A Clinician's Complete Guide to CLAN and PRAAT

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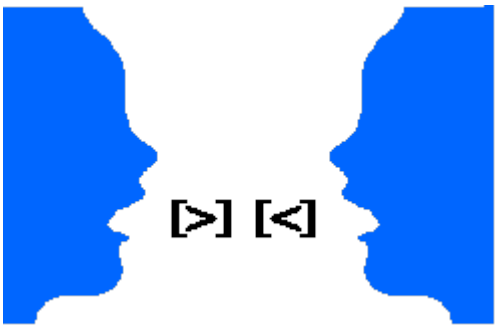

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Introduction: WHY you want to learn how to use these programs.

We have all been taught that a speech and language sample is the "gold standard" for evaluating our cases. But you know how tedious language sampling and fluency counts can be, from transcribing to calculating usable clinical scores. Probably, the last time most clinicians actually DID a language sample was in graduate school. Most fluency specialists, according to surveys we have done, reliably collect a spoken language sample, transcribe, and then code for different fluency types. However, then they do not really use this sample for much else.

This manual will teach you to use CHAT and CLAN, which will, using a SINGLE TRANSCRIPT:

- Speed up your accurate transcription of data by as much as five-fold;
- Link your transcript to the actual audio or video file you made in the clinic;
- For language analysis, automatically (!!!) compute clinical measures of interest, such as MLU, TTR, DSS, Brown's morphemes (for children), and a host of other values (WITHOUT MAKING MATH ERRORS!)
- For fluency analysis, automatically analyze the frequency of different types of disfluency behaviors and compute the percent stuttered words
- Allow you to link to free acoustics software DIRECTLY from the transcript, to calculate values such as speech rate and acoustical features of targeted words or utterances
- Create your OWN targeted analyses of your client's data
- Grammatically tag and analyze data from more than a dozen languages other than English
- Output to PHON for phonological analysis

These programs are open source software available for free, with excellent support from a major US government-supported team that built this wonderful utility, and a list of community users around the world. The three programs we describe in this manual are:

CHAT and CLAN
CHAT and CLAN are a part of CHILDES (CHIld Language Data Exchange System), which provides tools for studying conversational interactions, as well as serving as a repository for language corpora from around the world. CHAT a software program that is used to transcribe sound files using a standard set of rules (commonly called "CHAT format"). CLAN is a data analysis program and is used to analyze transcriptions that were transcribed in CHAT format. (For more information, go to http://childes.talkbank.org/)

PRAAT
Praat is a freely available program, developed by Dutch researchers, to perform acoustical analysis (see more further in this guide). It intersects directly with CLAN, via a command under MODE menu: send to sound analyzer drop down menu.

Getting Started: Computer setup

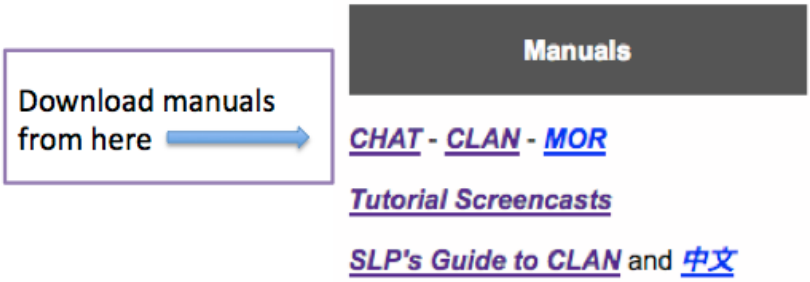
First, turn on your computer ☺ and be connected to the Internet. Second, be aware that a large set of short screencasts demonstrating much of what is described in this manual (and more!) is available online at http://talkbank.org/screencasts/ .

DOWNLOAD CLAN:
If you have used CLAN before, then before downloading a new version, you should remove your old version by just deleting the CLAN folder. To download CLAN, go to http://talkbank.org/clan/ and choose to download either the Windows version or the Mac version.

This is what you should see -- the Windows version on the left and the Mac version in the middle:

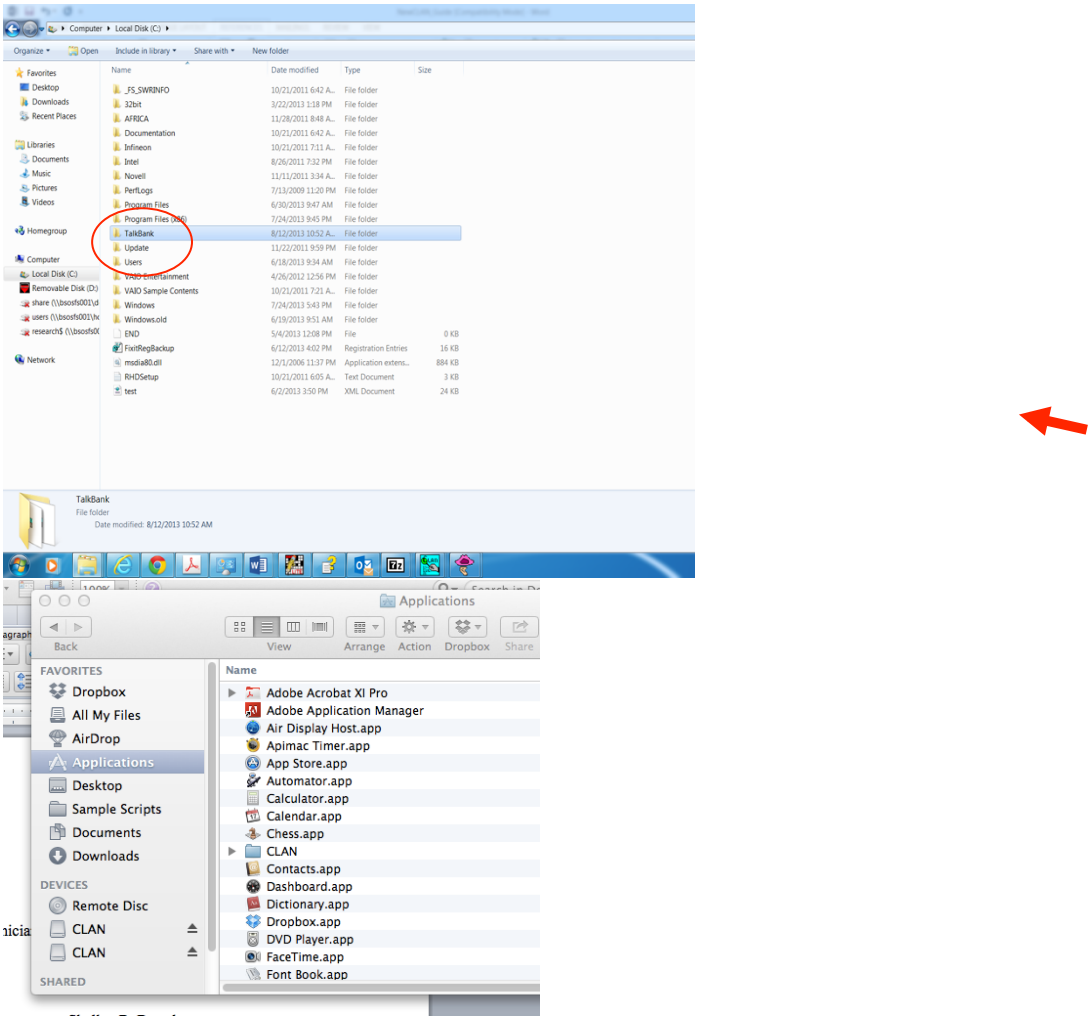
There are official **user manuals** for both CHAT and CLAN at the main TalkBank website -- http://talkbank.org/. You should download both of them, but these manuals are long and technical, so don't print them. Instead, we recommend saving the CHAT manual and the CLAN manual to your desktop. Importantly, these manuals are searchable by keyword, which may be useful later.

The manual you are reading right now should contain most of what you'll need to know, but if you have any questions, the manuals described above from this website are much more comprehensive!



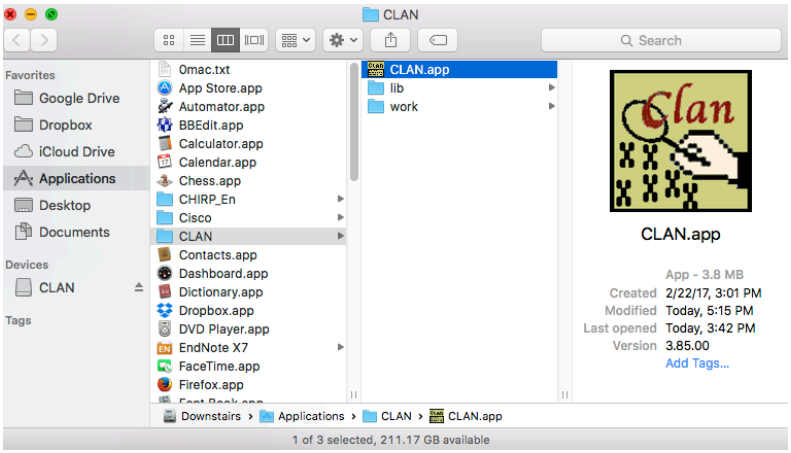
WHERE IS CLAN?

The default directory that gets built when CLAN is installed on a PC is called c:TalkBank/CLAN. It should be located on your C: drive, perhaps like this, on a PC:



On a Mac, open your FINDER, choose APPLICATIONS, and then you should see CLAN in the list. Double click the CLAN folder and you will see CLAN.app; click to launch. You should also drag that CLAN.app file to your dock for easy access.

The Talkbank/CLAN directory (PCs) and CLAN folder (Macs) have subfolders called LIB, and WORK. To make your life easier, you may want to put things you are working on in the subfolder called WORK. Store your audios and videos there, and the program will easily find them when you try to transcribe things. Below is a screenshot of the CLAN folder on a Mac, showing the CLAN application and its subfolders.



AUDIO AND VIDEO FILES

CHAT (the transcription rule system/program assumed by CLAN) allows you to link a transcript directly to audio or video. This speeds up transcription a LOT, and improves its accuracy. Only a few programs actually use the audio or video for analysis; the primary one is exporting an utterance to PRAAT to do acoustical analysis of what you've recorded. Clinicians may want to use PRAAT to analyze features such as speech rate, articulation of individual words, prosodic contour or range for looking at prosody in clients, as just one example.

For fluency cases, being able to review a transcript and see/hear what the client was actually doing is immensely helpful in being able to accurately count and locate disfluency behaviors. It also serves as a permanent record of what the client was doing and saying that can be maintained and compared over time by multiple listeners, SLPs, researchers, etc.

There is an amazing function of a linked transcript that we cannot demonstrate in this manual, but you will be able to see it when you follow all the instructions in this short guide. As you play a transcript in CLAN, it will show you the highlighted transcript lines and you will see/hear that segment of the sample at the same time. Because of the audio-video linkage, you can go directly to any given point in the transcript and listen to it.

The most commonly used audio and video formats that are supported by CLAN are .wav, .mov, .mp4, and .mp3. *Although CLAN supports most major audio and video formats, it does not recognize video files written to DVD*. If you wind up needing to transcribe a video from a DVD, you will have to use a video conversion program such as VLC or MPEG StreamClip to convert the individual video files on the DVD to .mp4 H-264 format.

How to Transcribe In CHAT

All CHAT transcripts have certain characteristics: Headers, Main Lines, and Dependent Tiers. Each of these is discussed below.

