TalkBank and CLARIN

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Basic Questions

- How did language emerge in the species?
- How does it change?
- How is it learned?
- How is it processed?
- What are the results of damage and variation?

Areas

Children:	CHILDES	PhonBank	Narrative	Bilingual
Clinical:	AphasiaBank	FluencyBank	Dementia	TBIBank
Adult:	CABank	TutorBank	GestureBank	ClassBank
Multilingualism:	BilingBank	SLABank	Online Tutors	DOVE

Funded Projects

	CHILDES	TalkBank	AphasiaBank	PhonBank	FluencyBank	LangBank	HomeBank
Age of Project	28	12	8	6	0.2	1	1
Words (millions)	59	47	1.8	0.8	0.5	2	audio
Linked Media (TB)	2.8	1.1	0.4	0.7	0.3	-	3.5
# Languages	41	22	6	18	4	2	2
# Publications	7000	320	256	480	-	4	5
# Users	2950	930	390	182	25	-	22
# Web Hits (millions)	4.1	1.3	0.3	0.1	-	-	

41 languages (including Cantonese)

*MIC: 睇 吓5 Sophie 畫 咗 啲 咩 圖畫 .

%mor: v|tai2=look_at asp|haa5=tentative n:prop|Sophie v|waak6=draw asp|zo2=perfective cl|di1=some wh|me1=what n|+n|tou4+n|waa2=drawing .

*CHI: 呢 啲 我哋 彈 琴 架 .

%mor: sfp|ne1=how_about cl|di1=some pro|ngo5-PL=I v|daan6=bounce n|kam4=piano sfp|gaa3 .

*SIS: 你 鍾意 Alicia 定係 呀 呀 Lulu 定係 Sophie 定係 Timmy ?

%mor: pro|nei5=you v|+v|zung1+n|ji3=like n:prop|Alicia conn|ding6hai6=or sfp|aa3 sfp|aa3 n:prop|Lulu conn|ding6hai6=or n:prop|Sophie conn|ding6hai6=or n:prop|Timmy ?

TalkBank Principles

- Community Driven
- Open access to data, media, derived corpora, and programs
- Standard format — CHAT, CHAT-XML, CHAT-CA
- CLAN programs running on CHAT format
- Transcripts linked to media
- Interoperable with other resources: R, Elan, Praat, SALT, Annis, CONLL, SpeechKitchen/Kaldi for ASR, LENA
- CHAT/PHON incorporates Praat

CLARIN Principles in TalkBank

- CLARIN-B center
  - InCommon login through Shibbolet
  - OAI-PMH server for OLAC, VLO
  - DOI through HandleServer, EZ-Cite
- CLARIN-K center
  - focus on analysis of spoken language
  - tutorials for CLAN, video tutorials
  - help desk, 5 Google Groups discussion boards
- SamtaleBank as a CLARIN illustration

Let's take a look on the web

- childes.talkbank.org
- talkbank.org
- homebank.talkbank.org
- sla.talkbank.org
- talkbank.org/access/SamtaleBank
- childes.talkbank.org/browser — Alicia at 3;3
- downloadable materials

Major Methods

1. Corpus Analysis

2. Profiling

3. Microanalysis

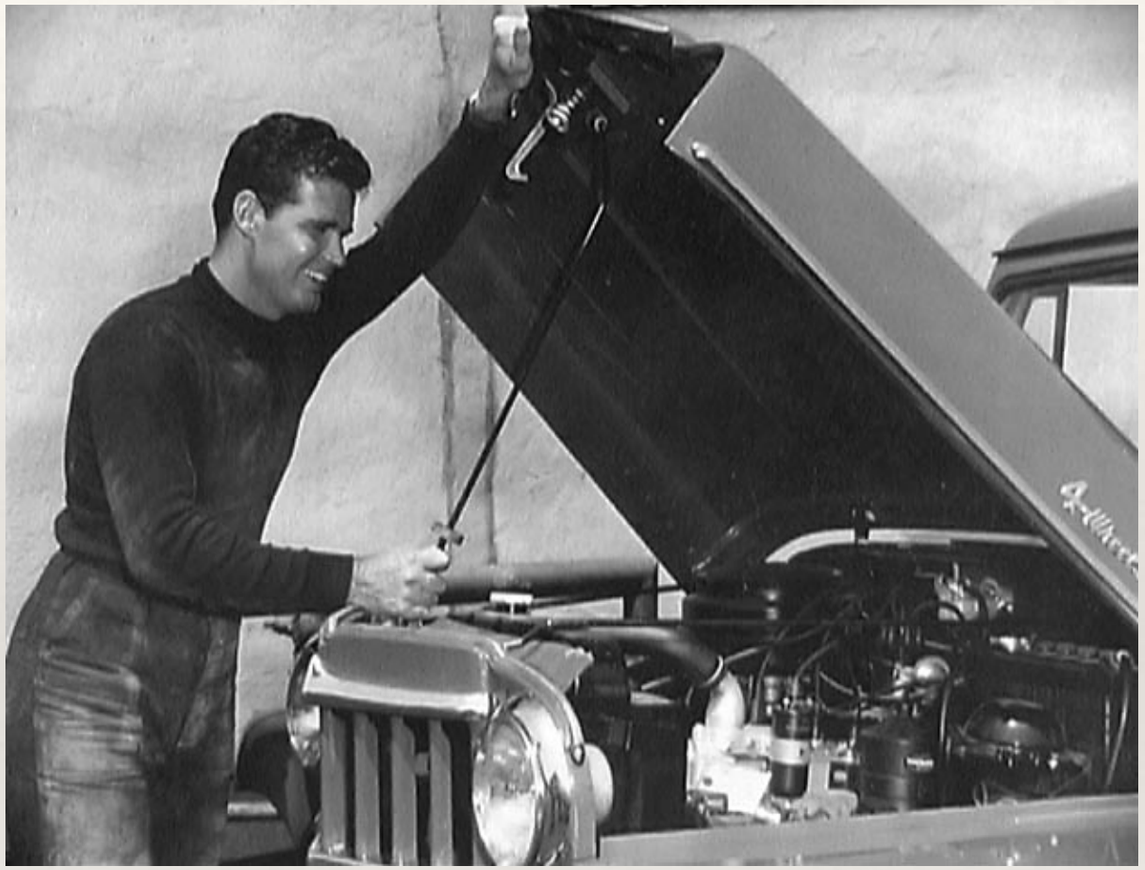
1. Corpus Analysis

- FREQ - Frequency analysis
  - wild cards
  - word files (morality words, LIWC, medical)
- KWAL - Key word and line
  - matches highlighted
- COMBO - Regular expression matching
- Hits can be triple-clicked to go back to transcript and play

LENA2CHAT

- 24 hour/day recordings in the home
- Much like Deb Roy's database and the "water" example, but open
- Huge ITS files reduced automatically to manageable CHAT files
- Check out http://homebank.talkbank.org

Looking under the Hood



MOR, POST, GRASP

- 41 languages, but only 11 have MOR/POST
- Cantonese, Danish, Dutch, English, French, Italian, Hebrew, Japanese, German, Mandarin, Spanish
- GRASP for English, German, Hebrew, Spanish, Mandarin

