

# REPORTING ON TBI BANK:

A revolutionary clinical tool

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Thank you. Well I'm hoping to introduce you to something new this afternoon and hopefully give you some tools to go away with.

- › Origins of TBI Bank
  - › Communication profile of TBI
  - › Computerised discourse tools
  - › TBI Bank discourse protocol
  - › Talk Bank
  - › Case example
    - Transcription of protocol
    - Coding
    - Analysis
  - › Future Directions
- 

I'll talk about what TBI Bank is, the history of it and how it relates to the communication profile after TBI. I'll talk about some computerized discourse tools and a protocol for eliciting a discourse sample and show you where you can access them online. I'll finish with a case example and by looking at future directions.

Users | Tags
Login | Register | Trouble logging in?

Command line: TBIBank/Turkstra/

Continuous playback: On:  Off:  Run

Dependent tiers: %mor:  Set options

```

0 @Loc: TBIBank/Turkstra/bud.cha
1 @Begin
2 @Languages: eng
3 @Participants: PAR Bud Participant
4 @ID: eng|turkstra|PAR||||Participant|||
5 @Media: bud, video
6 @Situation: Lyn is off-camera asking questions and Bud is in a
7 recording studio at the hospital.
8 @Bck: Bud is describing his accident.
9 @Comment: The instructions said one or two tabs, and as one tab
10 didn't leave a noticeable space, I used two.
11 *PAR: okay well . □
12 %mor: co|okay co|well .
13 *PAR: in a in about a month and a day it'll be two years . □
14 %mor: prep|in det|a prep|in prep|about det|a n|month coord|and det|a n|day pro|it-mod|will
15 v:cop|be det:num|two n|year-PL .
16 *PAR: it happened June second nineteen ninety five . □
17 %mor: pro|it v|happen-PAST n:prop|June n|second det:num|nineteen det:num|ninety
18 det:num|five .
19 *PAR: well okay I'll start from the beginning . □
20 %mor: co|well co|okay pro:sub|I-mod|will v|start prep|from det|the n|beginning
21
22 *PAR: I was it was my girl+friend's birthday . □
23 %mor: pro:sub|I aux|be&PAST&13S pro|it v:cop|be&PAST&13S pro:poss:det|my n|n|girl-n|friend-poss|s
24 n|n|birth-n|day .
25 *PAR: and I was I took her out to a party . □

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22

\*PAR: I was it was my girl+friend's birthday . □

3

So I just wanted to start by giving you a quick snapshot of what I'm talking about. What you're looking at here is a website that has a video of a person with a TBI on the bottom left and on the right is a discourse transcript that is linked to that video. The highlighted section is following what the person is saying at that time. So TBI Bank is a multimedia database that contains a set of integrated computerized tools to allow data to be accurately transcribed, coded and analyzed. These tools are freely accessible online.



## History of TBI Bank

- › Originated from desire to capture real life interactions in systematic manner.
  - › Started in the area of child language with the CHILDES (Child Language Data Exchange System) Project
  - › Expanded to include study of adult language including in the area of Traumatic Brain Injury (TBI)
