Lecture 9

NOMINAL REFERENCE AND ANAPHORA IN ENGLISH

I. *Logic of Centering* (**LC** = LC_n + $\mathbf{Con}_e$ + $\mathbf{Con}_{\Box eeet}$)

D1.0 (LC_n types) The set of **LC**-*types* is the smallest set **Typ** such that:

b. $t, e, \Box, s \Box$ **Typ** (***truth values***, ***e**ntities*, ***w**orlds*, IA-***s**tates*)

f. $(\Box\Box) \Box$ **Typ** if $\Box, \Box\Box$ **Typ** (functional types)

D1.1 (Basic **LC** terms).

c.	$\mathbf{Con}_e$	=	$\{ann, bill, \ldots\}$	*e*-constants	(*names*)
	$\mathbf{Con}_{se}$	=	$\{1_\top, 2_\top, \ldots, 1_\Box, 2_\Box, \ldots\}$	*se*-constants	(*demonstratives*)
	$\mathbf{Con}_{s\Box}$	=	$\{r\}$	$s\Box$-constant	(*current reality*)
	$\mathbf{Con}_{\Box et}$	=	$\{E, hunt, \ldots, man, \ldots\}$	$\Box et$-constants	(1-*place pred's*)
	$\mathbf{Con}_{\Box eet}$	=	$\{see, kill, \ldots, enemy, \ldots\}$	$\Box eet$-constants	(2-*place pred's*)
	$\mathbf{Con}_{\Box eeet}$	=	$\{give, introduce.to, \ldots\}$	$\Box eeet$-constants	(3-*place pred's*)
v.	$\mathbf{Var}_e$	=	$\{\mathbf{x}, y\}$	*e*-variables	(var's over *entities*)
	$\mathbf{Var}_\Box$	=	$\{w, w', w''\}$	$\Box$-variables	(var's over *worlds*)
	$\mathbf{Var}_s$	=	$\{i, j, k, h\}$	*s*-variables	(var's over IA-*states*)

D1.2 (**LC** syntax) For any $\Box\Box$ **Typ** the set of $\Box$-*terms* is the smallest set $\mathbf{Term}_\Box$ such that:

b.	$\Box \Box$ $\mathbf{Term}_\Box$	if $\Box \Box$ $\mathbf{Con}_\Box$ or $\Box \Box$ $\mathbf{Var}_\Box$	[***b**asic term*]
¬.	$\neg\Box \Box$ $\mathbf{Term}_t$	if $\Box \Box$ $\mathbf{Term}_t$	[***n**egation*]
∧.	$(\Box \wedge \Box) \Box$ $\mathbf{Term}_t$	if $\Box, \Box \Box$ $\mathbf{Term}_t$	[***c**onjunction*]
=.	$(\Box = \Box) \Box$ $\mathbf{Term}_t$	if $\Box, \Box \Box$ $\mathbf{Term}_\Box$	[***i**dentity*]
a.	$\Box\Box \Box$ $\mathbf{Term}_\Box$	if $\Box \Box$ $\mathbf{Term}_{(\Box\Box)}$ and $\Box \Box$ $\mathbf{Term}_\Box$	[***a**pplication*]
λ.	$\lambda u[\Box] \Box$ $\mathbf{Term}_{(\Box\Box)}$	if $u \Box$ $\mathbf{Var}_\Box$ and $\Box \Box$ $\mathbf{Term}_\Box$	[λ-*abstraction*]
∃.	$\exists u\Box \Box$ $\mathbf{Term}_t$	if $u \Box$ $\mathbf{Var}_\Box$ and $\Box \Box$ $\mathbf{Term}_t$	[$\exists$-*quantification*]
•.	$u \bullet \Box \Box$ $\mathbf{Term}_s$	if $u \Box$ $\mathbf{Var}_e$ and $\Box \Box$ $\mathbf{Term}_s$	[***s**tacking*]

N1 (Sugar coating). The following abbreviations may be used for **LC** terms (as for LC_n exc R):

(). ( ) may be omitted if the result is unambiguous.

$\Box$.	$\Box_\Box$	:=	$\Box\Box$	if this is a term	[*argument subscript*]
R.	$(\Box_r \Box_1 \ldots \Box_n)$	:=	$\Box i[\Box\, ri\, \Box_n \ldots \Box_1]$	"	[*relational condition*]
		:=	$\Box i[\Box\, ri\, \Box_n \ldots \Box_1 i]$	"	
		⋮	⋮		
		:=	$\Box i[\Box\, ri\, \Box_n i \ldots \Box_1 i]$	"	
$\Box$.	$(\Box \Box \Box\Box)$	:=	$\Box i[(\Box = \Box\Box i)]$	"	[*identity condition*]
			$\Box i[(\Box i = \Box\Box i)]$	"	
¬.	$\neg \Box$	:=	$\Box i[\neg \Box i]$	"	[*negation condition*]
[|.	$[\ \vert\ \Box]$	:=	$\Box i[\Box j[((j = i) \Box \Box i)]]$	"	[*test box*]
[*u*.	$[u\vert\ ]$	:=	$\Box i[\Box j[\Box u(j = u \bullet i)]]$	"	[*recentering box*]
	$[u\vert \Box]$	:=	$\Box i[\Box j[\Box u((j = u \bullet i) \Box \Box i)]]$	"	
	$[u_1\, u_2\vert \Box]$	:=	$\Box i[\Box j[\Box u_1 \Box u_2((j = u_1 \bullet u_2 \bullet i) \Box \Box i)]]$	"	
;.	$(\Box_1 ; \Box_2)$	:=	$\Box i[\exists j[\Box k(\Box_1 ik \Box \Box_2 kj)]]$	"	[***s**equencing*]
;;.	$\Box_1 ; \Box_2 ; \Box_3$	:=	$((\Box_1 ; \Box_2) ; \Box_3)$	"	[default assoc. to L]

D2.0 (LC_n frames) An LC_n *frame* is a set $D = \{D_\tau : \tau \in \mathbf{Typ}\}$ of τ-*domains*, D_τ, such that:

b. $D_t = \{1, 0\}$ [1 for *true*, 0 for *false*]
D_e is a non-empty set disjoint from D_t. [domain of *entities*]
D_ι is a non-empty set disjoint from D_t and D_e. [domain of *worlds*]
$D_s = \{\langle w, \top, \sigma\rangle : w \in D_\iota$ [domain of IA-*states*]
& for some $n \geq 0$, $\top \in D_e^n$
& for some $n' \geq 0$, $\sigma \in D_e^{n'}\}$

f. $D_{(\tau\sigma)} = \{f : \mathrm{Dom}\, f = D_\sigma$ & $\mathrm{Ran}\, f \subseteq D_\tau\}$ [domain of $(\tau\sigma)$-*functions*]

D2.1 (LC_N models and assignments).

M. An LC_n *model* is a triple $M = \langle D^M, [\![\cdot]\!]^M, \#^M\rangle$ such that:

- $\bullet_1$ $D^M = \{D_\tau^M : \tau \in \mathbf{Typ}\}$ is an LC_n frame
- $\bullet_2$ $[\![\cdot]\!]^M$ is a function, from LC_n constants, such that: [*M-interpretation*]
  $[\![\alpha]\!]^M \in D_\tau^M$ if $\alpha \in \mathbf{Con}_\tau$
- $\bullet_3$ For any $n \in \{1, 2, \ldots\}$ and $\langle w, \top, \sigma\rangle \in D_s^M$:
  $[\![n_\top]\!]^M(\langle w, \top, \sigma\rangle) = {}^n[\top]$ if $\top$ has at least n coordinates
  $= \#^M$ otherwise
  $[\![n_\sigma]\!]^M(\langle w, \top, \sigma\rangle) = {}^n[\sigma]$ if σ has at least n coordinates
  $= \#^M$ otherwise
  $[\![r]\!]^M(\langle w, \top, \sigma\rangle) = w$
- $\bullet_4$ $\{\#^M\} = \{d \in D_e^M$: for all $w \in D_\iota^M$, $[\![E]\!]^M(w)(d) = 0\}$ [*non-existent entity*]

g. An *M-assignment* is a function g, from LC_n variables, such that:
$g(u) \in D_\tau^M$ if $u \in \mathbf{Var}_\tau$

N2. (*u-to-d* alternatives). Let g be an *M*-assignment g, $u \in \mathbf{Var}_\tau$ and $d \in D_\tau^M$. We write $g[u/d]$ for the *M*-assignment such that: (i) $g[u/d](u) = d$, and (ii) $g[u/d](v) = g(v)$ for any variable $v \neq u$.

