To account for the co-occurrence of CLFs with indefinites (5–6), I propose that classifier-DPs can embed under indefinite DPs to restrict their domain to a singleton (Schwarzschild 2002).
  - ▶ After showing that *anaphoric* definites require both a classifier and a demonstrative, I argue that they are derived compositionally by combining the semantics of the (unique) definite classifier with that of the demonstrative.

sequence	result	section
CLF - NP	unique definite	
CLF - ~~NP~~	pronoun	§2
INDF - CLF - NP	specific indefinite	§3
CLF - NP - DEM	anaphoric definite	§4

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[1]Unless otherwise indicated, all data come from original elicitation with speakers of the San Mateo Ixtatán variant of Chuj. Glosses follow Leipzig conventions, with the addition of the following: A — Set A (ergative, possessive); B — Set B (absolutive); EXT — existential; FC — free choice; HUM — human plural marker; IV — intransitive status suffix; CLF — noun classifier; NUM.CLF — numeral classifier; PREP — preposition; RC — relative clause; TV — transitive status suffix.

2 Pronouns as NP deletion

- CLFs can surface without an overt NP, in which case they have been described as third person pronouns (Craig 1986; Buenrostro et al. 1989; Zavala 2000):

(9) Ay jun nok' tz'i' t'a-tik. Lan s-way *(**nok'**).
EXT INDF CLF dog PREP-DEM. PROG A3-sleep CLF
'There's a dog here. It's sleeping.'

Postal (1966); Elbourne (2001, 2005, 2013); Matthewson (2008):
pronoun = definite determiner + deletion of sister NP.

- Reasons to think this?
- First, pronouns often look like definite determiners:

(10) *French*
a. Je vois **la** femme.
I see the woman
'I see the woman.'
b. Je **la** vois.
I it see
'I see her.'

(11) *German* (Elbourne 2001)
a. Hans sieht **den** Mann.
Hans sees the man
'Hans sees the man.'
b. Hans sieht **den**.
Hans sees him
'Hans sees him.'

- Second, unlike nouns, pronouns often pattern like definite determiners in accepting an overt noun (Postal 1966; Abney 1987):

(12) a. we (linguists)
b. you (people)
c. you (liar)

- Therefore, similarly to Elbourne for English pronouns, I argue that Chuj pronouns have the structure in (15) and (16):

(13) a. [the NP]
b. [it ~~NP~~]

(14) a. [*the dog*]
b. [*it* ~~*dog*~~]

(15) a. [CLF NP]
b. [CLF ~~NP~~]

(16) a. [*nok' tz'i'*]
b. [*nok'* ~~*tz'i'*~~]

3 Indefinites with definite domain restrictors

- We now return to cases like (5) and (6), repeated below, where a noun classifier co-occurs with and indefinite determiner:

(17) CLF *indefinite:*
Ix-ja [*jun* (**winh**) winak].
PFV-arrive INDF CLF man
'A man arrived.'

(18) CLF ∃ *construction:*
Ay [*jun* (**winh**) winak] t'atik.
EXT INDF CLF man here
'There's a man here.'

PROBLEM:

If CLFs are definite determiners, then there are *too many determiners* in examples like (17) and (18).

Specific indefinites

- But notice that when occurring with a noun classifier, indefinites appear to take obligatory "wide scope" over other operators, including out of syntactic islands.
- Consider the following example and scenarios, in which the indefinite takes obligatory wide scope over the modal that the antecedent of the conditional restricts (assuming a Kratzerian (1986) analysis of conditionals):

(19) Context: *Malin is organizing a party in the village*
Te-junk'o'olal ix Malin [tato tz-jaw [jun **winh** icham]].
INTS-happy CLF Malin if IPFV-come INDF CLF elder
'Malin will be happy if an elder comes (to the party).'

✓ *if there is just one elder, for example Xun, such that if Xun comes to the party, Malin will be happy.*

\# *if Malin will be happy if at least one elder comes to the party, but it doesn't matter who.*

- The classifier above is optional. Without it, the indefinite could be interpreted either with wide or narrow scope (both scenarios would be felicitous).
- The presence of a noun classifier also creates so-called "referential indefinites" (Fodor & Sag 1982), which cannot receive a scopal account:

(20) *We were going to eat the chicken, but when we arrived it was missing, someone says:*
Ix-ik' b'at nok' kaxlan [jun **nok'** tz'i'].
PFV-bring go CLF chicken INDF CLF dog
'A dog stole the chicken!'

