

Grammatical centering: Pronouns, tense, and mood
Bittner 2007, 2008

0. DATA (*E* = English, *K* = Kalaallisut)

(*J*) Indexicality as topic anaphora (Bittner 07)

(*T*) Start-up topics:

reality ^T _{w0} :	•	^T <i>e</i> ₀ . <i>e</i> ₀ -agent speaks up
		^T <i>t</i> ₀ = \mathfrak{D}_{w0} <i>e</i> ₀ . <i>e</i> ₀ -instant

(1_{*E*}) *I am busy.*

I be.PRS.1SG busy

free/bound pronoun: *I*/1SG, tense: PRS

(1_{*K*}) *ulapig-pu-nga*

be.busy-IND.IV-1SG

bound pronoun: 1SG, mood: IND

(*T*) Tense as temporal centering (Bittner 08)

(3_{*E*}) i. *Ann has gone out.*

Ann have.PRS.3SG go.PRF out

ii. *John is asleep.*

John be.PRS.3SG asleep.

(*M*) Mood as modal centering (Bittner 07)

(6_{*K*}) a. *Aani angirlar-pu-q*

Aani come.home-IND.IV-3SG

Aani has come home.

b. *Aani angirlar-li*

Aani come.home-OPT.3SG

Let Aani come home!

c. *Aani, angirlar-i-t*

Aani come.home-IMP-2SG

Aani, come home!

⋮

(4_{*E*}) i. *Today when I came home,*

today **when** I come.PST home

Ann went out.

Ann go.PST out

ii. *John was asleep.*

John be.PST.3SG asleep

Cf. Temporal recentering w/o tense (Bitt07)

(4_{*K*}) i. (*Ulluq-mi angirlar-ga-ma*)
 (day-SG.LOC come.home-FCT_T-1SG)

(3_{*K*}) *Aani ani-pu-q*

Aani go.out-IND.IV-3SG

ii. *Juuna sinig-pu-q*

Juuna be.asleep-IND.IV-3SG

Cf. Modal recentering w/o mood

(7_{*K*}) *Aani-p*

Aani-SG.ERG

ulluq-mi qimat-pa-atit

day-SG.LOC leave-IND.TV-3SG.2SG

Aani left you today.

(8_{*K*}) *Aani-p=guuq*

Aani-SG.ERG=RPT

ulluq-mi qimat-pa-atit

day-SG.LOC leave-IND.TV-3SG.2SG

Aani, **I hear**, left you today.

(5_{*K*}) i. *Ullu-mi Aani angirlar-pu-q*

day-SG.LOC Aani come.home-IND.IV-3SG

Today Aani^T came home.

ii. *Quligulik-mit niu-mm-at*

helicopter-SG.ABL step.out-FCT₁-3SG₁

When she¹ stepped out of the helicopter,

uvi-ata arpag-llu-ni

husband-3SG₁.SG.ERG run-ELA_T-3SG_T

urnig-pa-a.

approach-IND.TV-3SG.3SG

her₁ husband^T ran toward her₁.

1. INDEXICALITY AS TOPIC ANAPHORA (Bittner 2007, sec. 2)

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle \quad \text{for all } w_0 \text{ in the initial } \textit{common ground}$$

(T) Start-up update

$$[\mathbf{w} \mid \mathbf{w} = r]; [\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{speak.up}_{d_\omega}]; [\mathbf{t} \mid \mathbf{t} =_{d_\omega} \vartheta \mathbf{d}\varepsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

s.t. • $\textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0)$
 • $t_0 = \vartheta_{w_0} e_0$

$$\begin{array}{l} \text{}^T w_0: \quad \bullet \quad \text{}^T e_0. e_0\text{-agent speaks up} \\ \quad \quad \quad | \quad \text{}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$
(1_E) I*English*

$$[\mathbf{a} \mid \text{1SG}_{d_\omega, d_\varepsilon} \mathbf{a}];$$

be. .PRS .1SG
 $[\mathbf{s} \mid \text{EXP } s =_{d_\omega} \mathbf{d}\alpha]; [\mathbf{d}\tau =_{d_\omega} \vartheta \mathbf{d}\varepsilon]; [\mathbf{d}\tau \subseteq_{d_\omega} d\sigma]; [\text{1SG}_{d_\omega, d_\varepsilon} \mathbf{d}\alpha];$

busy
 $[\mathbf{d}\sigma: \text{EXP } \textit{busy}_{d_\omega}]$

$$i_{1E} = \langle w_0, \langle a_1, t_0, e_0, w_0 \rangle, \langle s_1 \rangle \rangle$$

s.t. ∴

- $\text{1SG}_{w_0, e_0} a_1$
 $:= (\text{SG } a_1 \wedge \text{AGT}_{w_0} e_0 = a_1)$
- $\text{EXP}_{w_0} s_1 = a_1$
 $t_0 = \vartheta_{w_0} e_0$
 $t_0 \subseteq \vartheta_{w_0} s_1$
- $\textit{busy}_{w_0}(s_1, \text{EXP}_{w_0} s_1)$

I...-1SG: in $\text{}^T w_0$, $\text{}^T a_1$ is $\text{}^T e_0$ -agentPRS presup: in $\text{}^T w_0$, $\text{}^T t_0$ is $\text{}^T e_0$ -now(1_K) be.busy-*Kalaallisut*

$$[\mathbf{s} \mid s: \text{EXP } \textit{busy}_{d_\omega}];$$

-IND .IV -1SG
 $[\text{BEG } d\sigma <_{d_\omega} \mathbf{d}\varepsilon]; [\mathbf{d}\tau \subseteq_{d_\omega} d\sigma]; [\mathbf{a} \mid \text{EXP } d\sigma =_{d_\omega} \mathbf{a}]; [\text{1SG}_{d_\omega, d_\varepsilon} \mathbf{d}\alpha]$

$$i_{1K} = \langle w_0, \langle a_1, t_0, e_0, w_0 \rangle, \langle s_1 \rangle \rangle$$

s.t. ∴

- $\textit{busy}_{w_0}(s_1, \text{EXP}_{w_0} s_1)$
- $\vartheta_{w_0} \text{BEG}_{w_0} s_1 < \vartheta_{w_0} e_0$
 $t_0 \subseteq \vartheta_{w_0} s_1$
- $\text{EXP}_{w_0} s_1 = a_1$
- $\text{1SG}_{w_0, e_0} a_1$
 $:= (\text{SG } a_1 \wedge \text{AGT}_{w_0} e_0 = a_1)$

IND presup: s_1 is $\text{}^T w_0$ -fact verifiable from $\text{}^T e_0$ 1SG: in $\text{}^T w_0$, $\text{}^T a_1$ is $\text{}^T e_0$ -agent
$$\begin{array}{l} \text{}^T w_0: \quad \bullet \quad \text{}^T e_0. e_0\text{-agent speaks up} \\ \quad \quad \quad | \quad \text{}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \\ \quad \quad \quad \text{---} \quad \text{}^T s_1: e_0\text{-agent is busy} \end{array}$$

2 TENSE AS TEMPORAL CENTERING: ENGLISH (Bittner 2008)

2.0 Basic idea

Grammatical TENSE morphemes (a) have presuppositions that relate the perspective point to a topic time, and (b) may update temporal topics

2.1 Default topic time: Speech instant

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle$$

(T) Start-up update

$$[\mathbf{w} \mid \mathbf{w} = r]; [\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{speak.up}_{d_\omega}]; [\mathbf{t} \mid \mathbf{t} =_{d_\omega} \vartheta d\varepsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

- s.t. • $\textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0)$
 • $t_0 = \vartheta_{w_0} e_0$

$$\begin{array}{l} \text{}^T w_0: \\ \quad \bullet \\ \quad | \end{array} \quad \begin{array}{l} \text{}^T e_0. e_0\text{-agent speaks up} \\ \text{}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$

default *perspective point*
 default *topic time*

(3i_E) Ann

$$[\mathbf{a} \mid \mathbf{a} = \textit{ann}];$$

$$\begin{array}{l} \text{have.} \quad \quad \quad \text{.PRS} \quad \quad \quad \text{.3SG} \\ [\mathbf{s} \mid \text{EXP } s =_{d_\omega} \mathbf{d}\alpha]; [\mathbf{d}\tau =_{d_\omega} \vartheta \mathbf{d}\varepsilon]; [\mathbf{d}\tau \subseteq_{d_\omega} d\sigma]; [3\text{SG}_{d_\omega, d\varepsilon} \mathbf{d}\alpha]; \end{array}$$

$$\begin{array}{l} \text{go} \quad \quad \quad \text{.PRF} \\ [\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{go}_{d_\omega}]; [\text{CON } d\varepsilon =_{d_\omega} d\sigma, \text{AGT } d\varepsilon =_{d_\omega} \text{EXP } d\sigma]; \end{array}$$

$$\begin{array}{l} \text{out} \\ [l \mid \Pi(\text{CON } d\varepsilon) \subseteq_{d_\omega} l \subseteq_{d_\omega} \textit{outside } \Pi d\varepsilon] \end{array}$$

$$i_{1E} = \langle w_0, \langle a_1, t_0, e_0, w_0 \rangle, \langle l_1, e_1, s_1 \rangle \rangle$$

s.t. ∴

- $a_1 = \textit{ann}$
- $\text{EXP}_{w_0} s_1 = a_1$
 $t_0 = \vartheta_{w_0} e_0$
 $t_0 \subseteq \vartheta_{w_0} s_1$
- $3\text{SG}_{w_0, e_0} a_1$
 $:= (\text{SG } a_1 \wedge a_1 \notin (\text{AGT}_{w_0} e_0 + \text{EXP}_{w_0} e_0))$
- $\textit{go}_{w_0}(e_1, \text{AGT}_{w_0} e_1)$
 $\text{CON}_{w_0} e_1 = s_1$
- $\Pi_{w_0} \text{CON}_{w_0} e_1 \subseteq l_1 \subseteq \textit{outside } \Pi_{w_0} e_1$

PRS presup: in ${}^T w_0$, ${}^T t_0$ is ${}^T e_0$ -now
 PRS-state: in ${}^T w_0$, s_1 holds at ${}^T t_0$

$$\begin{array}{l} \text{}^T w_0: \\ \quad \bullet \\ \quad | \\ \quad \text{---} \\ \quad \bullet \end{array} \quad \begin{array}{l} \text{}^T e_0. e_0\text{-agent speaks up} \\ \text{}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \\ s_1 = \text{CON}_{w_0} e_1. \text{consequent state of } e_1 \text{ experienced by } a_1 \\ e_1: \text{}^T \text{Ann (non } e_0\text{-participant) goes out to } l_1 \end{array}$$

perspective point
topic time

(3ii_E) *John_{if}*[**a** | **a** = *john*];

be.

.PRS**.3SG**[*s* | EXP *s* =_{d_ω} **dα**]; [**dτ** =_{d_ω} **ϑdε**]; [**dτ** ⊆_{d_ω} *dσ*]; [**3SG**_{d_ω, d_ε} **dα**];

asleep

[*dσ*: EXP *asleep*_{d_ω}] $i_{2E} = \langle w_0, \langle a_2, a_1, t_0, e_0, w_0 \rangle, \langle s_2, l_1, e_1, \dots \rangle \rangle$

s.t. ∴

- $a_2 = john$
- $EXP_{w_0} s_2 = a_2$
 $t_0 = \vartheta_{w_0} e_0$
 $t_0 \subseteq \vartheta_{w_0} s_2$
- $3SG_{w_0, e_0} a_2$
 $:= (SG a_2 \wedge a_2 \notin (AGT_{w_0} e_0 + EXP_{w_0} e_0))$
- $asleep_{w_0}(s_2, EXP_{w_0} s_2)$

PRS presup: in τ_{w_0} , τ_{t_0} is τ_{e_0} -nowPRS-state: in τ_{w_0} , s_2 holds at τ_{t_0} τ_{w_0} :

- τ_{e_0} . e_0 -agent speaks up
- | $\tau_{t_0} = \vartheta_{w_0} e_0$. e_0 -instant
- $s_1 = CON_{w_0} e_1$. consequent state of e_1 experienced by a_1
- e_1 : Ann (non e_0 -participant) goes out to l_1
- s_2 : τ_{John} (non e_0 -participant) is asleep

***perspective point
topic time***

2.2 Temporal recentering by tense

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle$$

for all w_0 in the initial *common ground*

(\top) Start-up update

$$[\mathbf{w} | \mathbf{w} = r]; [\mathbf{e} | \mathbf{e}: \text{AGT } \textit{speak.up}_{\mathbf{d}_w}]; [\mathbf{t} | \mathbf{t} =_{\mathbf{d}_w} \vartheta \mathbf{d}\varepsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

$$\text{s.t. } \bullet \textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0) \wedge t_0 = \vartheta_{w_0} e_0$$

$$\top w_0: \quad \bullet \quad \begin{array}{l} \top e_0. e_0\text{-agent speaks up} \\ | \quad \top t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$

default *perspective point*

default *topic time*

$$(4i_E) \text{ Today} \quad \textit{if} \\ [\mathbf{t} | (\textit{day}_{\mathbf{d}_w} t), (\vartheta \mathbf{d}\varepsilon \subseteq_{\mathbf{d}_w} t)]; [\mathbf{t} | \mathbf{t} \subseteq \mathbf{d}\tau];$$

if = initial field (see sec. 3)

$$\text{when} \quad \mathbf{I} \\ [\mathbf{e} | \vartheta e \subseteq_{\mathbf{d}_w} \mathbf{d}\tau]; [\mathbf{a} | \text{1SG}_{\mathbf{d}_w, \mathbf{d}_e} \mathbf{a}]$$

$$i_{11} = \langle w_0, \langle a_{11}, t_{12}, t_0, e_0, w_0 \rangle, \langle e_{11}, t_{11} \rangle \rangle$$

s.t. \vdots

- $\textit{day}_{w_0} t_{11} \wedge \vartheta_{w_0} e_0 \subseteq t_{11}$
- $\vartheta_{w_0} e_{11} \subseteq t_{12} \subseteq t_{11}$
- $\text{1SG}_{w_0, e_0} a_{11}$
:= $(\text{SG } a_{11} \wedge \text{AGT}_{w_0} e_0 = a_{11})$

if-when: new topic time $\top t_{12}$

come.

$$[\mathbf{d}\varepsilon: \text{AGT } \textit{come}_{\mathbf{d}_w}]; [\text{AGT } \mathbf{d}\varepsilon =_{\mathbf{d}_w} \mathbf{d}\alpha];$$

.PST

$$[\mathbf{d}\tau <_{\mathbf{d}_w} \vartheta \mathbf{d}\varepsilon]; [\mathbf{d}\varepsilon \subseteq_{\mathbf{d}_w} \mathbf{d}\tau]; [\mathbf{t} | \mathbf{t} <_{\mathbf{d}_w} \vartheta \mathbf{d}\varepsilon, \mathbf{t} \subseteq_{\mathbf{d}_w} \vartheta \text{CON } \mathbf{d}\varepsilon];$$

home

$$[\mathbf{l} | \Pi \langle \text{CON } \mathbf{d}\varepsilon \rangle \subseteq_{\mathbf{d}_w} \mathbf{l} \subseteq_{\mathbf{d}_w} \textit{home.of}_{\mathbf{d}_w, \mathbf{d}_e} \langle \text{AGT } \mathbf{d}\varepsilon \rangle]$$

$$i_{12} = \langle w_0, \langle t_{13}, a_{11}, t_{12}, t_0, e_0, w_0 \rangle, \langle l_{11}, e_{11}, t_{11} \rangle \rangle$$

s.t. \vdots

- $\textit{come}_{w_0}(e_{11}, \text{AGT}_{w_0} e_{11}) \wedge \text{AGT}_{w_0} e_{11} = a_{11}$
- $t_{12} < \vartheta_{w_0} e_0$
 $\vartheta_{w_0} e_{11} \subseteq t_{12}$
 $t_{13} < \vartheta_{w_0} e_0 \wedge t_{13} \subseteq \vartheta_{w_0} \text{CON}_{w_0} e_{11}$
- $\Pi_{w_0} \text{CON}_{w_0} e_{11} \subseteq l_{11} \subseteq \textit{home.of}_{w_0, e_{11}}(\text{AGT}_{w_0} e_{11})$

PST-presup: in $\top w_0$, $\top t_{12}$ is $\top e_0$ -past

PST-event: in $\top w_0$, e_1 within $\top t_{12}$

PST-update: new topical $\top e_0$ -past $\top t_{13}$

$$\top w_0: \quad \bullet \quad \begin{array}{l} \top e_0. e_0\text{-agent speaks up} \\ | \quad t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$

(default) *perspective point*

|||||||
||

$$\begin{array}{l} t_{11}. e_0\text{-day} \\ \top t_{12}. e_0\text{-past within } e_0\text{-day} \end{array}$$

2ry *topical past*

$$\bullet \quad e_{11}: e_0\text{-agent comes home to } l_{11}$$

$$|| \quad \top t_{13}. e_0\text{-past within } e_{11}\text{-consequent time}$$

1ry *topical past*

*Ann*_{if}
[**a** | **a** = *ann*];

go.
[*dε*: AGT *go*_{d_ω}]; [AGT *dε* =_{d_ω} **dα**];

.PST (#PRS)
[**dτ** <_{d_ω} **∅dε**]; [*dε* ⊆_{d_ω} **dτ**]; [**t** | **t** <_{d_ω} **∅dε**, **t** ⊆_{d_ω} **∅CONdε**];

out (causal inference)
[*l* | Π(CON *dε*) ⊆_{d_ω} *l* ⊆_{d_ω} *outside* Π*dε*]; [Π*dε* ⊆_{d_ω} Π(CON *dε*₁)]

*i*₁₃ = ⟨*w*₀, ⟨*t*₁₄, *a*₁₂, *t*₁₃, ..., *e*₀, *w*₀⟩, ⟨*l*₁₂, *e*₁₂, *l*₁₁...⟩⟩
s.t. ⋮

- *a*₁₂ = *ann*
- *go*_{*w*₀}(*e*₁₂, AGT_{*w*₀} *e*₁₂) ∧ AGT_{*w*₀} *e*₁₂ = *a*₁₂
- *t*₁₃ < **∅**_{*w*₀} *e*₀
∅_{*w*₀} *e*₁₂ ⊆ *t*₁₃
*t*₁₄ < **∅**_{*w*₀} *e*₀ ∧ *t*₁₄ ⊆ **∅**_{*w*₀} CON_{*w*₀} *e*₁₂
- Π_{*w*₀} CON_{*w*₀} *e*₁₂ ⊆ *l*₁₂ ⊆ *outside* Π_{*w*₀} *e*₁₂
Π_{*w*₀} *e*₁₂ ⊆ Π_{*w*₀} CON_{*w*₀} *e*₁₁

PST-presup: in ^T*w*₀, ^T*t*₁₃ is ^T*e*₀-past
PST-event: in ^T*w*₀, *e*₁₂ within ^T*t*₁₃
PST-update: new topical past ^T*t*₁₄

(4ii_E) *Johnny*_{if}
[**a** | **a** = *johnny*];

be. .PST (#PRS) .3SG
[*s* | EXP *s* =_{d_ω} **dα**]; [**dτ**₁ <_{d_ω} **∅dε**]; [**dτ**₁ ⊆_{d_ω} *dσ*]; [3SG_{d_ω, d_ε} **dα**];

asleep
[*dσ*: EXP *asleep*_{d_ω}]

*i*₂ = ⟨*w*₀, ⟨*a*₂, *t*₁₄, *a*₁₂, *t*₁₃, ..., *e*₀, *w*₀⟩, ⟨*s*₂, *l*₁₂, *e*₁₂, *l*₁₁...⟩⟩
s.t. ⋮

- *a*₃ = *johnny*
- EXP_{*w*₀} *s*₃ = *a*₃
- *t*₁₄ < **∅**_{*w*₀} *e*₀
*t*₁₄ ⊆ **∅**_{*w*₀} *s*₃
- *asleep*_{*w*₀}(*s*₃, EXP_{*w*₀} *s*₃)

PST-presup: in ^T*w*₀, ^T*t*₁₄ is ^T*e*₀-past
PST-state: in ^T*w*₀, *s*₂ holds at ^T*t*₁₄

^T <i>w</i> ₀ :	<ul style="list-style-type: none"> • ^T<i>e</i>₀. <i>e</i>₀-agent speaks up <i>t</i>₀ = ∅_{<i>w</i>₀} <i>e</i>₀. <i>e</i>₀-instant <i>t</i>₁₁. <i>e</i>₀-day ^T<i>t</i>₁₂. <i>e</i>₀-past within <i>e</i>₀-day • <i>e</i>₁₁: <i>e</i>₀-agent comes home to <i>l</i>₁₁ ^T<i>t</i>₁₃. <i>e</i>₀-past within <i>e</i>₁₁-consequent time • <i>e</i>₁₂: ^TAnn goes out (of <i>l</i>₁₁) to <i>l</i>₁₂ ^T<i>t</i>₁₄: <i>e</i>₀-past within <i>e</i>₁₂-consequent time — <i>s</i>₂: ^TJohnny is asleep 	<p><i>perspective point</i></p> <p>2ry <i>topical past</i></p> <p>1ry <i>topical past</i></p>
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3 TEMPORAL CENTERING IN TENSELESS KALAALLISUT (Bittner 2007, 2008)

