From Kalaallisut to English: Analysis in CCG+UC$_2$

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(W2: Aug 5, 2009)

Plan for today

- Introduction:
  - syn-sem traits: English SA.SU.S vs. Kalaallisut BA.TO.L
  - scope corollary
- UC$_1$ + event (re)centering = UC$_2$ (see hdt)
- English and Kalaallisut in CCG+UC$_2$ (see hdt)
- Analysis of Kalaallisut BA.TO.L (review) vs. English SA.SU.S (new)
  Analysis of scope corollary (puzzle for next time)

Syn-sem traits: English vs. Kalaallisut

- **T1**: *Argument type*:
  What are the nominal arg's saturating the verbal pred.?
  - Eng. **SA**: *s*yntactic *a*rgument phrases only (NP subject, NP object, …)
  - Kal. **BA**: morphologically *b*ound *a*rguments only (pn cliticlaffix, n-root, …)
- **T2** *Prominence type*:
  What is the most prominent nominal relation?
  - Eng. **SU**: *su*bject prominent (grammar primarily contrasts SUbject vs. Direct Object)
  - Kal. **TO**: *to*pic prominent (grammar primarily contrasts T (topic) vs. ⊥ (background))
- **T3** *Word order type*:
  What determines the word order?
  - Eng. **S**: *s*yntactic rules (e.g. S → NP VP, etc, ∴ 'rigid' word order)
  - Kal. **L**: *l*exical operations (H-lift, pre-H lift, post-H lift, ∴ 'free' order)

Scope corollary

- In a SA-language the scope of SA (syntactic argument phrase) may be ambiguous
- In a BA-language the scope of BA (morphologically bound argument clitic, affix, or base) is unambiguous

English: Possibly ambiguous SA scope

- (Last month Ole$^{\top}$ ordered three books$^{\perp}$.)
- tv_E. He$_{\top}$ hasn't received *one*$_{\perp}$ *book* yet. (ambiguous SA scope)
  ∃¬. one book is still missing
  ¬∃. hasn't received any
- iv_E. *One book* hasn't been received yet.
  ∃¬. one book is still missing

Kalaallisut: Unambiguous BA scope

- (Last month Ole$^{\top}$ ordered three books$^{\perp}$.)
- tv_K. *Suli atuagaq ataasiq tigu-nngi(t)-la-a.*
  still book one get-not-DEC-3S$_{(T)}$.*3S*$_{(\perp)}$
  ∃¬. one book is still missing
- iv_K. 'passive': ABS theme, oblique (ABL) agent
  Suli atuagaq ataasiq tigu-niqa(r)-nngi(t)-la-q.
  still book one get-pssv-not-DEC-**3S**$_{(T)}$
  ∃¬. one book is still missing
- iv_K. antipassive: ABS agent, oblique (MOD) theme
  Suli atuagaq-mik ataasiq-mik tigu-si-nngi(t)-la-q.
  still book-MOD one-MOD get-*antip*-not-DEC-3S$_{(T)}$
  ¬∃. hasn't received any

T1: Observations (1-predicate)

- **T1** (argument type).
- *Kalaallisut*
  BA: verbal *n*-pred. requires *n* morphologically BOUND ARGUMENTS
  verbal *n*-pred. + *n* mrph. BOUND ARGUMENTS constitute a sentence (s)
- (1_K) *Ulapig-pu-nga*.
  busy-DEC$_{iv}$-1S ($n = 1$)
  I am busy.
- *English*:
  SA: verbal *n*-pred. requires *n* SYNTACTIC ARGUMENT phrases
  verbal *n*-pred. + *n* SYNTACTIC ARGUMENTS constitute a sentence (s)
- (1_E) *I am busy*.
  I be-TNS busy ($n = 1$)

T1: Ingredients for analysis (1-predicate)