  - › Needed to determine a standard international protocol for capturing communication after TBI
  - › Expert consensus + Evidence =
  - › The first internationally ratified and evidence-based communication protocol for use with TBI population.
- 

In a nutshell TBI Bank originated from the work led by Professor Brian MacWhinney based at Carnegie Mellon University. The team there aimed to develop a systematic and standardised manner for capturing real life interactions. Started in the area of child language but have since expanded to include the study of adult language including TBI and it has become apparent that we need to capture real life interactions or discourse in TBI.

In the late 2000's, a group of experts from all around the world came together and collaborated with the aim to develop a standard protocol for capturing communication after TBI. Developing anything that can be implemented worldwide is inherently challenging but it worked. The result was that we now have the first internationally ratified and evidence-based protocol for evaluating discourse after TBI.

- › Discourse requires integrated cognitive, linguistic and social skills
- › Discourse analysis = Gold standard (Coelho 2007; Togher 2001)
- › Challenges:
  - Time consuming
  - Many choices for analysis
- › TBI Bank can help:
  - Transcribe faster and more accurately
  - Run multiple analyses with a click



So I'll back track a little here to talk about the significance of TBI Bank. We know that people with TBI often have most difficulty when they need to use integrated linguistic, cognitive and social skills which can not be captured by traditional language evaluation but through discourse evaluation we can capture this. But as most of us would be aware discourse can be time consuming and there is a wide variability in choice of analysis. Its not surprising that people have that look on their face when you talk about discourse. The good news: the TBI Bank can address some of these challenges for example by providing tools that help with efficiency of transcription and running multiple analyses at one time.



The goal of TalkBank is to foster fundamental research in the study of human and animal communication. It will construct sample databases within each of the subfields studying communication. It will use these databases to advance the development of standards and tools for creating, sharing, searching, and commenting upon primary materials via networked computers.

Data	Focus Areas	Information
<a href="#">Browsable Database</a>	<a href="#">AphasiaBank</a>	<a href="#">People</a>
<a href="#">Downloadable Database</a>	<a href="#">BilingBank</a>	<a href="#">Digital Video</a>
<a href="#">Database Manuals</a>	<a href="#">CABank</a>	<a href="#">Digital Audio</a>
<a href="#">Ground Rules</a>	<a href="#">CHILDES</a>	<a href="#">Second Language</a>
<a href="#">Software</a>	<a href="#">Danish SamtaleBank</a>	<a href="#">Research Usage</a>
<a href="#">Contributing</a>	<a href="#">DementiaBank</a>	<a href="#">Plans and Dreams</a>