D2.2 (LC_n semantics) For any LC_n-model $M = \langle D^M, [\![\cdot]\!]^M, \#^M\rangle$ and *M*-assignment g:

r.	$[\![\alpha]\!]^{M,g}$	$\in$	D_τ^M	if $\alpha \in \mathbf{Term}_\tau$
b.	$[\![\alpha]\!]^{M,g}$	$=$	$[\![\alpha]\!]^M$	if $\alpha \in \mathbf{Con}_\tau$
		$=$	$g(\alpha)$	if $\alpha \in \mathbf{Var}_\tau$
¬.	$[\![\neg\alpha]\!]^{M,g}$	$=$	1	iff $[\![\alpha]\!]^{M,g} = 0$
∧.	$[\![(\alpha \wedge \beta)]\!]^{M,g}$	$=$	1	iff $[\![\alpha]\!]^{M,g} = 1$ & $[\![\beta]\!]^{M,g} = 1$
=.	$[\![(\alpha = \beta)]\!]^{M,g}$	$=$	1	iff $[\![\alpha]\!]^{M,g} = [\![\beta]\!]^{M,g}$
a.	$[\![\alpha\beta]\!]^{M,g}$	$=$	$[\![\alpha]\!]^{M,g}([\![\beta]\!]^{M,g})$	
∃.	$[\![\exists u[\alpha]]\!]^{M,g}$	$=$	$[\![\alpha]\!]^{M,g[u/d]}$: $d \in D_\tau^M$	if $u \in \mathbf{Var}_\tau$
□.	$[\![\Box u\alpha]\!]^{M,g}$	$=$	1	iff $\{d \in D_\tau^M : [\![\alpha]\!]^{M,g[u/d]} = 1\} \neq \{\}$
•.	$[\![u \bullet \alpha]\!]^{M,g}$	$=$	$\langle {}^1[[\![\alpha]\!]^{M,g}], g(u) \cdot {}^2[[\![\alpha]\!]^{M,g}], {}^3[[\![\alpha]\!]^{M,g}]\rangle$	if $u = \mathbf{x}$
		$=$	$\langle {}^1[[\![\alpha]\!]^{M,g}], {}^2[[\![\alpha]\!]^{M,g}], g(u) \cdot {}^3[[\![\alpha]\!]^{M,g}]\rangle$	if $u = y$

D3 (Truth).

t. A *t*-term α (*formula*) is *true* in *M* under g, written $\models_{M,g} \alpha$, iff $[\![\alpha]\!]^{M,g} = 1$.

c. A (*st*)-term α (*condition*) is *true* in a IA-state **s** in *M* under g, written $\models_{M,g,\mathbf{s}} \alpha$, iff $[\![\alpha]\!]^{M,g}(\mathbf{s}) = 1$.

u. A (*s*(*st*))-term α (*update*) is *true* in a IA-state **s** in *M* under g, written $\models_{M,g,\mathbf{s}} \alpha$,
iff, for some $\mathbf{s}'$, $[\![\alpha]\!]^{M,g}(\mathbf{s})(\mathbf{s}') = 1$.

II. Basic patterns of anaphora in *English*

- ***Data set* 1**:

(1) Once there was *a man*. *He* had *an enemy*.
[y| man_r y]; [| man_r $1_{\square}$]; [**x**| **x** $\square$ $1_{\square}$]; [y| $enemy_r$ $1_{\top}$ y]

In the end *the guy* killed *him*.
[| man_r $1_{\square}$]; [**x**| **x** $\square$ $1_{\square}$]; [y| $kill_r$ y $1_{\top}$]; [| man_r $2_{\top}$]; [| $1_{\square}$ $\square$ $2_{\top}$]

(2) Once there was *a man*. *He* had *an enemy*.
[y| man_r y]; [| man_r $1_{\square}$]; [**x**| **x** $\square$ $1_{\square}$]; [y| $enemy_r$ $1_{\top}$ y]

In the end *he* killed *him*.
[| man_r $1_{\top}$]; [| $kill_r$ $1_{\square}$ $1_{\top}$]; [| man_r $1_{\square}$]

he killed *him*.
[| man_r $1_{\square}$]; [**x**| **x** $\square$ $1_{\square}$]; [y| $kill_r$ y $1_{\top}$]; [| man_r $2_{\top}$]; [| $1_{\square}$ $\square$ $2_{\top}$]

(3) Once *a man* killed *a woman*.
[y| man_r y]; [**x**| **x** $\square$ $1_{\square}$]; [y| $kill_r$ y $1_{\top}$]; [| $woman_r$ $1_{\square}$]

- *Toward a hypothesis*:
  - •$_1$ An *indefinite* NP, [*a*(*n*) N], {must, cannot} {introduce, retrieve} a dref.
    If it introduces a dref, this dref {must, cannot} be {central, peripheral}
  - •$_2$ A *definite* NP, [*the* N] {must, cannot} {introduce, retrieve} a dref.
    ~~If it retrieves a dref~~, this dref {must, cannot} be {$1_{\top}$, $1_{\square}$, $2_{\top}$}
  - •$_3$ A *pronoun* {must, cannot} {introduce, retrieve} a dref.
  - •$_4$ If a *subject* (= preverbal NP) introduces a dref, it {must, cannot} be {central, peripheral}
  - •$_5$ If an *object* (= preverbal NP) introduces a dref, it {must, cannot} be {central, peripheral}

- ***Lex* 1**: To capture these generalizations we **hypothesize** the following *lexical meanings*:

pn.	$he_{\square}$	⇝	[| man_r $\square$|]	*pronoun*
n.	$man_{\square}$	⇝	[| man_r $\square$|]	*common noun*
	$enemy_{\square\square\square}$	⇝	[| $enemy_r$ $\square\square\square$|]	*relational noun*
th.	$the_{\square}$	⇝	[| $\square \neq 1_{\top}$]	*definite article*
a.	a(n)	⇝	[y|]	*indefinite article*
		⇝	[|]	
S.	$NOM_{\square}$	⇝	[**x**| **x** $\square$ $\square$|], if $\square \neq 1_{\top}$	*subject case*
		⇝	[| $\square$ $\square$ $\square$|], otherwise	
O.	$ACC_{\square}$	⇝	[| $1_{\square}$ $\square$ $\square$|]	*object case*
IV.	jog	⇝	[| jog_r $1_{\top}$]	*intransitive*: $1_{\top}$ Vs
TV.	kill	⇝	[| $kill_r$ $1_{\square}$ $1_{\top}$]	*transitive*: $1_{\top}$ Vs *old* $1_{\square}$
		⇝	[y| $kill_r$ y $1_{\top}$]	$1_{\top}$ Vs *new* $1_{\square}$

- *Testing* ***Lex* 1** *on* ***data set* 1**: *Online interpretation*

(1) Once there was *a* $man_{1\square}$ $\text{ACC}_{1\square}$
[y|]; [| man_r $1_\square$]; [| $1_\square$ □ $1_\square$];
≡? [y| man_r y]; ✓

He$_{1\square}$ $\text{NOM}_{1\square}$ had *an* $enemy_{1\top\,1\square}$ $\text{ACC}_{1\square}$
[| man_r $1_\square$]; [x| **x** □ $1_\square$]; [y|]; [| $enemy_r$ $1_\top$ $1_\square$]; [| $1_\square$ □ $1_\square$]
≡? [| man_r $1_\square$]; [x| **x** □ $1_\square$]; [y| $enemy_r$ $1_\top$ y] ✓

OK In the end *the*$_{1\square}$ $guy_{1\square}$ $\text{NOM}_{1\square}$ killed $him_{2\top}$ $\text{ACC}_{2\top}$
[| $1_\square \neq 1_\top$]; [| man_r $1_\square$]; [x| **x** □ $1_\square$]; [y| $kill_r$ y $1_\top$]; [| man_r $2_\top$]; [| $1_\square$ □ $2_\top$]
≡? [| man_r $1_\square$]; [x| **x** □ $1_\square$]; [y| $kill_r$ y $1_\top$]; [| man_r $2_\top$]; [| $1_\square$ □ $2_\top$] ✓

* In the end *the*$_{1\top}$ $guy_{1\top}$ …
[| $1_\top \neq 1_\top$]; [| man_r $1_\square$]; … ***predict***: * anaphora to current $1_\top$ ✓

(2) Once … see (1)

OK In the end *he*$_{1\top}$ $\text{NOM}_{1\top}$ killed *him*$_{1\square}$ $\text{ACC}_{1\square}$
[| man_r $1_\top$]; [| $1_\top$ □ $1_\top$]; [| $kill_r$ $1_\square$ $1_\top$]; [| man_r $1_\square$]; [| $1_\square$ □ $1_\square$]
≡? [| man_r $1_\top$]; [| $kill_r$ $1_\square$ $1_\top$]; [| man_r $1_\square$] ✓

OK In the end *he*$_{1\square}$ $\text{NOM}_{1\square}$ killed $him_{2\top}$ $\text{ACC}_{2\top}$
[| man_r $1_\square$]; [x| **x** □ $1_\square$]; [| $kill_r$ $1_\square$ $1_\top$]; [| man_r $2_\top$]; [| $1_\square$ □ $2_\top$]
≡? [| man_r $1_\top$]; [| $kill_r$ $1_\square$ $1_\top$]; [| man_r $1_\square$] ✓