HEADERS

Headers must be present at the top of every file before you can start transcribing. You actually need to write a tiny bit into a file BEFORE you can start transcribing. To open a new, empty

CHAT file, double click the CLAN icon. When the program opens, you will see a command window; this window is used for analysis, not for transcription, so you can close it. Then go to the File menu and click on New. This will give you a blank CHAT file window (default name is newfile.cha) where you can begin transcription. **YOU MUST TRANSCRIBE IN CLAN, NOT IN MS-WORD!!!**

Type in the following headers that are needed to start a file:

@Begin
@Languages: eng *(for English, use other codes for other languages; see the full manual)*
@Participants: CHI Kiddo Child *(first word is Speaker Tier name, second word is actual identifier/name of your speaker, and third is "role" or function in the interaction – e.g., child, therapist, father; separate multiple speakers by a comma (see next page for example)*
@Media: filename, video (*or* audio *if the media file is audio; always leave off the filename extension)*.
@End

Save this file, and be sure it saves with .cha as the file extension (last 3 letters after the period). Be sure there are NO spaces, periods, commas, non-Roman characters, or other punctuation in the filename before the .cha extension. Good examples are ARsession1.cha, Kid5age24mos.cha, JDbaselineflu.cha etc. It will typically store to whatever you mark as your working directory in CLAN (in the CLAN Commands window).

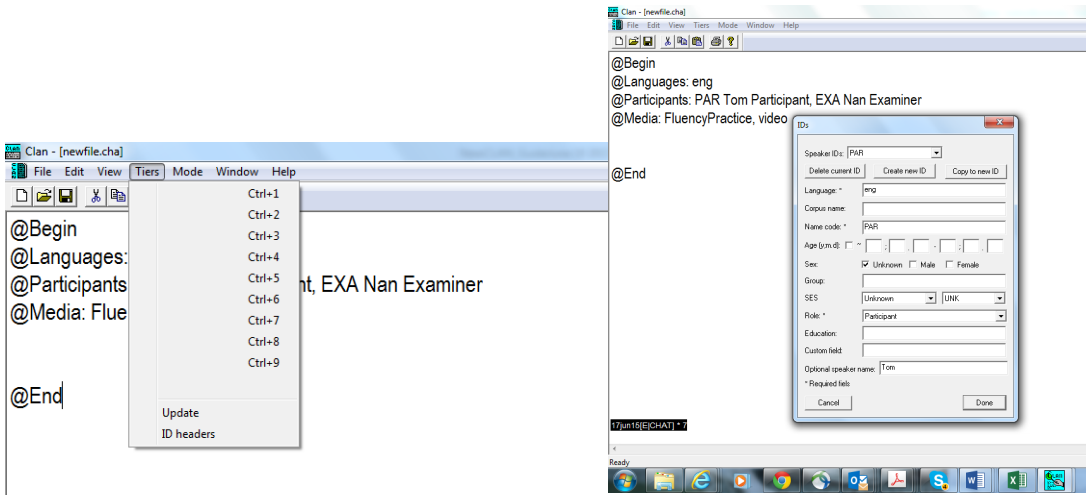
Basic Rules for Headers
1. Every line must end with a carriage return (oops, showing our ages here, the Enter or Return key; carriage returns are for typewriters; ask your parents what a typewriter is).

2. The first line in the file must be an @Begin header line.

3. The second line in the file must be an @Languages header line, such as "eng" for English.

4. The third line must be an @Participants header line listing three-letter codes for each participant, the participant's name, and the participant's role.

5. The next few lines are a set of @ID headers providing further details for each speaker. YOU DO NOT NEED TO TYPE THESE IN. **These will be inserted automatically for you when you use the drop down menu under Tiers (CLAN menu, top of screen) and select ID Headers (see screenshot on left below), after you have listed all the participants**. In this section, you can provide information about the speakers in your file (see screenshot on right). When you click DONE, it automatically inserts these lines, and adds this information. If you have more than one speaker, you must update each speaker's information.



Note: You can pull this window down at any time, and it can act as a short set of case history information, such as age, gender, diagnosis, and other notes. When you do it, some of it will then reflect in file headers when you open your CHAT file.

Another note: If you keeping track of many clients or subjects, many of the CLAN programs will output results in a spreadsheet. If you have updated information in the ID headers, these will print out as column variables, very handy for tracking client progress, examining patterns on your caseload or for study statistics.

6. IMPORTANT: Note that the @Media header tells the program which audio file you will be transcribing. They must match EXACTLY. If the title of the audio file does not exactly match the one that you write in the header, then the program will not be able to find the audio. You don't need to put the file extension in the name; CLAN knows that .mp3 or .wav is audio, .mov is video, etc. Your only options for media are audio or video.

7. The last line in the file (after all the main lines and dependent tiers) must be an @End line.

MAIN LINES

Lines beginning with * indicate what was actually said. These are called "main lines" or "main tiers". There are some basic rules for coding main lines.

1. Each main line should code one and only one utterance. When a speaker produces several utterances in a row, code each with a new main line.

2. After the asterisk on the main line comes a three-letter code in upper case letters for the participant who was the speaker of the utterance being coded. The three-letter code is followed by a colon and then **a tab (not spaces)**. These can be inserted with shortcuts, which will be described below in the section on How to Transcribe.

3. What was actually said is transcribed starting in the ninth space on the line (using TAB in CLAN brings you automatically to this position. REMINDER: Use a tab, not space bar, after each colon. If you use the shortcuts described above, this will happen automatically.

4. CHAT recognizes a variety of abbreviations for the persons in the audio/video.

However, to make maximal use of comparison databases being built that will allow you to compare a child or an adult with speech or language disorder to typical performance, WE SUGGEST THAT YOU ONLY USE *CHI FOR CHILD CLIENTS/STUDY PARTICIPANTS, AND *PAR FOR ANY ADULT CLIENT/PATIENT/STUDY PARTICIPANT. You can choose other three letter codes, but you will lose a lot of the wonderful science you can refer to afterwards if you do that. So, try to listen to this advice! Other typical abbreviations used in the system are MOT for mother and FAT for father and SLP for speech-language pathologist.

5. Utterances should end with an "utterance delimiter". The basic utterance terminators are the period, the exclamation mark, and the question mark. The other common ones are used to mark incomplete or trailing off utterances (see below). If you forget, you will find an error message that says, "missing utterance delimiter."

6. Use upper case letters only for proper nouns and proper modifiers and the word "I." CLAN will treat "We" and "we" as different words (unless you pick a CLAN option to ignore case) and MOR will parse "We" as a proper noun instead of a pronoun.

7. Unintelligible words with an unclear phonetic shape should be transcribed as xxx.

8. **IT IS A GOOD IDEA NOT TO GET TOO HUNG UP ON PRONUNCIATION**. CLAN IS PRIMARILY FOR LANGUAGE ANALYSIS, AND THE MOR PROGRAM WILL TRY TO COMPUTE VALUES BASED ON ATTEMPTS AT KNOWN WORDS IN A LANGUAGE. EVEN PHON (A WONDERFUL PROGRAM TO WHICH CLAN EXPORTS) WILL REQUIRE A TARGET REPRESENTATION TO AUTOMATICALLY COMPUTE INTENDED PRONUNCIATION FOR THE TARGET WORD. Thus, we suggest that you do NOT write things such as "dat" for "that", or "runnin" for "running" – try to write the **intended** word as it would be in the target language (e.g., write "that" and "running".) Otherwise, the MOR parser will try to look up a word such as "wabbit" (for *rabbit*) and won't find it, which defeats most of the language analyses in CLAN. You can notate real obvious differences in pronunciation like this:

*CHI: baba [: baby]

If you insist on getting down such nuances; MOR will then use the information in the brackets to figure out grammar. Incomplete words can be written with the omitted material in parentheses, as in (be)cause, runnin(g), and (a)bout.

Finally, variations in spelling catenatives (whadaya, dontchya) or other non-lexical forms (mmm? uhhuh) can be DEADLY to type-token ratios, VOCD and MOR. There are standard forms for these items later in the manual, where we discuss this potential problem area again.

10. Fluency codes are in APPENDIX 7 of this manual. Fluency is typically coded on the main line, though you can add fluency codes to any dependent tier. (Ask us if you have special needs, such as tagging part of speech that was stuttered).

For fluency coding, we strongly advise both clinicians and researchers to transcribe the sample first for content, and save it. We then suggest you **copy it with a new filename**, (e.g., copy

Tom.cha with a name such as Tomflu.cha, and do your fluency coding on that version). While all of the fluency codes we provide pass CHECK in CHAT, some have been known to complicate the more sophisticated language analyses, or import/export to PHON or SALT. So we suggest that you simply save the file with two different filenames, and use one for fluency analysis and the other for language analyses. They will both still be linked to the same video or audio – you don't need two copies of them.

DEPENDENT TIERS

Dependent tiers are optional additions to the transcript. These tiers begin with the % symbol and can contain codes and commentary regarding what was said in the Main Tier directly above it. There are some basic rules for coding dependent tiers.

1. The % symbol is followed by a three-letter code in lowercase letters for the dependent tier type, such as "pho" for phonology; a colon; and then a tab. The text of the dependent tier begins after the tab.

2. There are a number of pre-suggested dependent tiers for various purposes; consult the CHAT manual for ideas. You can also insert your own, if you want. But this will require you to adjust a file to make the transcript pass CHECK, so this is an *advanced topic* (see the end of this manual for advanced topics). **Some programs insert tiers**. For instance, the MOR program that we will describe for **automatically** analyzing the grammar in your transcript will insert a %mor dependent tier when you run it.

Here are two samples that illustrate headers, main lines, dependent tiers and basic rules described above.

@Begin
@Languages: eng
@Participants: CHI Ross Child, FAT Brian Father
@ID: eng|macwhinney|CHI|2;10.10||||Target_Child|||
@ID: eng|macwhinney|FAT|35;2.||||Target_Child|||
@Media: Ross, audio
*CHI: why isn't Mommy coming?
%com: Mother usually picks Ross up around 4 PM.
*FAT: don't worry.
*FAT: she'll be here soon.
*CHI: good.
@End

(Please note that we didn't start each utterance with a capital letter.)

Here is an example from an adult aphasia patient who is in an Aphasia Bank directory of cases called "Adler"(it has some other codes in it, but disregard them for now):

@Begin
@Languages: eng
@Participants: PAR adler02a Participant, INV Investigator
@ID: eng|Adler|PAR|69;9.|male|Conduction|adler02a|Participant||74.9|

@ID: eng|Adler|INV||||adler02a|Investigator|||
@Media: adler02a, video
@G: Speech
*INV: I am gonna be asking you to do some talking .
*INV: how do you think your speech is these days ?
*PAR: not good .
*PAR: &=laughs &=head:shake not good .
*PAR: &uh <I'm not> [/] I'm not good at this .
@End

SAVING THE .cha FILE AND STARTING THE FULL TRANSCRIPT
You will not be able to start transcribing using linked audio or video until you have saved the file to your computer with a complete set of header information. Remember to save the file with the exact same name as the audio file except with .cha as the extension. .cha stands for CHAT file format (e.g., NBR.cha, and NBR.mov, or SBB.cha and SBB.wav). The transcript needs to be saved in the same folder as the audio file.