<a href="#">Mailing Lists</a>	<a href="#">PhonBank</a>	<a href="#">CLAN Workshop</a>
<a href="#">MetaMaker</a>	<a href="#">SLABank</a>	
	<a href="#">SocioBank</a>	
	<a href="#">TBI Bank</a>	

TalkBank is an interdisciplinary research project funded from 1999 to 2004 by a grant from the National Science Foundation (BCS-998009, KDI, SBE) to Carnegie Mellon University and the University of Pennsylvania, as well as NSF ITR Grant 0324883 to CMU and Stanford for classroom video databases. Current support comes from the NSF SCOTUS grant, the NSF PSLC grant, and NIH Grants to CMU for CHILDES, PhonBank, and AphasiaBank.

TalkBank is coordinated by [Brian MacWhinney](#) (CMU).

This page has been accessed 581294 times since November 7, 2003.

 [Open Language Archives Community](#)  
A Network of Language Conforming with the Open Archives Initiative  
[Creative Commons License](#)

Where do you find this? If you type in talkbank.org you will get the following page. I've taken a closer shot of the highlighted section to show the links more clearly

Data	Focus Areas
<a href="#"><u>Browsable Database</u></a>	<a href="#"><u>AphasiaBank</u></a>
<a href="#"><u>Downloadable Database</u></a>	<a href="#"><u>BilingBank</u></a>
<a href="#"><u>Database Manuals</u></a>	<a href="#"><u>CABank</u></a>
<a href="#"><u>Ground Rules</u></a>	<a href="#"><u>CHILDES</u></a>
<a href="#"><u>Software</u></a>	<a href="#"><u>Danish SamtaleBank</u></a>
<a href="#"><u>Contributing</u></a>	<a href="#"><u>DementiaBank</u></a>
<a href="#"><u>Mailing Lists</u></a>	<a href="#"><u>PhonBank</u></a>
<a href="#"><u>MetaMaker</u></a>	<a href="#"><u>SLABank</u></a>
	<a href="#"><u>SocioBank</u></a>
	<a href="#"><u>TBIBank</u></a>

Firstly I'll draw your attention to the software link (click) which contains the software for transcribing, coding and analysing discourse and contains a link to the full manual for its use. A little tip there's also a much shorter 25 page training manual in (click) aphasiabank link to give you an broader sense of the program without getting too bogged down. What I'll do next is show you what comes up when you click on the TBI bank link

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# TBI Bank

TALK BANK

Sharing Data Software mac OS Digital Video

This page provides materials for collecting data from TBI subjects for the TBI Bank Project.

**Database**

- [Browsable Database](#)
- [Transcript Database](#)
- [Media Database](#)

**Materials**

- [Articles on TBI](#)

**Protocol**

- [Protocol List](#)
- [Protocol Instructions](#)
- [Full Protocol](#)
- [Troubleshooting](#)

**Protocol Results**

- [Coding Sheet for Investigator Administration](#)
- [Coding Sheet for Self Administration](#)
- [Coding Sheet to Supplement Self Administration](#)
- [Excel Spreadsheet for Data](#)
- [Excel Spreadsheet for Data \(blank\)](#)
- [Test Results Spreadsheet](#)
- [Test Results Spreadsheet \(blank\)](#)

**Database**

- [Browsable Database](#)
- [Transcript Database](#)
- [Media Database](#)

**Protocol**

- [Protocol List](#)
- [Protocol Instructions](#)
- [Full Protocol](#)
- [Troubleshooting](#)