3.0 Basic idea

- In tenseless Kalaallisut, temporal (re)centering is done mostly by (a) start-up topics, (b) topic update in initial fields (*if*, *ib* — see below), and (c) presuppositions of grammatical moods.
- Word order & information structure:
Kalaallisut has ‘free’ word order. But text studies show that a clause (verb + opt. dependents) conforms to the following topological schema, which correlates with information structure. (see Kalaallisut texts at <http://rci.rutgers.edu/~mbittner/ktxt.html>)

<u>initial field (<i>if</i>)</u>	<u>initial boundary (<i>ib</i>)</u>	<u>middle field (<i>mf</i>)</u>	<u>final boundary (<i>fb</i>)</u>	<u>final field (<i>ff</i>)</u>
(<i>if</i> -dependents)	(<i>ib</i> -dependents)	(<i>mf</i> -dependents)	verb	(<i>ff</i> -dependents)
upd. 1ry topic	upd. 2ry topic	upd. <i>background</i>	comment on topics	comment on bkg (upd. modal topic) (upd. background)

3.1 Default topic time: Speech instant

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle$$

(T) Start-up update

$$[w | w = r]; [e | e: \text{AGT } speak.up_{d_w}]; [t | t =_{d_w} \vartheta d\varepsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

- s.t. • $speak.up_{w_0}(e_0, \text{AGT}_{w_0} e_0)$
 • $t_0 = \vartheta_{w_0} e_0$

$${}^T w_0: \quad \bullet \quad {}^T e_0. e_0\text{-agent speaks up}$$

$$| \quad {}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant}$$

default *perspective point*
 default *topic time*

(3i_K) Aani_{if}

$$[a | a = aani];$$

if: 1ry topic ${}^T a_1$

go.out-

$$[e | e: \text{AGT } go.out_{d_w}];$$

fb: vrb-comment on ${}^T a_1$
 (at ${}^T t_0$ in ${}^T w_0$)

-IND

.IV

-3SG

$$[d\varepsilon <_{d_w} d\varepsilon]; [d\tau \subseteq_{d_w} \text{CON } d\varepsilon]; [\text{AGT } d\varepsilon =_{d_w} d\alpha]; [3\text{SG}_{d_w, d\varepsilon} d\alpha];$$

$$i_1 = \langle w_0, \langle a_1, t_0, e_0, w_0 \rangle, \langle e_1 \rangle \rangle$$

s.t. ∴

- $a_1 = ann$
- $go.out_{w_0}(e_1, \text{AGT}_{w_0} e_1)$
- $\vartheta_{w_0} e_1 < \vartheta_{w_0} e_0$
- $t_0 \subseteq \vartheta_{w_0} \text{CON}_{w_0} e_1$
- $\text{AGT}_{w_0} e_1 = a_1$
- $3\text{SG}_{w_0, e_0} a_1$

IND presup: e_1 is ${}^T w_0$ -fact verifiable from ${}^T e_0$
 IND-event: in ${}^T w_0$, CON e_1 holds at ${}^T t_0$ -instant

$${}^T w_0: \quad \bullet \quad {}^T e_0. e_0\text{-agent speaks up}$$

$$| \quad {}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant}$$

- $e_1: {}^T \text{Ann (non } e_0\text{-participant) goes out}$
 CON_{w₀} e_1 . consequent state of e_1

(3ii_K) *Juuna*_{if}[**a** | **a** = *juuna*];

be.asleep-

[*s* | *s*: EXP *asleep*_{d_ω}]

-IND

.IV

-3SG

[BEG *dσ* <_{d_ω} **dε**]; [**dτ** ⊆_{d_ω} *dσ*]; [EXP *dσ* =_{d_ω} **dα**]; [3SG_{d_ω, d_ε} **dα**];*if*: 1ry topic ^T*a*₂*fb*: vrb-comment on ^T*a*₂
(at ^T*t*₀ in ^T*w*₀)*i*₂ = ⟨*w*₀, ⟨*a*₂, *a*₁, *t*₀, *e*₀, *w*₀⟩, ⟨*s*₂, *e*₁⟩⟩

s.t. ∴

- *a*₂ = *juuna*
- *asleep*_{w₀}(*s*₂, EXP_{w₀} *s*₂)
- \mathfrak{I}_{w_0} BEG_{w₀} *s*₂ < \mathfrak{I}_{w_0} *e*₀
- t*₀ ⊆ \mathfrak{I}_{w_0} *s*₂
- EXP_{w₀} *s*₂ = *a*₂
- 3SG_{w₀, e₀} *a*₂

IND presup: *s*₂ is ^T*w*₀-fact verifiable from ^T*e*₀
 IND-state: in ^T*w*₀, *s*₂ holds at ^T*t*₀-instant

^T*w*₀:

- ^T*e*₀. *e*₀-agent speaks up
- | ^T*t*₀ = \mathfrak{I}_{w_0} *e*₀. *e*₀-instant
- *e*₁: Ann (non *e*₀-participant) goes out
- (_____ CON_{w₀} *e*₁. consequent state of *e*₁)
- _____ *s*₂: ^TJohn (non *e*₀-participant) is asleep

3.2 Temporal recentering without tense

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle$$

(T) Start-up update

$$[\mathbf{w} \mid \mathbf{w} = r]; [\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{speak.up}_{\mathbf{d}_w}]; [\mathbf{t} \mid \mathbf{t} =_{\mathbf{d}_w} \vartheta \mathbf{d}\varepsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

- s.t. • $\textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0)$
 • $t_0 = \vartheta_{w_0} e_0$

$$\begin{array}{l} \text{}^T w_0: \\ \quad \bullet \\ \quad | \end{array} \quad \begin{array}{l} \text{}^T e_0. e_0\text{-agent speaks up} \\ \text{}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$

default *perspective point*
 default *topic time*

$$(4i_K) \text{ day-} \quad \text{-SG.LOC}_{if}$$

$$[k^x \mid k^x \textit{day.of } \varepsilon \bullet]; [\mathbf{t} \mid \mathbf{t} \subseteq_{\mathbf{d}_w} \mathbf{d}k^x \langle \mathbf{d}\varepsilon \rangle]$$

emb *if*: 1ry top $\text{}^T t_{11}$

$$i_{11} = \langle w_0, \langle t_{11}, t_0, e_0, w_0 \rangle, \langle k^x_1 \rangle \rangle$$

s.t. ∴

- $\forall w \in \text{Dom } k^x_1 \forall e \bullet \in \text{Dom } k^x_1 w \exists t:$
 $t = k^x_1 w e \bullet \wedge \textit{day}_w t \wedge \vartheta_w e \bullet \subseteq t$
- $t_{11} \subseteq k^x_1 w_0 e_0$

$$\text{come.home-}$$

$$[e \mid e: \text{AGT } \textit{come.home}_{\mathbf{d}_w}];$$

emb *fb*: vrb-comnt
 on $\text{}^T t_{11}$

$$\text{-FCT}$$

$$[\mathbf{d}\varepsilon <_{\mathbf{d}_w} \mathbf{d}\varepsilon]; [\mathbf{d}\varepsilon \subseteq_{\mathbf{d}_w} \mathbf{d}\varepsilon]; [\mid \text{AGT } \mathbf{d}\varepsilon =_{\mathbf{d}_w} \text{AGT } \mathbf{d}\varepsilon];$$

$$\text{-1SG}$$

$$[\text{1SG}_{\mathbf{d}_w, \mathbf{d}_w} \text{AGT } \mathbf{d}\varepsilon]; [\mathbf{t} \mid \mathbf{t} \subseteq_{\mathbf{d}_w} \vartheta \text{CON } \mathbf{d}\varepsilon];$$

if: 1ry topic $\text{}^T t_{12}$

$$i_{12} = \langle w_0, \langle t_{12}, t_{11}, t_0, e_0, w_0 \rangle, \langle e_{11}, k^x_1 \rangle \rangle$$

s.t. ∴

- $\textit{come.home}_{w_0}(e_{11}, \text{AGT}_{w_0} e_{11})$
- $\vartheta_{w_0} e_{11} < \vartheta_{w_0} e_0$
 $\vartheta_{w_0} e_{11} \subseteq t_{11}$
- $\text{AGT}_{w_0} e_{11} = \text{AGT}_{w_0} e_0$
- $\text{1SG}_{w_0, e_0} \text{AGT}_{w_0} e_0$
 $:= (\text{SG } (\text{AGT}_{w_0} e_0) \wedge \text{AGT}_{w_0} e_0 = \text{AGT}_{w_0} e_0)$
- $t_{12} \subseteq \vartheta_{w_0} \text{CON}_{w_0} e_{11}$

FCT presup: e_{11} is $\text{}^T w_0$ -fact verifiable from $\text{}^T e_0$
 FCT-event: in $\text{}^T w_0$, e_{11} within $\text{}^T t_{11}$

if-event: in $\text{}^T w_0$, $\text{}^T t_{12}$ is part of e_{11} -conseq. time

$$\begin{array}{l} \text{}^T w_0: \\ \quad \bullet \\ \quad | \end{array} \quad \begin{array}{l} \text{}^T e_0. e_0\text{-agent speaks up} \\ t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$

default *perspective point*

$$\begin{array}{l} \text{||||||||||||||||} \\ \quad || \end{array} \quad \begin{array}{l} k^x_1 w_0 e_0. e_0\text{-day} \\ \text{}^T t_{11}. \text{part of } e_0\text{-day} \end{array}$$

2ry *topical period*

$$\bullet \quad e_{11}: e_0\text{-agent comes home}$$

$$\quad || \quad \text{}^T t_{12}. \text{part of } e_{11}\text{-consequent time}$$

1ry *topical period*

Aani_{ib}

[a | a = aani];

ib: 2ry topic ^Ta₁

go.out-

(causal inference)

fb: vrb-comment

[e | e: AGT go.out_{d_w}]; [Πdε ⊆_{d_w} ΠCON dε₁]on ^Ta₁ at ^Tt₁₂

-IND

.IV

-3SG

[dε <_{d_w} dε]; [dε ⊆_{d_w} dτ]; [AGT dε =_{d_w} dα]; [3SG_{d_w, dε} dα]; $i_{13} = \langle w_0, \langle a_1, t_{12}, t_{11}, t_0, e_0, w_0 \rangle, \langle e_{12}, e_{11}, k^r_1 \rangle \rangle$

s.t. ∴

- $a_1 = ann$
- $go.out_{w_0}(e_{12}, AGT_{w_0} e_{12})$
 $\Pi_{w_0} e_{12} \subseteq \Pi_{w_0} CON_{w_0} e_{11}$
- $\mathfrak{I}_{w_0} e_{12} < \mathfrak{I}_{w_0} e_0$
 $\mathfrak{I}_{w_0} e_{12} \subseteq t_{12}$
- $AGT_{w_0} e_{12} = a_1$
- $3SG_{w_0, e_0} a_1$

IND presup: e_{12} is ^Tw₀-fact verifiable from ^Te₀IND-event: in ^Tw₀, e_{12} within ^Tt₁₂(4ii_K) Juuna_{ib}

[a | a = juuna];

ib: 2ry topic ^Ta₂

be.asleep-

fb: vrb-comment

[s | s: EXP asleep_{d_w}]on ^Ta₂ (at ^Tt₁₂)

-IND

.IV

-3SG

[BEG dσ <_{d_w} dε]; [dτ ⊆_{d_w} dσ]; [EXP dσ =_{d_w} dα]; [3SG_{d_w, dε} dα]; $i_2 = \langle w_0, \langle a_2, a_1, t_{12}, t_{11}, t_0, e_0, w_0 \rangle, \langle s_2, e_{12}, e_{11}, k^r_1 \rangle \rangle$

s.t. ∴

- $a_2 = juuna$
- $asleep_{w_0}(s_2, EXP_{w_0} s_2)$
- $\mathfrak{I}_{w_0} BEG_{w_0} s_2 < \mathfrak{I}_{w_0} e_0$
 $t_0 \subseteq \mathfrak{I}_{w_0} s_2$
- $EXP_{w_0} s_2 = a_2$
- $3SG_{w_0, e_0} a_2$

IND presup: s_2 is ^Tw₀-fact verifiable from ^Te₀IND-state: in ^Tw₀, s_2 holds at ^Tt₁₂^Tw₀:

- ^Te₀. e_0 -agent speaks up
- | $t_0 = \mathfrak{I}_{w_0} e_0$. e_0 -instant
- ||||||||||||||||| $k^r_1 w_0 e_0$. e_0 -day
- || ^Tt₁₁. period within e_0 -day
- e_{11} : e_0 -agent comes home (to $\Pi_{w_0} CON_{w_0} e_{11}$)
- || ^Tt₁₂. period within e_{11} -consequent time
- e_{12} : Ann (non e_0 -particip.) goes out (of $\Pi_{w_0} CON_{w_0} e_{11}$)
- s_2 : ^TJohn (non e_0 -participant) is asleep

perspective point

2ry topical period

1ry topical period

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle$$

(^T) Start-up update

$$[\mathbf{w} | \mathbf{w} = r]; [\mathbf{e} | \mathbf{e}: \text{AGT } \textit{speak.up}_{d_w}]; [\mathbf{t} | \mathbf{t} =_{d_w} \vartheta \mathbf{d}\epsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

- s.t. • $\textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0)$
 • $t_0 = \vartheta_{w_0} e_0$

^T w ₀ :	•	^T e ₀ . e ₀ -agent speaks up	default <i>perspective point</i>
		^T t ₀ = $\vartheta_{w_0} e_0$. e ₀ -instant	default <i>topic time</i>

(5i_K) day- -SG.LOCif
 $[k^x | k^x \textit{day.of } \epsilon \bullet]; [\mathbf{t} | \mathbf{t} \subseteq_{d_w} d\kappa^x \langle \mathbf{d}\epsilon \rangle]$

if: 1ry top ^Tt₁

Aani_{ib}

ib: 2ry topic ^Ta₁

$$[\mathbf{a} | \mathbf{a} = \textit{aani}];$$

come.home-

fb: vrb-comment
 on ^Ta₁ at ^Tt₁

$$[\mathbf{e} | \mathbf{e}: \text{AGT } \textit{come.home}_{d_w}];$$

-IND

.IV

-3SG

$$[d\epsilon <_{d_w} \mathbf{d}\epsilon]; [d\epsilon \subseteq_{d_w} \mathbf{d}\tau]; [\text{AGT } d\epsilon =_{d_w} \mathbf{d}\alpha]; [3\text{SG}_{d_w, d\epsilon} \mathbf{d}\alpha];$$

$$i_1 = \langle w_0, \langle a_1, t_1, t_0, e_0, w_0 \rangle, \langle e_1, k^x_1 \rangle \rangle$$

s.t. ∴

- $\forall w \in \text{Dom } k^x_1 \forall e \bullet \in \text{Dom } k^x_1 w \exists t:$
 $t = k^x_1 w e \bullet \wedge \textit{day}_w t \wedge \vartheta_w e \bullet \subseteq t$
- $t_1 \subseteq k^x_1 w_0 e_0$
- $a_1 = \textit{ann}$
- $\textit{come.home}_{w_0}(e_1, \text{AGT}_{w_0} e_1)$
- $\vartheta_{w_0} e_1 < \vartheta_{w_0} e_0$
- $\vartheta_{w_0} e_1 \subseteq t_1$
- $\text{AGT}_{w_0} e_1 = a_1$
- $3\text{SG}_{w_0, e_0} a_1$

IND presup: e₁ is ^Tw₀-fact verifiable from ^Te₀
 IND-event: in ^Tw₀, e₁ within ^Tt₁

^T w ₀ :	•	^T e ₀ . e ₀ -agent speaks up	<i>perspective point</i>
		$t_0 = \vartheta_{w_0} e_0$. e ₀ -instant	
		$k^x_1 w_0 e_0$. e ₀ -day	
		^T t ₁ . period within e ₀ -day	<i>topical period</i>
	•	e ₁ : Aani (non e ₀ -participant) comes home	

(5ii_K) helicopter-
 $[k^x | helicopter\ k^x]; [l | (\Pi d\epsilon \subseteq_{d_0} l \subseteq_{d_0} dk^x \langle d\epsilon \rangle), (l \not\subseteq \Pi CON\ d\epsilon)]$

step.out-
 $[vehicle_{d_0}\ d\pi]; [d\epsilon: AGT\ step.out.of_{d_0}\ d\pi];$

-FCT
 $[d\epsilon <_{d_0} d\epsilon]; [d\epsilon \subseteq_{d_0} d\tau]; [a | a = d\alpha]; [AGT\ d\epsilon =_{d_0} d\alpha];$

-3SG₁
 $[3SG_{d_0, d\epsilon}\ d\alpha]; [t | t \subseteq_{d_0} \vartheta CON\ d\epsilon];$

if: 1ry topic ^Tt₂

$i_2 = \langle w_0, \langle t_2, a_1, t_1, t_0, e_0, w_0 \rangle, \langle a_1, l_2\ k^x_2, e_1, k^x_1 \rangle \rangle$

s.t. :

- $\forall w \in Dom\ k^x_2 \forall e \in Dom\ k^x_2 w \exists l, t:$
 $l = k^x_2 w e \wedge helicopter_{w, t}\ l \wedge \vartheta_w\ e \subseteq t$
- $\Pi_{w_0}\ e_1 \subseteq l_2 \subseteq k^x_1 w_0 e_1 \wedge l_2 \not\subseteq \Pi_{w_0}\ CON_{w_0}\ e_1$
- $step.out.of_{w_0}(e_1, AGT_{w_0}\ e_1, l_2)$
- $\vartheta_{w_0}\ e_1 < \vartheta_{w_0}\ e_0$
 $\vartheta_{w_0}\ e_1 \subseteq t_1$
- $AGT_{w_0}\ e_1 = a_1$
- $3SG_{w_0, e_0}\ a_1$
- $t_2 \subseteq \vartheta_{w_0}\ CON_{w_0}\ e_1$

IND presup: e_1 is ^Tw₀-fact verifiable from ^Te₀
 IND-event: in ^Tw₀, e_1 within ^Tt₁

^Tw₀:

- ^Te₀. e_0 -agent speaks up *perspective point*
- | $t_0 = \vartheta_{w_0}\ e_0$. e_0 -instant
- ||||||||||||||||| $k^x_1 w_0 e_0$. e_0 -day
- || ^Tt₁. period within e_0 -day 2ry topical period
- e_1 : Aani (non e_0 -participant) steps out of
- || l_2 in a k^x_2 -helicopter, (& thereby) comes home
- || ^Tt₂: period within e_1 -consequent time 1ry *topical period*

husband-

 $[k_{\alpha}^{\alpha} | k_{\alpha}^{\alpha} \text{ husband.of } \alpha];$ -3SG_L.SG.ERG_{ib} $[\mathbf{a} | 3\text{SG}_{\mathbf{d}_0, \mathbf{d}_\varepsilon} \mathbf{d}\alpha, \mathbf{d}\alpha \neq \mathbf{a}]; [\mathbf{d}\alpha =_{\mathbf{d}_0} \mathbf{d}\alpha \kappa^{\alpha} \{ \mathbf{d}\alpha, \mathbf{d}\varepsilon \}]$ *ib*: 2ry topic ${}^T a_2$

run-

 $[ee | ee: \text{AGT } \text{run}_{\mathbf{d}_0}];$ *mf*: update background-ELA_T-3SG_T $[\text{AGT } \mathbf{d}\varepsilon\varepsilon =_{\mathbf{d}_0} \mathbf{d}\alpha]; [{}^1\mathbf{d}\varepsilon\varepsilon \subseteq_{\mathbf{d}_0} \mathbf{d}\tau]; [3\text{SG}_{\mathbf{d}_0, \mathbf{d}_\varepsilon} \mathbf{d}\alpha];$

approach-

 $[k^{\alpha} | \mathbf{d}\varepsilon\varepsilon: \text{AGT } \text{approach}_{\mathbf{d}_0} k^{\alpha}];$ *fb*: vrb-comment on ${}^T a_2$
at ${}^T t_2$ (in ${}^T w_0$)

-IND

.TV

 $[{}^1\mathbf{d}\varepsilon\varepsilon <_{\mathbf{d}_0} \mathbf{d}\varepsilon]; [{}^1\mathbf{d}\varepsilon\varepsilon \subseteq_{\mathbf{d}_0} \mathbf{d}\tau]; [\text{AGT } \mathbf{d}\varepsilon\varepsilon =_{\mathbf{d}_0} \mathbf{d}\alpha, \mathbf{d}\kappa^{\alpha} \langle \mathbf{d}\varepsilon\varepsilon \rangle =_{\mathbf{d}_0} \mathbf{d}\alpha];$

-3SG.