- (universal) *default state* of infotention (represented in $UC_2 = UC_1$ + events):
  $c_0 = \text{ɤ}\{\langle\langle e_0\rangle, \langle\,\rangle\rangle\}$
  where $\langle e_0, \text{ll}\text{CTR}\text{ll}(e_0)\rangle \in \{\}\text{ll}spk\text{ll}$
  – c_0 represents the intuition that speaking up focuses attention on the speech act, e_0. Pictorially, here's a model for c_0 ($^{\top}$ on current topics):
    • $^{\top}e_0$: e_0-ctr speaks up
- English lexicon
  lexical categories
  busy AP: $\lambda\underline{e}[busy\langle\underline{e}, \text{CTR}\ \underline{e}\rangle]$
  be- IV/AP: $\lambda\underline{A}([e]^{\perp}; \underline{A}\ \perp\varepsilon)$
  grammatical categories (VP = s*PN)
  I PN: $\text{CTR}\langle\top\varepsilon\rangle$
  -TNS VP\IV: $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$
- Kalaallisut lexicon
  lexical categories
  busy- iv: $\lambda\underline{x}([e]^{\perp}; [busy\langle\perp\varepsilon, \underline{x}\rangle])$
  grammatical categories
  -DEC s\pn\iv: $\lambda\underline{P}\lambda\underline{x}.\ \underline{P}\ \underline{x}$
  -1S s\(s\pn): $\lambda\underline{P}.\ \underline{P}\ \text{CTR}\langle\top\varepsilon\rangle$

T1: Analysis of Kalaallisut (1_K)

(1_K) *Ulapig-pu-nga.*
busy-DEC$_{iv}$-1S

busy- | -DEC$_{iv}$ | -1S
iv: $\lambda\underline{x}([e]^{\perp}; [busy\langle\perp\varepsilon, \underline{x}\rangle])$ | s\pn\iv: $\lambda\underline{P}\lambda\underline{x}.\ \underline{P}\ x$ | s\(s\pn): $\lambda\underline{P}.\ \underline{P}\ \text{CTR}\langle\top\varepsilon\rangle$
———— <
s\pn: $\lambda\underline{x}([e]^{\perp}; [busy\langle\perp\varepsilon, \underline{x}\rangle])$
———— <
s: $[e]^{\perp}; [busy\langle\perp\varepsilon, \text{CTR}\ \top\varepsilon\rangle]$
s: $[e|\ busy\langle e, \text{CTR}\ \top\varepsilon\rangle]$

- Model for the output of Kalaallisut (1_K):

•	$^{\top}e_0$: e_0-ctr speaks up
——	e_1: e_0-ctr is busy

T1: Analysis of English (1_E) – Lexicon

(1_E) *am* = *be-TNS*

be- | *-TNS*
IV/AP: $\lambda\underline{A}([e]^{\perp}; \underline{A}\ \perp\varepsilon)$ | VP\IV: $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$
———— <**B**$_{\times}$
VP/AP: $\lambda\underline{A}\lambda\underline{x}((([e]^{\perp}; \underline{A}\ \perp\varepsilon)^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$

T1: Analysis of English (1_E) – Syntax

(1_E) *I* | *am* (= *be-TNS*) | *busy*
PN: CTR$\langle\top\varepsilon\rangle$ | VP/AP: $\lambda\underline{A}\lambda\underline{x}((([e]^{\perp}; \underline{A}\ \perp\varepsilon)^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}]])$ | AP: $\lambda\underline{e}[busy\langle\underline{e}, \text{CTR}\ \underline{e}\rangle]$
———— >
VP (= s\PN): $\lambda\underline{x}(([e]^{\perp}; [busy\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon\rangle])^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$
VP (= s\PN): $\lambda\underline{x}([e|\ busy\langle e, \text{CTR}\ e\rangle]^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$
———— <
s: $[e|\ busy\langle e, \text{CTR}\ e\rangle]^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \text{CTR}\ \top\varepsilon]$
s: $[e|\ busy\langle e, \text{CTR}\ e\rangle, \text{CTR}\ e =_i \text{CTR}\ \top\varepsilon]$
s: $[e|\ busy\langle e, \text{CTR}\ \top\varepsilon\rangle]$

- Model for the output of English (1_E):

•	$^{\top}e_0$: e_0-ctr speaks up
——	e_1: e_0-ctr is busy

T1: Observations (2-predicate)