(3) Once *a* $man_{1\square}$ $\text{NOM}_{1\square}$ killed *a* $woman_{1\square}$ $\text{ACC}_{1\square}$
[y|]; [| man_r $1_\square$]; [x| **x** □ $1_\square$]; [y| $kill_r$ y $1_\top$]; []; [| $woman_r$ $1_\square$]; [| $1_\square$ □ $1_\square$]
≡? [y| man_r $1_\square$]; [x| **x** □ $1_\square$]; [y| $kill_r$ y $1_\top$]; [| $woman_r$ $1_\square$] ✓

III. Ditransitive verbs; Gender and reflexivity

- ***Data set* 2**:

(4) *John* has *a baby*. Today *he* showed
[| $john_e$ □ $1_\square$]; [x| **x** □ $1_\square$]; [y| $baby.of_r$ $1_\top$ y]; [| msc_r $1_\top$]; [y|]; [y| $show.to_r$ y $1_\square$ $1_\top$];

her *herself* (in the mirror) and *she* laughed.
[| fem_r $3_\square$]; [| $1_\square$ □ $3_\square$]; [| fem_r $1_\square$]; [| $2_\square$ □ $1_\square$]; [| fem_r $1_\square$]; [x| **x** □ $1_\square$]; [| $laugh_r$ $1_\top$]

(5) Once there was *a woman*. *She* betrayed *a man*
[y| $woman_r$ y]; [| fem_r $1_\square$]; [x| **x** □ $1_\square$]; [y| $betray_r$ y $1_\top$]; [| man_r $1_\square$];

and then killed *herself*.
[y| $kill_r$ y $1_\top$]; [| fem_r $1_\top$]; [| $1_\square$ □ $1_\top$]

(6) *A man* saw a nice woman.
[y| man_r y]; [x| **x** □ $1_\square$]; [y| see_r y $1_\top$]; [| $nice_r$ $1_\square$]; [| $woman_r$ $1_\square$];

He introduced *himself* to *her*.
[| msc_r $1_\top$]; [y|]; [y| $intr.to_r$$1_\square$ y $1_\top$]; [| msc_r $1_\top$]; [| $1_\square$ □ $1_\top$]; [| $2_\square$ □ $3_\square$]; [| fem_r $3_\square$];

Homework 6 (8 pts)

- ***Lex 2***: Fill in the missing lexical meanings so as to extend our analysis to ***data set 2*** — i.e., so that the ***online interpretation test*** below comes out correctly..

rf.	John$_{\square}$	$\rightsquigarrow$	_____	*name*
	he$_{\square}$ / him$_{\square}$	$\rightsquigarrow$	_____	*masculine pronoun*
	she$_{\square}$ / her$_{\square}$	$\rightsquigarrow$	_____	*feminine pronoun*
	-self$_1$	$\rightsquigarrow$	_____	2-to-1 *reflexive* (e.g., in (5), (6))
	-self$_2$	$\rightsquigarrow$	_____	3-to-2 *reflexive* (e.g., in (4))
n.	man$_{\square}$	$\rightsquigarrow$	[| man_r $\square$]	*common noun*
	enemy$_{\square\square}$	$\rightsquigarrow$	[| $enemy_r$ $\square\square$]	*relational noun*
th.	the$_{\square}$	$\rightsquigarrow$	[| $\square \neq 1_{\top}$]	*definite article*
a.	a(n)	$\rightsquigarrow$	[y|]	*indefinite article*
		$\rightsquigarrow$	[|]	
S.	NOM$_{\square}$	$\rightsquigarrow$	[**x**| **x** $\square$ $\square$], if $\square \neq 1_{\top}$	*subject case*
			[| $\square$ $\square$ $\square$], otherwise	
O.	ACC$_{\square}$	$\rightsquigarrow$	[| $1_{\square}$ $\square$ $\square$]	1*st object case*
O$_{\square}$.	to$_{\square}$ / []$_{\square}$	$\rightsquigarrow$	_____	2*nd object case*
IV.	jog	$\rightsquigarrow$	[| jog_r $1_{\top}$]	*intransitive*: $1_{\top}$ Vs
TV.	kill	$\rightsquigarrow$	[| $kill_r$ $1_{\square}$ $1_{\top}$]	*transitive*: $1_{\top}$ Vs *old* $1_{\square}$
		$\rightsquigarrow$	[y| $kill_r$ y $1_{\top}$]	$1_{\top}$ Vs *new* $1_{\square}$
TV$_{\square}$.	show$_{[]}$	$\rightsquigarrow$	_____	*ditransitive*: $1_{\top}$ Vs *new* $1_{\square}$ *new* $2_{\square}$
	introduce	$\rightsquigarrow$	_____	$1_{\top}$ Vs *new* $1_{\square}$ to *new* $2_{\square}$

- Testing ***Lex** 2* on ***data set 2***: *Online interpretation.* ✓/x

(4) *John*__ _____ has *a* *baby*____ _____

_____; _____; _____; _____; _____

≡? [| $john_e$ □ $1_□$]; [**x**| **x** □ $1_□$]; [*y*| $baby.of_r$ $1_⊤$ *y*]; ___

Today *he*__ _____ showed

_____; _____; _____

≡? [| msc_r $1_⊤$]; [*y*|]; [*y*| $show.to_r$ *y* $1_□$ $1_⊤$]; ___

*her*__ _____ []__ *her*__ *-self*__ in the mirror

_____; _____; _____; _____; _____

≡? [| fem_r $3_□$]; [| $1_□$ □ $3_□$]; [| fem_r $1_□$]; [| $2_□$ □ $1_□$]; ___

and *she*___ _____ laughed.

_____; _____; _____

≡? [| fem_r $1_□$]; [**x**| **x** □ $1_□$]; [| $laugh_r$ $1_⊤$] ___

(5) Once there was *a* *woman*___ _____

____; _____ ; _____

≡? [*y*| $woman_r$ *y*]

*She*___ _____ betrayed *a* *man*___ _____

_____; _____ [*y*| $betray_r$ *y* $1_⊤$]; _____; _____ ; _____

≡? [| fem_r $1_□$]; [**x**| **x** □ $1_□$]; [*y*| $betray_r$ *y* $1_⊤$]; [| man_r $1_□$]; ___

and then killed *her*__ *-self*___ _____

[*y*| $kill_r$ *y* $1_⊤$]; _____ ; _____; _____

≡? [*y*| $kill_r$ *y* $1_⊤$]; [| fem_r $1_⊤$]; [| $1_□$ □ $1_⊤$] ___

(6) *A* *man*___ _____ saw *a* *nice*__ *woman*___ _____.

____; _____; _____; _____;___; _____; _____; _____

≡? [*y*| man_r *y*]; [**x**| **x** □ $1_□$]; [*y*| see_r *y* $1_⊤$]; [| $nice_r$ $1_□$]; [| $woman_r$ $1_□$]; ___

*He*__ _____ introduced

_____; _____; _____ ___

≡? [| msc_r $1_⊤$]; [*y*|]; [*y*| $intr.to_r$ $1_□$ *y* $1_⊤$];

*him*___ *-self*___ _____ to___ *her*____.

_____; _____; _____; _____; _____

≡? [| msc_r $1_⊤$]; [| $1_□$ □ $1_⊤$]; [| $2_□$ □ $3_□$];[| fem_r $3_□$] ___

Solution to Homework 6

- ***Lex* 2**: Fill in the missing lexical entries so at to extend our analysis to ***data set* 2.**

rf.	John$_{\square}$	$\rightsquigarrow$	[| *john*$_e$ $\square$ $\square$|	*name*
	he$_{\square}$ / him$_{\square}$	$\rightsquigarrow$	[| *msc*$_r$ $\square$|	*masculine pronoun*
	she$_{\square}$ / her$_{\square}$	$\rightsquigarrow$	[| *fem*$_r$ $\square$|	*feminine pronoun*
	-self$_1$	$\rightsquigarrow$	[| 1$_{\square}$ $\square$ 1$_{\top}$]	2-to-1 *reflexive*
	-self$_2$	$\rightsquigarrow$	[| 2$_{\square}$ $\square$ 1$_{\square}$]	3-to-2 *reflexive*
n.	man$_{\square}$	$\rightsquigarrow$	[| *man*$_r$ $\square$|	*common noun*
	enemy$_{\square\square\square}$	$\rightsquigarrow$	[| *enemy*$_r$ $\square\square\square$|	*relational noun*
th.	the$_{\square}$	$\rightsquigarrow$	[| $\square \neq 1_{\top}$]	*definite article*
a.	a(n)	$\rightsquigarrow$	[*y*|]	*indefinite article*
		$\rightsquigarrow$	[|]	
S.	NOM$_{\square}$	$\rightsquigarrow$	[**x**| **x** $\square$ $\square$|, if $\square \neq 1_{\top}$	*subject case*
			[| $\square$ $\square$ $\square$|, otherwise	
O.	ACC$_{\square}$	$\rightsquigarrow$	[| 1$_{\square}$ $\square$ $\square$|	1*st object case*
O$_{\square}$.	to$_{\square}$ / []$_{\square}$	$\rightsquigarrow$	[| 2$_{\square}$ $\square$ $\square$|	2*nd object case*
IV.	jog	$\rightsquigarrow$	[| *jog*$_r$ 1$_{\top}$]	*intransitive*: 1$_{\top}$ Vs
TV.	kill	$\rightsquigarrow$	[| *kill*$_r$ 1$_{\square}$ 1$_{\top}$]	*transitive*: 1$_{\top}$ Vs *old* 1$_{\square}$
		$\rightsquigarrow$	[*y*| *kill*$_r$ *y* 1$_{\top}$]	1$_{\top}$ Vs *new* 1$_{\square}$
TV$_{\square}$.	show$_{[]}$	$\rightsquigarrow$	[*y*|]; [*y*| *show.to*$_r$ *y* 1$_{\square}$ 1$_{\top}$]	*ditransitive*: 1$_{\top}$ Vs *new* 1$_{\square}$ *new* 2$_{\square}$
	introduce	$\rightsquigarrow$	[*y*|]; [*y*| *intr.to*$_r$ 1$_{\square}$ *y* 1$_{\top}$]	1$_{\top}$ Vs *new* 1$_{\square}$ to *new* 2$_{\square}$