MOR

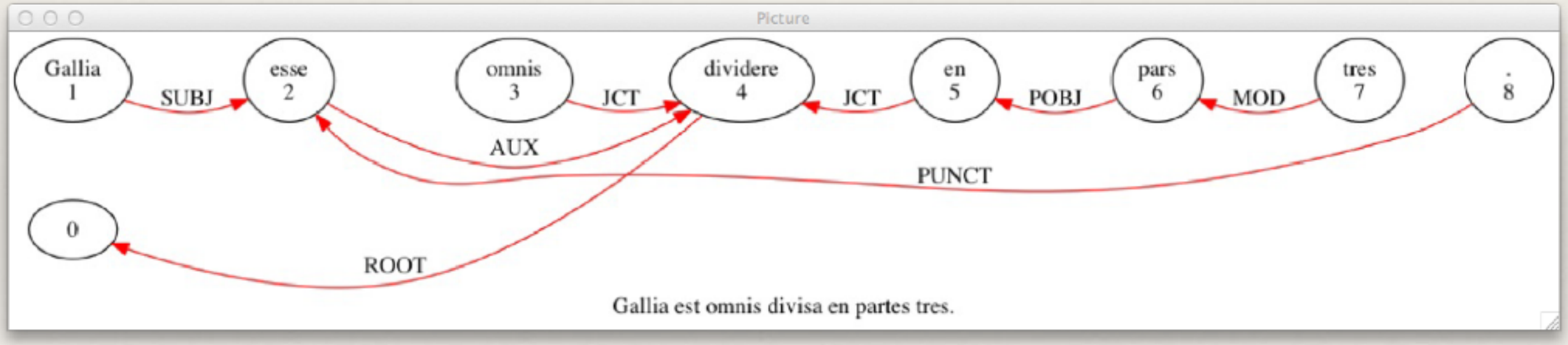
- More declarative than FST
- Part-of-speech tuned to spoken language
- Easy to use once there is a grammar
- Hard to build the grammar (A-rules, C-rules)
- 98% accuracy for English
- POSTMORTEM rules for German declension

Bilingual MOR

- *CHL: +" [- spa] <yo no la> [/] yo no la desmentí porque. [+ break]
- *CHL: what's my word against hers &ladadada .
- *CHL: +" [- spa] todos estamos con un calor and@s working@s .
- All words are tagged implicity; can be made explicit.
- Coding system makes code-switching junctures evident.
- Run English MOR, excluding [- spa], then Spanish MOR including [- spa]