- **T1** (argument type).
- *Kalaallisut*
  - **BA**: verbal *n*-pred. requires *n* morphologically BOUND ARGUMENTS
    verbal *n*-pred. + *n* mrph. BOUND ARGUMENTS constitute a sentence (s)
- (Look, there is a bear$^{\perp}$. Has Ole$^{\top}$ seen it$_{\perp}$?)
- (2_K) *Taku-pa-a.*
  see-DEC$_{tv}$-**3S**$_{(T)}$.*3S*$_{(\perp)}$ (n = 2)
  He$_{\top}$'s seen it$_{\perp}$.
- *English*:
  - **SA**: verbal *n*-pred. requires *n* SYNTACTIC ARGUMENT phrases
    verbal *n*-pred. + *n* SYNTACTIC ARGUMENTS constitute a sentence (s)
- (2_E) *He 's seen it.*
  HE have-TNS see-PF *IT* (n = 2)

T1: Ingredients for analysis (2-predicate)

English lexicon

- lexical categories (TV = IV/PN')

see	TV: $\lambda\underline{y}([e]^{\perp}; [see\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \underline{y}\rangle])$	

- grammatical categories (VP = s\PN)

HE	PN: $?\delta$	$(?\delta \in \{\top\delta, \perp\delta, \top\delta_2)$
IT	PN': $?\delta$	$(?\delta \in \{\perp\delta, \top\delta_2)$
-TNS	VP\IV: $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$	

Kalaallisut lexicon

- lexical categories (tv = iv\pn)

see-	tv: $\lambda\underline{y}\lambda\underline{x}([e]^{\perp}; [see\langle\perp\varepsilon, \underline{x}, \underline{y}\rangle])$	*taku-*

- grammatical categories (iv = s\pn)

-DEC	s\pn\iv: $\lambda\underline{P}\lambda\underline{x}.\ \underline{P}\ x$	*-pa*I…
-**3S**$_{(\top)}$	s\(s\pn): $\lambda\underline{P}.\ \underline{P}\ \top\delta$	*-a*I…
-*3S*$_{(\perp)}$	s\(s\pn): $\lambda\underline{P}.\ \underline{P}\ \perp\delta$	*-Ø*I…

T1: Analysis of Kalaallisut (2_K)

(2_K) *Taku-pa-a-Ø.*

see-DEC$_{tv}$-**3S**$_{(\top)}$-*3S*$_{(\perp)}$

- see- | -DEC$_{tv}$ | **3S**$_{(\top)}$ | -*3S*$_{(\perp)}$

tv (= iv\pn) | s\pn\iv: | s\(s\pn): | s\(s\pn):

$\lambda\underline{y}\lambda\underline{x}([e]^{\perp}; [see\langle\perp\varepsilon, \underline{x}, \underline{y}\rangle])$ | $\lambda\underline{P}\lambda\underline{x}.\ \underline{P}\ x$ | $\lambda\underline{P}.\ \underline{P}\ \top\delta$ | $\lambda\underline{P}.\ \underline{P}\ \perp\delta$

——— **<B**

s\pn\pn: $\lambda\underline{y}\lambda\underline{x}([e]^{\perp}; [see\langle\perp\varepsilon, \underline{x}, \underline{y}\rangle])$

——— **<B**

s\pn: $\lambda\underline{y}([e]^{\perp}; [see\langle\perp\varepsilon, \top\delta, \underline{y}\rangle])$

——— <

s: $([e]^{\perp}; [see\langle\perp\varepsilon, \top\delta, \perp\delta\rangle])$

s: $[e|\ see\langle e, \top\delta, \perp\delta\rangle]$

T1: Analysis of English (2_E) – Lexicon

(2_E) *has = have-TNS*

have- | *-TNS*

——— | ———

IV/IV$_{pf}$: | VP\IV:

$\lambda K.K$ | $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$

——— **<B$_x$**

VP/IV$_{pf}$: $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$

- *seen = see-PF*

see- | *-PF*

——— | ———

TV (= IV/PN') | IV$_{pf}$\IV:

$\lambda\underline{y}([e]^{\perp}; [see\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \underline{y}\rangle])$ | $\lambda K.\ K$