- Testing ***Lex* 2** on ***data set* 2**: *Online interpretation* ✓/x

(4) *John*$_{1\square}$ NOM$_{1\square}$ has *a* *baby*$_{1\top\ 1\square}$ ACC$_{1\square}$.
[| *john*$_e$ $\square$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$] [*y*|]; [| *baby.of*$_r$ 1$_\top$ 1$_\square$]; [| 1$_\square$ $\square$ 1$_\square$]
≡? [| *john*$_e$ $\square$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$]; [*y*| *baby.of*$_r$ 1$_\top$ *y*]; ✓

Today *he*$_{1\top}$ NOM$_{1\top}$ showed
[| *msc*$_r$ 1$_\top$]; [| 1$_\top$ $\square$ 1$_\top$]; [*y*|]; [*y*| *show.to*$_r$ *y* 1$_\square$ 1$_\top$];
≡? [| *msc*$_r$ 1$_\top$]; [*y*|]; [*y*| *show.to*$_r$ *y* 1$_\square$ 1$_\top$]; ✓

her$_{3\square}$ ACC$_{3\square}$ []$_{1\square}$ *her*$_{1\square}$ *-self*$_2$ in the mirror
[| *fem*$_r$ 3$_\square$]; [| 1$_\square$ $\square$ 3$_\square$]; [| 2$_\square$ $\square$ 1$_\square$]; [| *fem*$_r$ 1$_\square$]; [| 2$_\square$ $\square$ 1$_\square$]
≡? [| *fem*$_r$ 3$_\square$]; [| 1$_\square$ $\square$ 3$_\square$]; [| *fem*$_r$ 1$_\square$]; [| 2$_\square$ $\square$ 1$_\square$]; ✓

and *she*$_{1\square}$ NOM$_{1\square}$ laughed.
[| *fem*$_r$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$]; [| *laugh*$_r$ 1$_\top$]
≡? [| *fem*$_r$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$]; [| *laugh*$_r$ 1$_\top$] ✓

(5) Once there was *a* *woman*$_{1\square}$ ACC$_{1\square}$
[*y*|]; [| *woman*$_r$ 1$_\square$]; [| 1$_\square$ $\square$ 1$_\square$]
≡? [*y*| *woman*$_r$ *y*]; ✓

She$_{1\square}$ NOM$_{1\square}$ betrayed *a* *man*$_{1\square}$ ACC$_{1\square}$
[| *fem*$_r$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$]; [*y*| *betray*$_r$ *y* 1$_\top$]; [|]; [| *man*$_r$ 1$_\square$]; [| 1$_\square$ $\square$ 1$_\square$]
≡? [| *fem*$_r$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$]; [*y*| *betray*$_r$ *y* 1$_\top$]; [| *man*$_r$ 1$_\square$]; ✓

and then killed *her*$_{1\top}$ *-self*$_1$ ACC$_{1\top}$
[*y*| *kill*$_r$ *y* 1$_\top$]; [| *fem*$_r$ 1$_\top$]; [| 1$_\square$ $\square$ 1$_\top$]; [| 1$_\square$ $\square$ 1$_\top$]
≡? [*y*| *kill*$_r$ *y* 1$_\top$]; [| *fem*$_r$ 1$_\top$]; [| 1$_\square$ $\square$ 1$_\top$] ✓

(6) *A* *man*$_{1\square}$ NOM$_{1\square}$ saw *a* *nice*$_{1\square}$ *woman*$_{1\square}$ ACC$_{1\square}$
[*y*|]; [| *man*$_r$ 1$_\square$]; [**x**| **x** $\square$ 1$_\square$]; [*y*| *see*$_r$ *y* 1$_\top$]; [|]; [| *nice*$_r$ 1$_\square$]; [| *woman*$_r$ 1$_\square$]; [| 1$_\square$ $\square$ 1$_\square$];
≡? [*y*| *man*$_r$ *y*]; [**x**| **x** $\square$ 1$_\square$]; [*y*| *see*$_r$ *y* 1$_\top$]; [| *nice*$_r$ 1$_\square$]; [| *woman*$_r$ 1$_\square$]; ✓

He$_{1\top}$ NOM$_{1\top}$ introduced
[| *msc*$_r$ 1$_\top$]; [| 1$_\top$ $\square$ 1$_\top$]; [*y*|]; [*y*| *intr.to*$_r$ 1$_\square$ *y* 1$_\top$];
≡? [| *msc*$_r$ 1$_\top$]; [*y*|]; [*y*| *intr.to*$_r$ 1$_\square$ *y* 1$_\top$]; ✓

him$_{1\top}$ *-self*$_1$ ACC$_{1\top}$ to$_{3\square}$ *her*$_{3\square}$.
[| *msc*$_r$ 1$_\top$]; [| 1$_\square$ $\square$ 1$_\top$]; [| 1$_\square$ $\square$ 1$_\top$]; [| 2$_\square$ $\square$ 3$_\square$]; [| *fem*$_r$ 3$_\square$]
≡? [| *msc*$_r$ 1$_\top$]; [| 1$_\square$ $\square$ 1$_\top$]; [| 2$_\square$ $\square$ 3$_\square$]; [| *fem*$_r$ 3$_\square$] ✓

Lecture 10

NOMINAL REFERENCE AND ANAPHORA IN KALAALLISUT

I. Basic patterns

(E) *English*

- *a*(*n*) vs. {*the*, *he*}: ***new*** vs. ***old*** dref
- *the* vs. *he* : retrieve ***non-***$1_{\top}$ vs. $1_{\top} > 1_{\square}$…
- _V vs. V_ : ***central*** vs. ***peripheral*** dref

(K) *Kalaallisut*: *n-* for 'nominal base', *v-* for 'verbal base'

- *new n-* vs. *old* {*n-*, *v-*}: ***new*** vs. ***old*** dref
- **-3S** vs. -3S {$1_{\top}$, **x**} vs. {$1_{\square}$, *y*} (***proximate*** vs. *obviative* 3rd)
- *n-***S** vs. {*n-*S, *n-*}: ***central*** vs. ***peripheral*** dref

- ***Kalaallisut data set* 1**: *Noun incorporation* (*n-v-*) & *obviation* system (**-3S** vs -3S)

(1) Once a^{y} man NOM$^{\mathbf{x}}$ saw a^{y} woman.
Ilaanni anguti-p *arna-q* *taku-va-a.*
once man-**S**.ERG woman-S see-IND.TV-**3S**.3S
[*y*| *man*$_r$ *y*]; [**x**| **x** $\square$ $1_{\square}$]; [*y*| *woman*$_r$ *y*]; [| *see*$_r$ $1_{\square}$ $1_{\top}$]; [| $1_{\top} \neq 1_{\square}$]; [| 3S $1_{\top}$]; [| 3S $1_{\square}$]

(1$\square$) Once a^{y} man NOM$^{\mathbf{x}}$ saw^{y} a woman.
Ilaanni angut *arna-si-vu-q.*
once man.**S** woman-see-IND.IV-**3S**
[*y*| *man*$_r$ *y*]; [**x**| **x** $\square$ $1_{\square}$]; [*y*| *woman*$_r$ *y*]; [| *see*$_r$ $1_{\square}$ $1_{\top}$]; [| 3S $1_{\top}$];

(2) When **he**$_{1\top}$ saw *her*$_{1\square}$, **he**$_{1\top}$ smiled to *her*$_{1\square}$.
Taku-ga-mi-uk *qunngujuvvig-a-a.*
see-**FCT-3S**-3S smile.to-IND.TV-**3S**.3S
[| *see*$_r$ $1_{\square}$ $1_{\top}$]; [| 3S $1_{\top}$]; [| 3S $1_{\square}$]; [| *smile.to*$_r$ $1_{\square}$ $1_{\top}$]; [| 3S $1_{\top}$]; [| 3S $1_{\square}$]