✓ *if a particular dog known to the speaker, say Fido, stole the chicken.*

\# *if there are traces of a dog in the speaker's house, e.g. paw prints, that lead the speaker to think that a dog stole the chicken (note that this scenario would be felicitous in absence of a classifier).*

- Again, without the classifier, both scenarios above would be felicitous.

Singleton indefinites

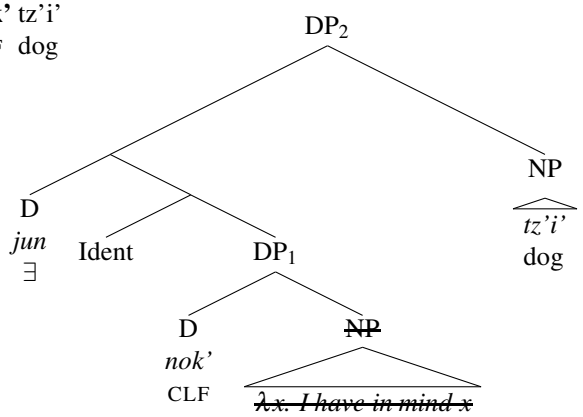
- Schwarzschild (2002) argues that specific indefinites derive from implicit domain restriction of an indefinite quantifier to a singleton set.
- The idea is that if an existential quantifies over a singleton set, then the interpretation must be specific.

PROPOSAL

Chuj definite DPs headed by noun classifiers (classifier DPs) can serve to restrict the domain of an indefinite quantifier to a singleton set.

- Solution to the *too many determiner* problem:
The reason there are two determiners is that there are two DPs.

(21) jun **nok'** tz'i'
INDF CLF dog
'a dog'



- Specifically, I propose that Chuj classifier DPs (with elided NPs) have the ability to appear in the restrictor of an indefinite quantifier.
- I assume the quantifier takes two restrictor arguments:

(22) *Denotation of the existential quantifier*
$[\![jun]\!] = \lambda f_1.\ \lambda f_2.\ \lambda g.\ \exists x[\ f_1(x) \wedge f_2(x) \wedge g(x)\ ]$

- While the first domain restricting argument is generally regarded as covert (e.g. realized by a context variable C in Westerståhl 1984; von Fintel 1994 or by syntactic ellipsis (e.g. Collins 2018), I propose that it can be partially overt in Chuj—only the classifier surfaces and the NP must be elided (=pronoun in Chuj).[2]

DERIVATION

- The classifier first composes with the (elided) NP, picking out a unique entity in a set of entities present in the context:

$[\![DP_1]\!] = \iota x \in C$ [the speaker has x in mind]

- In order to compose with the indefinite quantifier, I propose that the restrictor DP Ident shifts from type e to $<e,t>$ (Partee 1987), returning a predicate true of just one entity:

$[\![\text{Ident } DP_1]\!] = \lambda y.\ y = \iota x$ [the speaker has x in mind]

- When the existential composes with the step above, the result is an existential restricted to a singleton set, i.e. the set containing only the one thing that the speaker has in mind.

$[\![jun \text{ Ident } DP_1]\!] = \lambda f.\ [\lambda g_{et}.\ \exists y[y = \iota x[\text{the speaker has } x \text{ in mind}] \wedge f(y) \wedge g(y)]]$

- And finally the quantifier composes with the overt noun:

$[\![DP_2]\!] = \lambda g.\ \exists y[y = \iota x\ [\text{the speaker has } x \text{ in mind}] \wedge y \text{ is a dog} \wedge g(y)]$

Predictions

- This analysis makes clear predictions for the semantic and syntactic distribution of CLFs.

[2] The choice of syntactic structure follows Westerståhl (1984) and von Fintel (1994), who treat C as an argument of the quantifier. Another possibility is to treat the classifier as an adjunct of NP, and have it compose with the NP via Predicate Modification. I remain agnostic as to which parse is correct.

Prediction 1: Noun classifiers should not be allowed with "non-specific" indefinites (those which don't allow domain restriction down to a singleton).

- CLFs are not possible with random choice indefinites, independently argued to have an anti-singleton restriction on their domain (Alonso-Ovalle & Menéndez-Benito 2018):

(23) Yalnhej tas **(*anh)** itajil ix-in-yam-a'.
FC WH CLF herb PFV-A1S-grab-TV
'I grabbed a random herb.'
(Compare with English **I grabbed a certain random book*)

- CLFs are also incompatible with certain NPIs like *junok* 'any'. 'Any' has been independently argued to be a domain widener (Kadmon & Landman 1993).

