

## Centering and Zero Pronouns in Kaqchikel Mayan

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## Outline

- **Introduction**
  - **Kaqchikel Language**
  - **El Norte Text**
  - **Kaqchikel Structure**
- **Centering Theory**
- **Results**
- **Conclusion**

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## Kaqchikel Language

- Mostly spoken in Guatemala
- About half a million speakers
- Member of K'ichee' branch of Mayan languages

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## Kaqchikel Language (cont.)

- Orthography devised by the Academy of Mayan Languages of Guatemala
- Textbook/grammar/dictionary:
  - *¿La ütʼ awäch? Introduction to Kaqchikel Maya Language*, by R. McKenna Brown, Judith M. Maxwell, and Walter E. Little, 2006, University of Texas Press.

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## El Norte Text

- 1984 Field Methods class taught by Nancy Stenson at the University of Minnesota
- Film: *El Norte*, 1984: Gregory Nava, director
- Retold by consultant: Emilio Chagil, 379 clauses
- Story of a Mayan brother and sister who leave Guatemala after their parents are killed, immigrate illegally to the U.S. and try to survive there.

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## El Norte Text (cont.)

- Transcribed and glossed by Nancy Hedberg and Emilio Chagil in 1984, translated by Emilio Chagil.
- Analyzed initially for Centering Theory in 1999 by Nancy Hedberg and Sandra Dueck
- Revision in 2007 by Nancy Hedberg, with help from Maite Taboada.

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## Kaqchikel Structure

- Radically head-marking
  - Verbs marked for person/number of subject and object
  - Prepositions marked for person/number of object
  - Nouns marked for possessor
  - PRO-DROP: Marked arguments are omissible, but can show up as pronouns or full NPs.

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## Kaqchikel Structure (cont.)

- Morphologically ergative in agreement system
  - Subject of transitive verb: ergative
  - Object of transitive verb, subject of intransitive verb: absolutive
  - Possessor of noun: ergative
  - Object of preposition (relational noun): ergative

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## Kaqchikel Structure (cont.)

- Word order
  - Often SVO, but sometimes VSO, VOS
- Syntactic constructions
  - Passive: patient promoted to subject, marked ABS, agent demoted to oblique
  - Antipassive: agent marked ABS, patient demoted to oblique
  - Focus antipassive: agent questions, relative clause, clefts mark only the agent on the verb (ABS), patient demoted to oblique
  - Right and left dislocation

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## Outline

- Introduction
- **Centering Theory**
  - Introduction
  - Cf Template
  - Transitions
  - Rules
  - Utterance Segmentation
- Results
- Conclusion

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## Centering Theory

- Brennan, Friedman & Pollard 1987; Grosz, Joshi & Weinstein 1995; Walker, Joshi & Prince 1998; plus much further work.
- Computational theory of local discourse structure
  - Algorithm for tracking discourse entities throughout a text.
  - Algorithm for determining text coherence.
- Languages to which CT has been applied:
  - English, German, Italian, Spanish, Greek, Hindi, Turkish, Japanese.
  - Not to an aboriginal language of the Americas, not to a morphologically ergative language, and not to a basically verb-initial language.

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## Centering Theory (cont.)

- Each utterance introduces a set of discourse entities
  - Each discourse entity is a member of the set of forward looking centers: Cf set.
- Coherent texts will relate discourse entities across utterances in an orderly fashion
  - One member of the Cf set is the center of attention: Cb, the backwards-looking center.
  - The Cb of each utterance relates to previous Cb via a more-or-less coherent center transition (Ct): e.g. continue, shift.
  - The Cb of an utterance will be expressed with the shortest, most coherent referring expression of that utterance .

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## Centering Theory (cont.)

- Cf Template:
  - The Cf's of an utterance are more or less salient, and this affects how they are expressed grammatically.
  - The grammatical salience system may vary cross-linguistically, but basically:  
**Subject > Indirect Object > Direct Object > Other**
  - The **Cb** of  $U_i$  is the highest-ranked element of  $Cf(U_{i-1})$  that is realized in  $U_i$ .
  - The **Cp** of  $U_i$  is the highest-ranked element of  $U_i$  [preferred center].
  - Di Eugenio 1998: Possessor > possessed if possessed is inanimate; possessed > possessor if possessed is animate.