.3SG

 $[3\text{SG}_{\mathbf{d}_0, \mathbf{d}_\varepsilon} \mathbf{d}\alpha]; [3\text{SG}_{\mathbf{d}_0, \mathbf{d}_\varepsilon} \mathbf{d}\alpha, \mathbf{d}\alpha \neq \mathbf{d}\alpha]$ $i_2 = \langle w_0, \langle a_2, t_2, a_1, t_1, t_0, e_0, w_0 \rangle, \langle k^{\alpha}_2, ee_2, k^{\alpha}_2 a_1, l_2 k^{\alpha}_2, e_1, k^{\alpha}_1 \rangle \rangle$

s.t. :

- $\forall a \in \text{Dom } k^{\alpha}_2 \forall w \in \text{Dom } k^{\alpha}_2 a \forall e \in \text{Dom } k^{\alpha}_2 a w \exists a', t:$
 $a' = k^{\alpha}_2 a w e \bullet \wedge \text{husband.of}_{w, t}(a', a) \wedge \vartheta_w e \bullet \subseteq t$
- $3\text{SG}_{w_0, e_0} a_1 \wedge a_1 \neq a_2 \wedge a_2 = k^{\alpha}_2 a_1 w_0 e_1$
- $\text{process}_{w_0} ee_2$
 $\wedge \forall e \in ee_2: \text{run}_{w_0}(e, \text{AGT}_{w_0} e)$
 $\wedge \text{approach}_{w_0}(e, \text{AGT}_{w_0} e, k^{\alpha}_2 w e)$
 $\wedge \text{AGT}_{w_0} ee_2 = \cup \{ \text{AGT}_{w_0} e: e \in ee_2 \}$
 $\wedge k^{\alpha}_2 w_0 ee_2 = \cup \{ k^{\alpha}_2 w_0 e: e \in ee_2 \}$
- $\text{AGT}_{w_0} ee_2 = a_2$
- $\vartheta_{w_0} {}^1 ee_2 \subseteq t_2$
- $\vartheta_{w_0} {}^1 ee_2 < \vartheta_{w_0} e_0$
- $\vartheta_{w_0} {}^1 ee_2 \subseteq t_2$
- $\text{AGT}_{w_0} ee_2 = a_2 \wedge k^{\alpha}_2 w_0 ee_2 = a_1$
- $3\text{SG}_{w_0, e_0} a_2 \wedge 3\text{SG}_{w_0, e_0} a_1$

ELA_T-press: in ${}^T w_0$, stg1 of ee_2 within ${}^T t_2$ **IND-presup.:** stg1 of ee_2 is ${}^T w_0$ -fact
verifiable from ${}^T e_0$ IND_T-press: in ${}^T w_0$, stg1 of ee_2 within ${}^T t_2$ ${}^T w_0$:

- ${}^T e_0$. e_0 -agent speaks up
- | $t_0 = \vartheta_{w_0} e_0$. e_0 -instant
- ||||||||||||||||| $k^{\alpha}_1 w_0 e_0$. e_0 -day
- || ${}^T t_1$. period within e_0 -day
- e_1 : Aani (non e_0 -participant) steps out of
 l_2 in a k^{α}_2 -helicopter, comes home
- || ${}^T t_2$: period within e_1 -consequent time
- ee_2 : Aani's husband runs toward Aani

perspective point

2ry topical period

1ry *topical period*

4 MOOD AS MODAL CENTERING: KALAALLISUT (Bittner 2007, 2008)

4.0 Basic idea

- Grammatical MOOD morphemes (a) have presuppositions that relate the perspective point to a topical modality, and (b) may update modal topics.

4.1 Default topical modality: Speech world

$$i_{-1} = \langle w_0, \langle \rangle, \langle \rangle \rangle$$

(T) Start-up update

$$[\mathbf{w} \mid \mathbf{w} = r]; [\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{speak.up}_{d_\omega}]; [\mathbf{t} \mid \mathbf{t} =_{d_\omega} \vartheta \mathbf{d}\varepsilon]$$

$$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$$

- s.t.
- $\textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0)$
 - $t_0 = \vartheta_{w_0} e_0$

topical world

$${}^T w_0: \quad \bullet \quad \begin{array}{l} {}^T e_0. e_0\text{-agent speaks up} \\ | \\ {}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$$

perspective point(6a_K) Aani_{if}

$$[\mathbf{a} \mid \mathbf{a} = \textit{aani}];$$

come.home-

$$[\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{come.home}_{d_\omega}];$$

-IND**.IV****-3SG**

$$[\mathbf{d}\varepsilon <_{d_\omega} \mathbf{d}\varepsilon]; [\mathbf{d}\tau \subseteq_{d_\omega} \text{CON } \mathbf{d}\varepsilon]; [\text{AGT } \mathbf{d}\varepsilon =_{d_\omega} \mathbf{d}\alpha]; [3\text{SG}_{d_\omega, \mathbf{d}\varepsilon} \mathbf{d}\alpha];$$

if: 1ry topic ${}^T a_1$ *fb*: vrb-comment on ${}^T a_1$
(at ${}^T t_0$ in ${}^T w_0$)

$$i_1 = \langle w_0, \langle a_1, t_0, e_0, w_0 \rangle, \langle e_1 \rangle \rangle$$

s.t. ∴

- $a_1 = \textit{ann}$
- $\textit{come.home}_{w_0}(e_1, \text{AGT}_{w_0} e_1)$
- $\vartheta_{w_0} e_1 < \vartheta_{w_0} e_0$
- $t_0 \subseteq \vartheta_{w_0} \text{CON}_{w_0} e_1$
- $\text{AGT}_{w_0} e_1 = a_1$
- $3\text{SG}_{w_0, e_0} a_1$

IND presup: e_1 is ${}^T w_0$ -fact verifiable from ${}^T e_0$
IND-event: in ${}^T w_0$, **CON** e_1 holds at ${}^T t_0$ -instant

$${}^T w_0: \quad \bullet \quad \begin{array}{l} {}^T e_0. e_0\text{-agent speaks up} \\ | \\ {}^T t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \\ \bullet \\ \text{---} \quad e_1: {}^T \text{Ann (non } e_0\text{-participant) comes home} \\ \text{---} \quad \text{CON}_{w_0} e_1. \text{ consequent state of } e_1 \end{array}$$

4.2 *Modal recentering by matrix mood*

(T) Start-up update

 $[\mathbf{w} \mid \mathbf{w} = r]; [\mathbf{e} \mid \mathbf{e}: \text{AGT } \textit{speak.up}_{d_\omega}]; [\mathbf{t} \mid \mathbf{t} =_{d_\omega} \vartheta \mathbf{d}\varepsilon]$ $i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$ s.t. • $\textit{speak.up}_{w_0}(e_0, \text{AGT}_{w_0} e_0)$ • $t_0 = \vartheta_{w_0} e_0$ ω -topic $\begin{array}{l} \top w_0: \quad \bullet \quad \top e_0. e_0\text{-agent speaks up} \\ \quad \quad \quad | \quad \quad \top t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$ *perspective point* (ε -topic)(6b_K) Aani_{if} $[\mathbf{a} \mid \mathbf{a} = \textit{aani}];$

come.home-

 $[\underline{e} \mid \underline{e}: \text{AGT } \textit{come.home}];$

-OPT.

 $[(\mathbf{d}\varepsilon: \text{AGT } \textit{wish.for}_{d_\omega} d\varepsilon), (\text{CON } \mathbf{d}\varepsilon < \text{CON } d\varepsilon)]$ $[(d\varepsilon \subseteq \vartheta \text{CON } \mathbf{d}\varepsilon), (\text{AGT } d\varepsilon = \mathbf{d}\alpha)];$ $[\mathbf{p} \mid \mathbf{p} = \text{Dom } d\varepsilon]$

.3SG

 $[3\text{SG}_{d_\omega, d_\varepsilon} \mathbf{d}\alpha];$ $i_1 = \langle w_0, \langle p_1, a_1, t_0, e_0, w_0 \rangle, \langle \underline{e}_1 \rangle \rangle$

s.t. ∴

• $a_1 = \textit{ann}$ • $\forall w \in \text{Dom } \underline{e}_1: \textit{come.home}_w(\underline{e}_1 w, \text{AGT}_w \underline{e}_1 w)$ • $\textit{wish.for}_{w_0}(e_0, \text{AGT}_{w_0} e_0, \text{Dom } \underline{e}_1)$ • $\forall w \in \text{Dom } \underline{e}_1: \vartheta_w \text{CON}_w e_0 < \vartheta_w \text{CON}_w \underline{e}_1 w$ • $\forall w \in \text{Dom } \underline{e}_1: \vartheta_w \underline{e}_1 w \subseteq \vartheta_w \text{CON}_w e_0$ $\wedge \text{AGT}_w \underline{e}_1 w = a_1$ • $p_1 = \text{Dom } \underline{e}_1$ • $3\text{SG}_{w_0, e_0} a_1$ **OPT presup:** in $\top w_0, \top e_0$ is an act of wishing for \underline{e}_1 -future**OPT wish:** \underline{e}_1 is an action by $\top a_1$ terminating the consequent state of $\top e_0$ (wish satisfied)**OPT-upd.:** new Ω -topic: satisfaction worlds ω -topic $\begin{array}{l} \top w_0: \quad \bullet \quad \top e_0. e_0\text{-agent speaks up, wishes for } \top p_1\text{-future} \\ \quad \quad \quad | \quad \quad \top t_0 = \vartheta_{w_0} e_0. e_0\text{-instant} \end{array}$ *perspective point* (ε -topic) Ω -topic: $\top p_1 = \text{Dom } \underline{e}_1$ $w_1 \in \top p_1$ — $\text{CON}_{w_1} e_0. \text{desired consequent state of } \top e_0$ • $\underline{e}_1 w_1: \top \text{Ann (non } e_0\text{-participant) comes home}$

(6c_K) $Aani_{if}$, (prosody)
 $[a | a = aani]; [2SG_{d_\omega, d_\varepsilon} \mathbf{d}\alpha];$

if: 1ry topic $\top a_1 = \top e_0\text{-exp}$

come.home-

fb: vrb-comment on $\top a_1$

$[e | e: AGT \textit{come.home}];$

-IMP.

$[(\mathbf{d}\varepsilon: AGT \textit{command}_{d_\omega} d_\varepsilon), (\text{CON } \mathbf{d}\varepsilon < \text{CON } d_\varepsilon)]$

$[(d_\varepsilon \subseteq \vartheta \text{CON } \mathbf{d}\varepsilon), (AGT d_\varepsilon = \text{EXP}_{d_\omega} \mathbf{d}\varepsilon)];$

$[p | p = \text{Dom } d_\varepsilon]$

.2SG

$[2SG_{d_\omega, d_\varepsilon} \mathbf{d}\alpha];$

$i_1 = \langle w_0, \langle p_1, a_1, t_0, e_0, w_0 \rangle, \langle e_1 \rangle \rangle$

s.t. \vdots

- $a_1 = ann \wedge 2SG_{w_0, e_0} a_1$
 - $\forall w \in \text{Dom } e_1: \textit{come.home}_w(e_1 w, AGT_w e_1 w)$
 - $\textit{command}_{w_0}(e_0, AGT_{w_0} e_0, \text{Dom } e_1)$
 $\forall w \in \text{Dom } e_1: \vartheta_w \text{CON}_w e_0 < \vartheta_w \text{CON}_w e_1 w$
 - $\forall w \in \text{Dom } e_1: \vartheta_w e_1 w \subseteq \vartheta_w \text{CON}_w e_0$
 $\wedge AGT_w e_1 w = \text{EXP}_{w_0} e_0$
- $p_1 = \text{Dom } e_1$

IMP presup: in $\top w_0, \top e_0$ is an act of commanding
 e_1 -future

IMP cmd: e_1 is an action by $\top e_0\text{-exp}$ terminating
the consequent state of $\top e_0$ (cmd carried out)

IMP-upd.: new Ω -topic: compliance worlds

ω -topic

$\top w_0:$

- $\top e_0. e_0\text{-agt}$ speaks to $\top \text{Ann}$, commands $\top p_1$ -future
- | $\top t_0 = \vartheta_{w_0} e_0. e_0\text{-instant}$

perspective point

 Ω -topic: $\top p_1 = \text{Dom } e_1$

$w_1 \in \top p_1$

- $\text{CON}_{w_1} e_0. \text{commanded consequent state of } \top e_0$
- $e_1 w_1: \top \text{Ann}, e_0\text{-exp}$ in $\top w_0$, comes home

4.3 Modal recentering by evidential clitic

(\top) Start-up update

$[w | w = r]; [e | e: AGT speak.up_{d_w}]; [t | t =_{d_w} \vartheta d\epsilon]$

$i_0 = \langle w_0, \langle t_0, e_0, w_0 \rangle, \langle \rangle \rangle$

s.t. • $speak.up_{w_0}(e_0, AGT_{w_0} e_0)$

• $t_0 = \vartheta_{w_0} e_0$

ω -topic

\top_{w_0} : • \top_{e_0} . e_0 -agent speaks up
| $\top_{t_0} = \vartheta_{w_0} e_0$. e_0 -instant

perspective point

(7_K) Aani-SG.ERG_{if}

$[a | a = aani];$

if: 1ry topic \top_{a_1}

day- -SG.LOC

$[k^x | k^x day.of \epsilon \bullet]; [t | t \subseteq_{d_w} d\kappa^x \langle d\epsilon \rangle]$

ib: 2ry topic \top_{t_1}

leave-

$[e k^\alpha | e: AGT leave_{d_w} k^\alpha];$

fb: vrb-comment on \top_{a_1}
at \top_{t_1} (in \top_{w_0})

-IND .TV

$[d\epsilon <_{d_w} d\epsilon]; [d\epsilon \subseteq_{d_w} d\tau]; [a | AGT d\epsilon =_{d_w} d\alpha, d\kappa^\alpha \langle d\epsilon \rangle =_{d_w} a];$

-3SG. .2SG

$[3SG_{d_w, d\epsilon} d\alpha]; [2SG_{d_w, d\epsilon} d\alpha]$

$i_1 = \langle w_0, \langle t_1, a_{11}, t_0, e_0, w_0 \rangle, \langle a_{12}, e_1, k^\alpha_1, k^x_1 \rangle \rangle$

s.t. ∴

- $a_{11} = ann$
- $\forall w \in \text{Dom } k^x_1 \forall e \bullet \in \text{Dom } k^x_1 w \exists t:$
 $t = k^x_1 w e \bullet \wedge day_w t \wedge \vartheta_w e \bullet \subseteq t$
- $t_1 \subseteq k^x_1 w_0 e_0$
- $leave_{w_0}(e_1, AGT_{w_0} e_1, k^\alpha_1 w_0 e_1)$
- $\vartheta_{w_0} e_1 < \vartheta_{w_0} e_0$
 $\vartheta_{w_0} e_1 \subseteq t_1$
- $AGT_{w_0} e_1 = a_{11} \wedge k^\alpha_1 w_0 e_1 = a_{12}$
- $3SG_{w_0, e_0} a_{11} \wedge 2SG_{w_0, e_0} a_{12}$

IND presup: e_1 is \top_{w_0} -fact verifiable from \top_{e_0}
IND-event: in \top_{w_0} , CON e_1 holds at \top_{t_0} -instant

ω -topic

\top_{w_0} : • \top_{e_0} . e_0 -agent speaks up
| $\top_{t_0} = \vartheta_{w_0} e_0$. e_0 -instant

perspective point

||||||||||||||||||||| $k^x_1 w_0 e_0$. e_0 -day

||| \top_{t_1} . part of e_0 -day

1ry *topic time* (period)

• $e_1: \top_{a_{11}} = Ann$ (non e_0 -prtcp) leaves $\top_{a_{12}} = e_0$ -exp

(8_K) Aani-SG.ERG

[a] a = aani];

=RPT_{if}[p e | (e: AGT say_{d_ω} p), (e <_{d_ω} dε), (3_{d_ω, d_ε} <AGT e))];

day- -SG.LOC

[k^r | k^r day.of ε•]; [t | t ⊆_{d_Ω} dk^r <dε>]

leave-

[e k^α | e: AGT leave k^α];

-IND .TV

[d_ε <_{d_Ω} dε]; [d_ε ⊆_{d_Ω} dτ]; [a | AGT d_ε =_{d_Ω} dα, dk^α <d_ε> =_{d_Ω} a];

-3SG. .2SG

[3SG_{d_ω, d_ε} dα]; [2SG_{d_ω, d_ε} dα] $i_1 = \langle w_0, \langle t_1, p_1, a_{11}, t_0, e_0, w_0 \rangle, \langle a_{12}, \underline{e}_{12}, k^{\alpha}_1, k^r_1, e_{11} \rangle \rangle$

s.t. :

- $a_{11} = ann$
- $say_{w_0}(e_{11}, AGT_{w_0} e_{11}, p_1)$
 $\vartheta_{w_0} e_{11} < \vartheta_{w_0} e_0$
 $3_{w_0, e_0} (AGT_{w_0} e_{11})$
 $:= (AGT_{w_0} e_{11} \cap (AGT_{w_0} e_0 + EXP_{w_0} e_0))$
- $\forall w \in \text{Dom } k^r_1 \forall e \in \text{Dom } k^r_1 w \exists t:$
 $t = k^r_1 w e \wedge day_w t \wedge \vartheta_w e \subseteq t$
- $\forall w \in p_1: t_1 w \subseteq k^r_1 w e_0$
- $\text{Dom } \underline{e}_{12} = \text{Dom } k^{\alpha}_1$
 $\wedge \forall w \in \text{Dom } \underline{e}_{12}:$
 $leave_w(\underline{e}_{12} w, AGT_w \underline{e}_{12} w, k^{\alpha}_1 w \underline{e}_{12} w)$
- $\forall w \in p_1: \vartheta_w \underline{e}_{12} w < \vartheta_w e_{11}$
 $\forall w \in p_1: \vartheta_w \underline{e}_{12} w \subseteq t_1 w$
- $\forall w \in p_1: AGT_w \underline{e}_{12} w = a_{11} \wedge k^{\alpha}_1 w \underline{e}_{12} w = a_{12}$
- $3SG_{w_0, e_0} a_{11} \wedge 2SG_{w_0, e_0} a_{12}$

RPT-upd: in ${}^T w_0, {}^T p_1$ was said in e_{11} ,
 verifiable from ${}^T e_0$,
 by non- ${}^T e_0$ participant

IND presup: \underline{e}_1 is ${}^T p_1$ -fact verifiable from e_{11}
 IND-rpt.evt: in ${}^T p_1, \underline{e}_1$ within ${}^T t_1$ -period

 ω -topic ${}^T w_0:$

- ${}^T e_0$. e_0 -agent speaks up 1ry *perspective point*
- | ${}^T t_0 = \vartheta_{w_0} e_0$. e_0 -instant
- e_{11} : e_{11} -agent (non e_0 -participant) says ${}^T p_1$ 2ry *perspective point*

 Ω -topic: ${}^T p_1$ $w_1 \in p_1$

||||||||||||||||

 $k^r_1 w_1 e_0$. e_0 -day

|||

 ${}^T t_1 w_1$. part of e_0 -day1ry *topic time* (period)

•

 $\underline{e}_{12} w_1: {}^T a_{11} = \text{Ann}$ (non e_0 -prtcp) leaves ${}^{\perp} a_{12} = e_0$ -exp

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**Real vs. vivid scenarios:
Update semantics with centering**

0. DATA

- (\top) *Initial context* $c^* = \langle p^*, e^* \rangle$ (of initial *common ground* p^* & *speech act* e^*)
s.t. (i) $p^* \neq \emptyset$, (ii) $\forall w \in p^*(\text{speak.up}_w(e^*, \text{AGT}_w e^*))$

induces the following *default state* of information and attention

$[c^*] := \lambda i. \exists w \in p^*(i = \langle \langle p^*, \text{th}_w e^*, e^*, w \rangle, \langle \rangle \rangle)$

i.e. $\forall i \in [c^*]$:

$\mathbf{d}\omega i$ $\mathbf{d}\Omega i$

$\top_w \in \top p^*$:

•

|

$\top e^*$: e^* -agent speaks up

$\top \text{th}_w e^*$: e^* -instant

topic world, cmn. ground

$\mathbf{d}\epsilon i$: perspective point

$\mathbf{d}\tau i$: topic time

$[c^*]$ serves as the input state for interpreting what is said in e^*

English (E)

- (real) present

(1_E) *I am busy.*
I be.PRS.1SG busy

- (2_E) i. *Ann has dropped in.*
Ann have.PRS.3SG drop+in-PRF
ii. *John is delighted.*
John be.PRS.3SG delighted

- (real) past

(3_E) i. *Today when I came home,*
today when I come+home.PST_{if}
Ann dropped in.
Ann drop+in.PST
ii. *John was delighted.*
John be.PST.3SG delighted
(because Ann, his friend,
had come to visit)

- vivid future

(4_E) i. *Ann has promised*
Ann have.PRS.3SG promise.PRF
i'. *to drop in today.*
INF drop+in today
ii. *John will be delighted.*
John VIV.FUT be delighted

Kalallisut (K)

- real (present)