(24) Maj chax laj junok **(*ch'anh)** libro.
NEG.PFV find NEG NPI CLF book
'I didn't find any book(s).'
(Compare with English **I didn't buy any certain book*)

- CLFs are incompatible with WHAT-questions (with a singleton domain restrictor, the question would be trivialized)

(25) Tas **(#anh)** nib'al ha-gana?
WH CLF huipil A2S-desire
'What huipil do you want?
(Compare with English #*What certain book do you want?*)

Prediction 2: With indefinites, CLFs should not trigger a uniqueness presupposition for the overt nominal, but without indefinites, they should.

(26) Context: *There are five priests in Yuxquen and the speaker and addressee know it.*
Ix-in-lolon yet' [jun (**winh**) pale].
PFV-B1S-speak with INDF CLF priest
'I spoke with a priest.'

(27) [$_{DP}$ *jun* [$_{DP}$ winh ~~NP~~] [$_{NP}$ pale]]

(28) Context: *There's only one priest in Yuxquen and the speaker and addressee know it.*
Ix-in-lolon yet' [#(**winh**) Paleh].
PFV-B1S-speak with CLF priest
'I spoke with the priest.'

(29) [$_{DP}$ winh [$_{NP}$ paleh]]

Prediction 3: CLFs should be optional with indefinites (when the classifier DP is in the restrictor of the idefinite) but not when they appear alone with a noun (when the classifier heads the sole DP).

- This is predicted, since the possibility for indefinites to be implicitly restricted via the use of a contextual variable or elided relative clause (see e.g. von Fintel 1994; Schwarzschild 2002) should remain.

(30) Context: *There's a book, namely The Little Prince, that you want to buy. You tell your friend:*
Hin-gana tz-in-man [jun **(ch'anh)** libro].
A1S-desire IPFV-A1S INDF CLF book
'I want to buy a book.'

(31) Context: *You already told your friend there's a particular book that you find interesting. You tell your friend:*
Hin-gana tz-in-man [#**(ch'anh)** libro].
A1S-desire IPFV-A1S CLF book
'I want to buy the book.'

Ellipsis without linguistic antecedent

- Ellipsis tends to have a strict linguistic antecedence requirement (see e.g. Sag & Hankamer 1976), but there is no antecedent for NP ellipsis in my proposal.
- This issue is general to any analysis of specific indefinites based on domain restriction, and Schwarzschild (2002) proposes the following generalization:

(32) PRIVACY PRINCIPLE (Schwarzschild 2002: 52, 307)
It is possible for a felicitous utterance to contain a restricted quantifier even though members of the audience are incapable of delimiting the extension of the (implicit) restriction without somehow making reference to the utterance itself.

- It remains to be understood *why* restrictor environments are exempt from general antecedence requirements. I leave this for future work.

4 Anaphoric definites

- In this section, I return to cases like (4) where a noun classifier co-occurs with a demonstrative.

(33) CLF *with demonstrative*:
Saksak [*(**nok'**) tz'i' *chi*].
white CLF dog DEM
'That/the dog is white.'

- Apart from their expected deictic interpretation, the co-occurrence of noun classifiers with demonstratives is interesting, because this combination is required to form so-called *anaphoric* (or "strong") definites in Chuj.
- Recently, many linguists distinguish between two kinds of definites (see Schwarz 2009, 2013; Jenks 2018; Aguilar-Guevara et al. to appear):
  - ▶ *Unique (weak) definites* (≈ uniqueness).
  - ▶ *Anaphoric (strong) definites* (≈ anaphoricity + uniqueness).
- Contrary to unique definites, which only require the presence of the CLF (see appendix), anaphoric definites in Chuj require the presence of i) the classifier and ii) a demonstrative:

(34) *Narrative sequence in Chuj*
a. Ay [jun (**nok'**) **tz'i'**] yet' jun nok' mis t'atik.
EXT INDF CLF dog with INDF CLF cat here.
'There's a dog$_i$ and a cat here.'
b. Saksak [*(**nok'**) tz'i' #**(chi)**].
white CLF dog DEM
The dog$_i$ is white.'

- Donkey setences have also been described as requiring anaphoric definite article forms (in cases where the anaphor is an entire DP).

(35) Every farmer who owns a donkey, loves the donkey.

- As expected, in Chuj, donkey anaphors require a demonstrative (in order to get the co-varying reading).