Dependency Graphs

Web service runs by triple-clicking on %gra line

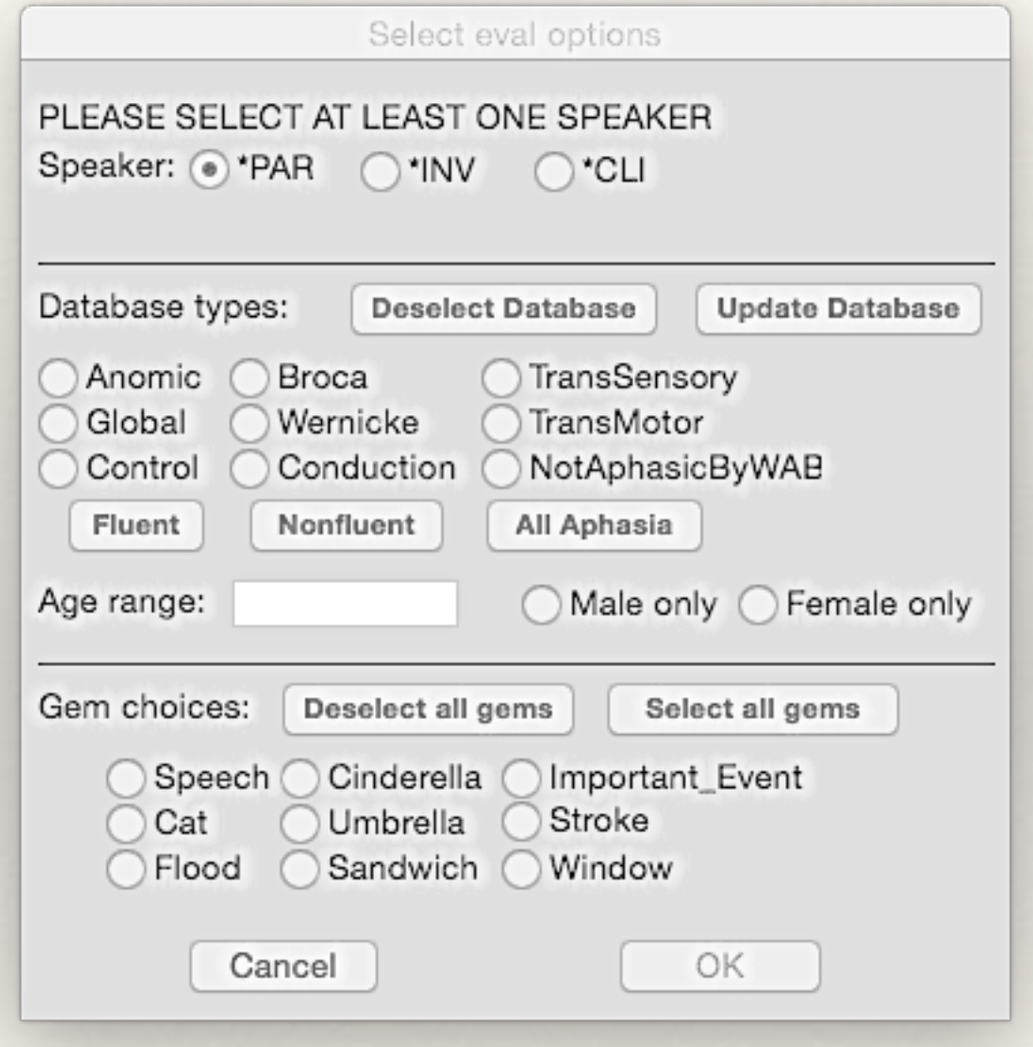


2. Profiling - EVAL/KIDEVAL

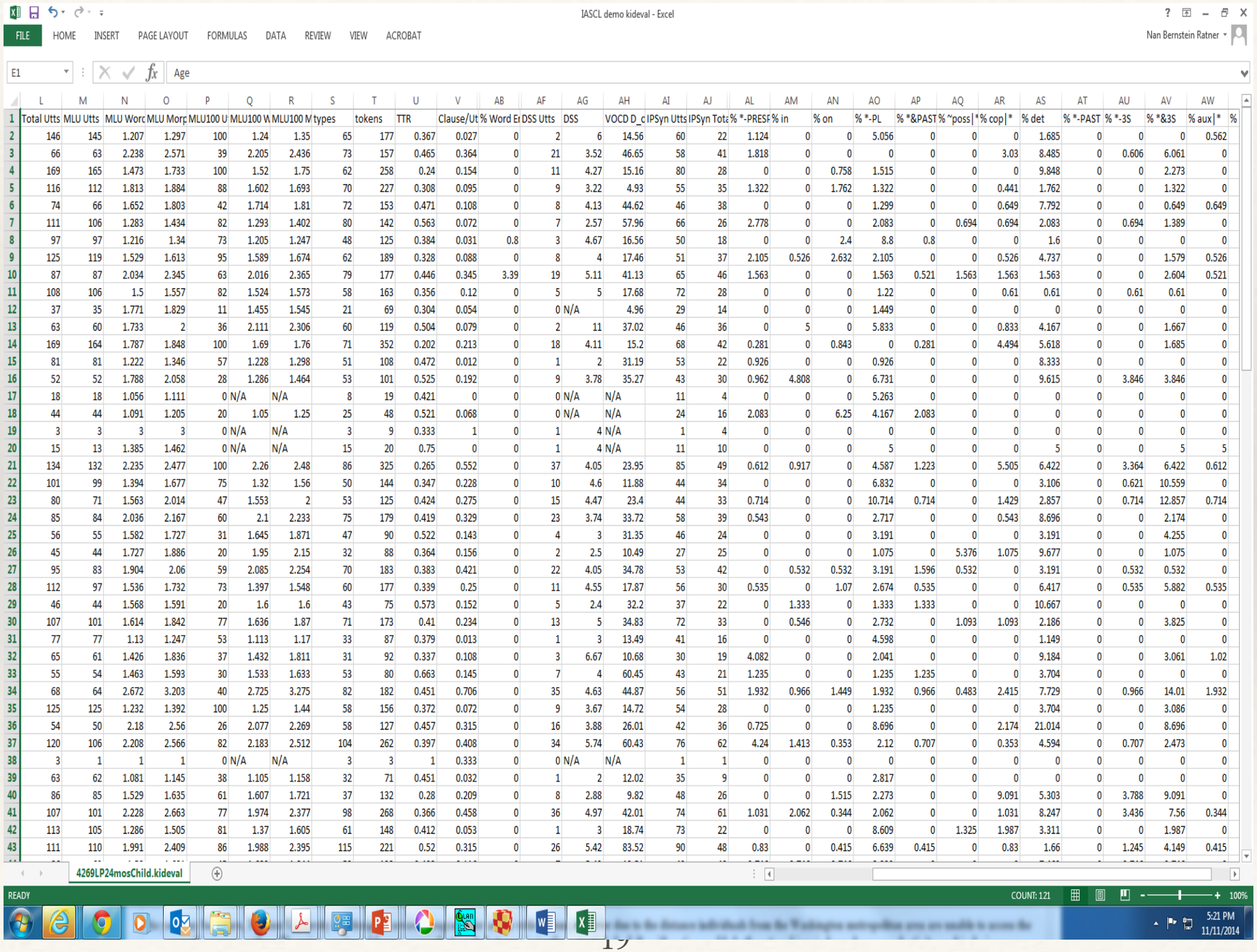
- This all depends on MOR and GRASP
- Comparison database with s.d. scores
- IPSyn, DSS
- MLU, MLT
- TTR, vocD, MATTR
- Brown's 14 morphemes
- TIMEDUR

EVAL

MLU, TTR
Verbs/Utt
% errors
% N, V, Aux, Adv, Conj, Pro
% PAST, PASTP, PL
Retracing, repetition