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## Centering Theory (cont.)

### Transition Types:

	$Cb(U_i) = Cb(U_{i-1})$	$Cb(U_i) \neq Cb(U_{i-1})$
$Cb(U_i) = Cp(U_i)$	<b>CONTINUE</b>	<b>SMOOTH-SHIFT</b>
$Cb(U_i) \neq Cp(U_i)$	<b>RETAIN</b>	<b>ROUGH-SHIFT</b>

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## Centering Theory (Continue)

- (1) (i) k'eyef-b'a x-ø-ki-b'an  
difficult-some CPL-3sA-3pE-do  
'They got into problems.'  
Cb: Rosa & Enrique  
Cf: Rosa & Enrique, difficulty  
Ct: CONTINUE
- (ii) i yamer x-e-kom-s-es pa-b'ey ru-ma jun k'ajol-achin  
and almost CPL-3pA-die-CAUSE-PASS on-road 3sE-by one young-man  
aj-mejikan  
PERSON-Mexican  
'And they were almost killed on the road by a young man, a Mexican'  
Cb: Rosa & Enrique  
Cf: Rosa & Enrique, road, Mexican  
Ct: CONTINUE

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## Centering Theory (Retain)

- (2) (ii) i yamer x-e-kom-s-es pa-b'ey ru-ma jun k'ajol-achin  
and almost CPL-3pA-die-CAUSE-PASS on-road 3sE-by one young-man  
aj-mejikan  
PERSON-Mexican  
'And they were almost killed on the road by a young man, a Mexican'  
Cb: Rosa & Enrique  
Cf: Rosa & Enrique, road, Mexican  
Ct: CONTINUE
- (iii) porke x-ø-u-b'ij chi-k-e chi ria y-e-r-q'asaj-pe  
because CPL-3sA-3sE-say to-3pE-to that s/he INCPL-3pA-3sE-take-come  
kere-pe estads-unids  
here-come states-united  
'Because he said to them that he would take them across over here to the United States.'  
Cb: Rosa & Enrique  
Cf: Mexican, Rosa & Enrique, U.S.  
Ct: RETAIN

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## Centering Theory (Smooth Shift)

- (3) (iii) porke x-ø-u-b'ij chi-k-e chi ria y-e-r-q'asaj-pe  
because CPL-3sA-3sE-say to-3pE-to that s/he INCPL-3pA-3sE-take-come  
kere-pe estads-unids  
here-come states-united  
'Because he said to them that he would take them across over here to the United States.'  
Cb: Rosa & Enrique  
Cf: Mexican, Rosa & Enrique, U.S.  
Ct: RETAIN
- (iv) pero ma-n-Ø-u-ya-ta ri-ru-pensar  
but NEG-INCPL-3sA-3sE-give-IRR DEF-3sE-thought  
'But that wasn't his intention [He didn't give his thought.]'  
Cb: Mexican  
Cf: Mexican, his thought  
Ct: SMOOTH SHIFT

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## Centering Theory (Rough Shift)

- (4) (i) kwan enrik x-Ø-u-tzat r-ana' chi ria xa najin kam  
when Enrique CPL-3sA-3sE-see 3sE-sister that s/he just CONT die  
'When Enrique saw his sister that she was dying'  
Cb: Rosa  
Cf: Enrique, Rosa  
Ct: RETAIN
- (ii) i x-Ø-kam r-ana'  
and CPL-3sA-die 3sE-sister  
'And his sister died.'  
Cb: Enrique  
Cf: Rosa, Enrique  
Ct: ROUGH SHIFT

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## Centering Theory (cont.)

- Ordering Rule:
  - Transition states are ordered. Continue is preferred to Retain, which is preferred to Smooth-shift, which is preferred to Rough-shift.

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## Centering Theory (cont.)

- Pronoun Rule:
  - In each  $U_i$  in a discourse segment  $D$  consisting of utterances  $U_1, \dots, U_n$ , if some element of  $Cf(U_{i-1})$  is realized as a zero pronoun in  $U_i$ , then so is  $Cb(U_i)$ . If there are no zero pronouns in  $U_i$ , but there is an entity realized as a pronoun in  $U_i$ , then so is  $Cb(U_i)$ .
  - Adapted from Turan 1998, who was talking about Turkish.