(36) Junjun anima' ix-il-an **junjun** **much**, ix-s-mak' [**nok'** much
each person PFV-see-AF INDF.DIST bird PFV-A3-kill CLF bird
#**(chi)**] heb'.
DEM PL
'Each person who saw a bird, killed that bird.'

- The obligatoriness of demonstratives with anaphoric definites is reminiscent of recent work by Jenks (2018), who also demonstrates that anaphoric definites must surface with demonstratives in Mandarin (including in donkey sentences):

(37) *Narrative segment in Mandarin* (adapted from Jenks 2018)
a. Jiaoshi li zuo-zhe yi ge nansheng he yi ge nüsheng.
classroom inside sit-PROG one CLF boy and one CLF girl
'There are a boy and a girl sitting in the classroom.'
b. Wo zutian yudao #(**na ge**) **nansheng**.
I yesterday meet that NUM.CLF boy
'I met the boy yesterday.'

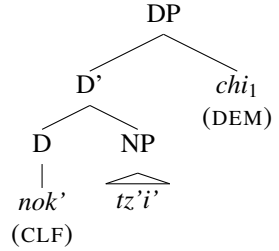
SKETCHING A PROPOSAL:

Anaphoric definites are derived compositionally by combining the semantics of the classifier with the semantics of the demonstrative.

Building on Jenks 2018, I propose that demonstratives introduce an anaphoricity presupposition on the referent of the unique NP, as implemented in the denotation in (38) (1 = index interpreted relative to a contextually provided assignment function g; Heim 1982):

(38) $[\![\text{DEM}_i]\!]^g = \lambda x\colon x = g(i).\ x$

(39) nok' tz'i' chi
CLF dog DEM
'this/the dog'



$[\![\text{D'}]\!]([\![chi]\!]^g)$
P: $\exists!x \in C\ [x \text{ is a dog}] \wedge \underline{x = g(1)}$
A: $\iota x \in C\ [x \text{ is a dog}]$

5 Conlusion & discussion

- In this talk, I provided a unified account of noun classifiers as (unique) definite determiners.
- To account for their exceptionally wide distribution, I proposed that:
  - ▶ NP-deletion accounts for pronominal cases of CLFs (following Elbourne 2001, 2005, 2013).
  - ▶ Classifier DPs can restrict the domain of an indefinite quantifier to a singleton set, accounting for cases where classifiers co-occured with indefinite quantifiers (extending Schwarzschild 2002)
  - ▶ CLFs combine with demonstratives to create anaphoric definites in Chuj (this account was based on Schwarz 2009 and Jenks 2018).
- The analysis accounts for the surprisingly wide distribution of classifiers in Chuj:

sequence	result
CLF - NP	unique definite
CLF - ~~NP~~	pronoun
INDF - CLF - NP	specific indefinite
CLF - NP - DEM	anaphoric definite

On choice-functions

- Since classifiers create specific indefinites, a natural alternative would be to consider whether they could denote choice function variables (of type $<et,e>$).
- This approach has been adopted by many to account for the exceptional scope of indefinites (see e.g. Reinhart 1997; Winter 1997; Kratzer 1998; Matthewson 1999).
- Two major views on the choice-function analysis of indefinites
  - (i) Indefinite determiners denote existentially bound choice function variables, and the site of existential closure can occur at any point in the structure (Reinhart 1997; Winter 1997).
  - (ii) Indefinites are ambiguous between a choice-function interpretation and a quantificational interpretation, and that the former must always take widest scope (Kratzer 1998; Matthewson 1999).
- But an analysis of CLFs as choice-function variables faces complications:
  1. CLFs are not the indefinite determiner proper, but occur separate from the determiner *jun*. How could a choice-functional variable co-occur with another existential/choice function variable?
  2. Since the analysis proposed by Reinhart (1997) and Winter (1997) predicts that existential closure can occur at any site, classifiers *could* occur with indefinites and still trigger narrow scope interpretations, contrary to case.
  3. A choice-function analysis of noun classifiers would not straightforwardly extend to the other non-indefinite environments in which noun classifiers occur, as in cases where noun classifiers surface alone as pronouns.

Refining the typology on definiteness

- Jenks (2018) proposes a typology of definiteness marking, reproduced below.