(1_K) *ulapig-pu-nga*
be.busy-IND.IV-1SG

- (2_K) i. *Juuna nuannaar-pu-q*
Juuna be.delighted-IND.IV-3SG
i'. *Aani isir-mm-at.*
Ann come.in-FCT_⊥-3SG_⊥

- real (past)

(3_K) i. *Ulluq-mi angirlar-ga-ma*
day-SG.LOC come.home-FCT_⊥-1SG
i'. *Aani pulaar-llu-ni isir-pu-q.*
Aani visit-ELA_⊥-3SG_⊥ cm.in-IND.IV-3SG
ii. *Ikinngut-ni isir-mm-at*
friend-3SG_⊥.SG come.in-FCT_⊥-3SG_⊥
ii'. *Juuna nuannaar-pu-q.*
Juuna be.delighted-IND.IV-3SG

- real prospect

(4_K) i. *Aani niriursui-pu-q*
Aan promise-IND.IV-3SG
i'. *ulluq-mi isir-ssa-llu-ni.*
day-SG.LOC come.in-prospect-ELA_⊥-3SG_⊥
ii. *Juuna nuannaar-ssa-pu-q.*
Juuna be.delighted-prospect-IND.IV-3SG

(1_K) be.busy- $[s \mid \text{busy}_{\mathbf{d}\omega} \langle s, \text{EXP} \rangle];$ $\lambda \lambda j. \exists i \in I \exists s(j = \langle \tau_i, s \cdot \perp_i \rangle \wedge \text{busy}_{\mathbf{d}\omega i}(s, \text{EXP}_{\mathbf{d}\omega i} s))$ **Kalaallisut**

D8, D7

-IND.IV $[\partial(\text{speak}_{\mathbf{d}\omega} \langle \mathbf{d}\epsilon, \text{AGT} \rangle);$ $\lambda \lambda j. j \in I \wedge \forall i \in I(\text{speak}_{\mathbf{d}\omega i}(\mathbf{d}\epsilon_i, \text{AGT}_{\mathbf{d}\omega i} \mathbf{d}\epsilon_i))$

D9.∂, D8, D7

 $[\text{BEG } d\sigma <_{\mathbf{d}\omega} \mathbf{d}\epsilon, \mathbf{d}\tau \subseteq_{\mathbf{d}\omega} d\sigma];$ $\lambda \lambda i. i \in I \wedge \vartheta_{\mathbf{d}\omega i} \text{BEG}_{\mathbf{d}\omega i} d\sigma i < \vartheta_{\mathbf{d}\omega i} \mathbf{d}\epsilon i \wedge \mathbf{d}\tau i \subseteq \vartheta_{\mathbf{d}\omega i} d\sigma i$

D8, D7

 $[\text{AGT } \mathbf{d}\epsilon =_{\mathbf{d}\omega} \text{EXP } d\sigma];$ $\lambda \lambda i. i \in I \wedge \text{AGT}_{\mathbf{d}\omega i} \mathbf{d}\epsilon i = \text{EXP}_{\mathbf{d}\omega i} d\sigma i$

D8, D7

[p];**[dΩ ~ dω]** $(\lambda \lambda j. \exists i \in I \exists p(j = \langle \langle \mathbf{p} \cdot \tau_i, \perp_i \rangle \rangle); (\lambda \lambda i. i \in I \wedge \mathbf{d}\Omega i = \mathbf{d}\omega i))$

D8, D9.~

-1SG $[\partial(\text{1SG}_{\mathbf{d}\omega, \mathbf{d}\epsilon} \text{AGT } \mathbf{d}\epsilon)];$ $\lambda \lambda j. j \in I \wedge \forall i \in I(\text{AGT}_{\mathbf{d}\omega i} \mathbf{d}\epsilon_i = \text{AGT}_{\mathbf{d}\omega i} \mathbf{d}\epsilon_i)$

D9.∂, D7

 $\forall i \in I_1 \exists w, p_1, s_1: p_1 = \mathbf{d}\omega i_1 \wedge i = \langle \langle p_1, p^*, \vartheta_w e^*, e^*, w \rangle, \langle s_1 \rangle \rangle$

s.t.

 $\tau_w \in \tau_{p_1}$

•

 $\tau e^*. e^*\text{-agt speaks up}$

|

 $\tau \vartheta_w e^*. e^*\text{-instant}$

—

 $s_1: e^*\text{-agt is busy}$

$$(\top) [c^*] := \lambda i. \exists w \in p^*(i = \langle \langle p^*, \vartheta_w e^*, e^*, w \rangle, \langle \rangle \rangle)$$

$$\forall i \in [c^*] \exists w \in p^*$$

s.t.

$$\begin{array}{l} \top w \in \top p^*: \quad \bullet \quad \top e^*: e^*\text{-agent speaks up} \\ \quad \quad \quad \quad \quad | \quad \quad \quad \top \vartheta_w e^*: e^*\text{-instant} \end{array}$$
(2i_E) Ann

[a] a = ann];

(\lambda \lambda j. \exists i \in I \exists a(j = \langle a \cdot \top_i, \perp_i \rangle \wedge a = ann));

if

[3SG_{d Ω , d ϵ} d α];

(\lambda \lambda i. i \in I \wedge d\Omega i \neq \emptyset \wedge \forall w \in d\Omega i (d\alpha i \not\subseteq (AGT_w d\epsilon_i + EXP_w d\epsilon_i)))

have.

[s e | EXP s =_{d ω} AGT e];

\lambda \lambda j. \exists i \in I \exists s, e(j = \langle \top_i, (s \cdot (e \cdot \perp_i)) \rangle) \wedge EXP_{d\omega i} s = AGT_{d\omega i} e)

.PRS.3SG

[\hat{c}(d\tau =_{d\omega} \vartheta d\epsilon)]; [d\tau \subseteq_{d\omega} d\sigma]; [d\alpha =_{d\omega} EXP d\sigma]

drop+in.

.PRF

[drop.in_{d ω} \langle d\epsilon, AGT \rangle];[d\sigma =_{d\omega} CON d\epsilon]

\lambda \lambda i. i \in I \wedge drop.in_{d\omega i}(d\epsilon i, AGT_w d\epsilon i); (\lambda \lambda i. i \in I \wedge d\sigma i = \vartheta_{d\omega i} CON d\epsilon i)

. (intonation)

[p];

[d\Omega \sim d\omega]

(\lambda \lambda j. \exists i \in I \exists p(j = \langle \langle p \cdot \top_i, \perp_i \rangle \rangle); (\lambda \lambda i. i \in I \wedge d\Omega i = d\omega i))

$$\forall i \in I_1 \exists p_1, a_1, \dots, w, s_1, e_1: p_1 = d\omega I_1 \wedge i = \langle \langle p_1, a_1, p^*, \vartheta_w e^*, e^*, w \rangle, \langle s_1, e_1 \rangle \rangle$$

s.t.

$$\begin{array}{l} \top w \in \top p_1: \quad \bullet \quad \top e^*: e^*\text{-agent speaks up} \\ \quad \quad \quad \quad \quad | \quad \quad \quad \top \vartheta_w e^*: e^*\text{-instant} \\ \quad \quad \quad \bullet \quad \quad \quad e_1: \top a_1 = \text{Ann (non } e^*\text{-participant) drops in} \\ \quad \quad \quad \quad \quad \quad \quad \quad \quad s_1 = \text{CON}_w e_1. \text{ consequent state of } e_1 \text{ exp. by } \top a_1 \end{array}$$
(2ii_E) John_{if}[a] a = john]; [3SG_{d Ω , d ϵ} d α]

be.

[s | d\alpha =_{d\omega} EXP s];

.PRS.3SG

[\hat{c}(d\tau =_{d\omega} \vartheta d\epsilon)]; [d\tau \subseteq_{d\omega} d\sigma]; [d\alpha =_{d\omega} EXP d\sigma]

delighted

[delighted_{d ω} \langle d\sigma, EXP \rangle]

. (intonation)

[p]; [d\Omega \sim d\omega]

English

(2i_K) Juuna_{if}[a| a = juuna]; [3SG_{d_Ω, d_ε} dα]

be.delighted-

[s| delighted_{d_Ω}(s, EXP)];

-IND.IV

[∂(speak_{d_Ω}(d_ε, AGT))];[BEG dσ <_{d_Ω} d_ε, dτ ⊆_{d_Ω} dσ]; [dα =_{d_Ω} EXP dσ];

[p]; [dΩ ~ dω]

-3SG

[∂(3SG_{d_Ω, d_ε} dα)] $\forall i \in I_{11} \exists p_1, a_1, \dots, w, s_1: p_1 = \mathbf{d}\omega I_1 \wedge i = \langle\langle p_1, a_1, p^*, \vartheta_w e^*, e^*, w \rangle, \langle s_1 \rangle\rangle$

s.t.

$\top_w \in \top_{p_1}$:	•	$\top e^*$: e*-agent speaks up
		$\top \vartheta_w e^*$: e*-instant
	_____	$s_1. \top a_1$ = Juuna is delighted

Kalaallisut

if (initial field)

fb (final bound.)

(2i'_K) Aani[⊥]_{ff}[a| a = aani]; [3SG_{d_Ω, d_ε} dα]

come.in-

[e| come.in_{d_Ω}(e, AGT)]; $\lambda I \lambda j. \exists i \in I \exists e(j = \langle \top_i, e \cdot \perp_i \rangle \wedge \mathbf{d}\Omega i \neq \emptyset \wedge \forall w \in \mathbf{d}\Omega i (\text{come.in}_w(e, \text{AGT}_w e))$ -FCT_⊥[d_ε <_{d_Ω} d_ε, dτ ⊆_{d_Ω} CON d_ε]; $\lambda I \lambda i. i \in I \wedge \mathbf{d}\Omega i \neq \emptyset \wedge \forall w \in \mathbf{d}\Omega i (\vartheta_w d\epsilon i < \vartheta_w \mathbf{d}\epsilon i \wedge \mathbf{d}\tau i \subseteq \vartheta_w \text{CON}_w d\epsilon i)$

(dτ-instant)

[dα =_{d_Ω} AGT d_ε]; $\lambda I \lambda i. i \in I \wedge \mathbf{d}\Omega i \neq \emptyset \wedge \forall w \in \mathbf{d}\Omega i (d\alpha i = \text{AGT}_w d\epsilon i)$ -3SG_⊥[∂(3SG_{d_Ω, d_ε} dα)] $\forall i \in I_{12} \exists \dots, w, e_1, a_2: \dots i = \langle\langle p_1, a_1, p^*, \vartheta_w e^*, e^*, w \rangle, \langle e_1, a_2, s_1 \rangle\rangle$

s.t.

$\top_w \in \top_{p_1}$:	•	$\top e^*$: e*-agent speaks up
		$\top \vartheta_w e^*$: e*-instant
	_____	$s_1. \top a_1$ = Juuna is delighted
	•	$e_1: a_2$ = Ann (non e*-particip.) comes in
	_____	CON _w e ₁ . consequent state of e ₁

Ann_{if}

[**a** | **a** = *ann*]; [3SG_{d Ω , d ϵ} **d α**];

drop+in.

[*e* | *drop.in*_{d ω} (*e*, AGT)];

.PST (matrix PST)

[∂ (**d τ** <_{d ω} ϑ **d ϵ**)];

$\lambda I \lambda j. j \in I \wedge \forall i \in I (\mathbf{d}\tau i < \vartheta_{\mathbf{d}\omega i} \mathbf{d}\epsilon i)$

[*d ϵ* $\subseteq_{\mathbf{d}\omega}$ **d τ**];

$\lambda I \lambda i. i \in I \wedge \vartheta_{\mathbf{d}\omega i} d\epsilon i \subseteq \mathbf{d}\tau i$

[**d α** =_{d ω} AGT *d ϵ*];

$\lambda I \lambda i. i \in I \wedge \mathbf{d}\alpha i = \text{AGT}_{\mathbf{d}\omega i} d\epsilon i$

[**t** | **t** <_{d ω} ϑ **d ϵ** , **t** $\subseteq_{\mathbf{d}\omega}$ ϑ CON*d ϵ*];

$\lambda I \lambda j. \exists i \in I \exists \mathbf{t} (j = \langle \mathbf{t} \cdot \tau_i, \perp_i \rangle \wedge \mathbf{t} < \vartheta_{\mathbf{d}\omega i} \mathbf{d}\epsilon i \wedge \mathbf{t} \subseteq \vartheta_{\mathbf{d}\omega i} \text{CON}_{\mathbf{d}\omega i} d\epsilon i)$

. (intonation)

[**p**]; [**d Ω** ~ **d ω**]

$\forall i \in I_{12} \exists w \dots p_1, t_{14}, a_{12}, e_{12}: p_1 = \mathbf{d}\omega I_{12} \wedge i = \langle \langle p_1, t_{14}, a_{12}, \dots, e^*, w \rangle, \langle e_{12}, \dots \rangle \rangle$

s.t.

$\tau_w \in \tau_{p_1}$	•	τ_{e^*} . <i>e*</i> -agt speaks up
		$\tau_{\vartheta_{wi} e^*}$. <i>e*</i> -instant
		t_{11} . <i>e*</i> -day
		$\tau_{t_{12}}$. <i>e*</i> -past within <i>e*</i> -day
	•	e_{11} : $\tau_{a_{11}}$ = <i>e*</i> -agt comes home
		$\tau_{t_{13}}$. <i>e*</i> -past within e_{11} -consequent time
	•	e_{12} : $\tau_{a_{12}}$ = Ann drops in
		$\tau_{t_{14}}$: <i>e*</i> -past within e_{12} -consequent time

(3ii_E) $John_{if}$

[**a** | **a** = *john*]; [3SG_{d Ω , d ϵ} **d α**];

be.

[*s* | **d α** =_{d ω} EXP *s*];

.PST_{mf}

[∂ (**d τ** <_{d ω} ϑ **d ϵ**)]; [**d τ** $\subseteq_{\mathbf{d}\omega}$ *d σ*]; ... / [∂ (**d τ** ₁ <_{d ω} ϑ **d ϵ**)]; [**d τ** ₁ $\subseteq_{\mathbf{d}\omega}$ *d σ*]; ...

delighted (consequence of e_{12})

[*delighted*_{d ω} (*d σ* , EXP)]

asleep (at e_{12} -time)

[*asleep*_{d ω} (*d σ* , EXP)]

. (intonation)

[**p**]; [**d Ω** ~ **d ω**]

- (3i_K) day- -SG.LOC_{if} *Kalaallisut*
 [t| day t]; [dε ⊆_{dΩ} dτ]; [t| t ⊆_{dΩ} dτ]
if
 come.home-
 [e| come.home_{dΩ}(e, AGT)];
 -FCT_T
 [dε <_{dΩ} dε, dε ⊆_{dΩ} dτ]; [AGT dε =_{dΩ} AGT dε]; (dτ-period)
 -1SG
 [∂(1SG_{dω, dε}(AGT dε))]; [t| t ⊆_{dΩ} ∅CON dε];
- (3i'_K) Aani_{ib} *ib*
 [a| a = aani]; [3SG_{dΩ, dε} dα]
 visit- *mf*
 [ee a| visit_{dω}(ee, AGT, a)];
 λλj. ∃i ∈ I∃ee, a(j = ⟨τ_i, (ee · (a · ⊥_i))) ∧ process_{dωi} ee
 ∧ ∀e ∈ ee(visit_{dωi}(e, AGT_w e, a)
 ∧ AGT_{dωi} ee = ∪ {AGT_{dωi} e: e ∈ ee})
 -ELA_T
 [¹dεε <_{dω} dε, ¹dεε ⊆_{dω} dτ]; [dα =_{dω} AGT dεε]; [e| e = ¹dεε];
 -3SG_T
 [∂(3SG_{dω, dε} AGT dεε)]; [AGT dε =_{dω} AGT dεε]
 come.in- *fb*
 [come.in_{dω}(dε, AGT)];
 -IND.IV
 [∂(speak_{dω}(dε, AGT))];
 [dε <_{dω} dε, dε ⊆_{dω} dτ]; [dα =_{dω} AGT dε];
 [p]; [dΩ ~ dω]
 -3SG
 [∂(3SG_{dω, dε} dα)];
- ∀i ∈ I₁ ∃p₁, t₁₃, t₁₂, ...w, e₁₂, ee₁, a₁, e₁₁, t₁₁: ...
 ∧ p₁ = dωI₁ ∧ i = ⟨⟨p₁, a₁, t₁₃, t₁₂, ..., e*, w⟩, ⟨e₁₂, ee₁, a₁, e₁₁, t₁₁⟩⟩
- s.t.
- | | | |
|--|---|---|
| ^T w ∈ ^T p ₁ | • | ^T e*. e*-agt speaks up |
| | | ^T ∅ _{wi} e*. e*-instant |
| | | t ₁₁ . e*-day |
| | | ^T t ₁₂ . e*-past within e*-day |
| • | | e ₁₁ : e*-agt comes home |
| | | ^T t ₁₃ . e*-past within e ₁₁ -consequent time |
| •• | | ee ₁ : ^T a ₁₁ = Aani (non e*-participnt) visits a ₁₂ |
| • | | e ₁₂ = ¹ ee ₁ : 1st stage of ee ₁ -visit, ^T a ₁₁ comes in |

(3ii_K) friend-[friend.of_{dΩ, dτ}(dα, dα)]; ifλIλi. i ∈ I ∧ dΩi ≠ ∅ ∧ ∀w ∈ dΩi(friend.of_{w, dτi}(dαi, dαi))-3SG_{τ.SG}[3SG_{dΩ, dε} dα, 3SG_{dΩ, dε} dα];λIλi. i ∈ I ∧ dΩi ≠ ∅ ∧ ∀w ∈ dΩi((dαi + dαi) ∅ (AGT_w dεi + EXP_{dωi} dεi))

[a a | a = dα, a = dα];

λIλj. ∃i ∈ I∃a, a(j = ⟨a · τ_i, a · ⊥_i⟩ ∧ a = dαi ∧ a = dαi)

come.in-

[come.in_{dΩ}(dε, AGT)];-FCT_⊥[dε <_{dΩ} dε, dε ⊆_{dΩ} dτ]; [dα =_{dΩ} AGT dε];

(dτ-period)

-3SG_⊥[∂(3SG_{dω, dω} dα)]; [t̄ t̄ ⊆_{dΩ} ∅CON dε];(3ii'_K) Juuna_{ib}[dα = juuna]; [3SG_{dΩ, dε} dα]

ib

be.delighted-

[s | delighted_{dω}(s, EXP)];

fb

-IND.IV

[∂(speak_{dω}(dε, AGT))];[BEG dσ <_{dω} dε, dτ ⊆_{dω} dσ]; [dα =_{dω} EXP dσ];

[p]; [dΩ ~ dω]

-3SG

[∂(3SG_{dω, dε} dα)];∀i ∈ I₂:∃p₂, t₂, a₁₂, ...w, s₂, a₁₁: p₂ = dωI₂ ∧ i = ⟨⟨p₂, t₂, a₁₂, ..., e*, w⟩, ⟨s₂, a₁₁, ...⟩⟩

s.t.

τ_w ∈ τ_{p₂}

- τ_{e*}. e*-agt speaks up
- | τ_{∅_{wi}} e*. e*-instant
- ||||| t₁₁. e*-day
- || τ_{t₁₂}. e*-past within e*-day
- e₁₁: e*-agt comes home
- || τ_{t₁₃}. e*-past within e₁₁-consequent time
- ee₁: a₁₁ = Aani (non e*-participnt) visits a₁₂
- e₁₂ = ¹ee₁: 1st stage of ee₁-visit, a₁₁ comes in
- || t₂w ⊆ ∅_w CON_w e₁₂: conseq. time of e₁₂-entry
- s₂: τ_{a₁₂} = Juuna (non e*-participnt) is delighted

3. VIVID FUTURE (English)

(4i_E) Ann[**a** | **a** = *ann*]; [3SG_{d Ω , d ϵ} **d α**];

have-

-PRS.3SG

[*s* | *e*] EXP *s* =_{d ω} AGT *e*]; [∂ (**d τ** =_{d ω} **ϑ d ϵ**)]; [**d τ** \subseteq _{d ω} *d σ*]; [**d α** =_{d ω} EXP *d σ*]promise-¹[*t*] *promise*_{d ω} (*d ϵ* , AGT, Dom *t*), (ϑ CON *d ϵ* – *t*) < *t* \subseteq ϑ CON *d ϵ*]; $\lambda\lambda j. \exists i \in I \exists t(j = \langle \top_i, t \cdot \perp_i \rangle \wedge \text{promise}_{d_{\omega i}}(d\epsilon i, \text{AGT}_{d_{\omega i}} d\epsilon i, \text{Dom } t))$ $\wedge \forall w \in \text{Dom } t((\vartheta_w \text{CON}_w d\epsilon i - tw) < tw \subseteq \vartheta_w \text{CON}_w d\epsilon i))$

-PRF

[*d σ* =_{d ω} CON *d ϵ*];[(prospective) *to*[∂ (**d τ** \subseteq CON *d ϵ*)]; [*p* | *p* = Dom *d τ*]; $\lambda\lambda j. \exists i \in I \exists p(j = \langle \top_i, p \cdot \perp_i \rangle \wedge p = \text{Dom } d\tau i))$

drop+in-

[*e*] *drop.in*(*e*, AGT)]; $\lambda\lambda j. \exists i \in I \exists e(j = \langle \top_i, e \cdot \perp_i \rangle \wedge \forall w \in \text{Dom } e(\text{drop.in}_w(e_w, \text{AGT}_w e_w))$] (scope of prospective *to*)[*d ϵ* \subseteq _{d Ω} *d τ* <_{d Ω} CON *d ϵ*]; [AGT *d ϵ* = AGT *d ϵ*]; [**t** | **t** \subseteq ϑ CON *d ϵ*]today_{ff}[*t*] (*day*_{d ω} *t*), (ϑ d ϵ \subseteq _{d ω} *t*); [*d ϵ* \subseteq _{d Ω} *d τ*];

. (intonation)

[**p**]; [**d Ω** ~ **d ω**] $\forall i \in I \exists w, \dots p_{12}, t_{12}, a_1, t_1, e_1, p_{11}, t_{11}, s_1, e_1:$ $p_{12} = \mathbf{d}\omega I_1 \wedge i = \langle \langle p_{12}, t_{12}, a_1, \dots, e^*, w \rangle, \langle t_1, e_1, p_{11}, t_1 s_1, e_1 \rangle \rangle$

s.t.