8

So the TBI Bank link will bring you to this page here. What will be of most interest for today are the links under database and protocol sections. I'll start by talking about the protocol.

### Monologic Discourse Tasks

- › I. Free Speech Samples (Brain Injury Story & Important Event)
- › II. Picture Descriptions (Broken Window; Refused Umbrella & Cat Rescue)
- › III. Story Narrative (Cinderella)
- › IV. Procedural Discourse (Peanut Butter & Jelly Sandwich or similar)

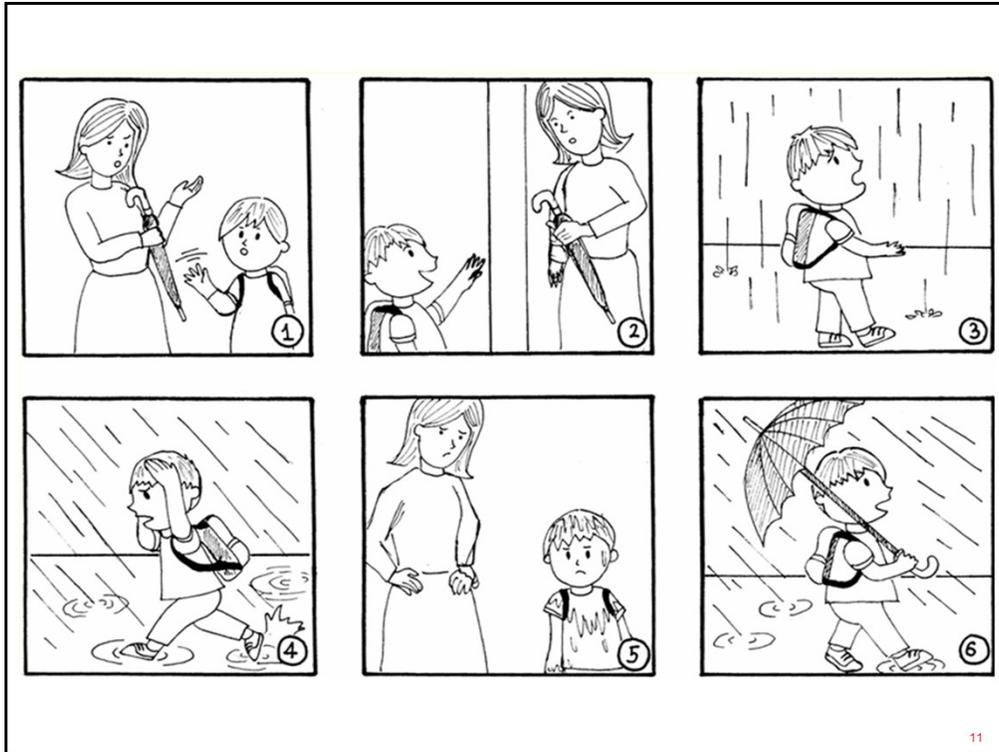


TBI Bank protocol is a standard protocol for eliciting discourse samples. As you can see on this page the protocol consists of a variety of monologic discourse tasks. These tasks sample a variety of discourse genres. Each of these tasks are also extremely well researched and internationally considered as the evidence based elicitation tasks. The full discourse protocol takes between 10-20 minutes to complete which is clinically practical. Participants are generally happy to complete these tasks. The samples can be recorded as either audio or video files but you will gain more information using video file.

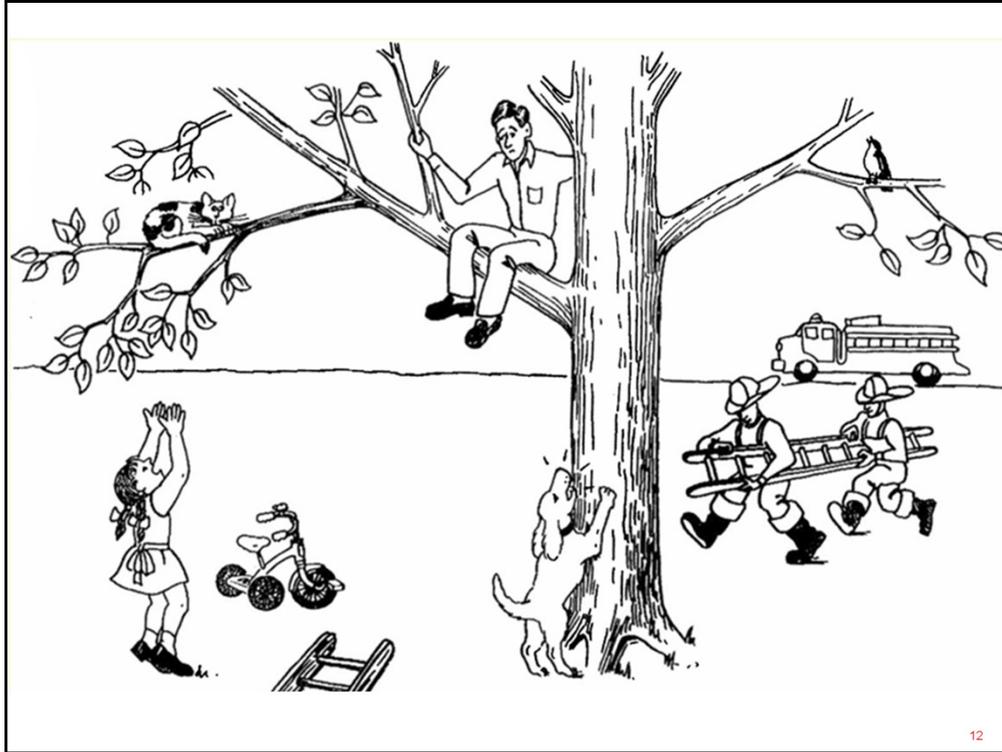
## Example: Brain Injury Story

- “I’m going to be asking you to do some talking. How do you think your speech is these days?”
- If no response in approximately 10 seconds, prompt: “How's your talking?”
- Listen, encourage full response.
- If no response, use Troubleshooting question: “Are you having trouble with your talking?”

If you click on the protocol instructions you will find a document with specific wording for eliciting each discourse task. For example, the protocol for eliciting the brain injury story in the free speech sample is: “I’m going to be asking you to do some talking. How do you think your speech is these days?” If no response in approximately 10 seconds, prompt: “How's your talking?” Listen, encourage a full response. If there is no response, you then use the Troubleshooting question for this item: “Are you having trouble with your talking?” Very structured and systematic way for eliciting each task.



Another task is the refused umbrella. In this task you show the participant the stimulus and say 'Here are some more pictures that tell a story. Take a look at all of them, and then I'll ask you to tell me the story with a beginning, a middle, and an end. Again, you can look at the pictures as you tell the story. (Wait 10 seconds)



This stimulus 'cat rescue' provides the participant with less visual structure to guide their response



For the Cinderella story retell you provide a copy of the book with the words covered . Once the person has looked through the book you take the book away and ask them to tell the story in their own words. This removes an extra level of structure for the participant who has to recall from the pictures or from their own memory.



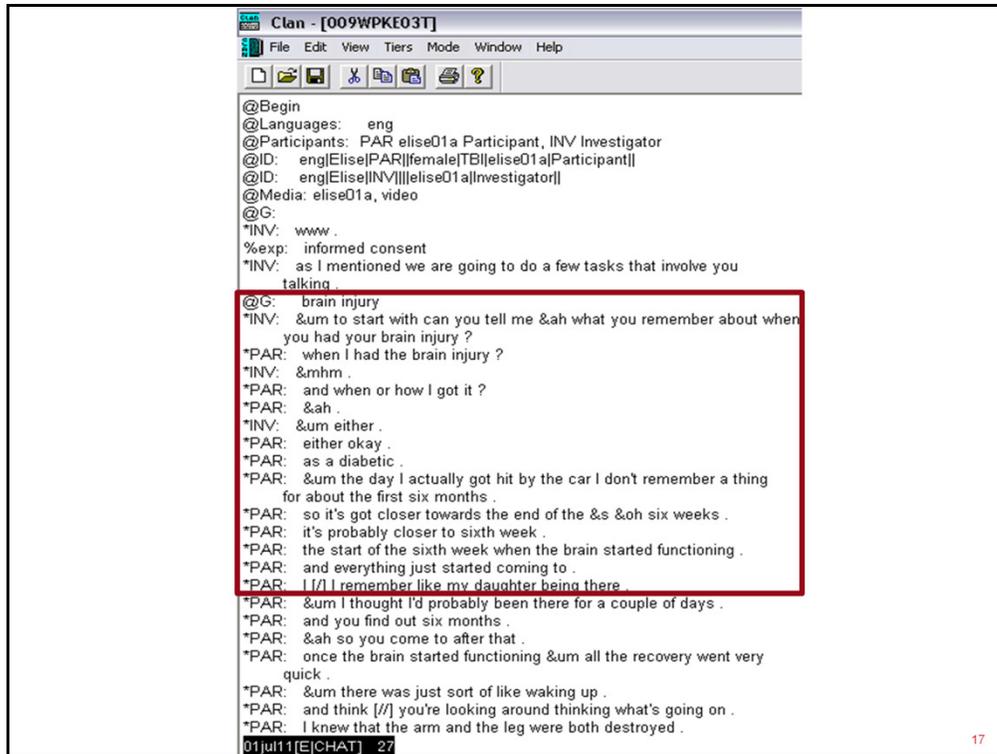
The stimulus for the procedure is only provided as troubleshooting option “These are the things you need to make a peanut butter and jelly sandwich (show picture). How would you make one?” Most people that I’ve seen do not need this stimulus to provide a response.