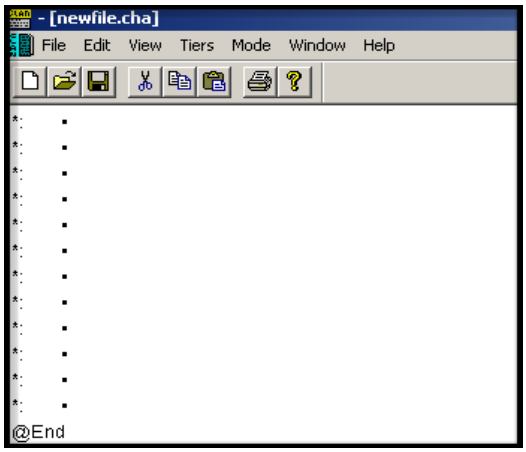
LINKING TEXT TO AUDIO OR VIDEO
This is the truly wonderful aspect of CHAT/CLAN (SALT cannot do this, sorry). Linking speeds up transcription (up to 3 or 4 times, easily, and sometimes even more), increases transcription accuracy and allows an infinite number of reviews or analyses of your session. Now you are ready to do this. Read all the steps below before starting this part of the process.

- Open CLAN and open your "starter" file that you just formatted.
- Close the commands window (Click the X in the upper left of box).
- Under the MODE drop down window, select transcribe audio or video OR press the F5 key to begin linking, but ...
- BE PREPARED BECAUSE THE RECORDING WILL START PLAYING AND YOU NEED TO BE READY TO PUSH THE SPACE BAR AT THE END OF EACH UTTERANCE. Pushing the space bar causes a "bullet" (it looks like a black dot) to appear and the cursor will move to the next line. Try inserting 10 to 20 bullets to start -- each time you hear a natural break, push the space bar. To stop the process, just push any key or click the mouse.
- If you get an error that the program can't locate the file, make sure: 1) the media file name matches the name listed in the @Media header in your CHAT transcript exactly; 2) you have stored the media file and the CHAT transcript in the same folder; 3) the media file name does NOT have any spaces, or any non-English characters in the filename or in the pathway to it; or 4) the audio or video file is REALLY an mp3, .mov, etc. (you cannot make a file into a different file simply by adding .mov to the end of a .wmv file, any more than you can make a .doc into an .xls simply by renaming it!). If all of the above steps are correct, consider taking these steps in this order: 1) restart CLAN; 2) restart your computer; 3) re-download CLAN; and 4) make sure Quicktime (Mac) or Windows Media Player (PC) is installed and working (try it on a non-CLAN file). Note that on PCs, file extension are hidden by default. If the file extension is missing, then you might be tempted to add it. For example, file "Shaggydog.mov" will look on PC desktop like "Shaggydog" only, because extension ".mov" is hidden. If you try to correct this by adding extension ".mov" to "Shaggydog"

the visible media file name will be "Shaggydog.mov", but the actual name will be "Shaggydog.mov.mov". CLAN will not be able to find this file.

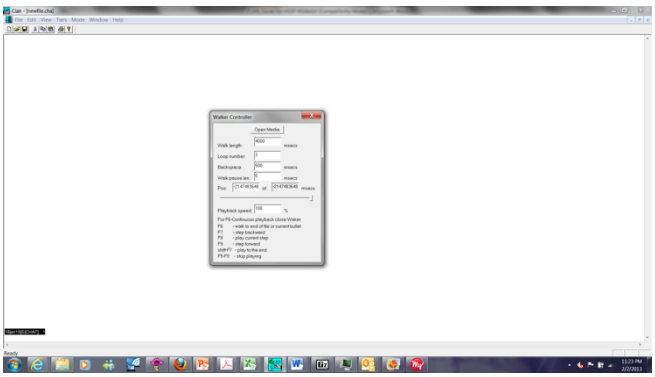
- When you have come to the end of the recording, type @End
- SAVE your file!
- After you have done this, each time you place the cursor by a "bullet" and press F4, you will hear the segment of the recording linked to that line. Transcribe what you hear using the instructions found in this manual. In the section below, we will show you how to make this part even easier!

When you're finished linking the file, the transcript will look like this:



This looks very strange but is the beginning of something wonderful.

Next, go to the WINDOW menu and open the Walker Controller from the drop down menu. It looks like this:



Many of the terms in this box may seem like gibberish, but the ones you care about are: *walk length, loop number, and playback speed*. *Walk length* controls how much you hear when playing back a bullet (if you don't hear everything you should when you play a bullet, your segment is longer than the default, so just increase this number until you seem to hear enough). The *loop number* is how many times the segment will repeat while you type – very critical – pick the one that makes you happy! *Playback speed* controls how fast the playback occurs. 100% is normal, but if the interaction is going too fast, you can decrease rate (and pretend you are transcribing Darth Vader). Alternatively, if you are falling asleep because the person talks too slowly, you can actually make it go faster by setting playback speed to numbers greater

than 100% (and transcribe Munchkins ☺). Keep the Walker Controller window open while you do the next steps below.

Click on the first bulleted line. Then click F6. ***(If this doesn't work in Mac**, go to System Preferences, Keyboard, and check "Use all F1, F2 keys as standard function keys.")* You should hear your segment play as many times as you told it to. You are now ready to transcribe. Here is another cool thing: unlike most programs, you can type while having the Walker open – typing won't deactivate the Walker window.

Now skip down to how to transcribe. Unless you are a perfectionist, in which case read the remainder of this section. Don't worry if your "bullets" (that's what the dots are called) don't line up exactly with utterances. THEY ARE PRIMARILY THERE JUST TO MAKE TRANSCRIBING EASIER AND MORE ACCURATE. NO PROGRAMS ACTUALLY COMPARE THE AUDIO/VIDEO BULLETS TO THE TRANSCRIPT, but the bullets **will** inform any analyses that involve timing information – e.g., words/minute. So, if you are very perfectionistic, you can easily change how much of an utterance is linked to which bullets. To do this:

- Put your cursor next to the bullet you want to change. (If you want to add more to the beginning, place the cursor next to the bullet above the one you want to change)
- Press F5. The audio will begin to play where that bullet starts
- Press the space bar when you want to end that bullet and begin the next one
- A black highlighting line will show you which line is currently recording
- When you've finished fixing the bullet(s), click the mouse anywhere and you will immediately stop recording bullets
- You can also see the numbers inside the bullet by typing ESC-A (press the esc key, release it, and type A) or by going to the CLAN menu to Mode and selecting "Expand bullets". A section on Manual Bullet editing below has more information about tweaking bullets.

HOW TO TRANSCRIBE

There are rules for this, for a reason. The programs expect transcripts to look a certain way, or they won't run, or they will generate gibberish, which makes the whole exercise meaningless. Once you get the hang of it, it's no different from any other activity in which you are asked to follow a format, such as a web address or a telephone number.

Transcribing on Main Lines

Main Lines begin with a *, the 3-letter speaker ID, a colon and a tab. A fast way to type in that information is to find the shortcuts assigned in the Tiers menu section in the CLAN menu. Select Tiers in the CLAN menu (as you did above for the ID headers) and notice, for example, that the Speaker ID (e.g., CHI) has been assigned to CTL-1 (or CMD-1 in Mac). If you do not see the Speaker ID assigned to a shortcut, just select Update. Now you'll see that each speaker tier gets assigned to a shortcut and instead of typing *CHI: followed by a tab, you can just type CTL-1. Place your cursor between the asterisk and the colon, and use the assigned shortcut to insert the info automatically.

Important: We advise that each main line should contain only one utterance or C-unit (conversational unit). An utterance or C-unit is a string of words that:

1. is followed by a pause of 1 second or more;
2. ends with a terminal intonation contour; or
3. has a complete grammatical structure.

Having a complete grammatical structure is a sure mark of an utterance, but often an utterance may have an incomplete structure in short one-word answers. Also, although a following pause can mark an utterance, often another person will talk right away, cancelling the pause.

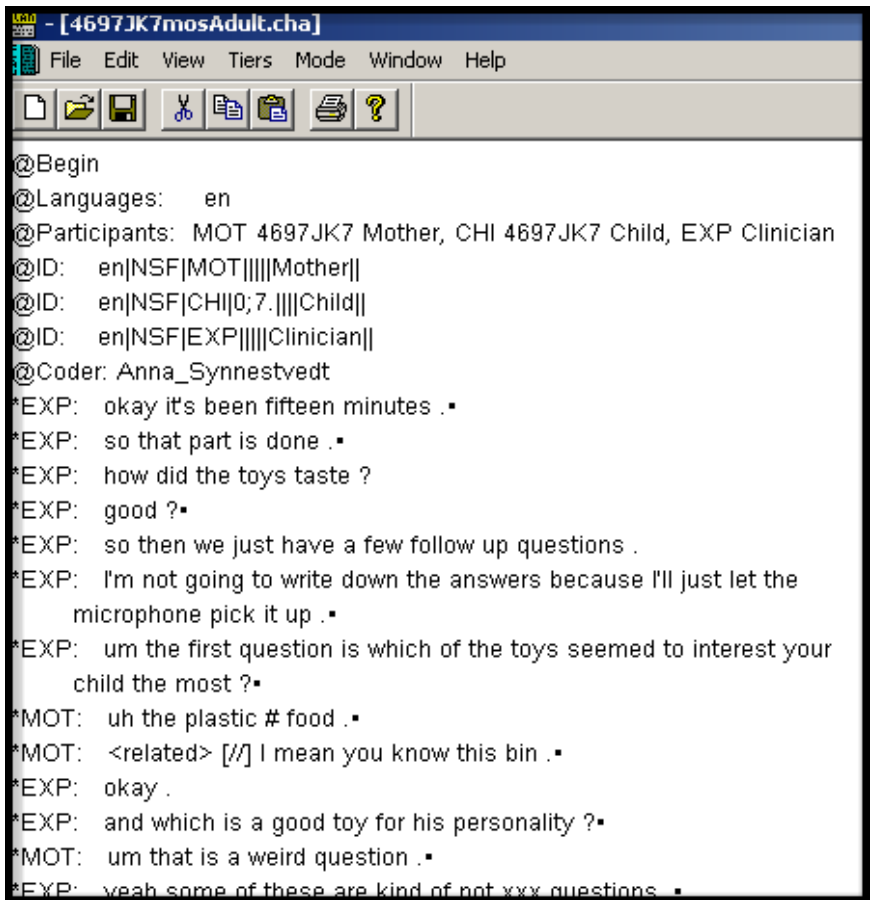
Reliable separation of a conversation into utterances or c-units is important, because measures such as MLU depend on reliable application of these criteria. Chapter 7 of the CHAT manual provides these additional guidelines:

1. Word repetitions should be marked with [/] and distinguished from repeated requests which are separate utterances.
2. Clauses combined with coordinating conjunctions (because, since, etc.) should be distinguished from clauses that use "and" as a conversational continuer.
3. Preposed elements such as vocatives, *yes*, and *well* should be joined to the main utterances, as should postposed elements such as *right*?

Other utterance termination criteria may use different rules, for example those from Berndt, Wayland, Rochon, Saffran, and Schwartz (2000) using a hierarchy of indices: syntax, intonation, pause, semantics.

After the *, Speaker ID, and tab are entered, type what the speaker says and end every line with some sort of punctuation, usually a period. Be sure to place a space between the end of the last word on a line and the punctuation mark (though if you don't do this, CLAN will add it, otherwise the CLAN commands don't work correctly).