(2$\square$) When **he**$_{1\top}$ saw *her*$_{1\square}$, *she*$_{1\square}$ NOM$^{\mathbf{x}}$ smiled^{y} to *he*$_{2\top}$ ACC$_{2\top}$
Taku-mm-a-ni *qunngujuvvig-a-a.*
see-FCT-3S-**3S** smile.to-IND.TV-**3S**.3S
[| *see*$_r$ $1_{\square}$ $1_{\top}$]; [| 3S $1_{\top}$]; [*y*| *y* $\square$ $1_{\top}$]; [| 3S $2_{\square}$]; [**x**| **x** $\square$ $2_{\square}$]; [| *smile.to*$_r$ $1_{\square}$ $1_{\top}$]; [| 3S $1_{\top}$]; [| 3S $1_{\square}$]

- ***Lex* 1**:

n-.	man-	⇝	[*y*| *man*$_r$ *y*]	*common noun base*
#.	-**S**, -**S**.ERG	⇝	[**x**| **x** $\square$ $1_{\square}$]	*subject number*
	-S	⇝	[|]	*object number*
tv-.	see-, -see	⇝	[| *see*$_r$ $1_{\square}$ $1_{\top}$]	*tr. base / suffix***:** $1_{\top}$ Vs $1_{\square}$
-TV.	-….TV	⇝	[| $1_{\top} \neq 1_{\square}$]	*tr. mood*
prx.	-**3S**	⇝	[| 3S $1_{\top}$]	*proximate* **3rd**: test *current* $1_{\top}$
	-**3S**$_{\square}$	⇝	[| 3S $\square$]; [**x**| **x** $\square$ $\square$]	make current $\square$ the *new* $1_{\top}$
obv.	-3S	⇝	[| 3S $1_{\square}$]	*obviative* 3r**d**: test *current* $1_{\square}$
	-3S$_{\square}$	⇝	[| 3S $\square$]; [*y*| *y* $\square$ $\square$]	make current $\square$ the *new* $1_{\square}$

II. Topic-tracking by mood and agreement

(M) MATRIX MOOD: Speech act; AGREEMENT: with $1_{\top}$ (*subject*) and $1_{\square}$ (*object*)

assertion	***denial***	***question***	***wish***
*taku-**va**-ra*	*taku-nngi-**la**-ra*	*taku-**vi**-uk?*	*taku-**la**-ra*
see-IND.TV-1S.3S	see-not-IRR-1S.3S	see-QUE-2S.3S	see-SBJ-1S.3S
1 see *him*	I don't see *him*	do you see *him*?	let me see *him*!

DEPENDENT MOOD: Discourse relation; AGREEMENT: with {$1_{\top}$, **x**} (***-ni*** / ***-mi***) vs {$1_{\square}$, *y*}

$\top$ ***fact***: *episode*	$\square$ ***fact***: *episode*	$\top$ ***hypothesis***	$\square$ ***hypothesis***
*taku-**ga**-**mi**-uk*	*taku-**mm**-a-**ni***	*taku-**gu**-**ni**-uk*	*taku-**pp**-a-**ni***
see-**FCT**-**3S**-3S	see-FCT-3S-**3S**	see-**HYP**-**3S**-3S	see-HYP-3S-3S
when **he** saw *him*	when *he* saw **him**	if/when **he** sees *him*	if/when *he* sees **him**

$\top$ ***fact*****:** *habit*	$\square$ ***fact*****:** *habit*	$\top$ ***elaboration***	$\square$ ***elaboration***
*taku-**gaannga**-**mi**-uk*	*taku-**gaanng**-a-**ni***	*taku-**llu**-gu*	*taku-**ga**-a-**ni***
see-**GNR**-**3S**-3S	see-GNR-3S-**3S**	see-**ELA**-3S	see-ELA.TV-3S-**3S**
when **he** sees *him*	when *he* sees **him**	e.g. to see *him*	e.g. [say] *he* saw **him**

- ***Kalaallisut data set* 2**: Use ***Lex* 2** to interpret (2–3) online and determine the appropriate English translations (= **Homework 7**).

(1) Once a^{y} man NOM^{x} saw a^{y} woman.
Ilaanni angut arna-si-vu-q.
once man.**S** woman-see-IND.IV-**3S**
[*y*| *man*$_{r}$ *y*]; [**x**| **x** $\square$ $1_{\square}$]; [*y*| *woman*$_{r}$ *y*]; [| *see*$_{r}$ $1_{\square}$ $1_{\top}$]; [| 3S $1_{\top}$];

(2) *Iniquga-lu-gu* *qungujuvvig-a-a*
consider.cute-**ELA**-3S smile.to-IND.TV-**3S**.3S

(3) *Taa-ssuma* *aamma* *qungujuvvig-a-a* *iniqugi-mm-a-ni*
that-**S.**ERG also smile.to-IND.TV-**3S**.3S consider.cute-FCT-3S-**3S**

- ***Lex* 2**:

cn-.	man-	⇝	[*y*| *man*$_{r}$ *y*]	*common noun* (*cn*) *base*
#.	-**S** / **-S**.ERG	⇝	[**x**| **x** $\square$ $1_{\square}$]	*subject number on cn-base*
	-S	⇝	[|]	*object number on cn-base*
dm-	that$_{\square}$-	⇝	[| $\square \neq 1_{\top}$];	*demonstrative* (*dm*) *base*
#.	-**S**$_{\square}$/ **-S**$_{\square}$.ERG	⇝	[**x**| **x** $\square$ $\square$]	*subject number on dm-base*
tv-.	see- / -see	⇝	[| *see*$_{r}$ $1_{\square}$ $1_{\top}$]	*tr. base / suffix***:** $1_{\top}$ Vs $1_{\square}$
		⇝	[*y*| *see*$_{r}$ *y* $1_{\top}$]	*tr. base / suffix***:** $1_{\top}$ Vs *new* $1_{\square}$
$\top\square$.	see-FCT	⇝	[| *see*$_{r}$ $1_{\top}$ $1_{\square}$]	*tr. base-*$\square$*mood*: $1_{\top}$ $\square$ $1_{\square}$
TV.	-TV	⇝	[| $1_{\top} \neq 1_{\square}$]	*tr. inflection*
prx.	-**3S**	⇝	[| 3S $1_{\top}$]	*proximate* **3rd**: test $1_{\top}$
	-**3S**$_{\square}$	⇝	[| 3S $\square$]; [**x**| **x** $\square$ $\square$]	make $\square$ the *new* $1_{\top}$
obv.	-3S$_{\square}$	⇝	[| 3S $\square$]; [| $1_{\square}$ $\square$ $\square$]	*obviative* 3rd: identify $\square$ as $1_{\square}$
	-3S$_{\square}^{y}$	⇝	[| 3S $\square$]; [*y*| *y* $\square$ $\square$]	make $\square$ the *new* $1_{\square}$

Homework 7

- ***Kalaallisut data set* 2**: Use ***Lex* 2** (on p. 10) to interpret the following text online and determine the appropriate English translations.

(1)

Once	a^y man NOM^x	saw a^y woman.		*Eng*
Ilaanni	*angut*	*arna-si-vu-q.*		
once	man.**S**	woman-see-IND.IV-**3S**		
	[*y*| man_r *y*]; [**x**| **x** □ $1_□$];	[*y*| $woman_r$ *y*]; [| see_r $1_□$ $1_⊤$];	[| 3S $1_⊤$];	**Lex 2** + LC

(2) • _____ *Eng*

Iniquga-lu-gu
consider.cute-**ELA**-3S____

_____ **Lex 2** + LC

• _____ *Eng*

qungujuvvig-a-a
smile.to-IND.TV-**3S**.3S____

_____ **Lex 2 +** LC

(3) • _____ *Eng*

Taa-ssuma	*aamma*	*qungujuvvig-a-a*
that___-**S**___**.**ERG	also	smile.to-IND.TV-**3S**.3S____

_____ **Lex 2 +** LC

• _____ *Eng*

iniqugi-mm-a-ni
consider.cute-FCT-3S___-**3S**

_____ **Lex 2 +** LC

Solution to Homework 7

- ***Kalaallisut data set* 2**: Use ***Lex* 2** (on p. 10) to interpret the following text online and determine the appropriate English translations.