——— **<B$_x$**

IV$_{pf}$/PN': $\lambda\underline{y}([e]^{\perp}; [see\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \underline{y}\rangle])$

T1: Analysis of English (2_E) – Syntax

(2_E) ***HE*** | *'s* (= *have-TNS*) | *seen* (= *see-PF*) | *IT*

——— | ——— | ——— | ———

PN: | VP/IV$_{pf}$: | IV$_{pf}$/PN': | PN':

$\top\delta$ | $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$ | $\lambda\underline{y}([e]^{\perp}; [see\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \underline{y}\rangle])$ | $\perp\delta$

——— >

IV$_{pf}$: $([e]^{\perp}; [see\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \perp\delta\rangle])$

IV$_{pf}$: $[e|\ see\langle e, \text{CTR}\ e, \perp\delta\rangle]$

——— >

VP (= s\PN): $\lambda\underline{x}([e|\ see\langle e, \text{CTR}\ e, \perp\delta\rangle]^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$

——— <

s: $([e|\ see\langle e, \text{CTR}\ e, \perp\delta\rangle]^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \top\delta])$

s: $[e|\ see\langle e, \top\delta, \perp\delta\rangle]$

T2. English

• **T2** (prominence type).

• *English*: Subject-prominent

SU. Grammar primarily contrasts SU (SUBJECT) vs. DO (direct object).

• ENGLISH LEXICON (sample):

• lexical categories (TV = IV/PN')

see-	TV: $\lambda\underline{x}([e]^{\perp}; [see\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \underline{x}\rangle])$	
be-	IV/IV_{ps}: $\lambda K(K^{\perp}; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR}\ e =_i \text{BCK}\ \perp\varepsilon])$	
• grammatical categories (VP = s\PN, QP = s/VP, QP' = IV\TV)		
-	QP/NP: $\lambda\underline{P}'\lambda\underline{P}((\![\mathbf{x}]\!]^{\top}; \underline{P}'\top\delta)^{\top}; \underline{P}\top\delta)$	
-'	QP'/NP: $\lambda\underline{P}'\lambda\underline{P}((\![y]\!]^{\perp}; \underline{P}'\perp\delta)^{\perp}; \underline{P}\perp\delta)$	
I, U, HE, …	PN: $\text{CTR}\langle\top\varepsilon\rangle, \text{DAT}\langle\top\varepsilon\rangle, ?\delta$	$(?\delta \in \{\top\delta, \perp\delta, \top\delta_2\})$
ME, U, HM, …	PN': $\text{CTR}\langle\top\varepsilon\rangle, \text{DAT}\langle\top\varepsilon\rangle, ?\delta$	$(?\delta \in \{\perp\delta, \top\delta_2\})$
-PS	IV_{ps}\TV: $\lambda\underline{P}.\ \underline{P}\ \text{BCK}\langle\perp\varepsilon\rangle$	
-TNS	VP\IV: $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$	
=N'T	VP\VP: $\lambda\underline{P}\lambda\underline{x}[\sim(\underline{P}\ \underline{x})]$	

T2. Kalaallisut

• **T2** (prominence type).

• *Kalaallisut*: Topic-prominent

TO. Grammar primarily contrasts ⊤ (topic) vs. ⊥ (background).

• KALAALLISUT LEXICON (sample):

• lexical categories (iv = s\pn, tv = iv\pn)