Here is what a transcript looks like:



Punctuation
There must be a delimiter (punctuation mark) at the end of every utterance. Most utterances will end in a period (.) question mark (?) or exclamation point (!). Be sure to put a space between the end of the last word and the punctuation mark.

No capital letters should be used except for "I" and proper nouns. There should be no punctuation inside of utterances (e.g., commas, semicolons, etc.) except for apostrophes. Some utterances will require different delimiters. These are described below.

Trailing Off +...
The trailing off or incompletion marker is the terminator for an incomplete, but not interrupted, utterance. Trailing off occurs when speakers shift attention away from what they are saying, sometimes even forgetting what they were going to say.

*CHI: smells good enough for +...
*MOT: what were you saying ?

If the speaker does not really get a chance to trail off before being interrupted by another speaker, then use the interruption marker +/. rather than the incompletion symbol. Do not use the incompletion marker to indicate simple pausing, repetition, or retracing.

Trailing Off of a Question +..?

If the utterance that is being trailed off has the shape of a question, then this symbol should be used.

*EXP: so do you have any of these toys at home or +..?

Interruption +/.
This symbol is used for an utterance that is incomplete because one speaker is interrupted by another speaker. Here is an example of an interruption:

*EXP: what did you +/.
*CHI: mommy .
*EXP: +, with your spoon .

Self Interruption +//.
This symbol is used for an utterance that is incomplete because one speaker interrupted him- or herself. Here is an example of a self-interruption:

*MOT: well we haven't started to +//.
*MOT: Alex put that down !

Retracing Without Correction [/] (also in fluency codes, Appendix 7)
The [/] symbol is used in those cases when a speaker begins to say something, stops and then repeats the earlier material without change. The material being retraced is enclosed in angle brackets. In a retracing without correction, it is necessarily the case that the material in angle brackets is the same as the material immediately following the [/] symbol. Here is an example of this:

*CHI: <I wanted> [/] I wanted to invite Margie .

If only one word is repeated, the angle brackets are not necessary. When the angle brackets are not used before the repeating symbol [/], CLAN assumes that only the last word was repeated.

If there are pauses (longer than 1 second) and fillers between the initial material and the retracing, they should be placed after the retracing symbol, as in:

*CHI: it's [/] (.) &um (.) it's [/] it's like (.) a &um (.) dog .

When a word or group of words is repeated several times with no fillers, all of the repetitions except for the last are placed into a single retracing with angle brackets.

Retracing with Correction [//] (also in fluency codes -- Appendix 7)
This symbol is used when a speaker starts to say something, stops, repeats the basic phrase, but changes any part of the phrase. Usually, the correction moves closer to the standard form, but sometimes it moves away from it. The material being retraced is enclosed in angle brackets. In retracing with correction, it is necessarily true that the material in the angle brackets is different from what follows the retracing symbol. Here is an example of this:

*CHI: <I wanted> [//] &-uh I thought I wanted to invite Margie .

Retracing with correction can combine with retracing without correction, as in this example:

*CHI: <the fish is> [//] the [/] the fish are swimming .

Sometimes retracings can become quite complex and lengthy. This is particularly true in speakers with fluency and language disorders. It is important not to underestimate the extent to which retracing goes on in such transcripts.

When most programs run, information associated with repetitions and corrections is EXCLUDED; if you run FREQ, for instance, to see its options, it will tell you this; if you want this info to be counted in analyses, there is an option in the Command line (type in +r6 along with your other command information).

CLAN allows you to code for anything you want. See CLAN manual if you want to code for other aspects. Once you learn how to code a few things, you will be able to fiddle around with it.

Overlaps

Sometimes two people will speak at the same time. In most cases, you don't care, and sometimes, for clinical interactions, you don't really want to code one person just saying, "uh-huh" over and over again. Or, you can put the other person on the next line, even if they were talking at the same time. But if you care, here are a few ways to code the overlap.

1. Lazy overlap +<

The "lazy overlap" symbol shows that the Participant spoke while the Investigator was speaking.

*INV: how did you communicate with her ?
*PAR: +< I just kept talking .

2. Overlap follows **[>]**

The "overlap follows" symbol indicates that the text enclosed in angle brackets is being said at the same time as the following speaker's bracketed speech. They are talking at the same time. This code must be used in combination with the "overlap precedes" symbol, as in this example:

*INV: how did you communicate <with her> [>] ?
*PAR: <I just kept talking> [<] .

You can insert spaces to make a visual indication of where the overlap occurs. CLAN will ignore the spaces.

*INV: how did you communicate <with her> [>] ?
*PAR: <I just kept talking> [<] .

FLUENCY codes: *typical disfluency* (please see section on stuttering codes in Appendix 7 for specific codes and programs to transcribe and analyze stuttering)

Unfilled pauses
You can indicate short, medium and long pauses by using (.) (..) and (…), respectively.

Filled pauses
When words are used as fillers, they should be marked with &- to show that they should not be included in lexical analyses (i.e. MLU or TTR analyses) *and SHOULD be counted in disfluency analyses*. Examples:

&-like
&-you_know (note that we pulled the you and know together with an underscore so it gets counted as one lexical item)
&-and, when it seems to be just a staller …

NON-Lexical fillers/disfluencies (um, uh, er, etc.) should be transcribed as &-um, &-uh, etc. Non-lexical fillers can also been transcribed with the ampersand only, but we recommend the ampersand-dash combination moving forward. There is a fine line between interjections (e.g., "oh"), communicative turn sounds, and these. Use the ampersand-dash combo (&-) to indicate what you think is a disfluency, as opposed to something that has a communicative function.

Quotation on Next Line +"/.
During story reading and similar activities, a great deal of talk may involve direct quotation. In order to mark off this material as quoted, a special symbol can be used, as in the following example:

*CHI: and then the little bear said +"/.
*CHI: +" please give me all of your honey .
*CHI: +" if you do, I'll carry you on my back .

The use of the +"/. symbol is linked to the use of the +" symbol. Breaking up quoted material in this way allows us to maintain the rule that each separate utterance should be on a separate line. You should only do this if the client is reading or quoting. If the child makes up utterances for a character, it's not all that important to mark it as quoted. You can just type what you hear. But some clinical and research questions like to notice when children or adults use another person's voice, because that is more sophisticated than simply narrating.

Quotation Precedes +"
This symbol is used when the material being directly quoted precedes the main clause, as in the following example:

*CHI: +" please give me all of your honey .
*CHI: the little bear said +".

Single quoted words:
Can use the @q marker, as in:

*CHI: and the boy said shh@q .

Multiple words that should hang together
Some words need to be treated as ONE word (e.g., "you know", "merry go round", "patty cake", or a person's name, such as Mister Spock, or Brian MacWhinney). When words link together to form a frozen phrase, link them with an underscore (you_know, patty_cake, Nan_Bernstein_Ratner). There are also complicated rules for using + to link generative compounds. If you get ? on a %mor tier parse, this could be the reason, and you can play with typing it differently (pulling it together, pull it apart with underscore or +) to see if the program is happier. There shouldn't be too much of this in most files.

Other Coding Conventions: ERRORS!
Most of the time, people don't speak in perfect sentences. Here are some coding conventions for some of the most common deviations.

If you are reading this, you are probably a clinician ☺. If you wind up with a file that doesn't have some errors, we'd be amazed. That's WHY you do language sampling! When you find an error in use, mark it in the following way:

*CHI: he had two mouses [: mice] [*] .

As in your old linguistics class, an asterisk flags something ungrammatical. You can just use the [*] or you can code errors more finely (the CHAT manual has lots of examples), but the main point here is that you noted an error (which will be computed in KidEVAL and EVAL), take away a DSS sentence point, and you use the replacement symbol [: mice] to let the MOR program know what the person was trying to say.

Missing words: 0

You can code an omitted word or part of speech using the zero symbol as shown below. Caution is urged, though, as coding of word omissions is a difficult and unreliable process. Items marked as omitted are not included in the MLU count.

*CHI: 0does he like it? (this corresponds to the "gloss" -- what you heard – "he like it?")

*PAR: 0mod he like it? (indicating that the modal "does" or "did" was omitted from "he like it?")

Phonological Fragments &+fr
If there is a fragment of a word use the &+ symbol and then type out the fragment, for example

*CHI: he had a &+fr friend.
*CHI: I really wanted to &+vi visit the zoo.

In the first example, the child began to say "friend" but stopped part way through the word. Notice that a lot of disfluencies are being tagged with the ampersand. The ampersand shows up in the Appendix under stuttering codes as well, for obvious reasons.

Unintelligible words xxx
If you cannot understand a word or phrase contained within an utterance, code it as xxx. Before doing so, try to listen a couple times to figure it out. If you think you can make out the sounds, you can use yyy, and then use a %pho tier to put these sounds in, but that's beyond the scope of this manual.

Pauses (.)
If the speaker pauses for a short duration, use the (.) symbol. This symbol is not necessary if the pause occurs between utterances, even if the bullet makes it sound like it happens at the beginning of the utterance. Pauses that occur between utterances do not need to be coded. Medium-length or long pauses can be marked with (..) and (…), respectively.

Babbling and Jargon (from kids or patients)
Sometimes you get sounds, but you have no English word to "gloss". You can import fonts and insert phonetic symbols (or characters from other languages, such as Chinese) See the CHILDES website for help with this if you need it. For many situations, it may be best to mark it as unintelligible using yyy (and trying to gloss what you heard) or xxx (no real best guess as to how to transcribe):

*CHI: yyy [=! dada] .

Reminder: Sounds or utterances that are truly unintelligible should be marked in this format:

*CHI: xxx [=! vocalizes/laughs/whines, etc] .

Now we have a bunch of Tables for various kinds of words. WHY? Because so many analyses will compare word types and tokens, having a system (and checking your spelling) is extremely important, or you will wind up crediting the speakers with more words than they really say. Sloppiness hurts your end result. A lot.

Simple Events
Often you will want to mark some non-verbal activity that a child produces at a particular juncture. You can do this using the &=text format. Example include &=moans, &=laughs, or &=coughs. This type of coding can be extended to mark imitations as in &=imit:plane if the child makes a plane noise, gestures as in &=ges:frustration, or other actions such as &=moves:doll, &=shows:pictures, or &=opens:mouth. The full list of these codes is given in section 7.9 of the CHAT manual.

Exclamations, Interactional Markers and Other Funny Words
Conversational speech has hundreds of forms that are fairly standard, but not spelled in conventional ways. For example, should one spell the word for realizing something as *ahhah* or *ahah* or even *ahaah*? For the hundreds of forms like this, the English MOR has selected one of the forms as standard. For example, it allows *okay*, but not *ok*; use *uhhuh* for the common *yes* variation and *uhuh* for *no* (though several other spellings are accepted as well). To find out the right way to spell each of these forms, you can consult the file 0allwords.cdc in the ENG folder of the MOR lexicon. That file has all the words recognized by English MOR in alphabetical order. After a while, you will get used to these conventions and will only need to

consult this file on occasion. If you want to focus specifically on learning the forms for exclamations and communicators, then you can look at the co.cut file in the /eng/lex folder.

Shortened Words

Sometimes the word will be shortened but still intelligible. You can put the deleted part of the word in parentheses. This will enable CLAN to do analyses on the word, and will help you later if you are trying to count syllables, or need to know exactly how the child said the word. The following table lists some examples.