(1)

Once	a^y man NOM^x		saw a^y woman.	*Eng*
Ilaanni	*angut*		*arna-si-vu-q.*	
once	man.**S**		woman-see-IND.IV-**3S**	
	[*y*| *man*$_r$ *y*];	[**x**| **x** □ $1_{□}$];	[*y*| *woman*$_r$ *y*]; [| *see*$_r$ $1_{□}$ $1_{⊤}$]; [| 3S $1_{⊤}$];	***Lex* 2** + LC

(2)
- He considered her cute and… *Eng*

  Iniquga-lu-gu
  consider.cute-**ELA**-3S$_{1□}$
  [\| *consider.cute*$_r$ $1_{□}$ $1_{⊤}$]; [\| 3S $1_{□}$]; [\| $1_{□}$ □ $1_{□}$] ***Lex* 2** + LC

- smiled to her. *Eng*

  qungujuvvig-a-a
  smile.to-IND.TV-**3S**.3S$_{1□}$
  [\| *smile.to*$_r$ $1_{□}$ $1_{⊤}$]; [\| $1_{⊤}$ ≠ $1_{□}$]; [\| 3S $1_{⊤}$]; [\| 3S $1_{□}$]; [\| $1_{□}$ □ $1_{□}$] **Lex 2 +** LC

(3)
- She too smiled to him *Eng*

Taa-ssuma	*aamma*
that$_{1□}$-**S**$_{1□}$**.**ERG	also

  [\| $1_{□}$ ≠ $1_{⊤}$]; [**x**\| **x** □ $1_{□}$]; **Lex 2 +** LC

  qungujuvvig-a-a
  smile.to-IND.TV-**3S**.3S$_{2⊤}$
  [*y*\| *smile.to*$_r$ *y* $1_{⊤}$]; [\| $1_{⊤}$ ≠ $1_{□}$]; [\| 3S $1_{⊤}$]; [\| 3S $2_{⊤}$]; [\| $1_{□}$ □ $2_{⊤}$] **Lex 2**

- because he considered her cute. *Eng*

  iniqugi-mm-a-ni
  consider.cute-FCT-3S$_{1□}$-**3S**
  [\| *consider.cute*$_r$ $1_{⊤}$ $1_{□}$]; [\| 3S $1_{□}$]; [\| $1_{□}$ □ $1_{□}$]; [\| 3s $1_{⊤}$] **Lex 2 +** LC

III. Recentering and anaphora by nouns and verbs

- ***Kalaallisut data set* 3**:

(1) Once a^{y} man NOM^{x} saw a^{y} woman.
Ilaanni angut arna-si-vu-q.
once man-**S** woman-see-IND.IV-**3S**
[y| *man*$_r$ y]; [**x**| **x** □ 1$_{□}$]; [y| *woman*$_r$ y]; [| *see*$_r$ 1$_{□}$ 1$_{⊤}$]; [| 3S 1$_{⊤}$];

He thought her cute, and
Iniquga-lu-gu
consider.cute-**ELA**.TV-3S$_{1□}$
[| *consider.cute*$_r$ 1$_{□}$ 1$_{⊤}$]; [| 1$_{⊤}$ ≠ 1$_{□}$]; [| 3S 1$_{□}$]; [| 1$_{□}$ □ 1$_{□}$]

smiled to her.
qungujuvvig-a-a
smile.to-IND.TV-**3S**.3S$_{1□}$
[| *smile.to*$_r$ 1$_{□}$ 1$_{⊤}$]; [| 1$_{⊤}$ ≠ 1$_{□}$]; [| 3S 1$_{⊤}$]; [| 3S 1$_{□}$]; [| 1$_{□}$ □ 1$_{□}$]

(2) Once a^{y} man NOM^{x} saw a^{y} woman.
Ilaanni angut arna-si-vu-q.
once man.**S** woman-see-IND.IV-**3S**
[y| *man*$_r$ y]; [**x**| **x** □ 1$_{□}$]; [y| *woman*$_r$ y]; [| *see*$_r$ 1$_{□}$ 1$_{⊤}$]; [| 3S 1$_{⊤}$];

The woman thought him cute, and
Arna-p iniquga-lu-gu
woman$_{1□}$-**S**$_{1□}$**.**ERG consider.cute-**ELA.**TV-3S$_{2⊤}$
[| *woman*$_r$ 1$_{□}$]; [**x**| **x** □ 1$_{□}$]; [y| *consider.cute*$_r$ y 1$_{⊤}$]; [| 1$_{⊤}$ ≠ 1$_{□}$]; [| 3S 2$_{⊤}$]; [| 1$_{□}$ □ 2$_{⊤}$]

smiled to him.
qungujuvvig-a-a.
smile.to-IND.TV-**3S**.3S$_{1□}$
[| *smile.to*$_r$ 1$_{□}$ 1$_{⊤}$]; [| 1$_{⊤}$ ≠ 1$_{□}$]; [| 3S 1$_{⊤}$]; [| 3S 1$_{□}$]; [| 1$_{□}$ □ 1$_{□}$]

But he approached
Taass-uma=li urnip-pa-a
that$_{1□}$-**S**$_{1□}$**.**ERG approach^{y}-IND.TV-**3S**.3S$_{1□}$
[| 1$_{□}$ ≠ 1$_{⊤}$]; [**x**| **x** □ 1$_{□}$];[y| *approach*$_r$ y 1$_{⊤}$]; [| 1$_{⊤}$ ≠ 1$_{□}$]; [| 3S 1$_{⊤}$]; [| 3S 1$_{□}$]; [| 1$_{□}$ □ 1$_{□}$]

another woman.
arnaq alla.
woman$_{1□}$.S other$_{2⊤\ 1□}$.S
[| *woman*$_r$ 1$_{□}$]; [|]; [| 1$_{□}$ ≠ 2$_{⊤}$]

• ***Lex* 3**:

cn-.	man-	⇝	[*y*| man_r *y*]	*common noun* (*cn*) *base*
	$man_{\square}$	⇝	[| man_r □]	
	$other_{\square\square}$	⇝	[*y*| *y* ≠ □□]	*relational noun* (*rn*) *base*
	$other_{\square\square\square}$	⇝	[| □ ≠ □□]	
dm-	$that_{\square}$	⇝	[| □ ≠ $1_{\top}$];	*demonstrative* (*dm*) *base*
#.	**-S / -S**.ERG	⇝	[**x**| **x** □ $1_{\square}$]	*subject number on indefinite cn-base*
	$\textbf{-S}_{\square}$ / $\textbf{-S}_{\square}$.ERG	⇝	[**x**| **x** □ □]	*subject number on* □*-anaphoric cn-base*
	-S	⇝	[|]	*object number on cn-base*
tv-.	see- / -see	⇝	[| see_r $1_{\square}$ $1_{\top}$]	*tr. base / suffix*: $1_{\top}$ Vs *old* $1_{\square}$
	see-	⇝	[*y*| see_r *y* $1_{\top}$]	*tr. base*: $1_{\top}$ Vs *new* $1_{\square}$
⊤□.	see-FCT	⇝	[| see_r $1_{\top}$ $1_{\square}$]	*tr. base-*□*mood*: $1_{\top}$ □ $1_{\square}$
TV.	-TV	⇝	[| $1_{\top}$ ≠ $1_{\square}$]	*tr. inflection*
prx.	**-3S**	⇝	[| 3S $1_{\top}$]	*proximate* **3rd**: test $1_{\top}$
	$\textbf{-3S}_{\square}$	⇝	[| 3S □]; [**x**| **x** □ □]	make □ the *new* $1_{\top}$
obv.	$-3S_{\square}$	⇝	[| 3S □]; [| $1_{\square}$ □ □]	*obviative* 3rd: identify □ as $1_{\square}$
	$-3S_{\square}^{y}$	⇝	[| 3S □]; [*y*| *y* □ □]	make □ the *new* $1_{\square}$

• Testing ***Lex* 3** on ***Kal data set* 3**: Online update

M = man, W = woman$_1$, W' = woman$_2$, ? = unknown
Input: $\langle w_i, \emptyset, \emptyset \rangle$

(2)	Once	a man		saw a woman.	
	Ilaanni	*angut*		*arna-*	*-si-vu-q*
	once	man-	**-S**	woman-	-see-IND.IV-**3S**
LC:		$[y\mid man_r\ y]$;	$[\mathbf{x}\mid \mathbf{x} \subseteq 1_\square]$;	$[y\mid woman_r\ y]$;	$[\mid see_r\ 1_\square\ 1_\top]$; $[\mid 3S\ 1_\top]$;
out:		$\langle w_i, \{1\}, \{\langle 1, M\rangle\}\rangle$	$\langle w_i, \{\langle 1, M\rangle\}, \{\langle 1, M\rangle\}\rangle$	$\langle w_i, \{\langle 1, M\rangle\}, \{W, M\}\rangle$	

The woman…

	Arna-	*-p*
	woman$_{1\square}$-	-**S**$_{1\square}$**.**ERG
LC:	$[\mid woman_r\ 1_\square]$;	$[\mathbf{x}\mid \mathbf{x} \subseteq 1_\square]$;
out:	$\langle w_i, \{W, M\}, \{\langle 1, W\rangle, \langle 1, M\rangle\}\rangle$	

…thought him cute, and …

	iniquga-	*-lu*	*-gu*
	consider.cute-	-**ELA.**TV	-3S$_{2\top}$
LC:	$[y\mid consider.cute_r\ y\ 1_\top]$;	$[\mid 1_\top \neq 1_\square]$;	$[\mid 3S\ 2_\top]$; $[\mid 1_\square \subseteq 2_\top]$
out:	$\langle w_i, \{W, M\}, \{\langle 1, ?\rangle, \langle 1, W\rangle, \langle 1, M\rangle\}\rangle$		$\langle w_i, \{W, M\}, \{\langle 1, M\rangle, \langle 1, W\rangle, \langle 1, M\rangle\}\rangle$