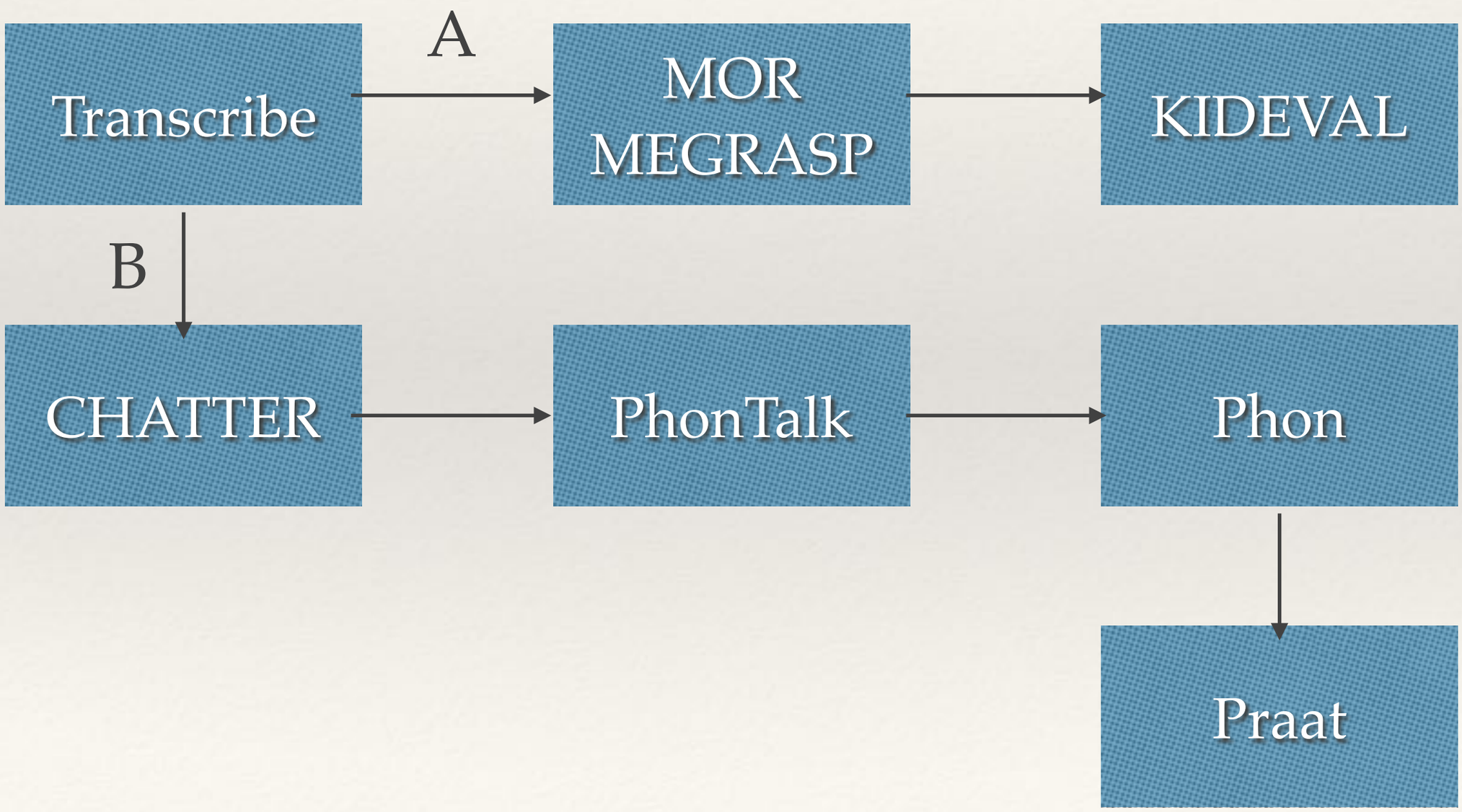


Sample Output



	L	M	N	O	P	Q	R	S	T	U	V	AB	AF	AG	AH	AI	AJ	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1	Total Utts	MLU Utts	MLU Word	MLU Morp	MLU100 U	MLU100 W	MLU100 M	types	tokens	TTR	Clause/Ut	% Word Er	DSS Utts	DSS	VOCD D_c	IPSyn Utts	IPSyn Tota	% *-PRESF	% in	% on	% *-PL	% *&PAST	% ~poss|*	% cop|*	% det	% *-PAST	% *-3S	% *&3S	% aux|*	%
2	146	145	1.207	1.297	100	1.24	1.35	65	177	0.367	0.027	0	2	6	14.56	60	22	1.124	0	0	5.056	0	0	0	1.685	0	0	0	0.562	
3	66	63	2.238	2.571	39	2.205	2.436	73	157	0.465	0.364	0	21	3.52	46.65	58	41	1.818	0	0	0	0	0	3.03	8.485	0	0.606	6.061	0	
4	169	165	1.473	1.733	100	1.52	1.75	62	258	0.24	0.154	0	11	4.27	15.16	80	28	0	0	0.758	1.515	0	0	0	9.848	0	0	2.273	0	
5	116	112	1.813	1.884	88	1.602	1.693	70	227	0.308	0.095	0	9	3.22	4.93	55	35	1.322	0	1.762	1.322	0	0	0.441	1.762	0	0	1.322	0	
6	74	66	1.652	1.803	42	1.714	1.81	72	153	0.471	0.108	0	8	4.13	44.62	46	38	0	0	0	1.299	0	0	0.649	7.792	0	0	0.649	0.649	
7	111	106	1.283	1.434	82	1.293	1.402	80	142	0.563	0.072	0	7	2.57	57.96	66	26	2.778	0	0	2.083	0	0.694	0.694	2.083	0	0.694	1.389	0	
8	97	97	1.216	1.34	73	1.205	1.247	48	125	0.384	0.031	0.8	3	4.67	16.56	50	18	0	0	2.4	8.8	0.8	0	0	1.6	0	0	0	0	
9	125	119	1.529	1.613	95	1.589	1.674	62	189	0.328	0.088	0	8	4	17.46	51	37	2.105	0.526	2.632	2.105	0	0	0.526	4.737	0	0	1.579	0.526	
10	87	87	2.034	2.345	63	2.016	2.365	79	177	0.446	0.345	3.39	19	5.11	41.13	65	46	1.563	0	0	1.563	0.521	1.563	1.563	1.563	0	0	2.604	0.521	
11	108	106	1.5	1.557	82	1.524	1.573	58	163	0.356	0.12	0	5	5	17.68	72	28	0	0	0	1.22	0	0	0.61	0.61	0	0.61	0.61	0	
12	37	35	1.771	1.829	11	1.455	1.545	21	69	0.304	0.054	0	0	N/A	4.96	29	14	0	0	0	1.449	0	0	0	0	0	0	0	0	
13	63	60	1.733	2	36	2.111	2.306	60	119	0.504	0.079	0	2	11	37.02	46	36	0	5	0	5.833	0	0	0.833	4.167	0	0	1.667	0	
14	169	164	1.787	1.848	100	1.69	1.76	71	352	0.202	0.213	0	18	4.11	15.2	68	42	0.281	0	0.843	0	0.281	0	4.494	5.618	0	0	1.685	0	
15	81	81	1.222	1.346	57	1.228	1.298	51	108	0.472	0.012	0	1	2	31.19	53	22	0.926	0	0	0.926	0	0	0	8.333	0	0	0	0	
16	52	52	1.788	2.058	28	1.286	1.464	53	101	0.525	0.192	0	9	3.78	35.27	43	30	0.962	4.808	0	6.731	0	0	0	9.615	0	3.846	3.846	0	
17	18	18	1.056	1.111	0	N/A	N/A	8	19	0.421	0	0	0	N/A	N/A	11	4	0	0	0	5.263	0	0	0	0	0	0	0	0	
18	44	44	1.091	1.205	20	1.05	1.25	25	48	0.521	0.068	0	0	N/A	N/A	24	16	2.083	0	6.25	4.167	2.083	0	0	0	0	0	0	0	
19	3	3	3	3	0	N/A	N/A	3	9	0.333	1	0	1	4	N/A	1	4	0	0	0	0	0	0	0	0	0	0	0	0	
20	15	13	1.385	1.462	0	N/A	N/A	15	20	0.75	0	0	1	4	N/A	11	10	0	0	0	5	0	0	0	5	0	0	5	5	
21	134	132	2.235	2.477	100	2.26	2.48	86	325	0.265	0.552	0	37	4.05	23.95	85	49	0.612	0.917	0	4.587	1.223	0	5.505	6.422	0	3.364	6.422	0.612	
22	101	99	1.394	1.677	75	1.32	1.56	50	144	0.347	0.228	0	10	4.6	11.88	44	34	0	0	0	6.832	0	0	0	3.106	0	0.621	10.559	0	
23	80	71	1.563	2.014	47	1.553	2	53	125	0.424	0.275	0	15	4.47	23.4	44	33	0.714	0	0	10.714	0.714	0	1.429	2.857	0	0.714	12.857	0.714	
24	85	84	2.036	2.167	60	2.1	2.233	75	179	0.419	0.329	0	23	3.74	33.72	58	39	0.543	0	0	2.717	0	0	0.543	8.696	0	0	2.174	0	
25	56	55	1.582	1.727	31	1.645	1.871	47	90	0.522	0.143	0	4	3	31.35	46	24	0	0	0	3.191	0	0	0	3.191	0	0	4.255	0	
26	45	44	1.727	1.886	20	1.95	2.15	32	88	0.364	0.156	0	2	2.5	10.49	27	25	0	0	0	1.075	0	5.376	1.075	9.677	0	0	1.075	0	
27	95	83	1.904	2.06	59	2.085	2.254	70	183	0.383	0.421	0	22	4.05	34.78	53	42	0	0.532	0.532	3.191	1.596	0.532	0	3.191	0	0.532	0.532	0	
28	112	97	1.536	1.732	73	1.397	1.548	60	177	0.339	0.25	0	11	4.55	17.87	56	30	0.535	0	1.07	2.674	0.535	0	0	6.417	0	0.535	5.882	0.535	
29	46	44	1.568	1.591	20	1.6	1.6	43	75	0.573	0.152	0	5	2.4	32.2	37	22	0	1.333	0	1.333	1.333	0	0	10.667	0	0	0	0	
30	107	101	1.614	1.842	77	1.636	1.87	71	173	0.41	0.234	0	13	5	34.83	72	33	0	0.546	0	2.732	0	1.093	1.093	2.186	0	0	3.825	0	
31	77	77	1.13	1.247	53	1.113	1.17	33	87	0.379	0.013	0	1	3	13.49	41	16	0	0	0	4.598	0	0	0	1.149	0	0	0	0	
32	65	61	1.426	1.836	37	1.432	1.811	31	92	0.337	0.108	0	3	6.67	10.68	30	19	4.082	0	0	2.041	0	0	0	9.184	0	0	3.061	1.02	
33	55	54	1.463	1.593	30	1.533	1.633	53	80	0.663	0.145	0	7	4	60.45	43	21	1.235	0	0	1.235	1.235	0	0	3.704	0	0	0	0	
34	68	64	2.672	3.203	40	2.725	3.275	82	182	0.451	0.706	0	35	4.63	44.87	56	51	1.932	0.966	1.449	1.932	0.966	0.483	2.415	7.729	0	0.966	14.01	1.932	
35	125	125	1.232	1.392	100	1.25	1.44	58	156	0.372	0.072	0	9	3.67	14.72	54	28	0	0	0	1.235	0	0	0	3.704	0	0	3.086	0	
36	54	50	2.18	2.56	26	2.077	2.269	58	127	0.457	0.315	0	16	3.88	26.01	42	36	0.725	0	0	8.696	0	0	2.174	21.014	0	0	8.696	0	
37	120	106	2.208	2.566	82	2.183	2.512	104	262	0.397	0.408	0	34	5.74	60.43	76	62	4.24	1.413	0.353	2.12	0.707	0	0.353	4.594	0	0.707	2.473	0	
38	3	1	1	1	0	N/A	N/A	3	3	1	0.333	0	0	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
39	63	62	1.081	1.145	38	1.105	1.158	32	71	0.451	0.032	0	1	2	12.02	35	9	0	0	0	2.817	0	0	0	0	0	0	0	0	
40	86	85	1.529	1.635	61	1.607	1.721	37	132	0.28	0.209	0	8	2.88	9.82	48	26	0	0	1.515	2.273	0	0	9.091	5.303	0	3.788	9.091	0	
41	107	101	2.228	2.663	77	1.974	2.377	98	268	0.366	0.458	0	36	4.97	42.01	74	61	1.031	2.062	0.344	2.062	0	0	1.031	8.247	0	3.436	7.56	0.344	
42	113	105	1.286	1.505	81	1.37	1.605	61	148	0.412	0.053	0	1	3	18.74	73	22	0	0	0	8.609	0	1.325	1.987	3.311	0	0	1.987	0	
43	111	110	1.991	2.409	86	1.988	2.395	115	221	0.52	0.315	0	26	5.42	83.52	90	48	0.83	0	0.415	6.639	0.415	0	0.83	1.66	0	1.245	4.149	0.415	