Table 3: Shortenings

Examples of Shortenings			
(a)bout	don('t)	(h)is	(re)frigerator
an(d)	(e)nough	(h)isself	(re)member
(a)n(d)	(e)spress(o)	-in(g)	sec(ond)
(a)fraid	(e)spresso	nothin(g)	s(up)pose
(a)gain	(es)presso	(i)n	(th)e
(a)nother	(ex)cept	(in)stead	(th)em
(a)round	(ex)cuse	Jag(uar)	(th)emselves
ave(nue)	(ex)cused	lib(r)ary	(th)ere
(a)way	(e)xcuse	Mass(achusetts)	(th)ese
(be)cause	(e)xcused	micro(phone)	(th)ey
(be)fore	(h)e	(pa)jamas	(to)gether
(be)hind	(h)er	(o)k	(to)mato
b(e)long	(h)ere	o(v)er	(to)morrow
b(e)longs	(h)erself	(po)tato	(to)night
Cad(illac)	(h)im	prob(ab)ly	(un)til
doc(tor)	(h)imself	(re)corder	wan(t)

Assimilations

Sometimes two or more words will blend together and sound completely different from the individual words that created them. In such cases you can type these assimilations into the main tier to reflect this change:

Table 4: Assimilations

Nonstandard	Standard	Nonstandard	Standard
coulda(ve)	could have	mighta	might have
dunno	don't know	need(t)a	need to
dyou	do you	oughta	ought to
gimme	give me	posta	supposed to
gonna	going to	shoulda(ve)	should have
gotta	got to	sorta	sort of
hadta	had to	sorta	sort of
hasta	has to	wanna	want to
hafta	have to	wassup	what's up
kinda	kind of	whaddya	what did you
lemme	let me	whyntcha	why didn't you
lotsa	lots of		

We've added: gotchya (ns) got you (s)

Transcribing Dependent Tiers

Why would you want to add tiers to your transcript? Well, common reasons are to mark for speech act intents, comments about what is going on, whether the client managed to include a narrative component in his story, etc. Dependent tier lines begin with the % symbol. This symbol is followed by a three-letter code in lowercase letters for the dependent tier type, such as "nar" for narrative code or "com" for a comment. The three letter code is followed by a colon and then a tab. The text of the dependent tier begins after the tab. A full list of pre-arranged, conventional tiers is in the CHAT manual. Consult it before making one up!

Comments %com

If you wish to note something odd or of interest in the recording, create a dependent tier for comments (%com).

*CHI: Alpha had a frog .
*CHI: then when Asa wake up he <could> [//] looked for his frog everywhere .
%com: the character's name changes from Alpha to Asa and back again .

Just like with main lines, there should always be a colon after the three-letter code and a tab after the colon before the actual comment begins. The same rules of punctuation and capital letters apply to these lines.

Why would you do this? It often helps to annotate something you noticed during the session that you are likely to forget later, that provides useful information about the utterance or interaction.

Note: If a significant portion of the file is unanalyzable, add a warning header at the top of the file, rather than comments all over the place; likewise, if there is a generic observation that affects the file, put it up at the top as well.

@Warning: The first 15 minutes of this file had background noise.

MOVING ON TO THE GOOD STUFF: CLAN ANALYSES

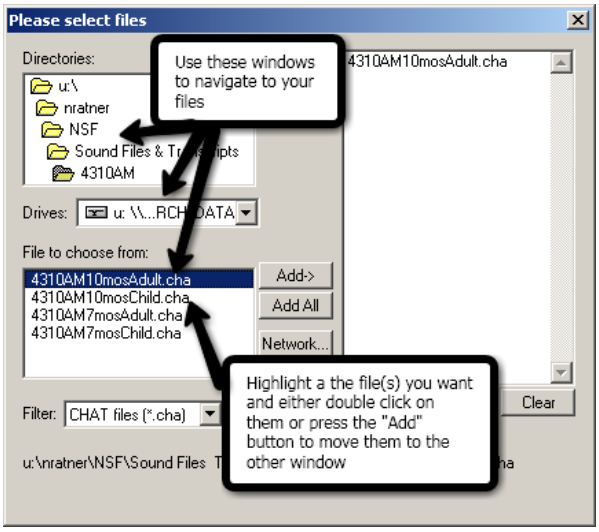
CHECK

Before you run any real analyses, it is important to make sure the transcripts are set up correctly or else the analyses won't run. To do this, you need to run a program called CHECK on the transcripts.

One easy way to run check is to use the **ESC-L function** while you're transcribing or once you've finished. With the transcript open, simply press the escape key, release it, then type L. You'll see a message at the bottom of the screen showing you where (by line number) you have an error and what the problem is. If you don't see line numbers in your transcript, go to Mode in the CLAN Menu and select Show line numbers. Keep using ESC-L to check until you get the Success! message at the bottom of the page. Then SAVE your file!

Another way to run CHECK, especially if you want to check multiple files, is to open the CLAN program. The Commands window should automatically open. If it does not, press CTRL-D (CMD-D on a Mac), or go to Windows in the CLAN menu and select Commands. In the commands window, type "check" followed by a space. Once you type in a command in the Commands window, a 'file in' button will appear above the window.

To choose the transcripts on which you'd like to run the analysis, click the "File in" button. A new window will open, and from there you navigate to where your transcripts are saved.



You can run CHECK and any of the following analyses on more than one transcript at a time if you so choose. If you do this, each file will be run separately in sequence. Once you have selected the file(s) you want to analyze and have moved them into the window on the right, press "Done." This will return you to the Commands window, and an "at" sign (@) will appear next to your command. Then press "Run" in the Commands window or simply hit Return on your keyboard and the analysis will run on its own.

Results of most CLAN analyses are sent to a FILE OUTPUT that pops up on the computer screen (except for a few analyses we will explain further). If you can't remember all the mistakes, you can save the output that showed up on your screen to a file using the usual File command on the toolbar, or you can cut and paste the output to a word file and save it.

Typical CHECK gripes:

Wrong format (spaces, not tabs). Confusing spaces and tabs between the Speaker ID and the line of dialogue is such a common mistake, there is actually a program to fix this. In the command window, type CHSTRING +q and then input the offending file. It will fix all the bad lines at once.

Missing headers. Typically, this problem occurs when you didn't format appropriately, or didn't include a speaker you then transcribed, or invented a role not in the approved list.

Missing "utterance delimiters". Sometimes it's easy to confuse a bullet for a period and forget to put some in. If you get a lot of these errors on a check run, there is a program to fix the situation: In the CLAN window, type DELIM and put in the offending file. DELIM will insert periods (but only periods) at the ends of utterances lacking final delimiters.

Forgetting to put @End at the end of the file ☹

Unrecognized symbols, people, etc. Typically, CHECK will actually underline and/or note the error in red what it doesn't like, and tell you the line it found it on, to help you go fix it (if it finds more than one error on a line, it will treat it as a completely different error, which can confuse, until you notice it had multiple sad things to say about line 61 or something like that). **COOL TIME AND LABOR-SAVING FACT: You can triple-click on the line number noted in the output and it will take you directly to that line or the error to fix it!**

CLAN actually runs two CHECKs when you run the CHECK command. Be sure to keep fixing the files until you get the "SUCCESS Second pass complete" message.

****HOWEVER, you <u>can</u> actually run most programs on files that CHECK is having some problems with; it may affect accuracy of output somewhat, but probably not in a clinically relevant way.** If a program won't run, it's because something is pretty wrong with your file, and you need to figure it out and fix it. *If you still have trouble, either contact chibolts (see listserv instructions) or e-mail one of us.*

CLINICAL ANALYSES: KIDEVAL

Recently (Fall 2012), CLAN developed a super-useful utility called KIDEVAL (there is also EVAL for adult aphasia samples). This program sends its output automatically to an Excel spreadsheet with a mother lode of analysis results, such as mean length of utterance in morphemes (MLU-M), mean length of utterance in words (MLU-W), type-token ratio (TTR), clause density, and number of major morphemes observed. It will even output a series of transcript analyses into the same Excel file.

There is only one minor thing you have to do first to use KIDEVAL and EVAL. You have to run a command called MOR on the transcript. MOR is short for "morphology" and will automatically insert a %mor tier, so that you don't have to figure out where morpheme boundaries are, or the syntactic construction of the sentence (e.g., parts of speech). Don't worry, your linguistics classes will still come in handy, but this saves a lot of work, and is much more accurate than doing stuff by hand.

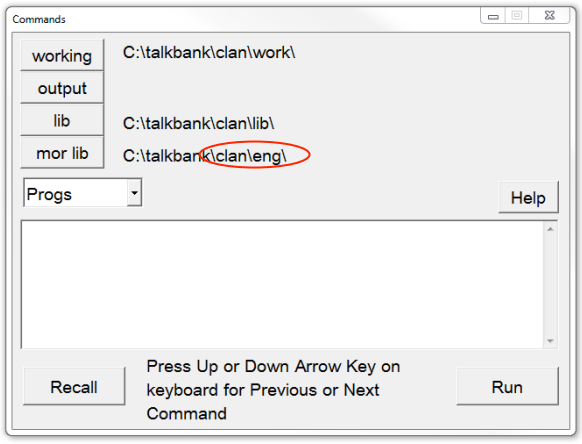
Preparing to run MOR

To run MOR for your language, you need to download the MOR grammar. It is supereasy to do this by selecting the option under the File menu called "Get MOR grammar". For English data, select "eng". Each MOR grammar that you download goes into its own folder. For example, the "eng" grammar goes into c:\talkbank\clan\eng and CLAN then also sets your MOR LIB to that folder. Depending on your computer and browser settings, your downloads may go elsewhere. Just be sure you know where the folder is so you can set eh MOR LIB button in the CLAN Commands window to the right place to find it.

You can also download MOR for 10 other languages. MOR has the best coverage and accuracy for English, but the others are not bad and all are much better than trying to do morphological analysis by hand.

You can even analyze bilingual samples ☺; however, if you are going to analyze a single file with more than one language, that is an advanced topic, and you should contact Shelley Brundage [brundage@gwu.edu]).

If all has worked well, you should see the following in your mor lib(rary): ENG or the language of your choice should be the last element in the path:



OK, you are ready to roll. In the CLAN commands window, just type MOR and select the file you want to analyze:

mor filename.cha

Morphology is inserted into files using a multi-step process. In the first step, every word in your transcript is looked up in a huuuuuuge dictionary that the program mor uses. Then, because many words in a language are ambiguous, a second program, POST, uses very sophisticated algorithms to assign the best possible parse to the mor output of your file. These parsers are very accurate (particularly when compared to harried researchers, students and clinicians ☺). Then it runs POSTMORTEM, which cleans up some further details on the %mor line. POSTMORTEM is particularly important for German (deu). Finally, it runs MEGRASP which adds a %gra tier to the transcript showing grammatical relations. If you want to get rid of that tier, you can run trim –t%gra +1 filename.cha (or *.cha for a group of files or use the File In button) to remove that tier from your transcripts.

BEFORE you run the MOR command, it's a good idea to make sure all of the words in your file can be identified by the MOR command. To do that, run this command: mor +xb filename.cha (or *.cha on a group of files, or use the File In function). This will produce a file ending in .cex that has the words CLAN couldn't find in its dictionary (e.g., something like "mouses"). It will indicate what line the odd word is on. If you triple click on the file (the line with the *** in the .cex file) it will open the appropriate file and take you to the transcript line. Fix the typo or add the target word right after the error, as in mouses [: mice] and SAVE YOUR FILE again. If you do this while transcribing, obviously, you are in better shape. If you find a lot of unrecognized words that you know ARE words, let the folks at CMU know (in any language that uses MOR). If you find only one or two, to be honest, your clinical measures probably won't be off by much. They are likely to be worse (and much slower) if you did it by hand.