 $\top_w \in \top p_{12}$

•

 $\top e^*$: *e**-agt speaks up

|

 $\top \vartheta_w e^*$: *e**-instant

•

 e_1 : $\top a_1$ = Ann (non *e**-particp.) promises $p_{11} = \text{Dom } t_{11}$ $s_1 = \text{CON}_w e_1$: conseq. state of e_1 exp. by $\top a_1$

|||||||

 t_1 : *e**-day $w_1 \in p_{11}$ (*e*₁-promised future)

•

 e_1 (in w_1)

CON_{w₁} e_1 : consequent state of e_1 (in w_1)

||

 $t_{11} w_1 \subseteq \vartheta_{w_1} \text{CON}_{w_1} e_1$

•

 $e_1 w_1$: e_1 -agt drops in, end of e_1 -conseq. state

||

 $\top t_{12} w_1 \subseteq \vartheta_{w_1} \text{CON}_w e_1 w_1$ ¹ ($t_1 - t_2$) := $ut. t \subseteq t_1 \ \& \ t \not\subseteq t_2 \ \wedge \ \forall t'(t' \subseteq t_1 \ \wedge \ t' \not\subseteq t_2 \ \rightarrow \ t' \subseteq t)$

(4ii) John

[**a** | **a** = *john*]; [3SG_{dΩ, dε} **dα**];

[VIV.FUT (*will*)

[$\partial(\emptyset \subset d\Omega \subseteq \mathbf{d}\Omega)$];

[$\partial(\emptyset \mathbf{d}\varepsilon <_{d\Omega} \mathbf{d}\tau)$];

[**p** | **p** = $d\Omega$]

modal (\neq mood): **dΩ**-vivid
tense: **dε**-future

be-

[\underline{s} k^α] EXP $\underline{s} = k^\alpha(\underline{s})$];

$\lambda\lambda j. \exists i \in I_{\underline{s}}, k^\alpha(j = \langle \tau_i, \underline{s} \cdot k^\alpha \cdot \perp_i \rangle) \wedge \text{Dom } \underline{s} = \text{Dom } k^\alpha$
 $\wedge \forall w \in \text{Dom } \underline{s} (\text{EXP}_w \underline{s}w = k^\alpha w \underline{s}w)$

] (scope of *will*)

[**dτ** $\subseteq_{d\Omega} d\sigma$]; [EXP $d\sigma =_{d\Omega} \mathbf{d}\alpha$]

delighted

[*delighted*($d\kappa^\alpha$)];

$\lambda\lambda i. i \in I \wedge \forall w \in d\kappa^\alpha i \forall e \bullet \in \text{Dom } d\kappa^\alpha i w \exists s, a: s = e \bullet \wedge a = d\kappa^\alpha i w s \wedge \text{delighted}_w(s, a)$

(coherence relation)

[BEG $d\sigma \subseteq_{d\Omega} \emptyset \text{CON } d\varepsilon$]

. (intonation)

[**p**]; [**dΩ** ~ **dω**];

$\forall i \in I_{22} \exists p_{12}, p_2, a_1, \dots, w, \underline{s}_2, k^\alpha_2:$

$\dots p_{12} = \mathbf{d}\omega I_{22} (= \mathbf{d}\omega I_1) \wedge i = \langle \langle p_{12}, p_2, a_2, \dots, w \rangle, \langle \underline{s}_2, k^\alpha_2, \dots \rangle \rangle$

s.t.

$\tau_w \in \tau_{p_{12}}$

- $\tau_{e^*}: e^*$ -agt speaks up
- | $\tau_{\emptyset_w} e^*: e^*$ -instant
- $e_1: a_1 = \text{Ann (non } e^*\text{-prtcip.) promises } p_{11} = \text{Dom } \underline{t}_{11}$
 $s_1 = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ exp. by } \tau_{a_1}$
- ||||||| $t_1: e^*$ -day

$w_1 \in p_2$ (e_1 -promised $\tau_{p_{12}}$ -*vivid* future) $\subseteq \tau_{p_{12}}$

- e_1 (in w_1)
- || $\text{CON}_{w_1} e_1: \text{consequent state of } e_1 \text{ (in } w_1)$
- $\underline{e}_1 w_1: e_1$ -agt drops in, end of e_1 -conseq. state
- || $\tau_{\underline{t}_{12} w_1} \subseteq \emptyset_{w_1} \text{CON}_w \underline{e}_1 w_1$
- $\underline{s}_2 w_2: \tau_{a_2} = \text{John (non } e^*\text{-prtcip) is } k^\alpha_2\text{-delighted}$

4. REAL PROSPECT (Kalaallisut)

(1_K) Aani if
 [a| a = aani]; [3SG_{d ω} , d ϵ d α];
 promise- fb
 [e \underline{t} | promise_{d ω} (e, AGT, \underline{t}), (ϑ CON d ϵ - \underline{t}) < \underline{t} \subseteq ϑ CON d ϵ];
 -IND.IV
 [$\hat{\partial}$ (speak_{d ω} (d ϵ , AGT))]; [d ϵ <_{d ω} d ϵ , d τ \subseteq _{d ω} CON d ϵ]; [d α =_{d ω} AGT d ϵ]; [p]; [d Ω ~ d ω]
 -3SG
 [$\hat{\partial}$ (3SG_{d ω} , d ϵ)]
 day- ff -SG.LOC_{ff}
 [k^r | day.of(k^r, ϵ •)]; [t | t =_{d ω} d κ ^r(d ϵ)]; [d τ \subseteq d τ]
 (accommodation)
 [p | p = Dom d τ];
 come.in-
 [e | come.in(e, AGT)];
 -prospect modified Bitt07
 [$\hat{\partial}$ (d τ \subseteq _{d Ω} CON d ϵ)];
 [d $\underline{\epsilon}$ \subseteq _{d Ω} d τ , CON d ϵ <_{d Ω} CON d $\underline{\epsilon}$];
 [s | ϑ s = ϑ CON d ϵ , EXP s =_{d Ω} AGT d $\underline{\epsilon}$];
 -ELA_T
 [BEG d $\underline{\sigma}$ <_{d ω} d ϵ , d τ \subseteq _{d ω} d $\underline{\sigma}$]; [d α =_{d ω} EXP d $\underline{\sigma}$]; [d $\underline{\sigma}$ =_{d ω} CON d ϵ]
 -3SG_T
 [$\hat{\partial}$ (3SG_{d ω} , d ϵ EXP d $\underline{\sigma}$)]; [EXP d $\underline{\sigma}$ =_{d ω} AGT d ϵ]

$\forall i \in I_1 \exists p_{11}, a_1, \dots, w, \underline{s}_1, \underline{e}_1, t_1, k^r_1, p_{12}, e_1, \underline{t}_1$:
 $p_{11} = \mathbf{d}\omega I_1 \wedge i = \langle \langle p_{11}, a_1, \dots, w \rangle, \langle \underline{s}_1, p_{12}, \underline{e}_1, t_1, k^r_1, p_{12}, e_1, \underline{t}_1 \rangle \rangle$
 s.t.
 $\top w \in \top p_{11}$ • $\top e^*$: e*-agt speaks up
 | $\top \vartheta_w e^*$: e*-instant
 • e_1 : $\top a_1 = \text{Ann}$ (non e*-prticip.) promises $p_{12} = \text{Dom } \underline{t}_1$
 _____ $\underline{s}_1 w = \text{CON}_w e_1$: conseq. state of e_1 (in w)
 ||||| t_1 : e*-day

~~~~~  
 $w_1 \in p_{12}$  (e<sub>1</sub>-promised future)  
                          •       $e_1$  (in  $w_1$ )  
                          \_\_\_\_\_       $\underline{s}_1 w_1 = \text{CON}_{w_1} e_1$ : conseq. state of  $e_1$  (in  $w_1$ )  
                          |||||       $\underline{t}_1 w_1$ : final subinterval of  $\vartheta_{w_1} \text{CON}_{w_1} e_1$   
                          •       $e_1 w_1$ : end of e<sub>1</sub>-conseq. time, e<sub>1</sub>-agt comes in

(4ii<sub>K</sub>) Juuna*if*[**a** | **a** = *juuna*]; [3SG<sub>dΩ, dε</sub> **dα**];

be.delighted-

*fb*[s | *delighted*(s, EXP)];-prospect<sup>1</sup>[ $\hat{\partial}(\vartheta d_{\underline{s}} \subseteq_{d\Omega} \text{CON } d_{\underline{s}})$ ];[BEG  $d_{\underline{s}} \subseteq_{d\Omega} \vartheta \text{CON } d_{\underline{s}}$ , CON  $d_{\underline{s}} <_{d\Omega} \text{CON } \langle \text{BEG } d_{\underline{s}} \rangle$ ];[s] ( $\vartheta_{\underline{s}} = \vartheta d_{\underline{s}} + \vartheta \text{CON } d_{\underline{s}}$ ), (EXP s =<sub>dΩ</sub> EXP  $d_{\underline{s}}$ );

-IND.IV

[ $\hat{\partial}(\text{speak}_{d_{\omega}} \langle d_{\underline{s}}, \text{AGT} \rangle)$ ];[BEG  $d_{\underline{s}} <_{d_{\omega}} d_{\underline{s}}$ ,  $d_{\tau} \subseteq_{d_{\omega}} d_{\underline{s}}$ ]; [**dα** =<sub>dω</sub> EXP  $d_{\underline{s}}$ ];[**p**]; [**dΩ** ~ **dω**]

-3SG

[ $\hat{\partial}(3\text{SG}_{d_{\omega}, d_{\epsilon}} \mathbf{d}\alpha)$ ];

(coherence relation)

[BEG  $d_{\underline{s}} \subseteq_{d\Omega} \vartheta \text{CON } d_{\underline{s}}$ ] $\forall i \in I_2 \exists p_{22}, a_2, \dots, w, \underline{s}_{22}, \underline{s}_{21}: \dots p_{22} = \mathbf{d}\omega I_{22} (= \mathbf{d}\omega I_1) \wedge i = \langle \langle p_{22}, a_2, \dots, e^*, w \rangle, \langle \underline{s}_{22}, \underline{s}_{21}, \dots \rangle \rangle$ 

s.t.

 $\top w \in \top p_{22}$ 

- $\top e^*$ : *e*\*-agt speaks up
- |  $\top \vartheta_w e^*$ : *e*\*-instant
- $e_1$ :  $\top a_1 = \text{Ann}$  (non *e*\*-prticip.) promises  $p_{12} = \text{Dom } \underline{t}_1$
- $\underline{s}_1 w = \text{CON}_w e_1$ : conseq. state of  $e_1$  (in  $w$ )
- $t_1$ : *e*\*-day

 $w_1 \in p_{12}$  ( $e_1$ -based *e*\*-predicted *e*\*-future)  $\subseteq \top p_{11}$ 

- $e_1$  (in  $w_1$ )
- $\underline{s}_1 w_1 = \text{CON}_{w_1} e_1$ : conseq. state of  $e_1$  (in  $w_1$ )
- $\underline{t}_1 w_1$ : final subinterval of  $\vartheta_{w_1} \text{CON}_{w_1} e_1$
- $\underline{e}_1 w_1$ : end of  $e_1$ -conseq. time,  $e_1$ -agt comes in
- $\text{CON}_{w_1} \underline{e}_1 w_1$ : conseq. state of  $\underline{e}_1 w_1$ -entry
- $\underline{s}_{21} w_1$ :  $\top a_1 = \text{Ann}$  (non *e*\*-prticip.) is delighted
- $\text{BEG}_{w_1} \underline{s}_{21} w_1$ : end of *e*\*-conseq. state, onset of  $\underline{s}_{21} w_1$ -delight
- $\underline{s}_{22} w_1$ : *e*\*-current prospect of  $\underline{s}_{21} w_1$ -delight

<sup>1</sup>  $(t_1 + t_2) := ut. t_1 \subseteq t \wedge t_2 \subseteq t \wedge \forall t'(t_1 \subseteq t' \wedge t_2 \subseteq t' \rightarrow t \subseteq t')$

### Vivid vs. remote scenarios

#### 0. DATA

##### English (E)

- vivid future

(1<sub>E</sub>) *Ann has promised*  
 Ann have.PRS.3SG promise.PRF  
*to drop in. today.*  
 INF drop+in today

- Vivid conditionals licensed by (1<sub>E</sub>)

(2<sub>E</sub>) *If you buy a bottle of wine*  
 if you buy.NPST a bottle of wine  
*she will be delighted.*  
 she VIV.FUT be delighted

(3<sub>E</sub>) *If she is tired*  
 if she be.NPST.3SG tired  
*we can (just) watch dvds*  
 she VIV.POS just watch dvd.PL

- Remote conditionals licensed by (1<sub>E</sub>)

(4<sub>E</sub>) *If I serve alcohol*  
 if I serve.NPST<sub>if</sub> alcohol  
*she might get drunk.*  
 she REM.POS get drunk

(5<sub>E</sub>) *If it were tomorrow<sub>F</sub>*  
 if it be.SBJ.3SG tomorrow<sub>F</sub>  
*I would bake a cake.*  
 I REM.FUT bake a cake

- Unrealized future

(6<sub>E</sub>) *Last week Ann promised*  
 last week Ann promise-PST  
*to drop in yesterday*  
 INF drop+in yesterday  
*but she forgot.*  
 but she forget.PST

- Remote conditional licensed by (6<sub>E</sub>)

(7<sub>E</sub>) *If I had bought wine for the occ.*  
 if I have.PST buy.PRF<sub>if</sub> wine for the occ.  
*it would have been wasted.*  
 it REM.FUT have be.PRF wasted

##### Kalallisut (K)

- real prospect

(1<sub>K</sub>) *Aani niriursui-pu-q*  
 Aani promise-IND.IV-3SG  
*ulluq-mi isir-ssa-llu-ni.*  
 day-SG.LOC enter-prospect-ELA<sub>T</sub>-3SG<sub>T</sub>

- Vivid conditionals licensed by (1<sub>K</sub>)

(2<sub>K</sub>) *Viinni-si-gu-vit*  
 bottle.of.wine-get-HYP<sub>T</sub>-2SG  
*nuannaar-ssa-pu-q.*  
 be.delighted-prospect-IND.IV-3SG

(3<sub>K</sub>) *Qasu-pp-at*  
 be.tired-HYP<sub>⊥</sub>-3SG<sub>⊥</sub>  
*filmi-r(-innar)-sinnaa-pu-gut.*  
 film-use.as.cust(-just)-be.possible-IND.IV-1PL

- Remote conditionals licensed by (1<sub>K</sub>)

(4<sub>K</sub>) *Imigassaq-llir-gu-ma*  
 alcohol-serve-HYP<sub>T</sub>-1SG  
*putuqqa-lir-qina-galuar-pu-q.*  
 be.drunk-begin-be.liable-galuar-IND.IV-3SG

(5<sub>K</sub>) *Aqagu isir-tuq-ssaq-u-galuar-pp-at*  
 nxt.day entr-<sub>V</sub>n-prosp've-be-galuar-HYP<sub>⊥</sub>-3SG<sub>⊥</sub>  
*kaagi-liur-ssa-galuar-pu-nga.*  
 cake-make-prospect-galuar-IND.IV-1SG

- Unrealized prospect

(6<sub>K</sub>) *Sapaatip akunnira kingulliq*  
 week (lit. Sunday interval) last  
*Aani niriursui-galuar-pu-q*  
 Aani promise-galuar-IND.IV-3SG  
*ippassaq isir-ssa-llu-ni.*  
 yesterday come.in-prospect-ELA<sub>T</sub>-3SG<sub>T</sub>

- Remote conditional licensed by (6<sub>K</sub>)

(7<sub>K</sub>) *Viinni-si-sima-galuar-gu-ma*  
 wine-get-prf-galuar-HYP<sub>T</sub>-1SG  
*asiu-sima-ssa-galuar-pu-q.*  
 be.wasted-prf-prospect-galuar-IND.IV-3SG

## 1. VIVID FUTURE (English)

(1<sub>E</sub>) Ann[**a** | **a** = *ann*]; [3SG<sub>dΩ, dε</sub> **dα**];

have-

[*s* | *e*] EXP *s* =<sub>dω</sub> AGT *e*];

-PRS.3SG

[ $\hat{\partial}(\mathbf{d}\tau =_{d\omega} \vartheta \mathbf{d}\varepsilon)$ ]; [ $\mathbf{d}\tau \subseteq_{d\omega} d\sigma$ ]; [ $\mathbf{d}\alpha =_{d\omega}$  EXP *dσ*]

promise-

[ $\underline{t}$  | *promise*<sub>dω</sub>(*dε*, AGT, Dom  $\underline{t}$ ), ( $\vartheta$ CON *dε* –  $\underline{t}$ ) <  $\underline{t} \subseteq \vartheta$ CON *dε*];

-PRF

[*dσ* =<sub>dω</sub> CON *dε*];[(prospective) *to*[ $\hat{\partial}(\mathbf{d}\tau \subseteq$  CON *dε*)]; [*p* | *p* = Dom *dτ*];

drop+in-

[ $\underline{e}$  | *drop.in*( $\underline{e}$ , AGT)];] (scope of prospective *to*)[ $d\varepsilon \subseteq_{d\Omega} d\underline{\tau} <_{d\Omega}$  CON *dε*]; [AGT *dε* = AGT *dε*]; [ $\underline{t}$  |  $\underline{t} \subseteq \vartheta$ CON *dε*]today<sub>ff</sub>[*t* | (*day*<sub>dω</sub> *t*), ( $\vartheta \mathbf{d}\varepsilon \subseteq_{d\omega} t$ )]; [ $d\varepsilon \subseteq_{d\Omega} d\underline{\tau}$ ];

. (intonation)

[**p**]; [**dΩ** ~ **dω**] $\forall i \in I_1 \exists p_{12}, \underline{t}_{12}, a_1, \dots, w, t_1, \underline{e}_1, p_{11}, \underline{t}_{11}, s_1, e_1:$  $p_{12} = \mathbf{d}\omega I_1 \wedge i = \langle \langle p_{12}, \underline{t}_{12}, a_1, \dots, e^*, w \rangle, \langle t_1, \underline{e}_1, p_{11}, \underline{t}_{11}, s_1, e_1 \rangle \rangle$ 

s.t.

 $\top w \in \top p_{12}$ 

•

 $\top e^*$ : *e\**-agt speaks up

|

 $\top \vartheta_w e^*$ : *e\**-instant

•

 $e_1$ :  $\top a_1$  = Ann (non *e\**-prticip.) promises  $p_{11} = \text{Dom } \underline{t}_{11}$  $s_1 = \text{CON}_w e_1$ : conseq. state of  $e_1$  exp. by  $\top a_1$ 

|||||||

 $t_1$ : *e\**-day

~~~~~

 $w_1 \in p_{11}$ (*e*₁-promised future)

•

 e_1 (in w_1)

—————

CON_{w₁} e_1 : consequent state of e_1 (in w_1)

||||

 $\underline{t}_{11} w_1$: final subinterval of ϑ_{w_1} CON_{w₁} e_1

•

 $\underline{e}_1 w_2$: end of e_1 -conseq. state, e_1 -agt drops in

||

 $\top \underline{t}_{12} w_1 \subseteq \vartheta_{w_1}$ CON_w $\underline{e}_1 w_1$

2. VIVID CONDITIONALS LICENSED BY ENGLISH (1_E)

(2_E) [If
 [∂(dε ⊆_{dΩ} dτ)]; testable hypothesis
 [w| w ∈ dΩ];

 you
 [a| 2SG_{dΩ, dε} a];

 buy-
 [e k^β| buy⟨e, AGT, k^β⟩];
 λλj. ∃i ∈ I∃e, k^β(j = ⟨T_i, e · k^β · ⊥_i⟩ ∧ Dom e = Dom k^β
 ∧ ∀w ∈ Dom e: buy_w(ew, AGT_w ew, k^βwew))