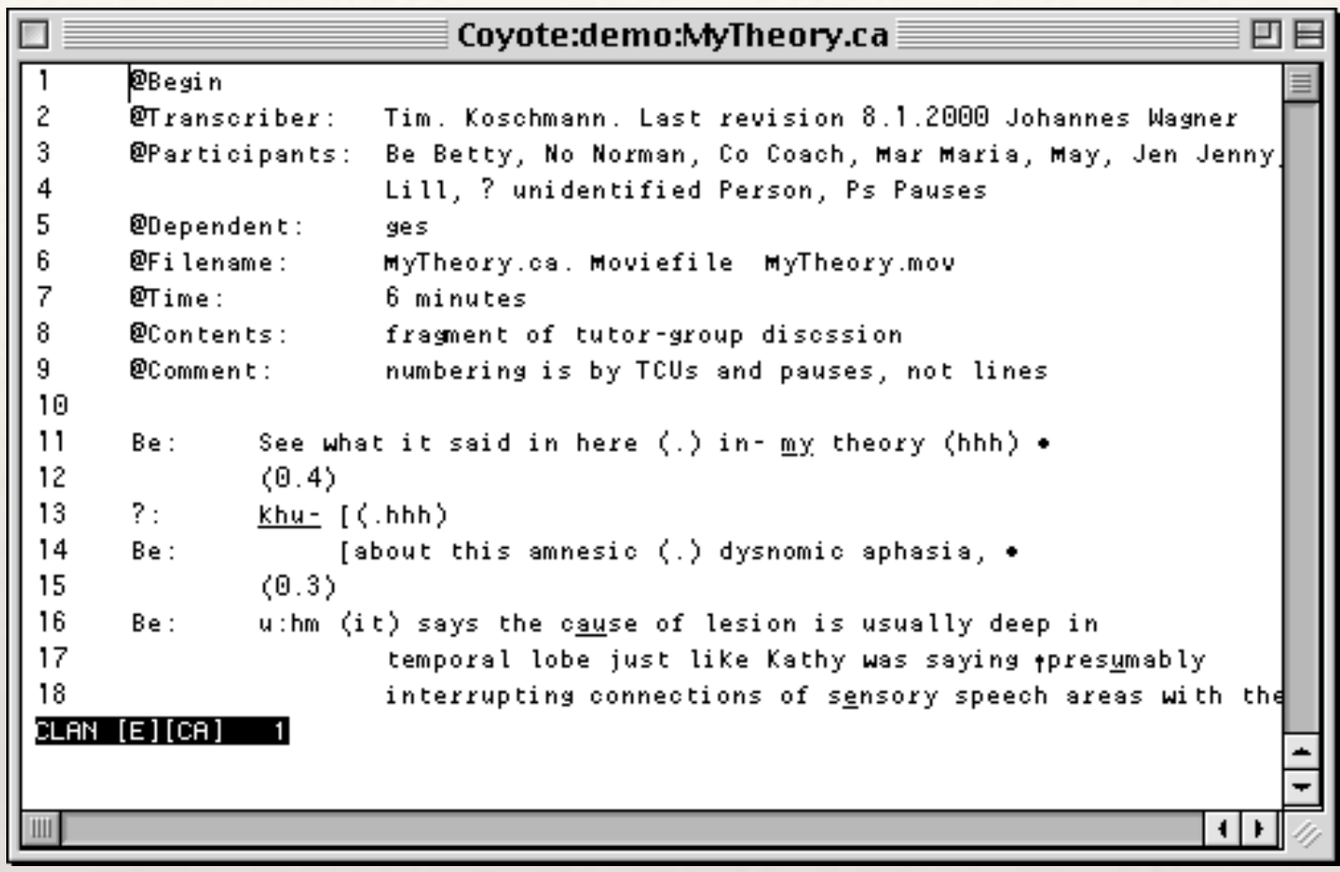
Analysis Pathways



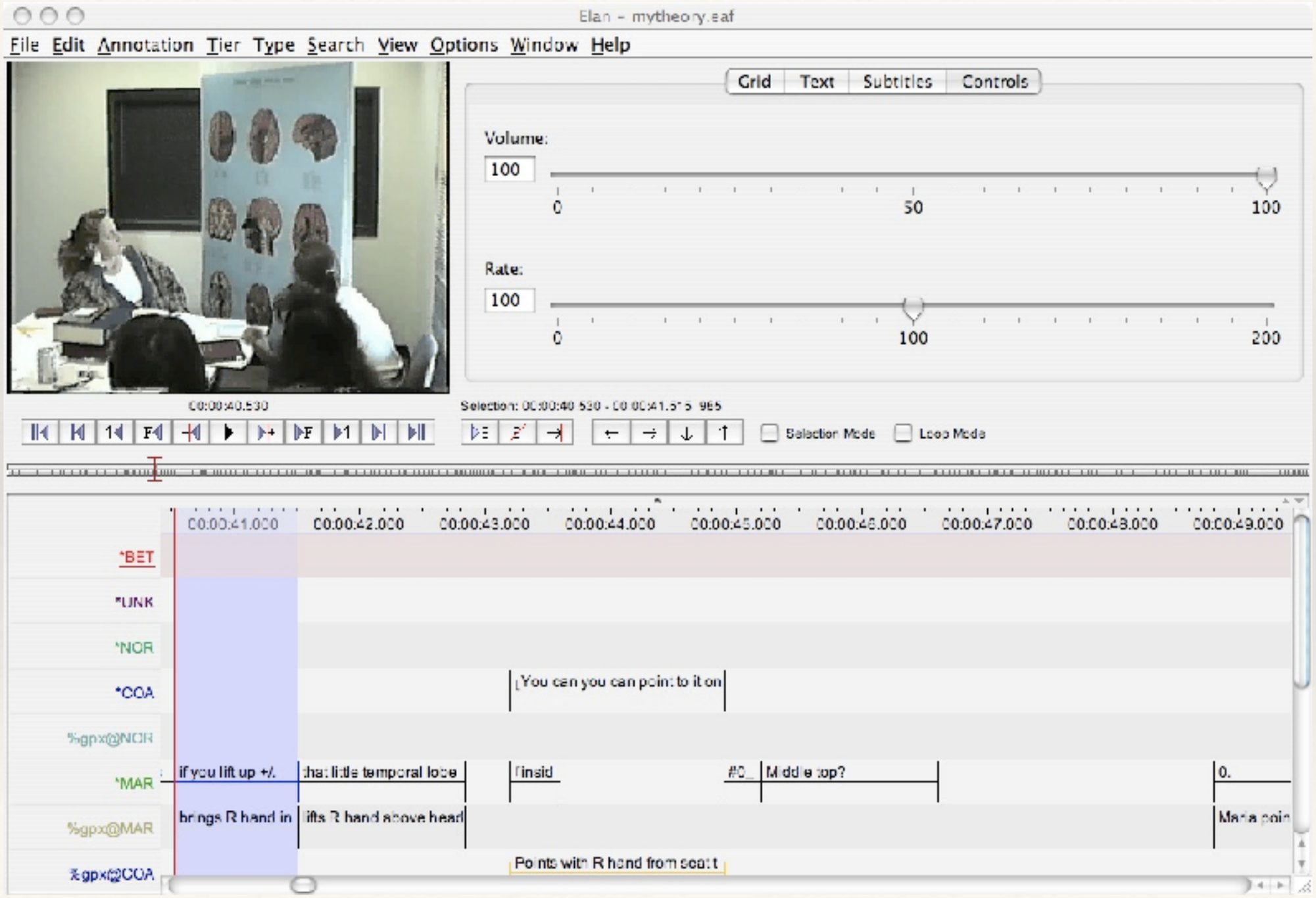
Error Analysis

- [*p] phonological p:w, p:n, p:m
- [* s] semantic s:r, s:ur. s:uk, s:per
- [* n] neologism n:k, n:uk, n:k:s, n:uk:s
- [* d] dysfluency
- [* m] morphology m:a:0es etc.
- [* f] formal lexical
- [+ gram] [+ jar] [+ es] [+ per] [+ cir]

3. Microanalysis (CA and Gesture)



CHAT2ELAN


Elan - mytheory.eaf
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Grid Text Subtitles Controls