…smiled to him.

	qungujuvvig-	*-a*	*-a*
	smile.to-	-IND.TV	-**3S**.3S$_{1\square}$
LC:	$[\mid smile.to_r\ 1_\square\ 1_\top]$;	$[\mid 1_\top \neq 1_\square]$;	$[\mid 3S\ 1_\top]$; $[\mid 3S\ 1_\square]$; $[\mid 1_\square \subseteq 1_\square]$
out:	$\langle w_i, \{W, M\}, \{\langle 1, M\rangle, \langle 1, W\rangle, \langle 1, M\rangle\}\rangle$		

But he…

	taass-	*-uma*	*=li*
	that$_{1\square}$-	-**S**$_{1\square}$**.**ERG	=but
LC:	$[\mid 1_\square \neq 1_\top]$;	$[\mathbf{x}\mid \mathbf{x} \subseteq 1_\square]$;	
out:	$\langle w_i, \{M, W, M\}, \{\langle 1, M\rangle, \langle 1, W\rangle, \langle 1, M\rangle\}\rangle$		

…approached…

	urnip-	*-pa*	*-a*
	approach^y-	-IND.TV	-**3S**.3S$_{1\square}$
LC:	$[y\mid approach_r\ y\ 1_\top]$;	$[\mid 1_\top \neq 1_\square]$;	$[\mid 3S\ 1_\top]$; $[\mid 3S\ 1_\square]$; $[\mid 1_\square \subseteq 1_\square]$
out:	$\langle w_i, \{M, W, M\}, \{\langle 1, ?\rangle, \langle 1, M\rangle, \langle 1, W\rangle, \langle 1, M\rangle\}\rangle$		

…another woman.

	arna-	*-q*	*alla.*
	woman$_{1\square}$-	-S	other$_{2\top\ 1\square}$.S
LC:	$[\mid woman_r\ 1_\square]$;	$[\mid]$;	$[\mid 1_\square \neq 2_\top]$
out:	$\langle w_i, \{M, W, M\}, \{\langle 1, W'\rangle, \langle 1, M\rangle, \langle 1, W\rangle, \langle 1, M\rangle\}\rangle$		

Quiz 3

1. (7 pts). Complete the LC *translations* to reflect your intuitions about the *salient meaning*.

***Data set* 3.** *Possessor case* (*'s* or silent *'~~s~~*) and *passive* (participle and *by*-phrase).

(1) Ann *'s* sister NOM

[| ann_e □ $1_□$]; _____; [__| *sister.of*$_r$_____]; _____;

was *betray-ed.*

_____; [| $betray_r$ $1_⊤$ $1_□$]

Now she NOM hates the guy ACC.

_____; _____;_____;_____;_____;_____

(2) John *'s* baby NOM

[| $john_e$ □ $1_□$]; _____; _____;_____;

was *show-n* a mirror ACC

_____; _____; ____; _____; _____;

by her ~~*'s*~~ father

_____; _____; _____; [__| *father.of*$_r$_____];

and laughed.

_____

2. (3 pts) ***Lex* 3**: Fill in the *missing lexical entries* so at to extend our analysis to ***data set* 3.**

rf.	John$_{\square}$	⇝	[| *john*$_e$ $\square$ $\square$]	*name*
	he$_{\square}$ / him$_{\square}$	⇝	[| *msc*$_r$ $\square$]	*masculine pronoun*
	she$_{\square}$ / her$_{\square}$	⇝	[| *fem*$_r$ $\square$]	*feminine pronoun*
n.	man$_{\square}$	⇝	[| *man*$_r$ $\square$]	*common noun*
	enemy$_{\square\square\square}$	⇝	[| *enemy*$_r$ $\square\square\square$]	*relational noun*
th.	the$_{\square}$	⇝	[| $\square \neq 1_{\top}$]	*definite article*
a.	a(n)	⇝	[*y*|]	*indefinite article*
		⇝	[|]	
S.	NOM$_{\square}$	⇝	[**x**| **x** $\square$ $\square$], if $\square \neq 1_{\top}$	*subject case*
			[| $\square$ $\square$ $\square$], otherwise	
O.	ACC$_{\square}$	⇝	[| $1_{\square}$ $\square$ $\square$]	1*st object case*
O$_{\square}$.	to$_{\square}$ / []$_{\square}$	⇝	[| $2_{\square}$ $\square$ $\square$]	2*nd object case*
A.	by$_{\square}$	⇝	_____	*passive agent case*
P.	's$_{\square}$ / '~~s~~$_{\square}$	⇝	_____	*possessor case*
	's$_{\square\square}$/ '~~s~~$_{\square\square}$	⇝	_____	*possessor case*
IV.	jog	⇝	[| *jog*$_r$ $1_{\top}$]	*intransitive*: $1_{\top}$ Vs
TV.	betray	⇝	[| *betray*$_r$ $1_{\square}$ $1_{\top}$]	*transitive*: $1_{\top}$ Vs *old* $1_{\square}$
		⇝	[*y*| *betray*$_r$ *y* $1_{\top}$]	$1_{\top}$ Vs *new* $1_{\square}$
TV$_{\square}$.	show$_{[]}$	⇝	[*y*|]; [*y*| *show.to*$_r$ *y* $1_{\square}$ $1_{\top}$]	*ditransitive*: $1_{\top}$ Vs *new* $1_{\square}$ *new* $2_{\square}$
	introduce	⇝	[*y*|]; [*y*| *intr.to*$_r$ $1_{\square}$ *y* $1_{\top}$]	$1_{\top}$ Vs *new* $1_{\square}$ to *new* $2_{\square}$
BE.	was	⇝	_____	*passive* 'be'
PS.	betray-ed	⇝	[| *betray*$_r$ $1_{\top}$ $1_{\square}$]	*pass. prt*: $1_{\top}$ is V-ed by $1_{\square}$
	show$_{[]}$-n	⇝	_____	

3. (7 pts). Fill in the *indices* and *lexical meanings* according to your ***Lex* 3**, and then fill in the predicted *output state*, where indicated, given the initial *input state* of information and attention.

• Testing ***Lex* 3** on ***data set* 3**: Online interpretation

(1) *Ann = A, Ann's sister = S, betrayer = B, unknown*$_1$ = ?, *unknown*$_2$ = ??
Input state: [w_i, □, □]

Ann___ *'s*___ sister_____ NOM_____

LC: [| ann_e □ $1_{□}$]; _____; _____; _____

out: [w_i,_____□ _____ _____

was *betray-ed.*

LC: _____; _____

out: [w_i,_____□ _____

Now she___ NOM___ hates the___ guy___ ACC___.

LC: _____;_____; _____;_____;_____;_____

out: [w_i,_____□

(2) *John = J, John's baby = B, mirror = □, unknown*$_1$ = ?, *unknown*$_2$ = ??
Input state: [w_i, □, □]

John___ *'s*___ baby____ NOM___

LC: [| $john_e$ □ $1_{□}$]; _____; _____; _____

out: [w_i, _____□ _____ _____

was *show*$_{[]}$*-n* a mirror__ ACC___

LC: _____; _____; ____; _____; _____

out: [w_i, _____□ _____ _____

*by*__ her__ ~~*'s*~~_____ father_____ and laughed.

LC: _____; _____; _____;_____; _____

out: [w_i, _____□ _____ _____

4. (3 pts). ***Kal data set* 4**: Fill in the predicted *outputs* and an *unambiguous English* translation.

(1) *Kaali = K, Kaali's father = F*
INPUT STATE: [w_i,]

Eng: _____

	Kaali-	*-p*	*angun-*	*-ni*	
	Kaali-	-**S.**ERG	father.of-	-**3S**.S	
LC:	[y| y *kaali*];	[**x**| **x** $1_{}$];	[y| *father.of*$_r$ $1_{\top}$ y];		[| 3S $1_{\top}$]; [|]

out: [w_i,_____] _____ _____

	napparsima-mm-	*-at*	*nikallunga-*	*-vu*	*-q*.
	ill-FCT-	-3S$_{1}$	depressed-	-IND.IV-**3S**	
LC:	[| *ill*$_r$ $1_{}$];	[| 3S $1_{}$]; [| $1_{}$ $1_{}$];	[| *depressed*$_r$ $1_{\top}$];		[| 3S $1_{\top}$]

out: _____ _____

Solution to Quiz 3

1. (7 pts). Complete the LC *translations* to reflect your intuitions about the *salient meaning*.