 VIV.NPST_{if} (episodic rdg)
 [dω ∈ dΩ]; dΩ-vivid
 [∂dε ≤_{dω} dτ]; non-pst verification tm
 λλi. i ∈ I ∧ dΩi ≠ ∅ ∧ ∀w ∈ dΩi(∂_w dεi ≤ dτiw)

 [dε ⊆_{dω} dτ]; [dα =_{dω} AGT dε];
 [t| ∂dε < t ⊆ ∂CON dε]; new verification time

 a bottle of wine
 [b| b =_{dω} dk^β⟨dε⟩, ONE_{dω}⟨b, dk^β⟩]; [bottle.of.wine dk^β];

] (scope of if)
 [p]; [dΩ ~ dω];

 (coherence relation) cf. Kehler 2002
 [dε₁ ⊆_{dΩ} ∂CON dε] Lascarides & Asher '93

∀i ∈ I₂₁ ∃t₂, p₁₂, t₁₂, a₁, ... w, p₂₁, b₂, e₂, k^β₂, w₂:
 ... p₂₁ = dωI₂₁ ∧ i = ⟨⟨t₂, EXP_w e*, p₁₂, t₁₂, a₁, ... , e*, w⟩, ⟨p₂₁, b₂, k^β₂, e₂, w₂, ...⟩⟩

s.t.
^Tw ∈ ^Tp₁₂ • ^Te*: e*-agt speaks up
 | ^T∂_w e*: e*-instant
 • e₁: ^Ta₁ = Ann (non e*-prticip.) promises p₁₁ = Dom t₁₁
 _____ s₁ = CON_w e₁: conseq. state of e₁ exp. by ^Ta₁
 ||||| t₁: e*-day

~~~~~  
 w<sub>2</sub> ∈ p<sub>21</sub> (p<sub>11</sub>-based <sup>T</sup>p<sub>12</sub>-vivid e\*-future) ⊆ <sup>T</sup>p<sub>12</sub> ∩ p<sub>11</sub>  
                                          •                      e<sub>1</sub> (in w<sub>2</sub>)  
                                          \_\_\_\_\_                      CON<sub>w<sub>2</sub></sub> e<sub>1</sub>: consequent state of e<sub>1</sub> (in w<sub>2</sub>)  
                                          ||||                      t<sub>11</sub>w<sub>2</sub>: final subinterval of ∂<sub>w<sub>2</sub></sub> CON<sub>w<sub>2</sub></sub> e<sub>1</sub>  
                                          •                      e<sub>1</sub>w<sub>2</sub>: end of e<sub>1</sub>-conseq. state, e<sub>1</sub>-agt drops in  
                                          ||                      <sup>T</sup>t<sub>12</sub>w<sub>2</sub> ⊆ ∂<sub>w<sub>2</sub></sub> CON<sub>w<sub>2</sub></sub> e<sub>1</sub>w<sub>2</sub>  
                                          •                      e<sub>21</sub>w<sub>2</sub>: e\*-exp buys a k<sup>β</sup><sub>2</sub>-bottle of wine b<sub>2</sub>w<sub>2</sub>  
                                          \_\_\_\_\_                      CON<sub>w<sub>2</sub></sub> e<sub>21</sub>w<sub>2</sub>  
                                          ||                      <sup>T</sup>t<sub>2</sub>w<sub>2</sub> ⊆ ∂<sub>w<sub>2</sub></sub> CON<sub>w<sub>2</sub></sub> e<sub>21</sub>w<sub>2</sub>

she

 $[\partial(3SG_{d\Omega, de} \mathbf{d}\alpha_1)]; [\mathbf{a} | \mathbf{a} = \mathbf{d}\alpha_1]$ [VIV.FUT (*will*) $[\partial(\emptyset \subset d\Omega \subseteq \mathbf{d}\Omega)];$  $[\partial(\partial \mathbf{d}\varepsilon <_{d\Omega} \mathbf{d}\tau)];$  $[\mathbf{p} | \mathbf{p} = d\Omega];$ modal ( $\neq$  mood):  $\mathbf{d}\Omega$ -vivid  
tense:  $\mathbf{d}\varepsilon$ -future

be-

 $[\underline{s} k^\alpha | \text{EXP } \underline{s} = k^\alpha \langle \underline{s} \rangle];$  $\lambda \lambda j. \exists i \in I \exists \underline{s}. k^\alpha(j = \langle \tau_i, \underline{s} \cdot k^\alpha \cdot \perp_i \rangle) \wedge \text{Dom } \underline{s} = \text{Dom } k^\alpha$   
 $\wedge \forall w \in \text{Dom } \underline{s} (\text{EXP}_w \underline{s} w = k^\alpha w \underline{s} w)$ ] (scope of *will*) $[\mathbf{d}\tau \subseteq_{d\Omega} d\sigma]; [\text{EXP } d\sigma =_{d\Omega} \mathbf{d}\alpha]$ 

delighted

 $[\text{delighted} \langle d\kappa^\alpha \rangle];$  $\lambda \lambda i. i \in I \wedge \forall w \in d\kappa^\alpha i \forall e \bullet \in \text{Dom } d\kappa^\alpha i w \exists s, a: s = e \bullet \wedge a = d\kappa^\alpha i w s \wedge \text{delighted}_w(s, a)$ 

(coherence relation)

 $[\text{BEG } d\sigma \subseteq_{d\Omega} \partial \text{CON } d\varepsilon];$ 

. (intonation)

 $[\mathbf{p}]; [\mathbf{d}\Omega \sim \mathbf{d}\omega];$  $\forall i \in I_{22} \exists p_{12}, p_2, a_1, \dots, w, \underline{s}_2, k^\alpha_2:$  $\dots p_{12} = \mathbf{d}\omega I_{22} (= \mathbf{d}\omega I_1) \wedge i = \langle \langle p_{12}, p_2, a_1, \dots, e^*, w \rangle, \langle \underline{s}_2, k^\alpha_2, \dots \rangle \rangle$ 

s.t.

 $\tau_w \in \tau_{p_{12}}$ 

- $\tau_{e^*}: e^*$ -agt speaks up
- |  $\tau_{\vartheta_w} e^*: e^*$ -instant
- $e_1: a_1 = \text{Ann (non } e^*\text{-prticip.) promises } p_{11} = \text{Dom } \underline{t}_{11}$   
 $s_1 = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ exp. by } a_1$
- |||||||  $t_1: e^*$ -day

 $w_2 \in {}^{(\tau)} p_2$  ( $p_{11}$ -based  $\tau_{p_{12}}$ -vivid  $e^*$ -future)  $\subseteq \tau_{p_{12}} \cap p_{11}$ 

- $e_1$  (in  $w_2$ )
- ||||  $\text{CON}_{w_2} e_1: \text{consequent state of } e_1 \text{ (in } w_2)$
- $\underline{e}_1 w_2: \text{end of } e_1\text{-conseq. state, } e_1\text{-agt drops in}$
- ||  $\tau_{\underline{t}_{12} w_2} \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_1 w_2$
- $\underline{e}_{21} w_2: e^*\text{-exp buys a } k^\beta_2\text{-bottle-of-wine } \underline{b}_2 w_2$
- ||  $\text{CON}_{w_2} \underline{e}_{21} w_2$
- ||  $\tau_{\underline{t}_2 w_2} \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_{21} w_2$
- ||  $\underline{s}_2 w_2: \tau_{a_1} = \text{Ann (non } e^*\text{-prticip) is } k^\alpha_2\text{-delighted}$

(3<sub>E</sub>) [If  
 $[\partial(d\underline{\varepsilon} \subseteq_{d\Omega} d\underline{\tau})]$ ;  
 $[w \mid w \in d\Omega]$ ;  
  
she  
 $[\partial(3SG_{d\Omega, d\varepsilon} \mathbf{d}\alpha)]$ ;  
  
be-  
 $[\underline{s} \ k^\alpha \text{ EXP } \underline{s} = k^\alpha \langle \underline{s} \rangle]$ ;  
  
VIV.NPST.3SG<sub>if</sub> (episodic rdg)  
 $[d\omega \in \mathbf{d}\Omega]$ ;  $[\partial d\underline{\varepsilon} \leq_{d\omega} d\underline{\tau}]$ ;  
 $[d\underline{\tau} \subseteq_{d\omega} d\underline{\sigma}]$ ;  $[\mathbf{d}\alpha =_{d\omega} \text{EXP } d\underline{\sigma}]$ ;  
 $[\mathbf{t} \mid \partial d\underline{\varepsilon} < \mathbf{t} \subseteq \partial d\underline{\sigma}]$ ;  
  
tired  
 $[\textit{tired} \ d\kappa^\alpha]$ ;  
  
] (scope of *if*)  
 $[p]$ ;  $[d\Omega \sim d\omega]$ ;  
  
(coherence relation)  
 $[d\underline{\varepsilon} \subseteq_{d\Omega} \partial d\underline{\sigma}]$

$\forall i \in I_{21} \exists t_2, p_{12}, t_{12}, \dots, w, p_{21}, \underline{s}_2, k^\alpha_2, w_2$ ;  
 $\dots p_{21} = d\omega I_{21} \wedge i = \langle \langle t_2, p_{12}, \dots, e^*, w \rangle, \langle p_{21}, \underline{s}_2, k^\alpha_2, w_2, \dots \rangle \rangle$

s.t.

|                          |       |                                                                         |
|--------------------------|-------|-------------------------------------------------------------------------|
| $\top w \in \top p_{12}$ | •     | $\top e^*$ : $e^*$ -agt speaks up                                       |
|                          |       | $\top \vartheta_w e^*$ : $e^*$ -instant                                 |
|                          | •     | $e_1$ : $\top a_1 = \text{Ann}$ (non $e^*$ -particp.) promises $p_{11}$ |
|                          | _____ | $s_1 = \text{CON}_w e_1$ : conseq. state of $e_1$ exp. by $\top a_1$    |
|                          |       | $t_1$ : $e^*$ -day                                                      |

~~~~~

$w_2 \in p_{21}$	(p_{11} -based $\top p_{12}$ - vivid e_1 - nonpast)	$\subseteq \top p_{12} \cap p_{11}$
	•	e_1 (in w_2)
	_____	$\text{CON}_{w_2} e_1$: consequent state of e_1 (in w_2)
		$t_{11} w_2$: final subinterval of $\vartheta_{w_2} \text{CON}_{w_2} e_1$
	•	$e_1 w_2$: end of e_1 -conseq. state, e_1 -agt drops in
		$\top t_{12} w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} e_1 w_2$
	_____	$\underline{s}_2 w_2$: $\top a_1 = \text{Ann}$ is k^α_2 -tired
		$\top t_2 w_2 \subseteq \vartheta_{w_2} \underline{s}_2 w_2$: e_1 -future within \underline{s}_2 -time

we

$[\partial(1PL_{d\Omega, de} \mathbf{d}\alpha + AGT \mathbf{d}\epsilon)]; [\mathbf{a} \mathbf{a} =_{d\omega} \mathbf{d}\alpha + AGT \mathbf{d}\epsilon];$

[VIV.POS (*can*)

$[\partial(\emptyset \subset d\Omega \subseteq \mathbf{d}\Omega)];$

$[\partial(\exists d\epsilon <_{d\Omega} \mathbf{d}\tau)];$

$[\mathbf{p} | \emptyset \subset \mathbf{p} \subseteq d\Omega]$

watch

$[\underline{ee} k^\beta | watch(\underline{ee}, AGT, k^\beta)];$

$\lambda I \lambda j. \exists i \in I \exists \underline{ee}, k^\beta (j = \langle \tau_i, \underline{ee} \cdot k^\beta \cdot \perp_i \rangle \wedge process \underline{ee} \wedge Dom^1 \underline{ee} = Dom k^\beta$
 $\wedge \forall \underline{e} \in \underline{ee} \forall w \in Dom \underline{e} (watch_w(\underline{e}, \underline{aw}, k^\beta w \underline{ew}) \wedge AGT_w \underline{e} = AGT_w \underline{ee})$

dvds] (scope of *can*)

$[*dv d k^\beta]; [{}^1 d\epsilon \epsilon \subseteq_{d\Omega} \mathbf{d}\tau]; [AGT d\epsilon \epsilon =_{d\Omega} \mathbf{d}\alpha]$

(coherence relation) . (intonation)

$[{}^1 d\epsilon \epsilon \subseteq_{d\Omega} \mathbf{d}\tau]; [\mathbf{p}]; [\mathbf{d}\Omega \sim \mathbf{d}\omega];$

$\forall i \in I_{22} \exists p_{12}, p_{22}, a_2, \dots w, \underline{ee}_2, k^\beta_2:$

$\dots p_{12} = \mathbf{d}\omega I_{22} (= \mathbf{d}\omega I_1) \wedge i = \langle \langle p_{12}, p_{22}, a_2, \dots w \rangle, \langle \underline{ee}_2, k^\beta_2, \dots \rangle \rangle$

s.t.

$\tau_w \in \tau_{p_{12}}$	•	$\tau e^*: e^* \text{-agt speaks up}$
		$\tau \mathfrak{D}_w e^*: e^* \text{-instant}$
	•	$e_1: a_1 = \text{Ann (non } e^* \text{-prticip.) promises } p_{11} = \text{Dom } t_{11}$
	—	$s_1 = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ exp. by } a_1$
		$t_1: e^* \text{-day}$

$w_2 \in {}^{(\tau)} p_{22} (p_{21} \text{-based } \tau p_{12} \text{-vivid } e_1 \text{-possible future}) \subseteq p_{21}$

•	$e_1 \text{ (in } w_2)$
—	$\text{CON}_{w_2} e_1: \text{consequent state of } e_1 \text{ (in } w_2)$
	$t_{11} w_2: \text{final subinterval of } \mathfrak{D}_{w_2} \text{CON}_{w_2} e_1$
•	$\underline{e}_1 w_2: \text{end of } e_1 \text{-conseq. state, } e_1 \text{-agt drops in}$
	$\tau t_{12} w_2 \subseteq \mathfrak{D}_{w_2} \text{CON}_{w_2} \underline{e}_1 w_2$
—	$s_2 w_2: \tau a_1 = \text{Ann is } k^\alpha_2 \text{-tired}$
	$\tau t_2 w_2 \subseteq \mathfrak{D}_{w_2} s_2 w_2: e_1 \text{-future within } s_2 \text{-time}$
••	$\langle {}^1 \underline{ee}_2 w_2, \dots {}^f \underline{ee}_2 w_2 \rangle: \tau a_2 = e^* \text{-agt} + a_1 (e^* \text{-we) watch } k^\beta_3 \text{-dvds}$

$w_2 \in p_{21} (p_{11} \text{-based } \tau p_{12} \text{-vivid } e_1 \text{-nonpast}) \subseteq \tau p_{12} \cap p_{11}$

•	$e_1 \text{ (in } w_2)$
—	$\text{CON}_{w_2} e_1: \text{consequent state of } e_1 \text{ (in } w_2)$
	$t_{11} w_2: \text{final subinterval of } \mathfrak{D}_{w_2} \text{CON}_{w_2} e_1$
•	$\underline{e}_1 w_2: \text{end of } e_1 \text{-conseq. state, } e_1 \text{-agt drops in}$
	$\tau t_{12} w_2 \subseteq \mathfrak{D}_{w_2} \text{CON}_{w_2} \underline{e}_1 w_2$
—	$s_2 w_2: \tau a_1 = \text{Ann is } k^\alpha_2 \text{-tired}$
	$\tau t_2 w_2 \subseteq \mathfrak{D}_{w_2} s_2 w_2: e_1 \text{-future within } s_2 \text{-time}$

3. REMOTE CONDITIONALS LICENSED BY ENGLISH (1_E)

- (4_E) [If
 $[\partial(\mathbf{d}\underline{\tau} \subseteq_{d\Omega} \text{CON } d\underline{\varepsilon})]$;
 $[w | w \in d\Omega]$;
 I
 $[\mathbf{a} | 1\text{SG}_{d\Omega, d\varepsilon} \mathbf{a}]$
 serve-
 $[\underline{e} k^\beta | \text{serve}(\underline{e}, \text{AGT}, k^\beta)]$;
 VIV.NPST_{if} (episodic rdg)
 $[d\omega \in \mathbf{d}\Omega]$;
 $[\partial d\underline{\varepsilon}_1 \leq_{d\omega} \mathbf{d}\underline{\tau}]$;
 $[d\underline{\varepsilon} \subseteq_{d\omega} \mathbf{d}\underline{\tau}]$; $[\mathbf{d}\alpha =_{d\omega} \text{AGT } d\underline{\varepsilon}]$;
 $[\mathbf{t} | \partial d\underline{\varepsilon}_1 <_{d\omega} \mathbf{t} \subseteq \partial \text{CON } d\underline{\varepsilon}]$;
 alcohol
 $[\text{alcohol } dk^\beta]$;
] (scope of *if*) (coherence relation)
 $[p]$; $[d\Omega \sim d\omega]$; $[d\underline{\varepsilon} \subseteq \partial \text{CON } d\underline{\varepsilon}_1]$

$\forall i \in I_{21} \exists t_{21}, p_{12}, t_{12}, a_1, \dots, w, p_{21}, e_{21}, k^\beta_2, w_2$:
 $\dots p_{21} = d\omega I_{21} \wedge i = \langle \langle t_{21}, \text{AGT}_w e^*, p_{12}, t_{12}, a_1, \dots, e^*, w \rangle, \langle p_{21}, e_{21}, k^\beta_2, w_2, \dots \rangle \rangle$

s.t.

$\begin{array}{l} \top w \in \top p_{12} \\ \bullet \\ | \\ \bullet \\ \hline \text{|||||} \end{array} \begin{array}{l} \top e^*: e^*\text{-agt speaks up} \\ \top \partial_w e^*: e^*\text{-instant} \\ e_1: \top a_1 = \text{Ann (non } e^*\text{-partic.) promises } p_{11} = \text{Dom } t_{11} \\ s_1 = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ exp. by } \top a_1 \\ t_1: e^*\text{-day} \end{array}$

$w_2 \in p_{21} (p_{11}\text{-based } \top p_{12}\text{-vivid } \underline{e}_1\text{-future}) \subseteq \top p_{12} \cap p_{11}$

$\begin{array}{l} \bullet \\ \hline \text{||||} \\ \bullet \\ \parallel \\ \bullet \\ \parallel \end{array} \begin{array}{l} e_1 \text{ (in } w_2) \\ \text{CON}_{w_2} e_1: \text{consequent state of } e_1 \text{ (in } w_2) \\ t_{11}w_2: \text{final subinterval of } \partial_{w_2} \text{CON}_{w_2} e_1 \\ \underline{e}_1w_2: \text{end of } e_1\text{-conseq. state, } e_1\text{-agt drops in} \\ \top t_{12}w_2 \subseteq \partial_{w_2} \text{CON}_{w_2} \underline{e}_1w_2 \\ \underline{e}_{21}w_2: e^*\text{-agt serves } k^\beta_2\text{-alcohol} \\ \top t_{21}w_2 \subseteq \partial_{w_2} \text{CON}_{w_2} \underline{e}_{21}w_2 \end{array}$

she

[$\partial(3SG_{d\Omega, d\epsilon} \mathbf{d}\alpha_1)$]; [$\mathbf{a} \mid \mathbf{a} = \mathbf{d}\alpha_1$][REM.POS (*might*)¹[$\partial(\emptyset \subset d\Omega \subseteq (\mathbf{d}\Omega - \cap(\text{BUL}_{d\omega} \mathbf{d}\epsilon))$); [$\partial(\vartheta d\epsilon <_{d\Omega} \mathbf{d}\tau)$];[$\mathbf{S} \mid S = \text{DOX}_{d\omega} \mathbf{d}\epsilon$]; [$\mathbf{p} \mid \emptyset \subset \mathbf{p} \subseteq \text{MIN}_{d(\Omega t)} d\Omega$]

get

drunk

[$\underline{e} \mid k^\alpha \mid \underline{e} \notin \text{Dom } k^\alpha, \text{EXP } \underline{e} = \text{EXP}\langle \text{CON } \underline{e} \rangle = k^\alpha\langle \text{CON } \underline{e} \rangle$]; [$\text{drunk}\langle dk^\alpha \rangle$]] (scope of *might*)[$d\epsilon \subseteq_{d\Omega} \mathbf{d}\tau$]; [$\text{EXP } d\epsilon =_{d\Omega} \mathbf{d}\alpha$]; [$\mathbf{t} \mid \vartheta d\epsilon < \mathbf{d}\tau \subseteq \vartheta \text{CON } d\epsilon$];

(coherence relation) . (intonation)

[$d\epsilon \subseteq_{d\Omega} \vartheta \text{CON } d\epsilon_1$]; [\mathbf{p}]; [$\mathbf{d}\Omega \sim \mathbf{d}\omega$]; $\forall i \in I_{22} \exists p_{23}, p_{22}, a_1, \dots, e^*, w, \underline{e}_{22}, k_2^\alpha:$ $\dots p_{23} = \mathbf{d}\omega I_{22} \wedge i = \langle \langle p_{23}, a_1 p_{22}, \dots, w \rangle, \langle \underline{e}_{22}, k_2^\alpha, \text{DOX}_w e^*, \dots \rangle \rangle$

s.t.