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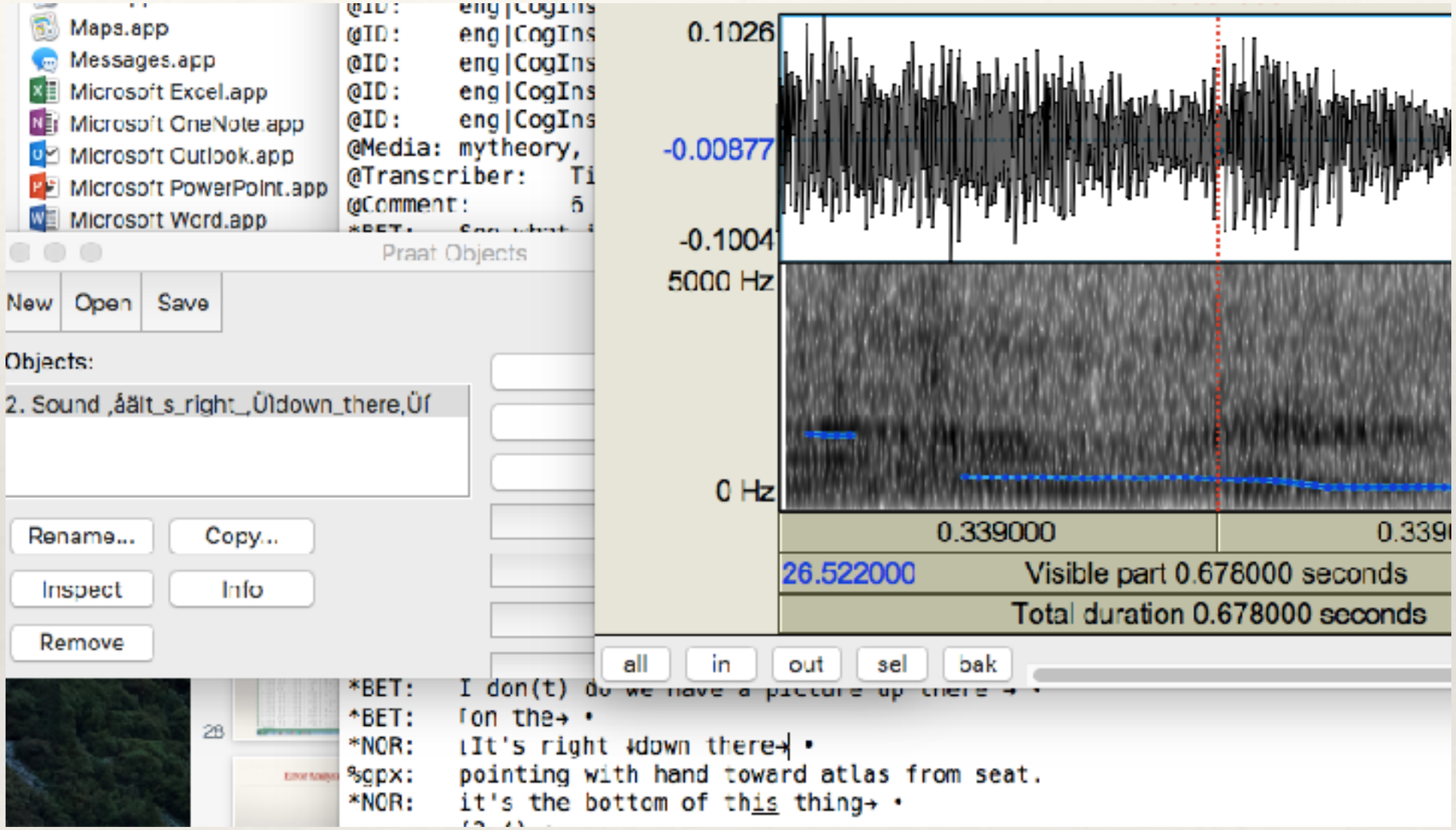
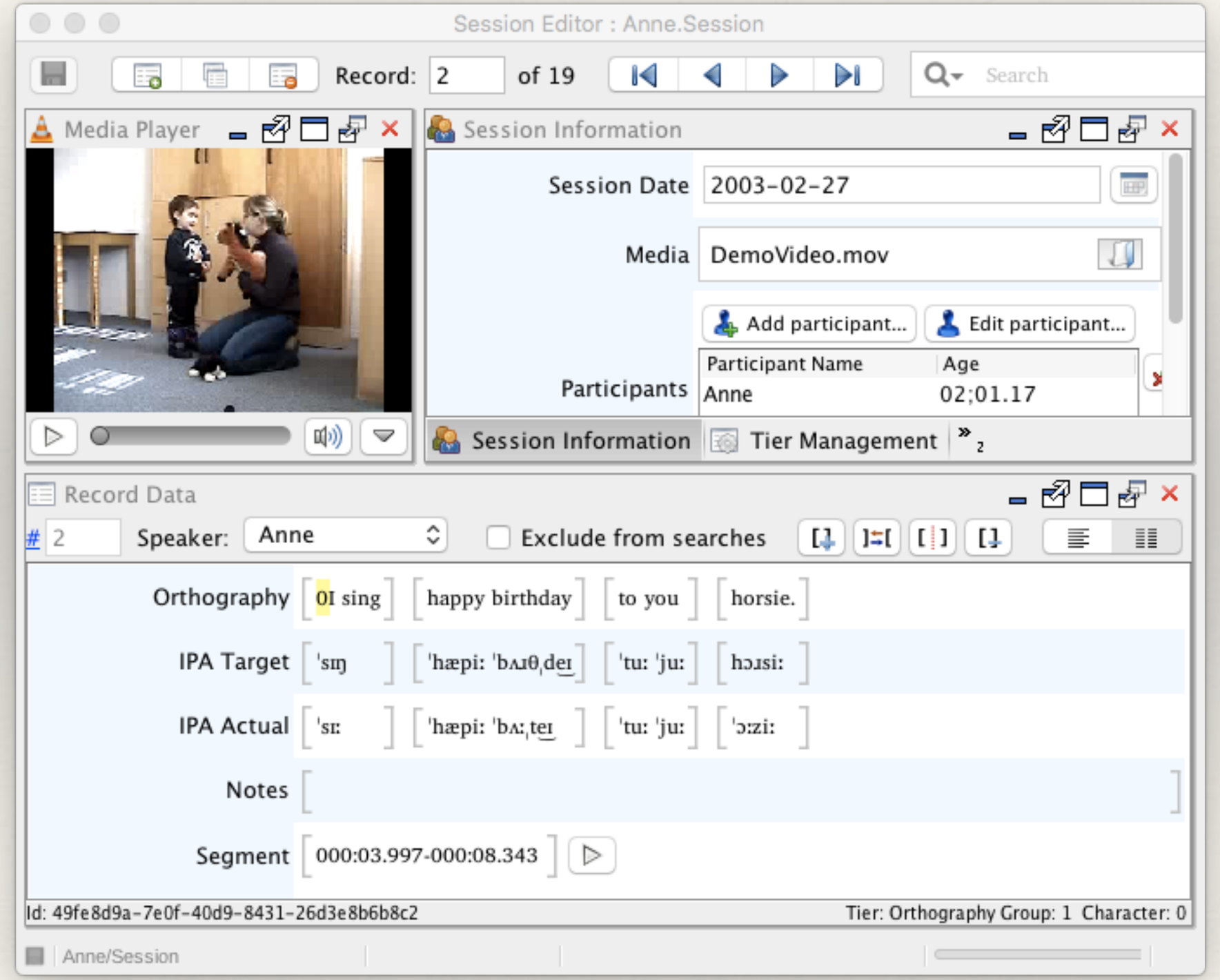
00:00:40.530
Selection: 00:00:40.530 - 00:00:41.575 985
Selection Mode
Loop Mode
00:00:41.000
00:00:42.000
00:00:43.000
00:00:44.000
00:00:45.000
00:00:46.000
00:00:47.000
00:00:48.000
00:00:49.000
*BET
*UNK
*NOR
*COA
%gpx@NOR
*MAR
%gpx@MAR
%gpx@COA
You can you can point to it on
if you lift up +/.
the little temporal lobe
inside
#0_
Middle top?
0.
brings R hand in
lifts R hand above head
Points with R hand from seat t