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## Centering Theory (cont.)

- Utterance Segmentation
  - Kamayama 1998, Miltsakaki 2003
- Here:
  - Adverbial clause: separate utterance
  - Relative clause: part of main clause utterance
  - Complement clause: part of main clause utterance

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- Centering Theory
- Results
  - Transition and Form of Referring Expression
  - Preverbal, Postverbal Realization
  - Morphological Ergativity
  - Tracking Main Characters
- Conclusion

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## Results: Transition and Form of Referring Expression

	NONE	Ø	Pronoun	NP	Demon	TOTAL
CONT		120	18	6	1	145
RET		32	5	3	1	44
SS		16	8	18		42
RS		3				3
ZERO	23					23
TOTAL	23	174	31	27	2	257

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## Results: Transition and Form of Referring Expression (cont.)

	Ø	PRO+NP+DEMON
CONT+RET	155	35
SS+RS	19	26

$$\chi^2 = 29.32, \text{ d.f.} = 1, p < .001$$

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## Results: Transition and Form of Referring Expression (cont.)

(5) (i) i k'o chi jun señor ri naj ni-Ø-pe-we.  
and exist that one man that far INCL-3sA-come-WE  
'And there was a man who came from far away.'

Cb: NONE  
Cf: man, far away  
Ct: ZERO

(ii) x-Ø-u-suj ru-samaj ri-enrik.  
CPL-3sA-3sE-offer 3sE-work DEF-enrique  
'He offered Enrique work.'

Cb: the man (Ø)  
Cf: the man, Enrique, work  
Ct: CONTINUE

(iii) pero ria k'o juba ru-pena n-Ø-u-ya-qa ri-ya-ros  
but he exist some 3sE-pain INCL-3sA-3sE-leave-down DEF-FEM-Rosa  
'But he is afraid to leave Rosa behind.'

Cb: Enrique (ria)  
Cf: Enrique, Rosa  
Ct: SMOOTH SHIFT

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## Results: Preverbal, Postverbal Realization

	PreV	PostV
CONT+RET	20	14
SS+RS	22	4

$$\chi^2 = 4.66, \text{ d.f.} = 1, p < .05$$

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## Results: Preverbal, Postverbal Realization (cont.)

(6)(i) x-e-ki-jo-ta x-e-ki-tzolij-el  
CPL-3pA-3pE-want-IRR CPL-3pA-3pE-send-leave  
'They wanted to send them back.'

Cb: Authorities (Ø)  
Cf: Authorities, Rosa & Enrique  
Ct: CONTINUE

(ii) per komo rie ki-bän chel kom mejikan  
but as they 3pE-do like as Mexican  
'But they made like Mexicans.'

Cb: Rosa & Enrique (pre-verbal rie)  
Cf: Rosa & Enrique, Mexicans  
Ct: SMOOTH SHIFT

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## Results: Preverbal, Postverbal Realization (cont.)

(7)(i) x-e-käm-s-ës-ta  
CPL-3pA-die-CAUSE-PASS-IRR  
['because if they had stayed in Guatemala,] they would be killed.'

Cb: Rosa & Enrique (Ø)  
Cf: Rosa & Enrique  
Ct: CONTINUE

(ii) aqal x-Ø-ki-tamaj rie  
slowly CPL-3sA-3pE-learn they  
'Slowly they learned [how to survive here]'

Cb: Rosa & Enrique (post-verbal rie)  
Cf: Rosa & Enrique, here  
Ct: CONTINUE

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## Results: Morphological Ergativity

Subject > Object ranking works best since Absolutive > Ergative leads to less coherent transitions.

**ERG > ABS**                      **ABS > ERG**

- And also they needed to borrow money.  
**CONTINUE**                      **RETAIN**
- Thanks to God, they didn't have to borrow the money.  
**CONTINUE**                      **SMOOTH SHIFT**
- Since there was one of their people, a woman, who that is to say was just like their relative down there in Guatemala.  
**RETAIN**                              **RETAIN**
- She gave some money to them.  
**SMOOTH SHIFT**                      **RETAIN**

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## Results: Morphological Ergativity (cont.)