 $\top w \in \top p_{23}$

•

 $\top e^*$: e^* -agt speaks up, believes s/he's in $\text{DOX}_w e^*$

|

 $\top \vartheta_w e^*$: e^* -instant

•

 e_1 : $\top a_1 = \text{Ann}$ (non e^* -prtcip.) promises $p_{11} = \text{Dom } \underline{t}_{11}$ $s_1 = \text{CON}_w e_1$: conseq. state of e_1 exp. by $\top a_1$

|||||

 t_1 : e^* -day $w_2 \in \top p_{22}$ (p_{21} -based e^* -**believable** but e^* -**undesirable** \underline{e}_{21} -future)

•

 e_1 (in w_2)

—————

 $\text{CON}_{w_2} e_1$: consequent state of e_1 (in w_2)

|||||

 $\underline{t}_{11} w_2$: final subinterval of $\vartheta_{w_2} \text{CON}_{w_2} e_1$

•

 $\underline{e}_1 w_2$: end of e_1 -conseq. state, e_1 -agt drops in

||

 $\top \underline{t}_{12} w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_1 w_2$

•

 $\underline{e}_{21} w_2$: e^* -agt serves k_2^β -alcohol

||

 $\top \underline{t}_{21} w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_{21} w_2$

•

 $\underline{e}_{22} w_2$: $\top a_1 = \text{Ann}$ gets k_2^α -drunk (is not k_2^α -drunk in $\underline{e}_{22} w_2$)

—

 $\text{CON}_{w_2} \underline{e}_{22} w_2$: $\top a_1 = \text{Ann}$ is k_2^α -drunk

||

 $\top \underline{t}_{21} w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_{22} w_2$ $w_2 \in p_{21}$ (p_{11} -based $\top p_{12}$ -**vivid** e_1 -**future**) $\subseteq \top p_{12} \cap p_{11}$

•

 e_1 (in w_2)

—————

 $\text{CON}_{w_2} e_1$: consequent state of e_1 (in w_2)

|||||

 $\underline{t}_{11} w_2$: final subinterval of $\vartheta_{w_2} \text{CON}_{w_2} e_1$

•

 $\underline{e}_1 w_2$: end of e_1 -conseq. state, e_1 -agt drops in

||

 $\top \underline{t}_{12} w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_1 w_2$

•

 $\underline{e}_{21} w_2$: e^* -agt serves k_2^β -alcohol

||

 $\top \underline{t}_{21} w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_{21} w_2$ ¹ $\text{BUL}_w e := \{p: \exists s(\vartheta_w e \subseteq \vartheta_w s \wedge \text{EXP}_w s = \text{AGT}_w e \wedge \text{want}_w(s, \text{EXP}_w s, p))\}$ $\text{DOX}_w e := \{p: \exists s(\vartheta_w e \subseteq \vartheta_w s \wedge \text{EXP}_w s = \text{AGT}_w e \wedge \text{believe}_w(s, \text{EXP}_w s, p))\}$

(5_E) [If
 $[\partial(d\underline{\varepsilon} \subseteq_{d\Omega} d\underline{\tau})]$
 $[w | w \in \text{Dom } d\underline{\varepsilon}]$
 it
 $[\partial(3\text{SG}_{d\Omega, d\varepsilon} d\underline{\varepsilon})]; [\underline{t} | d\underline{\varepsilon} \subseteq_{d\omega} \underline{t}]$
 be-
 $[\underline{s} k^f(\vartheta\underline{s}) = k^f(\underline{s})];$
 REM. NPST_{if} (were)
 $[d\omega \notin d\Omega_1]; [\vartheta d\varepsilon \leq_{d\omega} d\underline{\tau}];$
 $[d\underline{\tau} \subseteq_{d\omega} d\underline{\sigma}]; [d\underline{\tau} =_{d\omega} f(\vartheta d\underline{\sigma})];$
 $[\underline{t} | \vartheta d\varepsilon < \underline{t} \subseteq \vartheta d\underline{\sigma}];$
 tomorrow
 $[dk^\tau \subseteq \text{tmr}_{d\omega}(d\varepsilon)];$
 $\lambda\lambda i. i \in I \wedge \forall w \in \text{Dom } dk^\tau i \forall t \in \text{Ran } dk^\tau i w (t \subseteq \text{tomorrow.of}_{d\omega} d\varepsilon i)$
] (scope of if) (coherence relation)
 $[p]; [d\Omega \sim d\omega]; [d\underline{\varepsilon} \subseteq_{d\Omega} \text{CON } d\varepsilon]$

$\forall i \in I_{21} \exists t_{22}, t_{21}, p_{12}, t_{12}, a_1, \dots, p^*, e^*, w, p_{21}, \underline{s}_2, k^{\tau_2}, w_2:$
 $\dots p_{21} = d\omega I_{21} \wedge i = \langle \langle t_{22}, t_{21}, p_{12}, t_{12}, a_1, p^*, \dots, e^*, w \rangle, \langle p_{21}, \underline{s}_2, k^{\tau_2}, w_2, \dots \rangle \rangle$

s.t.

$\top w \in \top p_{12}$	• • ————— 	$\top e^*: e^*\text{-agt speaks up}$ $\top \vartheta_w e^*: e^*\text{-instant}$ $e_1: \top a_1 = \text{Ann (non } e^*\text{-particip.) promises } p_{11} = \text{Dom } t_{11}$ $s_1 = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ exp. by } \top a_1$ $t_1: e^*\text{-day}$
--------------------------	--------------------------	---

$w_2 \in p_{21} (e_1\text{-based } p_{11}\text{-remote } e^*\text{-future}) \subseteq \text{Dom } e_1 - p_{11}$

• • ————— 	$e_1 w_2: \top a_1 = \text{Ann drops in}$ $\top t_{21} w_2 = \vartheta_{w_2} e_1 w_2 = f(\vartheta_{w_2} \underline{s}_2 w_2) = k^{\tau_2} w_2 \underline{s}_2 w_2$ $e^*\text{-tomorrow}$ $\underline{s}_2 w_2: \text{prestate of } e_1 w_2$
--------------------------	---

$w_1 \in p_{11} (e_1\text{-promised future})$

• ————— 	$e_1 (in w_1)$ $\text{CON}_{w_1} e_1: \text{consequent state of } e_1 (in w_1)$ $t_{11} w_1: \text{final subinterval of } \vartheta_{w_1} \text{CON}_{w_1} e_1$
• 	$e_1 w_2: \text{end of } e_1\text{-conseq. state, } e_1\text{-agt drops in}$ $\top t_{12} w_1 \subseteq \vartheta_{w_1} \text{CON}_w e_1 w_1$

I

[**a** | AGT_{dΩ, dε} **a**]

[REM.FUT (*would*)

[$\partial(\emptyset \subset d\Omega \subseteq \text{Dom } d\underline{\varepsilon} - d\Omega_1)$]; [$\partial(\partial \mathbf{d}\varepsilon <_{d\Omega} \mathbf{d}\tau)$];

[S | $S = \text{BUL}_{d\omega} \mathbf{d}\varepsilon$]; [**p** | $\mathbf{p} = \text{MIN}_{d(\Omega t)}$ $d\Omega$]

bake¹

[$\underline{e}e$ k^β | *bake*($\underline{e}e$, AGT), $^f \underline{e}e = \text{BEG } k^\beta$];

a

cake

[\underline{b} | $\underline{b} = d\kappa^\beta \langle ^f d\underline{\varepsilon}\varepsilon \rangle$, ONE(\underline{b} , $d\kappa^\beta$)]; [*cake* $d\kappa^\beta$]

] (scope of *would*)

[$^f d\underline{\varepsilon}\varepsilon \subseteq_{d\Omega} \mathbf{d}\tau$]; [AGT $d\underline{\varepsilon}\varepsilon =_{d\Omega} \mathbf{d}\alpha$]; [$\mathbf{d}\varepsilon < \mathbf{d}\tau \subseteq \partial \text{CON } ^f d\underline{\varepsilon}\varepsilon$];

(coherence relation)

. (intonation)

[$d\underline{\varepsilon} \subseteq_{d\Omega} \partial \text{CON } ^f d\underline{\varepsilon}\varepsilon$]; [**p**]; [$\mathbf{d}\Omega \sim \mathbf{d}\omega$];

$\forall i \in I_{22} \exists t_{22}, t_{21}, p_{12}, t_{12}, a_1, \dots, p^*, e^*, w, p_{21}, t_2, w_2$:

$\dots p_{21} = d\omega I_{21} \wedge i = \langle \langle \{p^*\}, t_{22}, t_{21}, p_{12}, t_{12}, a_1, p^*, \dots, e^*, w \rangle, \langle p_{21}, t_2, w_2, \dots \rangle \rangle$

s.t.

$^T w \in ^T p_{12}$



$^T e^*$: e^* -agt speaks up

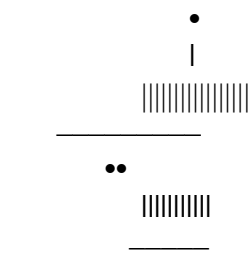
$^T \vartheta_w e^*$: e^* -instant

e_1 : $^T a_1 = \text{Ann}$ (non e^* -prticip.) promises $p_{11} = \text{Dom } t_{11}$

$s_1 = \text{CON}_w e_1$: conseq. state of e_1 exp. by $^T a_1$

t_1 : e^* -day

$w_2 \in p_{21}$ (e_1 -based e^* -desirable but p_{11} -remote e^* -future)



$\underline{e}_1 w_2$: $^T a_1 = \text{Ann}$ drops in

$^T t_{21} w_2 = \vartheta_{w_2} \underline{e}_1 w_2 = ^f (\vartheta_{w_2} \underline{s}_2 w_2) = k^x_2 w_2 \underline{s}_2 w_2$

e^* -tomorrow

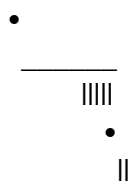
$\underline{s}_2 w_2$: prestate of $\underline{e}_1 w_2$

$\langle ^1 \underline{e}e_2 w_2, \dots ^f \underline{e}e_2 w_2 \rangle$: e^* -agt bakes a k^β_2 -cake \underline{b}_2

$^T t_{23} \subseteq \vartheta_{w_2} ^f \underline{e}e_2 w_2$

$\text{CON}_{w_2} ^f \underline{e}e_2 w_2$: final conseq. state of $\underline{e}e_2$ (with \underline{b}_2 -cake)

$w_1 \in p_{11}$ (e_1 -promised future)



e_1 (in w_1)

$\text{CON}_{w_1} e_1$: consequent state of e_1 (in w_1)

$t_{11} w_1$: final subinterval of $\vartheta_{w_1} \text{CON}_{w_1} e_1$

$\underline{e}_1 w_2$: end of e_1 -conseq. state, e_1 -agt drops in

$^T t_{12} w_1 \subseteq \vartheta_{w_1} \text{CON}_{w_1} \underline{e}_1 w_1$

¹ ($\underline{e} = \text{BEG } k^\beta$) := ($\text{Dom } \underline{e} = \text{Dom } k^\beta$

$\wedge \forall w \in \text{Dom } \underline{e} (\underline{e}w \in \text{Dom } k^\beta w \wedge \forall e \bullet \in \text{Dom } k^\beta w (\vartheta_w \underline{e}w < \vartheta_w e \bullet))$

4. REAL PROSPECT (Kalaallisut)

(1_K) Aani[**a** | **a** = *aani*]; [3SG_{d_Ω}, **d_ε** **d_α**];*if*

promise-

[*e* | *e* | *promise*_{d_ω}(*e*, AGT, *t*), (∅CON *d_ε* – *t*) < *t* ⊆ ∅CON *d_ε*];*fb*

-IND.IV

[∂(*speak*_{d_ω}(**d_ε**, AGT))];[*d_ε* <_{d_ω} **d_ε**, **d_τ** ⊆_{d_ω} CON *d_ε*]; [**d_α** =_{d_ω} AGT *d_ε*];[**p**]; [**d_Ω** ~ **d_ω**]

-3SG

[∂(3SG_{d_ω}, **d_ε**)]

day-

-SG.LOC_{ff}[*k^r* | *day.of*(*k^r*, **ε•**)]; [*t* | *t* =_{d_ω} *dκ^r*(**d_ε**)]; [**d_τ** ⊆ *d_τ*]*ff*

(accommodation)

[*p* | *p* = Dom **d_τ**];

come.in-

[*e* | *come.in*(*e*, AGT)];

-prospect

[∂(**d_τ** ⊆_{d_Ω} CON *d_ε*)];[*d_ε* ⊆_{d_Ω} **d_τ**, CON *d_ε* <_{d_Ω} CON *d_ε*];[*ε* | ∅_ε = ∅CON *d_ε*, EXP *ε* =_{d_Ω} AGT *d_ε*];-ELA_τ[BEG *d_σ* <_{d_ω} **d_ε**, **d_τ** ⊆_{d_ω} *d_σ*]; [**d_α** =_{d_ω} EXP *d_σ*]; [*d_σ* =_{d_ω} CON *d_ε*]-3SG_τ[∂(3SG_{d_ω}, **d_ε** EXP *d_σ*)]; [EXP *d_σ* =_{d_ω} AGT *d_ε*]

modified Bitt07

 $\forall i \in I_1 \exists p_{11}, a_1, \dots, w, \underline{s}_1, \underline{e}_1, t_1, k^r_1, p_{12}, e_1, \underline{t}_1:$ $p_{11} = \mathbf{d}\omega I_1 \wedge i = \langle \langle p_{11}, a_1, \dots, w \rangle, \langle \underline{s}_1, p_{12}, \underline{e}_1, t_1, k^r_1, p_{12}, e_1, \underline{t}_1 \rangle \rangle$

s.t.

 $\top w \in \top p_{11}$ •
|
•

|||||

 $\top e^*$: *e**-agt speaks up $\top \vartheta_w e^*$: *e**-instant e_1 : $\top a_1 = \text{Ann}$ (non *e**-particp.) promises $p_{12} = \text{Dom } \underline{t}_1$ $\underline{s}_1 w = \text{CON}_w e_1$: conseq. state of e_1 (in w) t_1 : *e**-day $w_1 \in p_{12}$ (e_1 -promised future)

•

—————
|||||

•

 e_1 (in w_1) $\underline{s}_1 w_1 = \text{CON}_{w_1} e_1$: conseq. state of e_1 (in w_1) $\underline{t}_1 w_1$: final subinterval of $\vartheta_{w_1} \text{CON}_{w_1} e_1$ $\underline{e}_1 w_1$: end of e_1 -conseq. time, e_1 -agt comes in

5. VIVID CONDITIONALS LICENSED BY KALAALLISUT (1_K)

(2 _K) bottle.of.wine-	-get	<i>if</i>
[<i>k</i> ^β] * <i>bottle.of.wine</i> <i>k</i> ^β]; [<i>e</i>] <i>get</i> (<i>e</i> , AGT, <i>dk</i> ^β);		
[-HYP		cf. -FCT _⊥ in (2i' _K)
[<i>w</i>] <i>w</i> ∈ dΩ , dε < _w dε , dε ⊆ _w dτ];		dΩ -vivid dε -future
τ	(scope of HYP _τ)	
[<i>∂</i> (2SG _{d_e, d_e} EXP dε)]; [p]; [dΩ ~ <i>dω</i>];		
-2SG _⊥	<i>if</i>	(coherence relation)
[<i>∂</i> (2SG _{d_ω, d_e} EXP dε)]; [t] t ⊆ ∅CON dε]; [dε ₁ ⊆ _{d_Ω} ∅CON dε]		
be.delighted-		<i>fb</i>
[<i>s</i>] <i>delighted</i> (<i>s</i> , EXP)];		
-prospect ¹		
[<i>∂</i> (dτ ⊆ _{d_Ω} CON dε)];		
[BEG <i>dσ</i> ⊆ _{d_Ω} dτ , CON dε < _{d_Ω} CON (BEG <i>dσ</i>)];		
[<i>s</i>] (∅s = ∅dε + ∅CON dε), (EXP <i>s</i> = _{d_Ω} EXP <i>dσ</i>);		
-IND.IV		
[<i>∂</i> (<i>speak</i> _{d_ω} (dε , AGT))]; [BEG <i>dσ</i> < _{d_ω} dε , dτ ⊆ _{d_ω} <i>dσ</i>]; [dα = _{d_ω} EXP <i>dσ</i>]; [p]; [dΩ ~ dω]		
-3SG	(coherence relation)	
[<i>∂</i> (3SG _{d_ω, d_e} dα)]; [BEG <i>dσ</i> ⊆ ∅CON dε]		

$\forall i \in I_2 \exists p_{22}, \dots, w, \underline{s}_{21}, \underline{s}_{22}: \dots p_{22} = \mathbf{d}\omega I_{22} (= \mathbf{d}\omega I_1) \wedge i = \langle \langle p_{22}, p_{21}, \dots, e^*, w \rangle, \langle \underline{s}_{22}, \underline{s}_{21}, \dots \rangle \rangle$

s.t.

$\tau_w \in \tau_{p_{22}}$	•	τe^* : <i>e</i> [*] -agt speaks up
		$\tau \vartheta_w e^*$: <i>e</i> [*] -instant
	•	e_1 : $\tau a_1 = \text{Ann}$ (non <i>e</i> [*] -prticip.) promises $p_{12} = \text{Dom } \underline{t}_1$
	—————	$\underline{s}_1 w = \text{CON}_w e_1$: conseq. state of e_1 (in w)
		t_1 : <i>e</i> [*] -day

~~~~~  
 $w_2 \in {}^{(\tau)}p_{21}$  ( $p_{12}$ -based  $\tau p_{11}$ -vivid *e*<sup>\*</sup>-future)  $\subseteq \tau p_{11} \cap p_{12}$

|       |                                                                                                                                     |
|-------|-------------------------------------------------------------------------------------------------------------------------------------|
| •     | $e_1$ (in $w_1$ )                                                                                                                   |
| ————— | $\underline{s}_1 w_1 = \text{CON}_{w_1} e_1$ : conseq. state of $e_1$ (in $w_1$ )                                                   |
|       | $\underline{t}_1 w_1$ : final subinterval of $\vartheta_{w_1} \text{CON}_{w_1} e_1$                                                 |
| •     | $e_1 w_1$ : end of $e_1$ -conseq. time, $e_1$ -agt comes in                                                                         |
| •     | $e_2 w_1$ : <i>e</i> <sup>*</sup> -exp gets $k_2^\beta$ -bottle(s) of wine                                                          |
| ————— | $\text{CON}_{w_1} e_2 w_1$ : conseq. state of $e_2 w_1$                                                                             |
|       | $\tau \underline{t}_2 w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} e_2 w_2$                                                       |
| —     | $\underline{s}_{21} w_2$ : $\tau a_1 = \text{Ann}$ (non <i>e</i> <sup>*</sup> -prticipnt) is delighted                              |
| •     | $\text{BEG}_{w_2} \underline{s}_{21} w_2$ : end of <i>e</i> <sup>*</sup> -conseq. state, onset of $\underline{s}_{21} w_2$ -delight |
| ————— | $\underline{s}_{22} w_2$ : <i>e</i> <sup>*</sup> -current prospect of $\underline{s}_{21} w_2$ -delight                             |

<sup>1</sup>  $(t_1 + t_2) := ut. t_1 \subseteq t \wedge t_2 \subseteq t \wedge \forall t'(t_1 \subseteq t' \wedge t_2 \subseteq t' \rightarrow t \subseteq t')$

- (3<sub>K</sub>) **be.tired** *if*  
 $[\underline{s} | \textit{tired}(\underline{s}, \text{EXP})];$   
 $[-\text{HYP}_{\perp}$   
 $[w | w \in \mathbf{d}\Omega, \mathbf{d}\varepsilon <_w \mathbf{d}\sigma, \mathbf{d}\tau \subseteq_w \mathbf{d}\sigma];$   
 $\perp$  (scope of  $\text{HYP}_{\tau}$ )  
 $[\partial(\text{3SG}_{\mathbf{d}\Omega, \mathbf{d}\varepsilon} \mathbf{d}\alpha), \text{EXP } \mathbf{d}\sigma =_{\mathbf{d}\omega} \mathbf{d}\alpha]; [a | a = \mathbf{d}\alpha]; [\mathbf{p}]; [\mathbf{d}\Omega \sim \mathbf{d}\omega];$   
 $-\text{3SG}_{\perp}$  *if* (coherence relation)  
 $[\partial(\text{3SG}_{\mathbf{d}\Omega, \mathbf{d}\omega} \mathbf{d}\alpha)]; [\underline{t} | \underline{t} \subseteq \vartheta \mathbf{d}\sigma]; [\underline{d}\varepsilon \subseteq_{\mathbf{d}\Omega} \vartheta \mathbf{d}\sigma]$   
**film-** *use.as.customary-* *fb*  
 $[k^{\beta} | *film k^{\beta}]; [\underline{ee} | \textit{use.as.customary}(\underline{ee}, \text{AGT}, k^{\beta})];$   
**-be.possible**  
 $[\partial(\mathbf{d}\tau \subseteq_{\mathbf{d}\Omega} \text{CON } \mathbf{d}\varepsilon)];$   
 $[p | \emptyset \subset p \subset \mathbf{d}\Omega];$   
 $[\mathbf{d}\varepsilon \subseteq_{\mathbf{d}\Omega} \mathbf{d}\tau, \text{CON } \mathbf{d}\varepsilon <_{\mathbf{d}\Omega} \text{CON } \mathbf{d}\varepsilon];$   
 $[\underline{s} | (\vartheta \underline{s} = \vartheta \mathbf{d}\varepsilon + \vartheta \text{CON } \mathbf{d}\varepsilon), (\text{EXP } \underline{s} =_{\mathbf{d}\Omega} \text{AGT } \mathbf{d}\varepsilon)];$   
**-IND.IV**  
 $[\partial(\textit{speak}_{\mathbf{d}\omega}(\mathbf{d}\varepsilon, \text{AGT}))];$   
 $[\text{BEG } \mathbf{d}\sigma <_{\mathbf{d}\omega} \mathbf{d}\varepsilon, \mathbf{d}\tau \subseteq_{\mathbf{d}\omega} \mathbf{d}\sigma]; [\mathbf{a} | \mathbf{a} =_{\mathbf{d}\omega} \text{EXP } \mathbf{d}\sigma];$   
 $[\mathbf{p}]; [\mathbf{d}\Omega \sim \mathbf{d}\omega]$   
**-1PL** (coherence relation)  
 $[\partial(\text{1PL}_{\mathbf{d}\omega, \mathbf{d}\varepsilon} \mathbf{d}\alpha)]; [\mathbf{d}\varepsilon \subseteq \vartheta \text{CON } \mathbf{d}\varepsilon]$

$\forall i \in I_{22} \exists p_{23}, p_{21}, a_2, t_2, \dots, w, s_{22}, p_{22}, ee_2, k_2^\beta, a_1, w_2, k_2^\alpha, s_{21}:$   
 $\dots p_{23} = \mathbf{d}\omega I_2 \wedge p_{22} = \mathbf{d}\omega I_2 \wedge i = \langle\langle p_{23}, a_2, p_{21}, t_2, \dots, e^*, w \rangle, \langle s_{22}, p_{22}, ee_2, k_2^\beta, a_1, w_2, k_2^\alpha, s_{21}, \dots \rangle\rangle$

s.t.

$\top w \in \top p_{23}$       •       $\top e^*: e^*$ -agt speaks up  
                          |       $\top \vartheta_w e^*: e^*$ -instant  
                          •       $e_1: \top a_1 = \text{Ann (non } e^*\text{-prtcip.) promises } p_{12} = \text{Dom } t_1$   
                          \_\_\_\_\_       $s_1 w = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ (in } w)$   
                          |||||       $t_1: e^*$ -day