CHAT2PRAAT - sociophonetics

- Highlight utterance bullet
- Send to sound analyzer
- Extracts audio from video
- In Praat, draw a picture



CHAT2PHON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Record: 2 of 19
Search
Media Player
Session Information
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Media DemoVideo.mov
Add participant...
Edit participant...
Participants
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Age
Anne
02;01.17
Session Information
Tier Management
Record Data
2
Speaker: Anne
Exclude from searches
Orthography
0I sing
happy birthday
to you
horsie.
IPA Target
ˈsɪŋ
ˈhæpiː ˈbʌɪθˌdeɪ
ˈtuː ˈjuː
hɔɹsiː
IPA Actual
ˈsɪː
ˈhæpiː ˈbʌːˌteɪ
ˈtuː ˈjuː
ˈɔːziː
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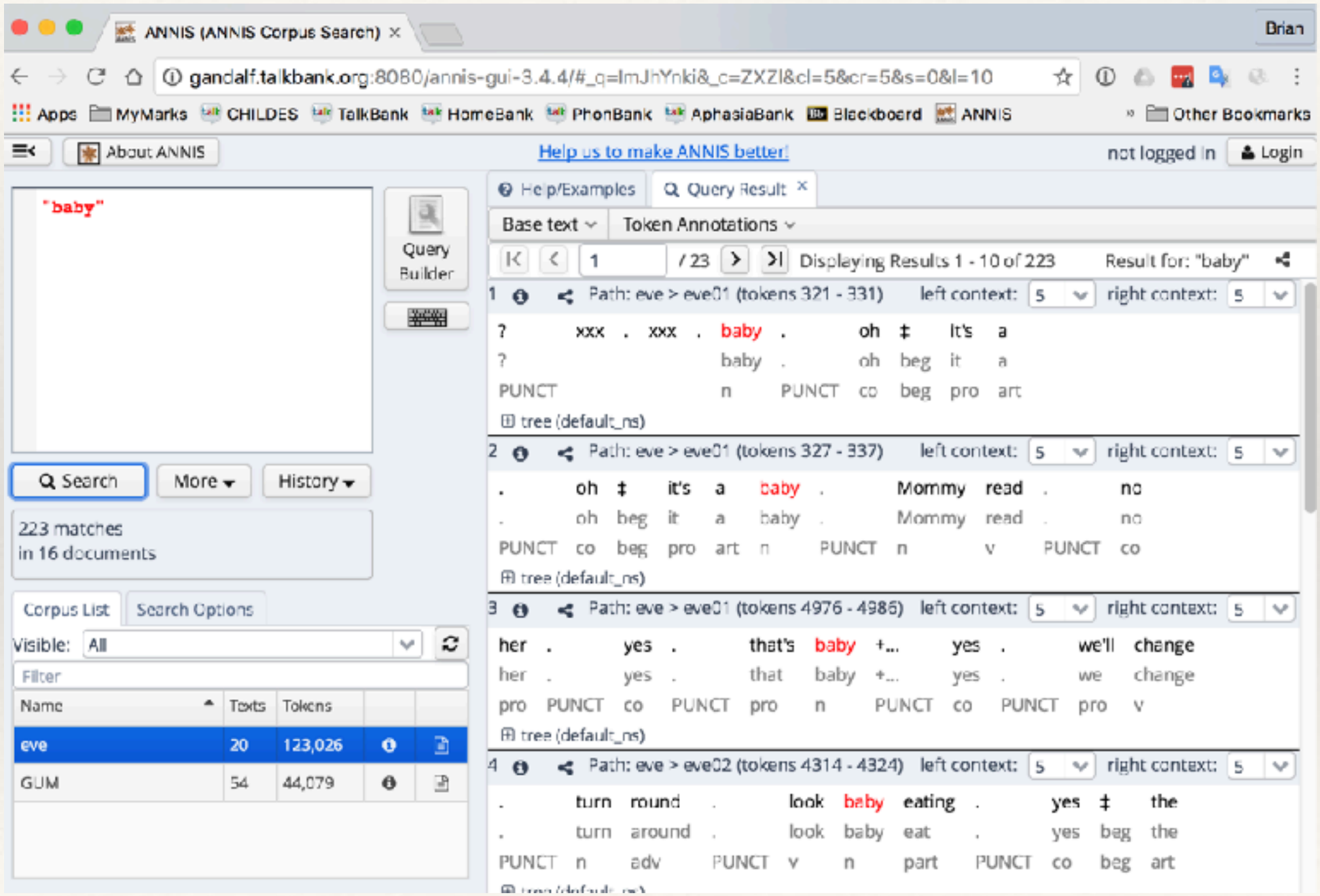
Tier: Orthography Group: 1 Character: 0
Anne/Session