Then, it is good to CHECK the file again. If there's a problem, you really should go back and make a fix. This is typically that POST didn't disambiguate a line and there is still a ^ separating grammatical options. If there are only a few of these, you can use the escape-2 command to choose the right options by hand.

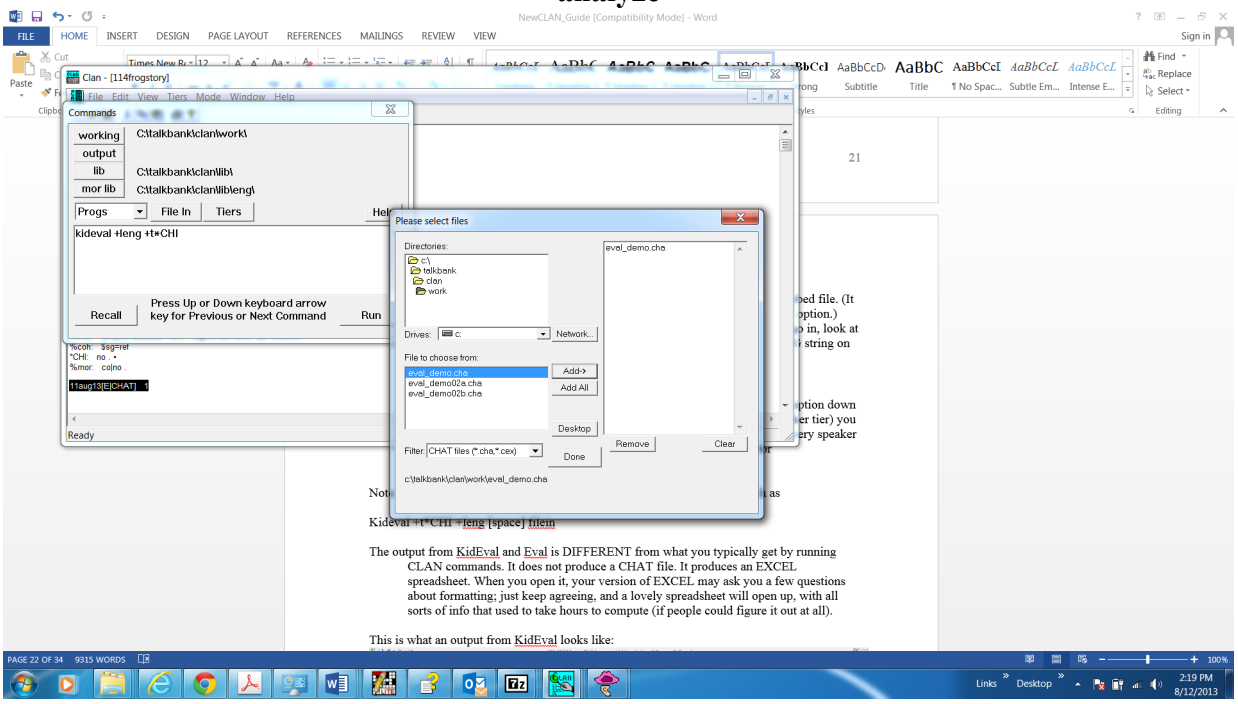
KIDEVAL: the answer to the SLP's dreams for child (and adult) language sampling.
STAY TUNED for **EVAL**, below, which analyzes language samples from adults along dimensions more typically relevant for aphasia.

Once you have your file automatically MOR-ed and you checked to make sure there aren't lots of ? marks under perfectly good words, just type KIDEVAL in the CLAN Command window. It will ask you who (which speaker tier) you want to analyze, which makes sense, since you don't typically care about every speaker in the sample. You must also pick a language option (such as +leng for language=English). Click and you are done (VOILA!)

Note: you must put SPACES between the parts of the command line, such as

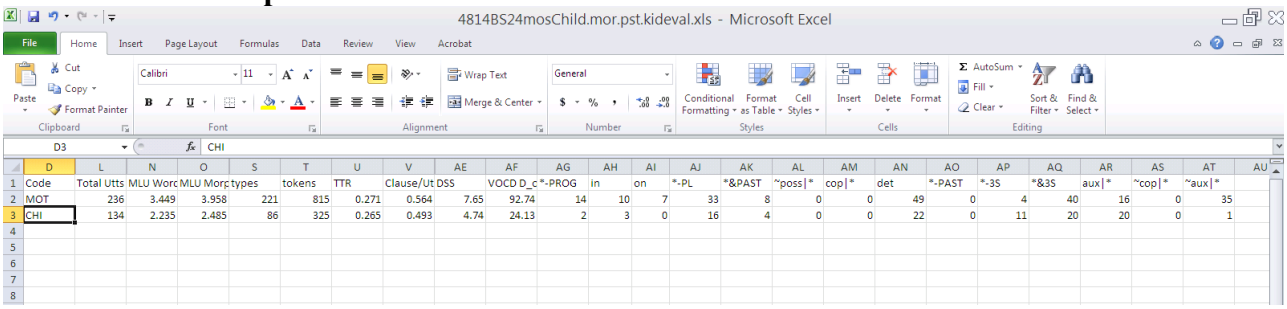
KIDEVAL [space] +t*CHI [space] +leng [space] click file in [then pick the file/files you want]

In other words, for English: KIDEVAL +leng +t*CHI <click on the file(s) you want to analyze>



The output from KidEval and EVAL is DIFFERENT from what you typically get by running CLAN commands. It does not put the data in a CLAN output file. It produces an Excel spreadsheet that you open in Excel (the output file will tell you where CLAN 'put" the spreadsheet). When you open it, your version of Excel may ask you a few questions about formatting; just keep agreeing, and a lovely spreadsheet will open up, with all sorts of info that used to take hours to compute (if people could figure it out at all, or do the linguistics or math right).

This is what an output from KIDEVAL looks like:



	D	L	N	O	S	T	U	V	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	Code	Total Utts	MLU Word	MLU Morp	types	tokens	TTR	Clause/Ut	DSS	VOCD D_c	*-PROG	in	on	*-PL	*&PAST	~poss|*	cop|*	det	*-PAST	*-3S	*&3S	aux|*	~cop|*	~aux|*
2	MOT	236	3.449	3.958	221	815	0.271	0.564	7.65	92.74	14	10	7	33	8	0	0	49	0	4	40	16	0	35
3	CHI	134	2.235	2.485	86	325	0.265	0.493	4.74	24.13	2	3	0	16	4	0	0	22	0	11	20	20	0	1
4																								
5																								
6																								
7																								
8																								

This is a big display, so here is a fast guide to what you are looking at (we have actually hidden some columns you would get if ran the program, just to fit the most clinically useful stuff into the screen shot.)

TO SAVE THIS SPREADSHEET AS A REAL EXCEL SPREADSHEET, you need to go to the menu to FILE, SAVE as, give it a name, and then scroll up to select the xlsx format, decide where you want it saved, and press save. Otherwise, it's just in text format, even though it looks like a legitimate spreadsheet.

Each person's data goes on a single row (there was both a Mother and Child in this file, and we looked at both of them, just for fun). Going across the top, you see, in order:

- The total number of utterances the speaker produced

- Mean Length of Utterance (MLU) in words (this is strictly not MLU, which is measured in morphemes, but is very good for looking at other languages.)

- MLU in morphemes (the traditional measure)

- MLU and MLU-W have recently updated "norms" for children across childhood (2;6-8;11). See Rice et al., (2010) Mean Length of Utterance levels in 6-month intervals for children 3 to 9 years with and without language impairments. Journal of Speech, Language, and Hearing Research, 53, 333–349. (See **Appendix 1**).

- Types: the number of different words used in the sample (there are options in CLAN for lumping word roots and inflections, but this one takes each word version separately)

- Tokens: the total number of all words in the sample

- TTR: the Type-Token ratio, a measure of lexical diversity. This number goes from .001 to 1.0; a low value indicates a lot of repetition (as if someone said "yada yada" 100 times and nothing else); a high value means each word in the sample was different. You actually can't get numbers too close to 1.0 and still have grammar – think about it.

- There are a number of references showing typical TTR values for children across early development. One (Miller et al., 2005) is included in **Appendix 2.**

- Number of different words in 100 words (NDW): this value has evolving norms. Stay tuned; Some are provided in **Appendix 3.**

- Clause/utt: clausal density, the average number of clauses per utterance.

- DSS: Developmental Sentence Score (Lee, 1974). This normed value is a classic in clinical child language sample analysis. The manual refers you to source material and norms (we have pdf files of the scoring procedures and norms if you'd like them; due to copyright, we provide them separately). REMINDER: DSS gives a sentence point to anything you didn't place an error code on. If you didn't mark utterances as ungrammatical when you saw them, this value will be somewhat higher than it should be when comparing norms. See some reference norms in **Appendix 4.**

- IPSyn: Index of Productive Syntax (Scarborough, 1990). See sources and reference values for IPSYN in **Appendix 5**. Several of the items in IPSyn are computed on the basis of the %gra line and this means that your input transcripts must have a %gra line, if you want to compute IPSyn in KIDEVAL. However, when you run MOR, this also runs MEGRASP automatically to compute a %gra line, so you should be able to do all of this automatically.

- VocD: Vocabulary diversity. This is a twist on TTR, but supposedly more reliable when looking at files that vary substantially in length. The CLAN manual has lots of information about this measure. It is used by many researchers instead of TTR. *For fluency researchers, we have serious concerns about all other vocabulary diversity measures, because PWS tend to talk so much less in most sampling sessions.* Some reference values for VocD are provided in **Appendix 6**.

- *-PROG through ~aux|* : These columns provide "Brown's morphemes", in developmental order, as they were seen in the sample. These numbers are either RAW COUNTS, or percentages, depending upon which *option* for KIDEVAL you pick[1] and add to the command line. [2]

EVAL
EVAL is for clinicians who want to know about ADULTS' language abilities, and was developed to analyze the speech of persons with aphasia. When you type (or choose) EVAL in the command window, it will ask you to pick a file, then pick among options. If you like, it can compare your client to a database of people in AphasiaBank, a large cooperative endeavor funded by TalkBank (Brian MacWhinney and Audrey Holland, PIs). Basically, if you can run KIDEVAL, you can run EVAL. It requires the same %mor line, so be sure you run the MOR command first.

If, under options, you pick "Update database", and you pick controls for your comparison group, the resulting Excel spreadsheet will flag (with asterisks), categories in which your patient differed by more than a standard deviation from the control adults who were studied in the AphasiaBank initiative. We think this is pretty cool, frankly [actually, one reviewer of this manual used lots stronger "linguistic enthusiasm"].