***Data set* 3.** *Possessor case* (*'s* or silent *'s*) and *passive* (participle and *by*-phrase).

(1) Ann *'s* sister NOM *was* *betray-ed.*
[| ann_e □ $1_□$]; [y| $y \neq 1_□$]; [| *sister.of*$_r$ $2_□$ $1_□$]; [**x**| **x** □ $1_□$]; [y| $y \neq 1_\top$]; [| $betray_r$ $1_\top$ $1_□$]

Now she NOM hates the guy ACC.
[| *fem*$_r$ $1_\top$]; [| $1_\top$ □ $1_\top$]; [| $hate_r$ $1_□$ $1_\top$]; [| $1_□ \neq 1_\top$]; [| guy_r $1_□$]; [| $1_□$ □ $1_□$]

(2) John *'s* baby NOM
[| $john_e$ □ $1_□$]; [y| $y \neq 1_□$]; [| *baby.of*$_r$ $2_□$ $1_□$]; [**x**| **x** □ $1_□$];

was *show-n* a mirror ACC
[y| $y \neq 1_\top$]; [y| *show.to*$_r$ $1_\top$ y $1_□$]; [|]; [| $mirror_r$ $1_□$]; [| $1_□$ □ $1_□$]

by her ~~*'s*~~ father and laughed.
[| $2_□$ □ $4_□$]; [| *fem*$_r$ $1_\top$]; [| $4_□ \neq 1_\top$]; [| *father.of*$_r$ $1_\top$ $4_□$]; [| $laugh_r$ $1_\top$]

2. (3 pts) ***Lex* 3**: Fill in the *missing lexical entries* so at to extend our analysis to ***data set* 3.**

rf.	John□	⇝	[| $john_e$ □ □|	*name*
	he□ / him□	⇝	[| msc_r □|	*masculine pronoun*
	she□ / her□	⇝	[| fem_r □|	*feminine pronoun*
n.	man□	⇝	[| man_r □|	*common noun*
	enemy□□□	⇝	[| $enemy_r$ □□□|	*relational noun*
th.	the□	⇝	[| □ ≠ $1_\top$]	*definite article*
a.	a(n)	⇝	[y|]	*indefinite article*
		⇝	[|]	
S.	NOM□	⇝	[**x**| **x** □ □|, if □ ≠ $1_\top$ [| □ □ □|, otherwise	*subject case*
O.	ACC□	⇝	[| $1_□$ □ □|	1*st object case*
O.	to□ / []□	⇝	[| $2_□$ □ □|	2*nd object case*
A.	by□	⇝	[| $2_□$ □ □|	*passive agent case* (w/*ditransitive*)
P.	's□ / '~~s~~□	⇝	[y| $y \neq$ □]	*possessor case* (*new* possession)
	's□□□/ '~~s~~□□□	⇝	[| □□≠ □|	*possessor case* (*old* possession)
IV.	jog	⇝	[| jog_r $1_\top$]	*intransitive*: $1_\top$ Vs
TV.	betray	⇝	[| $betray_r$ $1_□$ $1_\top$]	*transitive*: $1_\top$ Vs *old* $1_□$
		⇝	[y| $betray_r$ y $1_\top$]	$1_\top$ Vs *new* $1_□$
TV.	show[]	⇝	[y|]; [y| *show.to*$_r$ y $1_□$ $1_\top$]	*ditransitive*: $1_\top$ Vs *new* $1_□$ *new* $2_□$
	introduce	⇝	[y|]; [y| *intr.to*$_r$ $1_□$ y $1_\top$]	$1_\top$ Vs *new* $1_□$ to *new* $2_□$
BE.	was	⇝	[y| $y \neq 1_\top$]	*passive* 'be'
PS.	betray-ed	⇝	[| $betray_r$ $1_\top$ $1_□$]	*pass. prt*: $1_\top$ is V-ed by $1_□$
	show[]-n	⇝	[y| *show.to*$_r$ $1_\top$ y $1_□$]	$1_\top$ is V-ed *new* $1_□$ by *old* $1_□$

3. (7 pts). Fill in the *indices* and *lexical meanings* according to your ***Lex* 3**, and then fill in the predicted *output*, where indicated, given the initial *input state* of information and attention.

• Testing ***Lex* 3** on ***data set* 3**: Online interpretation

(1) *Ann = A, Ann's sister = S, betrayer = B, unknown*$_1$ = ?, *unknown*$_2$ = ??
Input state: $\langle w_i, \{\}, \{A\}\rangle$

	Ann$_{1\square}$	*'s*$_{1\square}$	sister$_{2\square\ 1\square}$	NOM$_{1\square}$
LC:	$[\mid ann_e\ \square\ 1_\square]$;	$[y\mid y \neq 1_\square]$;	$[\mid sister.of_r\ 2_\square\ 1_\square]$;	$[\mathbf{x}\mid \mathbf{x}\ \square\ 1_\square]$;
out:		$\langle w_i, \{\}, ?, A\rangle$	$\langle w_i, \{\}, S, A\rangle$	$\langle w_i, S, S, A\rangle$

	was	*betray-ed.*
LC:	$[y\mid y \neq 1_\top]$;	$[\mid betray_r\ 1_\top\ 1_\square]$;
out:	$\langle w_i, S, ??, S, A\rangle$	$\langle w_i, S, B, S, A\rangle$

	Now she$_{1\top}$	NOM$_{1\top}$	hates	the$_{1\square}$	guy$_{1\square}$	ACC$_{1\square}$.
LC:	$[\mid fem_r\ 1_\top]$;	$[\mid 1_\top\ \square\ 1_\top]$;	$[\mid hate_r\ 1_\square\ 1_\top]$;	$[\mid 1_\square \neq 1_\top]$;	$[\mid guy_r\ 1_\square]$;	$[\mid 1_\square\ \square\ 1_\square]$
out:			$\langle w_i, S, B, S, A\rangle$			

(2) *John = J, John's baby = B, mirror = □, unknown*$_1$ = ?, *unknown*$_2$ = ??
Input state: $\langle w_i, \{\}, J\rangle$

	John$_{1\square}$	*'s*$_{1\square}$	baby$_{2\square\ 1\square}$	NOM$_{1\square}$
LC:	$[\mid john_e\ \square\ 1_\square]$;	$[y\mid y \neq 1_\square]$;	$[\mid baby.of_r\ 2_\square\ 1_\square]$;	$[\mathbf{x}\mid \mathbf{x}\ \square\ 1_\square]$;
out:		$\langle w_i, \{\}, ?, J\rangle$	$\langle w_i, \{\}, B, J\rangle$	$\langle w_i, B, B, J\rangle$

	was	*show*$_{[]}$*-n*	a	mirror$_{1\square}$	ACC$_{1\square}$
LC:	$[y\mid y \neq 1_\top]$;	$[y\mid show.to_r\ 1_\top\ y\ 1_\square]$;	$[\mid]$;	$[\mid mirror_r\ 1_\square]$;	$[\mid 1_\square\ \square\ 1_\square]$
out:	$\langle w_i, B, ?, B, J\rangle$	$\langle w_i, B, ??, ?, B, J\rangle$		$\langle w_i, B, \square, ?, B, J\rangle$	

	by$_{4\square}$	her$_{1\top}$	~~*'s*~~$_{4\square,\ 1\top}$	father$_{1\top\ 4\square}$	and	laughed.
LC:	$[\mid 2_\square\ \square\ 4_\square]$;	$[\mid fem_r\ 1_\top]$;	$[\mid 4_\square \neq 1_\top]$;	$[\mid father.of_r\ 1_\top\ 4_\square]$;		$[\mid laugh_r\ 1_\top]$
out:	$\langle w_i, B, \square, J, B, J\rangle$			$\langle w_i, B, \square, J, B, J\rangle$		$\langle w_i, B, \square, J, B, J\rangle$

4. (3 pts). ***Kal data set* 4**: Fill in the predicted *outputs* and an *unambiguous English* translation.

(1) *Kaali = K, Kaali's father = F*
INPUT STATE: $\langle w_i, \{\}, \square\rangle$

Eng: Kaali is depressed because his father is ill.

	Kaali-	*-p*	*angun-*	*-ni*
	Kaali-	-**S.**ERG	father.of-	-**3S**.S
LC:	$[y\mid y\ \square\ kaali]$;	$[\mathbf{x}\mid \mathbf{x}\ \square\ 1_\square]$;	$[y\mid father.of_r\ 1_\top\ y]$;	$[\mid 3S\ 1_\top]$; $[\mid]$
out:	$\langle w_i, \{\}, K\rangle$	$\langle w_i, K, K\rangle$	$\langle w_i, K, F, K\rangle$	

	napparsima-mm-	*-at*	*nikallunga-*	*-vu*	*-q.*
	ill-FCT-	-3S$_{1\square}$	depressed-	-IND.IV-**3S**	
LC:	$[\mid ill_r\ 1_\square]$;	$[\mid 3S\ 1_\square]$; $[\mid 1_\square\ \square\ 1_\square]$;	$[\mid depressed_r\ 1_\top]$;		$[\mid 3S\ 1_\top]$
out:	$\langle w_i, K, F, K\rangle$		$\langle w_i, K, F, K\rangle$		