CHAT in ANNIS



CA Coding

Special Characters

```
↑    shift to high pitch; F1 up-arrow
↓    shift to low pitch; F1 down-arrow
⇗    rising to high; F1 1
↗    rising to mid; F1 2
→    level; F1 3
↘    falling to mid; F1 4
⇘    falling to low; F1 5
∞    unmarked ending; F1 6
≋    ≋continuation; F1 +
∙    inhalation; F1 .
≈    latching≈; F1 =
≡    ≡uptake; F1 u
⌈    top begin overlap; F1 [
⌉    top end overlap; F1 ]
⌊    bottom begin overlap; F1 {
⌋    bottom end overlap; F1 }
∆    ∆faster∆; F1 right-arrow
∇    ∇slower∇; F1 left-arrow
⁎    ⁎creaky⁎; F1 *
⁇    ⁇unsure⁇; F1 /
°    °softer°; F1 0
◉    ◉louder◉; F1 )
▁    ▁low pitch▁; F1 d
▔    ▔high pitch▔; F1 h
☺    ☺smile voice☺; F1 l
♋    ♋breathy voice♋ marker; F1 b
∬    ∬whisper∬; F1 w
Ϋ    Ϋyawn Ϋ; F1 y
∮    ∮singing∮; F1 s
§    §precise§; F1 p
∾    constriction∾; F1 n
↻    ↻pitch reset; F1 r
Ἡ    laugh in a word; F1 c
„    Tag or sentence final particle; F2 t
‡    ‡ Vocative or summons; F2 v
```

Gestural Detail

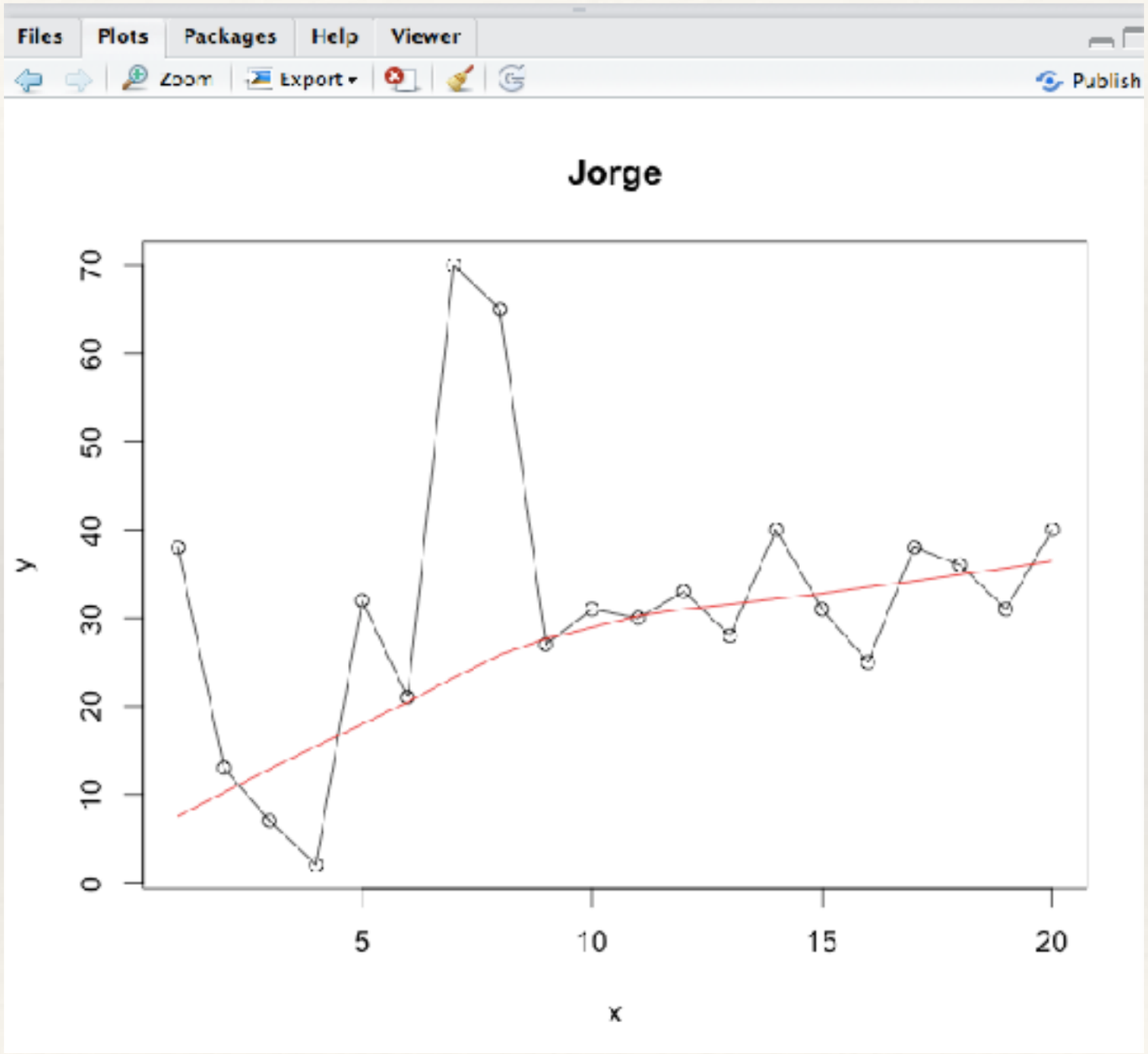
- Interaction / Sequence / Segment
- Each participant coded through sequence
  - Deedee 1a-1b-1c
  - Nina 1a-1b-1c
- Bullet links each segment back to transcript
- Coding: gaze direction, action, classification, meaning, language
- Rapport coding through gaze, smile, language

Discourse Analysis

- CHAINS, KEYMAP, DIST
- CHIP
- PD (Propositional density)
- CI (Complexity index)
- SCRIPT + Speech Kitchen ASR

Time Series - corpora to R

Alberto and Jorge — I no go.



Collaborative Commentary

@Begin
@Languages: en
@Participants: MOT Mother, CHI David Target_Child
@ID: en|rollins|MOT|||||Mother||
@ID: en|rollins|CHI|1;8.||||Target_Child||
@Activities: book

*MOT:	ahhah: look we can read books Tim .
%spa:	$DHA:YY $DHA:RP

Commentary (5)

*MOT:	it's a look and see <book> [>] .
%spa:	$DHA:ST

Commentary (7)

*MOT:	<ahhah> [>] we open it up and there are a set of eyes and there is a bird looking at David .
%spa:	$DJF:ST $DHA:ST

Commentarty (2)

*MOT:	<the bear has a baby> [>] bottle .
%spa:	$DHA:ST

Commentary (1)

*MOT:	yes # David has baby <bottles> [>] .
%spa:	$DRP:ST

Commentary (3)

*MOT:	<oh> [>] .
%spa:	$DHA:MK

Commentary (0)

*MOT:	<there's a mirror> [>] .
%spa:	$DJF:ST

Commentary (4)

*MOT:	can David see <David> [>] .
%spa:	$DHA:RQ

Commentary (7)

*CHI:	0 .

Messages for CLARIN

- Importance of open access
- Importance of uniform transcription format linked to analysis programs
- Importance of focus on specific research communities for:
  - corpus development
  - tool development
  - FUNDING

Conclusions

- We need to expand TalkBank
- CLARIN can make wider use of TalkBank methods
- We can promotate TalkBank-CLARIN integration