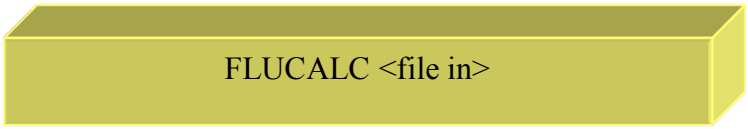
ANALYZING WRITTEN (Typed) LANGUAGE SAMPLES IN CLAN:

You can analyze written language using EVAL and/or KIDEVAL. To do this, remove any information you don't want to analyze (e.g., student identifiers, headers specific to the assignment), and RE-SAVE the file as plain text (.txt). This is important, as it will remove irrelevant information (such as font codes, margins, etc. that tend to foil CLAN). Then use the command TEXTIN in the commands window and input your new file. This will produce a CHAT file (e.g., myfile.textin.cha). When you open this file, you will find that it has created a set of headers in CHAT format, and replaced speaker tiers with the generic code *TXT, placing each sentence on a main line by using punctuation markers. You will need to do some editing. You can use global search and replace to change *TXT to *CHI, for example. You will need to change header wording manually by using the update tiers option you learned to use earlier. You may need to do additional small cleanup to delete sentence internal punctuation, change "smart" curly quotes and apostrophes from MS-Word to straight quote and apostrophes, etc. But your file should quickly be ready to MOR and then analyze using EVAL and/or KIDEVAL, using the same steps outlined earlier in this manual.

[1] To get raw counts for this program, add the command +o4.
[2] To see what kinds of options exist for ANY program, go to the command window and just pull down or type the program name, then click RUN. The screen output will give you the proper syntax and any unique options that exist for that program.

FLUENCY ANALYSES IN CLAN:

You can run fluency AND language analyses on the same file. To produce a list of disfluent words, separated by type of disfluency, all you need to do is use the following command:



FLUCALC will perform a fluency analysis of a language sample, in both raw counts and percentages of intended words. It will also provide a "beta" weighted disfluency value over words, based on the formula proposed by the Illinois Stuttering Project (Yairi & Ambrose, 1999) for computations made on syllable counts.

You must use fluency codes specified in this manual (and in the CHAT manual in "Disfluency Transcription). As noted, values are currently word- (rather than syllable-) based. Plans are underway to permit a syllable-based option to be used in interpreting scores against commonly reported measures such as the *SSI-4*.

You must run MOR for the appropriate language in order to then run FLUCALC.

The same speech/language sample can be used for both language sample analysis (KIDEVAL, EVAL) and fluency appraisal via FLUCALC.

Output is in spreadsheet format (please note that CLAN spreadsheets are Excel compatible, but must be imported using options that Excel will provide when you first open the spreadsheet).

Columns specify the following values (beyond those provided by header information, such as gender, age, corpus, etc.):

- Total utterances in the sample
- Total mor words: these are the total intended words, as identified by application of MOR to the sample
- # Prolongation: raw count of sound prolongations
- % Prolongation (over mor words)
- # Broken word
- % Broken word
- # Block
- % Block
- # PWR (Part-word repetition)
- % PWR

- # PWR RU (Repetition units): these are sometimes called iterations, or the number of excess repetitions in a part-word repetition. This column totals all RUs seen in the sample, for use in the weighted disfluency score
- % PWR RU
- # Phonological fragment – these are best viewed as abandoned word attempts, e.g. *&+fr- tadpole*, where the speaker appears to change word choices; this code was original to CLAN programs.
- % Phonological fragment
- # WWR (whole word repetition)
- % WWR
- # WWR RU (repetition units; please see PWR above)
- % WWR RU
- # Phrase repetitions
- % Phrase repetitions
- # Word revisions
- % Word revisions
- # Phrase revisions
- % Phrase revisions
- # Pauses
- % Pauses
- # Pause duration (if specified by coder)
- % Pause duration
- # Filled pauses
- % Filled pauses
- # SLD (stutter-like disfluency); this is done by summing over categories in columns Prolongations through whole-word repetitions (WWR), with the exception of columns reporting repetition units (RUs)
- % SLD: proportion of stutter-like disfluencies over total intended words
- # TD (typical disfluencies): this is done by summing categories in columns Phrase repetitions through filled pauses)
- % TD
- # Total (SLD+TD): this sums all forms of disfluency, both stutter-like and typical, seen in the sample
- % Total (SLD+TD)
- Weighted SLD. This is an adapted version of the SLD formula for distinguishing between typical disfluency and stuttering profiles in young children. It was originated by Yairi & Ambrose (1999) and originally referenced against a standard sample of 100 syllables, rather than words, as here.
    - This formula multiplies the SUM of part-word and whole-word repetitions by the MEAN of the observed repetition units in the sample; it then adds this value to TWICE the sum of prolongations and blocks. This formula penalizes the severity of the segment repetition profile as well as the presence of prolonged

sounds and blocks, which are virtually absent in any sample of typically fluent speech.

- Please note that currently, CLAN is not able to isolate whole word repetitions (the only ones counted in Yairi & Ambrose's formula) from repetitions of poly-syllabic word targets). We are currently using contributed corpora to the FluencyBank in order to provide guidance on how to adjust interpretation of the Weighted SLD for clinical purposes and hope to provide such guidance in the near future.

The output will look like this, with column headings for each of the output variables across the first row, and filenames for each file analyzed down the first column:

A	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
File	mor Utts	mor Word	# Prolonga	% Prolonga	# Broken w	% Broken w	# Block	% Block	# PWR	% PWR	# PWR RU	% PWR RU	# Phonolo	% Phonolo	# WWR	% WWR	# WWR RU	% WWR RU	# Phrase re	% Phrase re	# Word rep	% Word rep	# Phrase re	% Phrase re	# Pauses	% Pauses	# Pause du	% Pause du	# Filled pau	% Filled pa	# SLD	% SLD	# TD	% TD	# Total (SL	% Total (SL	Weighted S
S001_3mo	107	368	2	0.005	0	0	0	0	5	0.014	15	0.041	0	0	7	0.019	13	0.035	0	0	0	0	0	0	0	0	0	0	1	0.003	14	0.038	1	0.003	15	0.041	8.696
S001_intal	112	339	2	0.006	1	0.003	1	0.003	4	0.012	9	0.027	0	0	0	0	0	0	0	0	0	0	1	0.003	0	0	0	0	5	0.015	8	0.024	6	0.018	14	0.041	4.425
S002_9mo	351	1432	14	0.01	1	0.001	3	0.002	81	0.057	107	0.075	24	0.017	47	0.033	52	0.036	21	0.015	6	0.004	16	0.011	2	0.001	0	0	91	0.064	170	0.119	136	0.095	306	0.214	13.478
S002_intal	374	895	11	0.012	0	0	0	0	30	0.034	73	0.082	0	0	5	0.006	19	0.021	4	0.004	0	0	1	0.001	6	0.007	0	0	6	0.007	46	0.051	17	0.019	63	0.07	12.737
S003_intal	71	199	0	0	0	0	1	0.005	5	0.025	7	0.035	0	0	0	0	0	0	0	0	1	0.005	0	0	1	0.005	0	0	2	0.01	6	0.03	4	0.02	10	0.05	4.523
S005_3mo	316	842	5	0.006	1	0.001	7	0.008	23	0.027	30	0.036	3	0.004	22	0.026	28	0.033	2	0.002	1	0.001	7	0.008	2	0.002	0	0	24	0.029	61	0.072	36	0.043	97	0.115	9.739
S006_6mo	91	237	0	0	0	0	0	0	0	0	0	0	5	0.021	1	0.004	3	0.013	1	0.004	0	0	0	0	0	0	0	0	1	0.004	6	0.025	2	0.008	8	0.034	1.266
S006_9mo	255	854	0	0	1	0.001	0	0	4	0.005	4	0.005	0	0	1	0.001	7	0.008	2	0.002	0	0	4	0.005	0	0	0	0	2	0.002	6	0.007	8	0.009	14	0.016	1.288
S006_intal	214	529	0	0	2	0.004	2	0.004	17	0.032	25	0.047	5	0.009	21	0.04	31	0.059	0	0	0	0	0	0	0	0	0	0	6	0.011	47	0.089	6	0.011	53	0.1	11.342
S007_12m	127	346	3	0.009	1	0.003	2	0.006	21	0.061	33	0.095	3	0.009	7	0.02	14	0.04	6	0.017	0	0	2	0.006	0	0	0	0	15	0.043	37	0.107	23	0.066	60	0.173	16.474
S007_intal	159	618	6	0.01	1	0.002	0	0	32	0.052	58	0.094	0	0	27	0.044	40	0.065	0	0	0	0	2	0.003	0	0	0	0	10	0.016	66	0.107	12	0.019	78	0.126	17.799
S008_3mo	146	430	11	0.026	0	0	1	0.002	22	0.051	38	0.088	11	0.026	9	0.021	14	0.033	4	0.009	1	0.002	1	0.002	0	0	0	0	4	0.009	54	0.126	10	0.023	64	0.149	17.674
S008_intal	179	415	20	0.048	0	0	0	0	35	0.084	62	0.149	23	0.055	16	0.039	26	0.063	1	0.002	0	0	0	0	0	0	0	0	12	0.029	94	0.227	13	0.031	107	0.258	30.843
S008_intal	131	267	6	0.022	0	0	0	0	12	0.045	18	0.067	8	0.03	6	0.022	9	0.034	0	0	0	0	1	0.004	0	0	0	0	7	0.026	32	0.12	8	0.03	40	0.15	14.607
S010_intal	63	129	0	0	3	0.023	1	0.008	3	0.023	5	0.039	1	0.008	2	0.016	2	0.016	0	0	0	0	1	0.008	8	0.062	0	0	6	0.047	10	0.078	15	0.116	25	0.194	6.977
S010_intal	125	282	2	0.007	0	0	3	0.011	3	0.011	4	0.014	0	0	4	0.014	5	0.018	1	0.004	1	0.004	0	0	0	0	0	0	8	0.028	12	0.043	10	0.035	22	0.078	6.738
S010_intal	173	344	0	0	0	0	0	0	0	0	0	0	0	0	4	0.012	5	0.015	4	0.012	1	0.003	0	0	0	0	0	0	7	0.02	4	0.012	12	0.035	16	0.047	1.453
S011_12m	207	494	8	0.016	0	0	0	0	7	0.014	8	0.016	1	0.002	6	0.012	7	0.014	7	0.014	2	0.004	2	0.004	0	0	0	0	16	0.032	22	0.045	27	0.055	49	0.099	6.275
S011_intal	419	953	2	0.002	0	0	0	0	38	0.04	52	0.055	0	0	52	0.055	80	0.084	12	0.013	2	0.002	3	0.003	0	0	0	0	139	0.146	92	0.097	156	0.164	248	0.26	14.271
S012_9mo	295	550	0	0	0	0	0	0	2	0.004	4	0.007	51	0.093	3	0.005	3	0.005	3	0.005	0	0	0	0	0	0	0	0	8	0.015	56	0.102	11	0.02	67	0.122	1.273
S013_intal	453	1324	0	0	0	0	0	0	6	0.005	14	0.011	0	0	12	0.009	14	0.011	3	0.002	1	0.001	2	0.002	0	0	0	0	0	0	18	0.014	6	0.005	24	0.018	2.115
S015_3mo	243	353	0	0	0	0	6	0.017	15	0.042	38	0.108	0	0	1	0.003	1	0.003	0	0	0	0	0	0	0	0	0	0	6	0.017	22	0.062	6	0.017	28	0.079	14.448
S015_intal	43	96	0	0	0	0	0	0	0	0	0	0	0	0	1	0.01	2	0.021	0	0	0	0	0	0	0	0	0	0	0	0	1	0.01	0	0	1	0.01	2.083
S017_3mo	143	466	0	0	0	0	0	0	1	0.002	1	0.002	1	0.002	3	0.006	4	0.009	2	0.004	0	0	1	0.002	0	0	0	0	0	0	5	0.011	3	0.006	8	0.017	1.073
S017_intal	112	425	0	0	0	0	0	0	6	0.014	13	0.031	0	0	11	0.026	19	0.045	3	0.007	0	0	2	0.005	0	0	0	0	1	0.002	17	0.04	6	0.014	23	0.054	7.529
S018_intal	164	367	0	0	0	0	0	0	3	0.008	5	0.014	0	0	9	0.025	9	0.025	2	0.005	0	0	2	0.005	3	0.008	0	0	3	0.008	12	0.033	10	0.027	22	0.06	3.815
S019_intal	188	564	0	0	1	0.002	10	0.018	8	0.014	13	0.023	8	0.014	4	0.007	4	0.007	0	0	1	0.002	7	0.012	1	0.002	0	0	13	0.023	31	0.055	22	0.039	53	0.094	6.56
S020_intal	131	254	3	0.012	0	0	3	0.012	29	0.114	59	0.232	2	0.008	5	0.02	8	0.031	0	0	0	0	0	0	0	0	0	0	2	0.008	42	0.165	2	0.008	44	0.173	31.102
S021_intal	259	641	3	0.005	4	0.006	2	0.003	45	0.07	104	0.162	28	0.044	22	0.034	42	0.066	10	0.016	0	0	1	0.002	0	0	0	0	100	0.156	104	0.162	111	0.173	215	0.335	24.337
S023_intal	280	832	12	0.014	2	0.002	0	0	29	0.035	62	0.075	0	0	20	0.024	23	0.028	7	0.008	0	0	1	0.001	0	0	0	0	18	0.022	63	0.076	26	0.031	89	0.107	13.101
S024_intal	264	557	0	0	0	0	0	0	3	0.005	6	0.011	0	0	2	0.004	2	0.004	1	0.002	1	0.002	1	0.002	1	0.002	0	0	1	0.002	5	0.009	5	0.009	10	0.018	1.436
S025_intal	181	554	0	0	0	0	4	0.007	6	0.011	9	0.016	0	0	25	0.045	32	0.058	3	0.005	0	0	2	0.004	0	0	0	0	7	0.013	35	0.063	12	0.022	47	0.085	8.845