Table 1: *Typology of definiteness marking* (Jenks 2018)

	Bipartite	Marked anaphoric	Generally marked	Marked unique
Unique	Def_{weak}	Ø	Def	Def_{weak}
Anaphoric	Def_{strong}	Def_{strong}	Def	Ø
Languages	German, Lakhota	Madarin, Akan, Wu	Cantonese, English	(unattested)

- Chuj would seem to fit in Jenks' typology as a *bipartite* language.
- But the bipartite languages in Jenks 2018, like Fering and Lakhota, use different article forms to mark the distinction between unique and anaphoric definites.

(40) FERING (Ebert 1971)

a. Ik skal deel tu [**a** **/ *di** kuupmaan].
I must down to the$_{weak}$ / the$_{strong}$ grocer.
'I have to go down to the grocer.' (unique definite)

b. Oki hee an hingst keeft. [***A** **/ Di** hingst] haaltet.
Oki has a horse bought. the$_{weak}$ / the$_{strong}$ horse limps
'Oki has bought a horse. The horse limps.' (anaphoric definite)

- Chuj, on the other hand, appears to achieve this distinction compositionally by combining the unique definite semantics of the noun classifier with the semantics of the demonstrative.
- So it appears that some bipartite languages (Fering) mark the distinction between anaphoric and unique definites via two different lexical items (as proposed by Jenks 2018), whereas others (Chuj) achieve this distinction compositionally.

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Appendix

More background on Chuj classifiers

- There are 16 CLFs in Chuj, and which classifier appears depends on the properties of the nominal referent:

Table 2: *Chuj noun classifiers*

CLF	Introduces	Example	
ix	female entities	*ix chichim*	'the elder (f.)'
winh	male entities	*winh icham*	'the elder (m.)'
nok'	animals & derived products	*nok' nholob'*	'the egg'
te'	wood & related entities	*te' k'atzitz*	'the log'
anh	plants & related entities	*anh paj'ich*	'the tomato'
k'en	stone/metal & related entities	*k'en tumin*	'the money'
lum	earth & related entities	*lum yaxlu'um*	'the mountain'
ch'anh	vines & related entities	*ch'anh hu'um*	'the paper'
ixim	corn & related entities	*ixim wa'il*	'the tortilla'
atz'am	salt & related entities	*atz'am atz'am*	'the salt'
ha	liquids	*ha niwan*	'the river'
k'ak	cloth(es)	*k'ak nip*	'the huipil'
k'inal	rain	*k'inal nhab'*	'the rain'
waj	masculine proper names	*waj Matin*	'Mateo'
naj	masculine proper names (children)	*naj Matin*	'Mateo'
uch	feminine proper names (children)	*uch Malin*	'Mary'

- Crucially, *noun* classifiers are not *numeral* classifiers.
- Chuj has numeral classifiers, and they can co-occur with noun classifiers.[3]

(41) Ix-ja [ox-**wanh** *nok'* chej] t'atik.
PFV-arrive three-NUM.CLF CLF animal here
'Three horses arrived here.'

Evidence that classifiers are unique definites

- In this paper, I propose that CLFs are *unique* definite determiners: they presuppose the uniqueness of the referent in a set of entities present in the context (C).
- If this is the case, they should behave like so-called *weak* definites, argued by Schwarz (2009) and Jenks (2018) to encode only uniqueness.Schwarz (2009) argues that unique/weak definites include:
  - ► immediate situation uses (e.g. *the desk* in a room with just one desk)
  - ► larger or global situation uses (e.g. *the president* while in a particular country).
  - ► "non-specific" uses (e.g. *the newspaper*; *the market*, see Carlson et al. 2006)

(42) *Immediate situation use*
Context: *You're in a room where there's a book. The speaker asks you to move it somewhere else.*

Ak'em [***(ch'anh)** libro] t'achi.
put CLF jacket there
'Put the book over there.'

(43) *Larger situation use*

Ix-jaw [***(ix)** Presidente].
PFV-arrive CLF Presidente
'The president arrived.'

(44) *Non-specific use*

Ix-in-yam ***(k'en)** bus, yet' pax waj Xun.
PFV-A1S-grab CLF bus, and also CLF Xun
'I grabbed the bus, and so did Xun' (they could've taken different buses)

[3] I take the non-overlap of Chuj's noun classifiers with its numeral classifiers as evidence that numeral classifiers and noun classifiers are different grammatical categories in Chuj. This contrast is less clear in some South Eastern languages like Cantonese and Vietnamese, for which numeral classifiers are also definite determiners (see e.g. Cheng & Sybesma 1999; Simpson 2005; Jenks 2018). Future work should study more closely whether Chuj noun classifiers can be associated with the latter.