- Because this woman had been saving money.  
**CONTINUE**                      **SMOOTH SHIFT**
- She would have wanted to come here also to the United States before.  
**CONTINUE**                      **SMOOTH SHIFT**
- But in any case she didn't come.  
**CONTINUE**                      **CONTINUE**
- Then she gave it to them, Rosa and Enrique.  
**CONTINUE**                      **RETAIN**

More coherent ERG > ABS: 5  
More coherent ABS > ERG: 1  
Equal coherence: 2

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## Results: Tracking main characters

- Human Cb:
  - Rosa (107), Enrique (136), their mother (3), their father (5), the rich people (4), their relative (5), the Mexican who tried to kill them (5), the U.S. immigration authorities at the border (2), generic 'you'(6), Rosa's friend at work (9), Enrique's informer (2), the US immigration authorities in California (3), the man who offered Enrique work in Chicago (1), the poor people (3).
- Inanimate Cb:
  - the North (1), the movie (1), the story (2).
- Human Cp, non-Cb:
  - the man who brought them across the border, Enrique's friend at work, the doctor.
- Animate non-Cp, non-Cb:
  - the Mexican immigration authorities, the rats (passive agent), owner of the house (passive agent), the lady who was to give Enrique work in Chicago.

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## Results: Tracking main characters (cont.)

(9) [Because here you don't wash clothes with your hands. You wash almost nothing. You don't use your hands. Only you have to learn how to do it. You look at, read the instructions on the machines, what to move to make it work. Poor Rosa has to suffer with this because at first she didn't know what it says or what to do.]

(i) i x-Ø-cha:p ru-ma rajaw ri-haj ri-b'eyoma'-taq-winaq  
And CPL-3sA-catch.PAS 3sE-by owner DEF-house DEF-rich-PLUR-people  
'And she was caught by the owner of the house of the rich people.'  
Cb: Rosa  
Cf: Rosa, the owner, house, rich people  
Ct: CONTINUE

[Because she at first just washed the clothes with her hands.]

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## Conclusion

- Centering can be used to track main characters through a narrative.
- In Kaqchikel, Ø-pronouns are used for Cb continuation, full pronouns/NPs for shifts.
- Preverbal pronouns/NPs are used for Cb shifts, postverbal ones for Cb continuation.
- Future work: Study of discourse segmentation--cued by discourse particles, prosody (pause, frequency reset), and form of referring expression.

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Thank You!

Appendix

## Results: Partial Shifts

- Hurewitz 1998, 285:
  - “When two utterances have the relationship such that  $Cb(U_{n-1})$  is a subset of of several elements or pieces of elements in  $Cf(U_{n-1})$ , the transition between the utterances can be termed a Partial-Shift.”
- Here:
  - **set to member:** SMOOTH SHIFT, ROUGH SHIFT
  - **member to set:** CONTINUE, RETAIN

	SET-to-MEMBER	MEMBER-to-SET
∅	2	8
NP	8	0

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## Results: Partial Shifts (cont.)

- (8) (i) per ma-x-e-r-käm-s-aj-ta  
 but NEG-CPL-3pA-3sE-die-CAUSE-TR-IRR  
 ‘But he didn’t kill them.’  
 Cb: Mexican (∅)  
 Cf: Mexican, Rosa & Enrique  
 Ct: CONTINUE
- (ii) sol ri-enrik x-∅-u-b’än golpear-ri  
 only DEF-enrique CPL-3sA-3sE-do strike-REFL  
 ‘Only Enrique got hurt.’  
 Cb: Enrique (NP)  
 Cf: Enrique  
 Ct: SMOOTH SHIFT (PARTIAL SHIFT: set to member)

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## Results: Partial Shifts (cont.)

- (iii) per ru-ma ya-ros x-∅-u-to’  
 but 3sE-by FEM-Rosa CPL-3sA-3sE-help  
 ‘But Rosa helped him.’  
 Cb: Enrique (∅)  
 Cf: Rosa, Enrique  
 Ct: RETAIN
- (iv) i x-∅-ki-to’la-ki  
 and CPL-3sA-3pE-help-REFL  
 ‘And they helped each other.’  
 Cb: Rosa & Enrique (∅)  
 Cf: Rosa & Enrique  
 Ct: CONTINUE (PARTIAL-SHIFT: member to set)

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