- › Aphasia Bank Repetition Test (2007)
  - › Verb Naming Test (from the Northwestern Assessment of Verbs and Sentences-Revised, Field Test Version)
  - › Boston Naming Test, Second Edition, Short Form (2001)
  - › Western Aphasia Battery-Revised (2007) -- AQ only
  - › Optional - Verbal Fluency (F, A, S).
  - › Repeatable Battery for the Assessment of Neuropsychological Status (1998)
- 

So that should give you an idea of the discourse protocol. But the protocol can also be supplemented by additional tests and measures including the AphasiaBank repetition test, the verb naming test, boston naming test, the WAB, verbal fluency tasks and a neuropsychological battery

- › 54 year old male
- › Car accident
- › Initial GCS < 8
- › PTA Duration > 1 month
- › Verb Naming Test = 21/22
- › Boston Naming Test = 47/60
- › WAB Aphasia Quotient = 92.4/100

So I might try to tie everything in a bit more by talking about a case example. This is a case of a gentleman in his early fifties who was 3 months post TBI at this review. He sustained a severe TBI from a car accident. His initial GCS was less than 8 and his PTA duration greater than 1 month. He got 21 out of the 22 verb naming items. He was outside of the normal limits for his age on the Boston Naming Test and he got an aphasia quotient of 92.4 which is just under the cut off for determining aphasia (Cut off is 93.8) . Had most difficulty with spontaneous speech and generative naming components of the WAB



I've obtained one sample of his transcript here. This is what the program will look like when you're working with it.

The program has functions that allow you to simultaneously transcribe and play the file and includes functions that allow you to even slow down rate of replay or repeat sections automatically so that you can transcribe much faster and more accurately.

@G: brain injury  
\*INV: &um to start with can you tell me &ah what you remember about when  
you had your brain injury ?  
\*PAR: when I had the brain injury ?  
\*INV: &mhm .  
\*PAR: and when or how I got it ?  
\*PAR: &ah .  
\*INV: &um either .  
\*PAR: either okay .  
\*PAR: as a diabetic .  
\*PAR: &um the day I actually got hit by the car I don't remember a thing  
for about the first six months .  
\*PAR: so it's got closer towards the end of the &s &oh six weeks .  
\*PAR: it's probably closer to sixth week .  
\*PAR: the start of the sixth week when the brain started functioning .  
\*PAR: and everything just started coming to .  
\*PAR: I [/] I remember like my daughter being there .

18

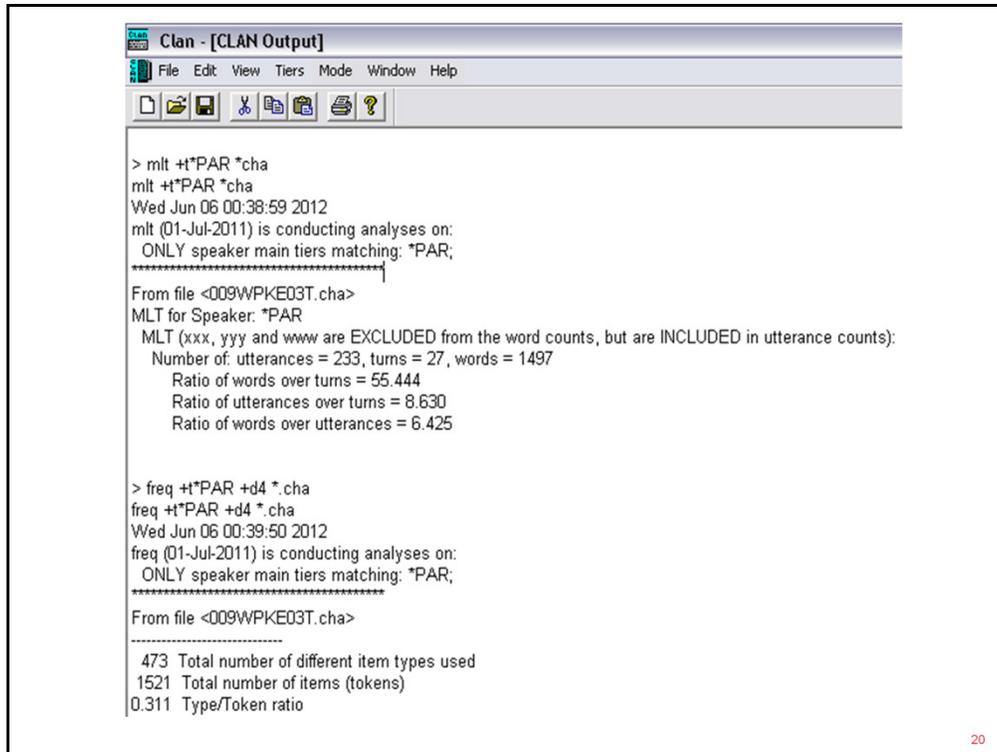
I've zoomed in on a section here that contains the part of the transcript with the brain injury story. You will notice that the transcription is coded. You code and transcribe as you go using the coding conventions outlined in the manual. And once you've transcribed it you run an automatic check that automatically picks up any coding or transcription errors to help with the accuracy.