-pssv	iv\tv: $\lambda\underline{R}\lambda\underline{x}.\ \underline{R}\ \underline{x}\ \text{CTR}\langle\perp\varepsilon\rangle$	*-niqar*\…
-antip	iv\tv: $\lambda\underline{R}\lambda\underline{x}.\ \underline{R}\ \text{BCK}\langle\perp\varepsilon\rangle\ \underline{x}$	*-si*\…
• grammatical categories (s^+ = s/s)		
-(ERG)$^{\top}$	s^+\cn: $\lambda\underline{P}\lambda K.\ (\![\mathbf{x}]\!]^{\top}; \underline{P}\top\delta)^{\top}; K$	*-Ø|p|…|…(-$3_{\top}$)*
-(ERG)$^{\perp}$	s^+\cn: $\lambda\underline{P}\lambda K.\ ([y]^{\perp}; \underline{P}\perp\delta)^{\perp}; K$	*-Ø|p|…|…(-$3_{\perp}$)*
-MOD	s^+\cn: $\lambda\underline{P}\lambda K.\ (K^{\perp}; \underline{P}\ \text{BCK}\langle\perp\varepsilon\rangle)$	*-mik*
-1S	s\(s\pn): $\lambda\underline{P}.\ \underline{P}\ \text{CTR}\langle\top\varepsilon\rangle$	*-nga|…*
-2S	s\(s\pn): $\lambda\underline{P}.\ \underline{P}\ \text{DAT}\langle\top\varepsilon\rangle$	*-tit|…*
$-3S_{(\top)}$, $-3S_{(\perp)}$	s\(s\pn): $\lambda\underline{P}.\ \underline{P}\top\delta$, $\lambda\underline{P}.\ \underline{P}\perp\delta$	*|a…, -Ø…*

T2: Observations (passive)

• (Yesterday Ole$^{\top}$ ordered three books$^{\perp}$.)

• English (SUBJECT-prominent lg.)

(3_E) *One book has (already) been received.*
one book have-TNS (already) be-PF receive-PS

• Kalaallisut (TOPIC-prominent lg.)

(3_K) *Atuagaq ataasiq tigu-niqar-(riir)-pu-q.*
book one take-pssv-(already)-DEC_{iv}-$3S_{(\top)}$

T2: Analysis of English (3_E) – Lexicon

• *have-TNS*

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VP/IV_{pf}: $\lambda K\lambda\underline{x}(K^{\perp}; [\text{CTR}\ \perp\varepsilon =_i \underline{x}])$

• *be-* *-PF*

———————————— ————

IV/IV_{ps} IV_{pf}\IV:

$\lambda K(K^{\perp}; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR}\ e =_i \text{BCK}\ \perp\varepsilon])$ $\lambda K.\ K$

———————————————————— <**B**×

IV_{pf}/IV_{ps}: $\lambda K(K^{\perp}; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR}\ e =_i \text{BCK}\ \perp\varepsilon])$

• *receive-* *-PS*

———————————— ————

TV (= IV/PN') IV_{ps}\TV:

$\lambda\underline{y}([e]^{\perp}; [rcv\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \underline{y}\rangle])$ $\lambda\underline{P}.\ \underline{P}\ \text{BCK}\langle\perp\varepsilon\rangle$

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IV_{ps}: $([e]^{\perp}; [rcv\langle\perp\varepsilon, \text{CTR}\ \perp\varepsilon, \text{BCK}\ \perp\varepsilon\rangle])$

IV_{ps}: $[e\mid rcv\langle e, \text{CTR}\ e, \text{BCK}\ e\rangle]$

T2: Analysis of English (3_E) – Syntax (VP)

- *… has been received.*

has (= *have-TNS*)

———————————————

VP/IV_{pf}: $\lambda K \lambda \underline{x}(K^{\perp}; [\text{CTR } \perp\varepsilon =_i \underline{x}])$

been (= *be-PF*)	*received* (= *receive-PS*)
———————————	———————————
IV_{pf}/IV_{ps}:	IV_{ps}
$\lambda K(K^{\perp}; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \text{BCK } \perp\varepsilon])$	$[e\mid rcv\langle e, \text{CTR } e, \text{BCK } e\rangle]$
——————————— >	
IV_{pf}: $([e\mid rcv\langle e, \text{CTR } e, \text{BCK } e\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \text{BCK } \perp\varepsilon])$	

——————————————————————————— >

VP: $\lambda \underline{x}([e\mid rcv\langle e, \text{CTR } e, \text{BCK } e\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \text{BCK } \perp\varepsilon])^{\perp}; [\text{CTR } \perp\varepsilon =_i \underline{x}])$

VP: $\lambda \underline{x}([e\mid rcv\langle e, \text{CTR } e, \text{BCK } e\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \text{BCK } \perp\varepsilon, \text{CTR } e =_i \underline{x}])$