~~~~~  
 $w_2 \in p_{22} (^{\top} p_{21}\text{-based } p_{11}\text{-vivid } e^*\text{-possible future}) \subseteq p_{21}$

• $e_1 \text{ (in } w_1)$
 _____ $s_1 w_1 = \text{CON}_{w_1} e_1: \text{conseq. state of } e_1 \text{ (in } w_1)$
 || $t_1 w_1: \text{final subinterval of } \vartheta_{w_1} \text{CON}_{w_1} e_1$
 • $e_1 w_1: \text{end of } e_1\text{-conseq. time, } e_1\text{-agt comes in}$
 _____ $s_{21} w_1: a_1 = \text{Ann is } k_2^\alpha\text{-tired}$
 || $\top t_2 w_2 \subseteq \vartheta_{w_2} s_{21} w_2$
 •••• $\langle {}^1 ee_2 w_2, \dots, {}^f ee_2 w_2 \rangle: \top a_2 = e^*\text{-agt} + \dots \text{ watch } k_2^\beta\text{-dvds}$
 • ${}^1 ee_2 w_2: \text{end of } e^*\text{-conseq. state, stage1 of } ee_2\text{-dvd.watching}$
 _____ $s_{22} w_2: e^*\text{-current prospect of } ee_2\text{-dvd.watching}$

~~~~~  
 $w_2 \in (^{\top} p_{21} (p_{12}\text{-based } p_{11}\text{-vivid } e^*\text{-future}) \subseteq \top p_{11} \cap p_{12}$

•       $e_1 \text{ (in } w_1)$   
      \_\_\_\_\_       $s_1 w_1 = \text{CON}_{w_1} e_1: \text{conseq. state of } e_1 \text{ (in } w_1)$   
      ||       $t_1 w_1: \text{final subinterval of } \vartheta_{w_1} \text{CON}_{w_1} e_1$   
      •       $e_1 w_1: \text{end of } e_1\text{-conseq. time, } e_1\text{-agt comes in}$   
      \_\_\_\_\_       $s_{21} w_1: a_1 = \text{Ann is } k_2^\alpha\text{-tired}$   
      ||       $\top t_2 w_2 \subseteq \vartheta_{w_2} s_{21} w_2$

6. REMOTE CONDITIONAL LICENSED BY KALAALLISUT (1<sub>K</sub>)

(4<sub>K</sub>) alcohol- -serve if  
 $[k^\beta | alcohol\ k^\beta]; [e | serve\langle e, AGT, dk^\beta \rangle];$

-HYP<sub>T</sub>  
 $[w | w \in \mathbf{d}\Omega, \mathbf{d}\varepsilon <_w \mathbf{d}\underline{\varepsilon}, \mathbf{d}\underline{\varepsilon} \subseteq_w \vartheta\text{CON}\mathbf{d}\underline{\varepsilon}_1]; [\partial(2\text{SG}_{\mathbf{d}\Omega, \mathbf{d}\varepsilon} \text{AGT } \mathbf{d}\varepsilon)]; [\mathbf{p}]; [\mathbf{d}\Omega \sim \mathbf{d}w];$

-1SG<sub>L</sub> if (coherence relation)  
 $[\partial(1\text{SG}_{\mathbf{d}\Omega, \mathbf{d}w} \text{AGT } \mathbf{d}\varepsilon)]; [\mathbf{t} | \mathbf{t} \subseteq \vartheta\text{CON } \mathbf{d}\underline{\varepsilon}]; [\mathbf{d}\underline{\varepsilon} \subseteq_{\mathbf{d}\Omega} \vartheta\text{CON } \mathbf{d}\underline{\varepsilon}_1]$

be.drunk- -begin fb  
 $[\underline{s} | drunk\langle \underline{s}, \text{EXP} \rangle]; [e | e = \text{BEG } \mathbf{d}\underline{\sigma}, \text{EXP } e = \text{EXP } \mathbf{d}\underline{\sigma}];$

-be.liable  
 $[\partial(\mathbf{d}\tau \subseteq_{\mathbf{d}\Omega} \text{CON } \mathbf{d}\varepsilon)];$   
 $[\mathbf{d}\underline{\varepsilon} \subseteq_{\mathbf{d}\Omega} \mathbf{d}\tau, \text{CON } \mathbf{d}\varepsilon <_{\mathbf{d}\Omega} \text{CON } \mathbf{d}\underline{\varepsilon}];$   
 $[\underline{s} | (\vartheta\underline{s} = \vartheta\mathbf{d}\varepsilon + \vartheta\text{CON } \mathbf{d}\varepsilon), (\text{EXP } \underline{s} =_{\mathbf{d}\Omega} \text{EXP } \mathbf{d}\underline{\varepsilon})];$   
 $[\mathbf{S} | \mathbf{S} = \text{BUL}_{\mathbf{d}w} \mathbf{d}\varepsilon, \mathbf{d}\Omega \emptyset \text{MIN}_{\mathbf{S}} \mathbf{d}\Omega];$

-*galuar*  
 $[\partial(d(\Omega t) = \text{BUL}_{\mathbf{d}w} \mathbf{d}\varepsilon)]; [p | p \in d(\Omega t), \mathbf{d}\Omega \emptyset p];$

-IND.IV  
 $[\partial(speak_{\mathbf{d}w}\langle \mathbf{d}\varepsilon, \text{AGT} \rangle)]; [\text{BEG } \mathbf{d}\underline{\sigma} <_{\mathbf{d}w} \mathbf{d}\varepsilon, \mathbf{d}\tau \subseteq_{\mathbf{d}w} \mathbf{d}\underline{\sigma}]; [\mathbf{d}\alpha =_{\mathbf{d}w} \text{EXP } \mathbf{d}\underline{\sigma}]; [\mathbf{p}]; [\mathbf{d}\Omega \sim \mathbf{d}w]$

-3SG (coherence relation)  
 $[\partial(3\text{SG}_{\mathbf{d}w, \mathbf{d}\varepsilon} \mathbf{d}\alpha)]; [\mathbf{d}\underline{\varepsilon} \subseteq \vartheta\text{CON } \mathbf{d}\underline{\varepsilon}_1]$

$\forall i \in I_2 \exists p_{22}, t_2, \dots, w, \underline{s}_{22}, \underline{e}_{22}, \underline{s}_{21}, p_{21}, w_2, \underline{e}_{21}, k^\beta_2:$   
 $\dots p_{22} = \mathbf{d}w I_{22} (= \mathbf{d}w I_1) \wedge i = \langle \langle p_{22}, t_2, \dots, w \rangle, \langle \text{BUL}_w e^*, \underline{s}_{22}, \underline{e}_{22}, \underline{s}_{21}, p_{21}, w_2, \underline{e}_{21}, k^\beta_2, \dots \rangle \rangle$

s.t.

|                          |   |                                                                                           |
|--------------------------|---|-------------------------------------------------------------------------------------------|
| $\top w \in \top p_{22}$ | • | $\top e^*: e^*\text{-agt speaks up}$                                                      |
|                          |   | $\top \vartheta_w e^*: e^*\text{-instant}$                                                |
|                          | • | $e_1: \top a_1 = \text{Ann (non } e^*\text{-prtcip.) promises } p_{12} = \text{Dom } t_1$ |
|                          | — | $\underline{s}_1 w = \text{CON}_w e_1: \text{conseq. state of } e_1 \text{ (in } w)$      |
|                          |   | $t_1: e^*\text{-day}$                                                                     |

~~~~~  
 $w_2 \in p_{21} (p_{12}\text{-based } \top p_{11}\text{-vivid but } e^*\text{-undesirable } e^*\text{-future}) \subseteq \top p_{11} \cap p_{12}$

	•	$e_1 \text{ (in } w_2)$
	—	$\underline{s}_1 w_2 = \text{CON}_{w_2} e_1: \text{conseq. state of } e_1 \text{ (in } w_2)$
		$t_1 w_2: \text{final subinterval of } \vartheta_{w_2} \text{CON}_{w_2} e_1$
	•	$\underline{e}_1 w_2: \text{end of } e_1\text{-conseq. time, } e_1\text{-agt comes in}$
	—	$\text{CON}_{w_2} \underline{e}_1 w_2: \text{conseq. state of } \underline{e}_1 w_2$
	•	$\underline{e}_{21} w_2: e^*\text{-agt serves } k^\beta_2\text{-alcohol}$
		$\top t_2 w_2 \subseteq \vartheta_{w_2} \text{CON}_{w_2} \underline{e}_{21} w_2$
	—	$\underline{s}_2 w_2: \top a_1 (= e_1\text{-agt}) = \text{Ann is drunk}$
	•	$\underline{e}_{22} w_2 = \text{BEG}_{w_2} \underline{s}_2 w_2$

APPENDIX: UPDATE WITH CENTERING (UC)

D0. Basic terms of UC

<u>Variables</u>	<u>Constants</u>	<u>Demonstratives</u>	<u>Type</u>	<u>Name of objects</u>
			t	truth values
a , <i>a</i>	<i>john</i> , a^* , a_n , ...		α	animate entities
b , <i>b</i>	b_n		β	inanimate entities
e , <i>e</i>	e^* , e_n		ε	(atomic) events
s , <i>s</i>	s^* , s_n		σ	states (of entities)
t , <i>t</i>	t^* , t_n		τ	times
l , <i>l</i>	l^* , l_n		π	places
w , <i>w</i>	w_n , ...		ω	worlds
ev , <i>ev</i>	ev_n		$\varepsilon \vee \sigma := \varepsilon \bullet$	(atomic) eventualities
p , <i>p</i>	p^* , p_n , ...		$\omega t :=: \Omega$	ω -sets (<i>aka</i> propositions)
S , <i>S</i>			Ωt	Ω -sets (<i>aka</i> ordering sources)
a , <i>a</i>			$\omega \alpha :=: \underline{\alpha}$	α -concepts
\vdots			\vdots	\vdots
ev , <i>ev</i>			$\underline{\varepsilon \bullet}$	$\varepsilon \bullet$ -concepts
k^N			$\omega \varepsilon \bullet N$	N-kinds ($N \in \{t, \alpha, \beta, \tau, \pi, \Omega\}$)
h^V			$\omega \tau V$	V-habits ($V \in \{\varepsilon, \sigma, \varepsilon \varepsilon\}$)
	BEG		$\omega \sigma \varepsilon$	beginning (of state)
	AGT		$\omega \varepsilon \alpha$	agent (of action)
	EXP		$\omega \varepsilon \bullet \alpha$	experiencer (of eventuality)
	ϑ		$\omega \varepsilon \bullet \tau$	time (of eventuality)
	Π		$\omega \varepsilon \bullet \pi$	place (of eventuality)
<i>z</i>	z_n , c^* , ...		ζ	dref stacks
<i>i, j, k, h</i>			$\zeta \times \zeta := s$	indices
<i>I, J, K, H</i>			<i>st</i>	(information & attention) states

D1. Set of *dref* types

- $\{t, \alpha, \beta, \varepsilon, \sigma, \tau, \pi, \omega\} \subseteq \Theta$
- $(\varepsilon \vee \sigma) \in \Theta$
- $(RR') \in \Theta$, if $R, R' \in \Theta$

In the following *axioms* for *dref* stacks, $n \in \{1, 2, \dots\}$ and $R, R' \in \Theta$:

Ax1	$\exists z_\zeta: \forall n(n(z) = \dagger) \wedge \forall R(R(z) = z)$	empty stack
Ax2	$\forall z_\zeta \forall R \forall d_R: {}^1(d \cdot z) = d \wedge \forall n(n > 1 \rightarrow {}^n(d \cdot z) = {}^{n-1}(z))$	<i>n</i> th coord of $(d \cdot z)$
Ax3	$\forall z_\zeta \forall R \forall d_R: {}^R(d \cdot z) = (d \cdot {}^R(z)) \wedge \forall R'(R' \neq R \rightarrow {}^{R'}(d \cdot z) = {}^{R'}(z))$	R-coord's of $(d \cdot z)$
Ax4	$\forall z_\zeta \forall R \forall d_R \exists z'_\zeta: (d \cdot z) = z'$	enough stacks
Ax5	$\forall z_\zeta \forall z'_\zeta: \forall n(n(z) = {}^n(z')) \rightarrow z = z'$	stack identity

D2. Sequence notation & coordinates

- $\langle \rangle :=$ the stack z such that $\forall n(n(z) = \dagger) \wedge \forall R \in \Theta(R(z) = z)$
- $\langle d_1, \dots, d_n \rangle := d_1 \cdot (\dots \cdot (d_n \cdot \langle \rangle))$
- $\top_i := {}^1_i$
- $\perp_i := {}^2_i$

D3. Initial contexts & default states

- An *initial context* is a dref stack $c^* = \langle p^*, e^* \rangle$
s.t. $p^* \neq \emptyset$ & $\forall w \in p^*(\text{speak.up}_w(e^*, \text{AGT}_w e^*))$
- c^* induces the *default state* $[c^*] := \lambda i_s. \exists w \in p^*(i = \langle \langle p^*, \vartheta_w e^*, e^*, w \rangle, \langle \rangle \rangle)$

D4. Demonstratives

- $dR, \mathbf{dR} := dR_0, \mathbf{dR}_0$ for $R \in \Theta$
- $dR_n := \lambda i_s. n+1 \binom{R}{\perp i}$
- $\mathbf{dR}_n := \lambda i_s. n+1 \binom{R}{\tau i}$

D5. Global values, substates

- $\delta I := \{\delta_{sR} i : i_s \in I_{st}\}$ for $R \in \Theta$
- $I_{\delta=d} := \{i_s \in I \mid \delta_{sR} I = d_R\}$ for $R \in \Theta$

D6. Conditions (type st)

- $PL\langle \delta \rangle := \lambda i_s. |\delta i| > 1$
- $SG\langle \delta \rangle := \lambda i_s. |\delta i| = 1$
- $\delta = \delta' := \lambda i_s. \delta i = \delta' i$
- $\delta \in \Delta := \lambda i_s. \delta i \in \Delta i$
- $MOST\langle \Delta, \Delta' \rangle := \lambda i_s. \Delta' i \subseteq \Delta i \wedge |\Delta i \cap \Delta' i| > |\Delta i - \Delta' i|$
- $SM\langle \Delta, \Delta' \rangle := \lambda i_s. \emptyset \subset \Delta' i \subseteq \Delta i$
- $R_{\mathbf{d}\omega}\langle s, EXP \rangle := \lambda i_s. R_{\mathbf{d}\omega}(s, EXP_{\mathbf{d}\omega} s)$
- $R_{\mathbf{d}\omega}\langle e, AGT, a \rangle := \lambda i_s. R_{\mathbf{d}\omega}(e, AGT_{\mathbf{d}\omega} e, a)$
- $\mathbf{d}\tau \subseteq_{\mathbf{d}\omega} \mathbf{d}\sigma := \lambda i_s. \mathbf{d}\tau i \subseteq \vartheta_{\mathbf{d}\omega} \mathbf{d}\sigma i$
- $d\varepsilon \subseteq_{\mathbf{d}\omega} \mathbf{d}\tau := \lambda i_s. \vartheta_{\mathbf{d}\omega} d\varepsilon i \subseteq \mathbf{d}\tau i$
- $1SG_{\mathbf{d}\Omega, \mathbf{d}\varepsilon} \mathbf{a} := \lambda i_s. \forall w \in \mathbf{d}\Omega i (SG \mathbf{a} \wedge \mathbf{a} = AGT_w \mathbf{d}\varepsilon i)$
- $2SG_{\mathbf{d}\Omega, \mathbf{d}\varepsilon} \mathbf{a} := \lambda i_s. \forall w \in \mathbf{d}\Omega i (SG \mathbf{a} \wedge \mathbf{a} = EXP_w \mathbf{d}\varepsilon i)$

D7. Local updates (type $(st)(st)$)

- $[v] := \lambda I_{st} \lambda j_s. \exists i_s \in I \exists v_R (j = \langle \tau i, v \cdot \perp i \rangle)$ for $v_R \in {}^L\text{Var}, R \in \Theta$
- $[v] := \lambda I_{st} \lambda j_s. \exists i_s \in I \exists v_R (j = \langle v \cdot \tau i, \perp i \rangle)$ for $v_R \in {}^T\text{Var}, R \in \Theta$
- $[C_1, \dots, C_n] := \lambda I_{st} \lambda j_s. i \in I \wedge C_1 i \wedge \dots \wedge C_n i$
- $(D_1; D_2) := \lambda I_{st}. D_2(D_1 I)$
- $[v \mid C_1, \dots, C_n] := [v]; [C_1, \dots, C_n]$ for $v_R \in {}^L\text{Var} \cup {}^T\text{Var}, R \in \Theta$

D8. Non-local updates (type $(st)(st)$)

- $[\partial(C)] := \lambda I_{st} \lambda j_s. j \in I \wedge \forall i \in I(Ci)$
- $[\Delta \sim \delta] := \lambda I_{st} \lambda j_s. j \in I \wedge \Delta j = \delta I$ for $\Delta_{s(Rt)}, \delta_{sR}, R \in \{e, \omega, \Omega\}$
- $[\Delta \sim_{\chi} \delta] := \lambda I_{st} \lambda j_s. j \in I \wedge \Delta j = \delta I_{\chi=\chi j}$ for $\Delta_{s(Rt)}, \delta_{sR}, R \in \{e, \omega, \Omega\}$
- $[\Delta \sim_{\chi} \delta] := \lambda I_{st} \lambda j_s. j \in I \wedge \Delta j = \{\delta I_{\chi=\chi j}\}$ for $\Delta_{s(\Omega t)}, \delta_{s\omega}$
- $[SG\{\delta\}] := \lambda I_{st} \lambda j_s. j \in I \wedge |\delta I| = 1$
- $[SG_{\chi}\{\delta\}] := \lambda I_{st} \lambda j_s. j \in I \wedge |\delta I_{\chi=\chi j}| = 1$

D10. Truth (relative to initial context c^*)

- $|= D := \exists j_s (j \in D[c^*])$