```

@G: brain injury
*INV: &um to start with can you tell me &ah what you remember about when
you had your brain injury ?
%mor: inf|to v|start prep|with aux|can pro|you v|tell pro|me pro:wh|what pro|you
v|remember adv|about conj:sub|when pro|you v|have&PAST pro:poss:det|your
n|brain n|injury ?
*PAR: when I had the brain injury ?
%mor: conj:sub|when pro|| v|have&PAST det|the n|brain n|injury ?
*INV: &mhm .
*PAR: and when or how I got it ?
%mor: conj:coo|and conj:sub|when conj:coo|or adv:wh|how pro|| v|get&PAST pro|it
?
*PAR: &ah .
*INV: &um either .
%mor: adv|either .
*PAR: either okay .
%mor: conj:coo|either co|okay .
*PAR: as a diabetic .
%mor: prep|as det|a adj|diabetic .

```

Once it is checked, the parts of speech are automatically coded. In this example, the computer has automatically generated the parts of speech and grammatical structure. So it has coded 'when' as a subordinate conjunction, I as a pronoun, 'have' as a past tense verb, 'the' as a determiner and the words 'brain and injury' as nouns and in doing so it has also generated the sentence structure.



The screenshot shows the CLAN software interface with a menu bar (File, Edit, View, Tiers, Mode, Window, Help) and a toolbar. The main window displays the following text:

```
> mlt +!*PAR *.cha
mlt +!*PAR *.cha
Wed Jun 06 00:38:59 2012
mlt (01-Jul-2011) is conducting analyses on:
  ONLY speaker main tiers matching: *PAR;
*****
From file <009WPKE03T.cha>
MLT for Speaker: *PAR
MLT (xxx, yyy and www are EXCLUDED from the word counts, but are INCLUDED in utterance counts):
  Number of: utterances = 233, turns = 27, words = 1497
    Ratio of words over turns = 55.444
    Ratio of utterances over turns = 8.630
    Ratio of words over utterances = 6.425

> freq +!*PAR +d4 *.cha
freq +!*PAR +d4 *.cha
Wed Jun 06 00:39:50 2012
freq (01-Jul-2011) is conducting analyses on:
  ONLY speaker main tiers matching: *PAR;
*****
From file <009WPKE03T.cha>
-----
  473 Total number of different item types used
 1521 Total number of items (tokens)
 0.311 Type/Token ratio
```

20

Once you have the transcript completed and coded you can then run analyses at the press of a button. This screen here shows you what it looks like. It reminds me of doing stats at uni but don't let that turn you off!

MLT for Speaker: \*PAR

MLT (xxx, yyy and www are EXCLUDED from the word count)

Number of: utterances = 233, turns = 27, words = 1497

Ratio of words over turns = 55.444

Ratio of utterances over turns = 8.630

Ratio of words over utterances = 6.425

473 Total number of different item types used

1521 Total number of items (tokens)

0.311 Type/Token ratio

87 the  
52 I  
51 and  
48 to  
36 a  
26 it  
24 of  
21 just  
17 so  
17 that  
17 there  
17 you  
16 in  
16 she  
14 but

What I've done here is just copied and zoomed in on the output from the previous screen. All I did here was enter a command and the computer has given me the participants mean length of turn = 8.630, the type token ratio which was 0.311 and a list of the frequency of words used starting with the highest at the top.

Potential uses for analysis:

- › Diagnostic tool
- › Outcome measure
- › Communication partner training

Potential clinical applications:

- › Student on placement
- › 1-2 patients most valuable

So what can you do with this information? You now have objective measures of the persons discourse which you could use it as a potential diagnostic tool or as an outcome measure. You might also want to use it to support communication partner training. The best part is that you've been able to get the information that's relevant to your patient and you've able to do it much faster than you have been able to before.

You might also consider this as a task for a student on placement or you might want to pick 1-2 patients who you think it would be of most value to complete.

- › TBI Bank = Watch this space
- › Reduced participant burden in long term
- › Shared international database
- › Longitudinal communication recovery

So I hope that's given you a better understanding of TBI Bank. Keep in mind that TBI Bank is a relatively new endeavour but it's clear that there is further potential for its use. One further aim set by the team at Carnegie Mellon University is to continue to develop the TBI Bank database for shared research purposes. Having a shared international corpus of research data will result in less burden on participants in the long term and will facilitate the process of research so that we can get this information out to you faster. On that note, if you were interested in contributing I would encourage you to contact the TBI Bank coordinators whose details are on the website. My team at the University of Sydney are also currently conducting a project looking at longitudinal recovery of discourse after TBI to contribute to the database.

Contact: [elise.bogart@sydney.edu.au](mailto:elise.bogart@sydney.edu.au)

Project: Longitudinal Communication Recovery in the first 12 months after TBI

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- Professor Brian MacWhinney & Carnegie Mellon University for technical support and funding



That concludes my talk for today. Please find my details and acknowledgements as follows.

Thanks