VP: $\lambda \underline{x}([e\mid rcv\langle e, \text{CTR } e, \underline{x}\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \underline{x}])$

T2: Analysis of English (3_E) – Syntax (SUQU)

- *One book…*

-	*one*	*book*
———————————	———————————	———
QP/NP:	NP/CN:	CN:
$\lambda \underline{P}'\lambda \underline{P}(([\mathbf{x}]^{\top}; \underline{P}'\tau\delta)^{\top}; \underline{P}\tau\delta)$	$\lambda P \lambda \underline{x}([P\langle\perp\delta\rangle]; [\underline{x} \in \perp\delta\mathbb{I}])$	$\lambda x.\ bk\ x$

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QP/CN: $\lambda P'\lambda \underline{P}(([\mathbf{x}]; [P'\langle\perp\delta\rangle]; [\tau\delta \in \perp\delta\mathbb{I}])^{\top}; \underline{P}\tau\delta)$

——————————————————————————————————— >

QP (= s/VP): $\lambda \underline{P}(([\mathbf{x}]; [bk\langle\perp\delta\rangle]; [\tau\delta \in \perp\delta\mathbb{I}])^{\top}; \underline{P}\tau\delta)$

T2: Analysis of English (3_E) – Syntax (SUQU + VP)

- (Yesterday $Ole^{\top}$ ordered three $books^{\perp}$.)
- *One book has been received.*

one book

——————————————————————————— >

QP (= s/VP): $\lambda \underline{P}(([\mathbf{x}]; [bk\langle\perp\delta\rangle]; [\tau\delta \in \perp\delta\mathbb{I}])^{\top}; \underline{P}\tau\delta)$

has been received

——————————————————————————— >

VP: $\lambda \underline{x}([e\mid rcv\langle e, \text{CTR } e, \underline{x}\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \underline{x}])$

——————————————————————————————————— >

s: $([\mathbf{x}]; [bk\langle\perp\delta\rangle]; [\tau\delta \in \perp\delta\mathbb{I}])^{\top}; ([e\mid rcv\langle e, \text{CTR } e, \tau\delta\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \tau\delta])$

s: $[\mathbf{x}]; [bk\langle\perp\delta\rangle]; [\tau\delta \in \perp\delta\mathbb{I}]; [e\mid rcv\langle e, \text{CTR } e, \tau\delta\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \tau\delta]$

T2: English done, on to Kalaallisut (passive)

- (Yesterday $Ole^{\top}$ ordered three $books^{\perp}$.)

- English (SUBJECT-prominent lg.)

(3_E) *One book has (already) been received.*
one book have-TNS (already) be-PF receive-PS
$[\mathbf{x}]; [bk\langle\perp\delta\rangle]; [\tau\delta \in \perp\delta\mathbb{I}]; [e\mid rcv\langle e, \text{CTR } e, \tau\delta\rangle]; [e\mid e \subseteq_i \perp\varepsilon, \text{CTR } e =_i \tau\delta]$

- Kalaallisut (TOPIC-prominent lg.)

(3_K) *Atuagaq ataasiq tigu-niqar-(riir)-pu-q.*
book one take-pssv-(already)-DEC_{iv}-$3S_{(T)}$

T2: Analysis of Kalaallisut (3_K) – (s^+)

- *book-*$^{\mathsf{T}}$ *one* -_{T} …

  book $\quad$ -^{T}

  ———— $\quad$ ————————

  cn: $\quad$ $s^+\backslash cn$:

  $\lambda\underline{x}[bk\langle\underline{x}\rangle]$ $\quad$ $\lambda\underline{P}\lambda K(([\mathbf{x}]^{\mathsf{T}}; \underline{P}\,\mathsf{T}\delta)^{\mathsf{T}}; K)$

  ———————————— <

  s^+: $\lambda K([\mathbf{x}|\ bk\langle\mathbf{x}\rangle])^{\mathsf{T}}; K)$

  one $\quad$ -_{T}

  ———————— $\quad$ ————————

  cn: $\lambda\underline{x}([\bot\delta \in \underline{x}||]; [\underline{x} \in \bot\delta||]$ $\quad$ $s^+\backslash cn$: $\lambda\underline{P}\lambda K(\underline{P}\,\mathsf{T}\delta; K)$

  ———————————————————— <

  s^+: $\lambda K([\bot\delta \in \mathsf{T}\delta||]; [\mathsf{T}\delta \in \bot\delta||]; K)$

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  s^+: $\lambda K([\mathbf{x}|\ bk\langle\mathbf{x}\rangle])^{\mathsf{T}}; ([\bot\delta \in \mathsf{T}\delta||]; [\mathsf{T}\delta \in \bot\delta||]; K))$

T2: Analysis of Kalaallisut (3_K) – (s)

- One book$^{\mathsf{T}}$ …

  book-$^{\mathsf{T}}$ $\quad$ one-$_{\mathsf{T}}$

  ———————————————————— >**B**

  s^+: $\lambda K([\mathbf{x}|\ bk\langle\mathbf{x}\rangle]^{\mathsf{T}}; ([\bot\delta \in \mathsf{T}\delta||]; [\mathsf{T}\delta \in \bot\delta||]; K))$

- … it$_{\mathsf{T}}$ has been received.

  take- $\quad$ -pssv $\quad$ -DEC$_{iv}$ $\quad$ -3S$_{(T)}$

  ———————— $\quad$ ———————— $\quad$ ———— $\quad$ ————

  tv: $\quad$ iv\tv: $\quad$ s\pn\iv: $\quad$ s\(s\pn):

  $\lambda\underline{y}\lambda\underline{x}([e]^{\perp}; [rcv\langle\bot\varepsilon, \underline{x}, \underline{y}\rangle])$ $\quad$ $\lambda\underline{R}\lambda\underline{z}.\ \underline{R}\ \underline{z}\ \mathrm{CTR}\langle\bot\varepsilon\rangle$ $\quad$ $\lambda\underline{P}\lambda\underline{x}.\ \underline{P}\ \underline{x}$ $\quad$ $\lambda\underline{P}.\ \underline{P}\ \mathsf{T}\delta$

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  iv: $\lambda\underline{z}([e|\ rcv\langle e, \mathrm{CTR}\ e, \underline{z}\rangle])$ $\quad$ s\iv: $\lambda\underline{P}.\ \underline{P}\ \mathsf{T}\delta$

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  s: $[e|\ rcv\langle e, \mathrm{CTR}\ e, \mathsf{T}\delta\rangle])$

- $[\mathbf{x}|\ bk\langle\mathbf{x}\rangle]; [\bot\delta \in \mathsf{T}\delta||]; [\mathsf{T}\delta \in \bot\delta||]; [e|\ rcv\langle e, \mathrm{CTR}\ e, \mathsf{T}\delta\rangle]$

T2: Conclusion (passive)

- (Yesterday Ole$^{\mathsf{T}}$ ordered three books$^{\perp}$.)

- English (SUBJECT-prominent lg.)

(3_E) *One book has (already) been received.*

one book have-TNS (already) be-PF receive-PS

$[\mathbf{x}]; [bk\langle\bot\delta\rangle]; [\mathsf{T}\delta \in \bot\delta||]; [e|\ rcv\langle e, \mathrm{CTR}\ e, \mathsf{T}\delta\rangle]; [e|\ e \subseteq_i \bot\varepsilon, \mathrm{CTR}\ e =_i \mathsf{T}\delta]$

- Kalaallisut (TOPIC-prominent lg.)

(3_K) *Atuagaq ataasiq tigu-niqar-(riir)-pu-q.*

book$^{\mathsf{T}}$ $\quad$ one$_{\mathsf{T}}$ $\quad$ take-pssv-(already)-DEC$_{iv}$-3S$_{(T)}$

$[\mathbf{x}|\ bk\langle\mathbf{x}\rangle]; [\bot\delta \in \mathsf{T}\delta||]; [\mathsf{T}\delta \in \bot\delta||]; [e|\ rcv\langle e, \mathrm{CTR}\ e, \mathsf{T}\delta\rangle]$