YOU ARE NOW DONE WITH EVERYTHING YOU NEED TO KNOW ABOUT RUNNING CLINICAL ANALYSES USING CLAN.
YOU CAN STILL ASK OTHER CLINICAL AND/OR RESEARCH QUESTIONS USING THE SAME TRANSCRIPT, SO HERE ARE SOME MORE PROGRAMS TO LOOK AT.
YOU CAN ALSO GO TO THE CLAN MANUAL AND BE AMAZED AT HOW MANY THINGS YOU CAN DO WITH A SINGLE TRANSCRIPT.
HAVE FUN!

Remember, the screencasts provide short demonstrations of most everything that's covered in this manual.

AND IF YOU WANT TO LEARN HOW YOU CAN USE YOUR TRANSCRIPT TO DO PHONOLOGICAL ANALYSIS, GO TO https://www.phon.ca/phontrac

JOINING CHI-BOLTS

We predict you will really like CLAN after the rather steep initial learning curve; if you think you will use it after being MADE to use it in any class assignments, we suggest you do something pretty simple to stay up to date and figure out "glitches" or new ways to use the system. Go back up to the CHILDES Project site; under contacts, there is an option to join membership lists. CHI-Bolts is the non-intrusive but helpful listserv that helps people who get frustrated, who seem to have located problems (bugs), who wish Brian MacWhinney & Leonid Spektor would write a new program or option [sometimes, their wish is fulfilled within hours], or who want to lurk and see how people get creative. You won't get more than one note a week, typically.

If you think you have found a "bug", please do the following: send the list your sample file, the command string you used, and the nasty message CLAN sent you instead of the printout that you hoped for.

CONVERTING SALT FILES

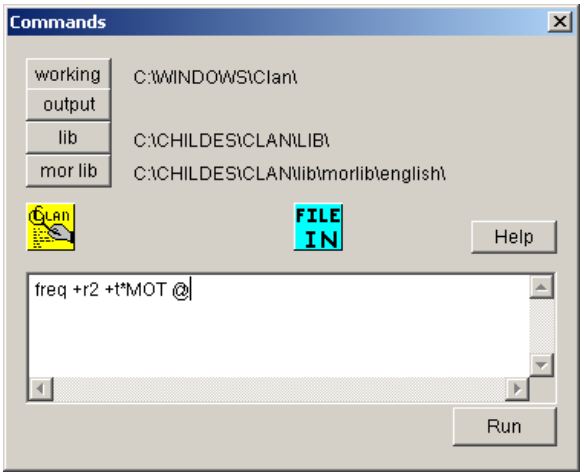
Are you a SALT user? If we have won you over to the extent that you wish you could analyze OLD files using CHAT/CLAN, we can still help you. If you have a SALT file, the SALTIN command will turn the file to CHAT and then, typically with few fixes, you can then start from

the point at which you run MOR, POST, etc. to get EVAL or KIDEVAL output to compare. If you have totally unformatted text, the TEXTIN command takes files, no matter how messy (one sentence on a line, or whole paragraphs), and generates a rough CHAT transcript that you can clean up and work with using the information in this guide.

OTHER COMMANDS AND PROGRAMS PEOPLE USE A LOT:
For all the CLAN commands listed here if you type or select a CLAN utility and press 'run', you will get a printout that specifies the command line and the many options for 'tailoring' that program to your needs. There is also a CLAN "glossary" with some simplified suggestions at the AphasiaBank site on TalkBank.org

FREQ
FREQ is a command that can be run in CLAN once a transcript is completed that lists all of the words used in that transcript and a count of how many times each word is used. BECAUSE IT CAN BE CUSTOMIZED, FREQ IS THE MOST POPULAR AND USEFUL PROGRAM IN CLAN. It's normally used to compute the Type-Token Ratio (TTR), but can be used for much more.

To run FREQ for spell-checking, simply type "freq +r1" into the Commands window followed by a space. To run FREQ for target identification, type "freq +t*MOT" followed by a space into the Commands window, as shown above. "FREQ" is the command. The t*MOT tells the program to only run on lines beginning with *MOT. When the analysis is run with no speaker tier identification, it will automatically run on all main lines.



Once you have typed in your command, click the "file in" button and choose the file(s) on which you wish to run FREQ in the same way you chose files for CHECK. Then click Run on the Commands window or press Enter on your keyboard to run the analysis. An output file will open with a list of all words used in the transcripts.

If you are spell-checking, read through the words and identify any misspellings or miscodings. Common things to look for are: words connected to punctuation marks, which will happen if spaces are not inserted between the end of the utterance and the punctuation or if an error has been made in the coding; typing xx when it should be xxx for unintelligible words or phrases; and misspellings of words such as "spahgetti." (see KWAL below for how to fix this kind of nasty mistake).

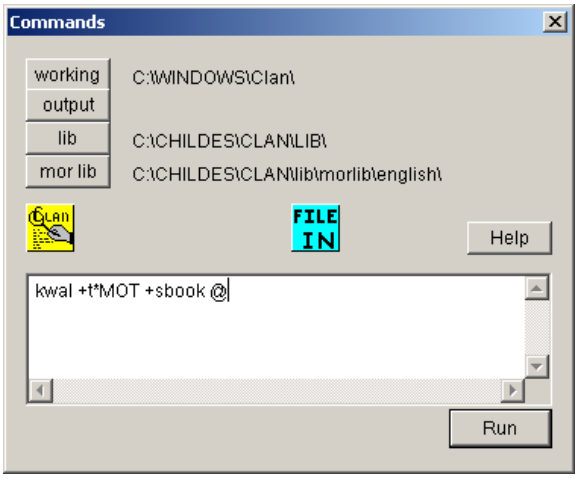
The manual for CLAN shows the many things you can count using FREQ, which are virtually **unlimited** (which is why most researchers spend most of their lives using this single option). A widely used option is to make a text file with a class of words you'd like to track (such as fluency codes, question words, pronouns, etc.) and then FREQ your language sample using that file as input. That can be a way to check which pronouns the child has or doesn't yet have, etc. It works just like freq, except that you use the option +s@<filename> in the command line, where "+s" means 'search for' what is described in the file specified. So, if I made a file with question words, one per line, and saved it as questions.cut in the lib directory (we usually use cut to distinguish these files for actual language samples), we could write:

freq +t*CHI +s@questions.cut <filename>

And the output would list how many times the child used what, who, where, when, why and how. Examples of how to use FREQ to search common kinds of things that clinicians or researchers might want are listed in great detail in the "real" CLAN manual.

There is already a "fluency" folder inside CLAN/LIB that contains a utility file with all the stuttering codes. It is used to calculate fluency rates, and can be used for other analyses as well (if you are a researcher). For instance, you could insert the stutter codes from the main tier on dependent tiers, such as the %mor line. Then you could calculate the rate of stuttering on various parts of speech[3].

KWAL (for KeyWordAndLine)
KWAL is another analysis run by CLAN using the Commands window. This analysis takes a word and finds the lines on which that word occurs in each transcript. This analysis is necessary to find out which lines the targets are on and in what position in the utterance each target is located.
To run KWAL, type "kwal +t*MOT +s" followed by the target of choice and then a space into the commands window. Be sure to type a space before each plus sign and after your target word.

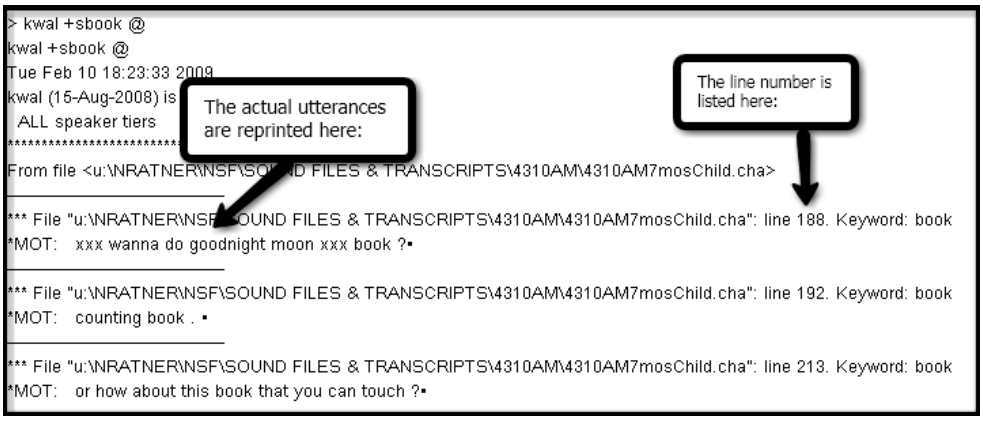


[3] For an example, see Tsai, Peitzu, Brundage, Shelley, Lim, Valerie and Bernstein Ratner, Nan (2010). Linguistic analysis of bilingual stuttering: concepts and methods. In P. Howell & J. Van Borsel (eds.). *Fluency disorders and language diversity*. Taylor & Francis.

(If the target you are looking up contains an apostrophe, enclose the target in quotation marks. For example: kwal +t*MOT +s“he’s”)

Then click on the “file in” button and follow the same instructions for choosing your files as in the FREQ analysis. Click “Run” in the Commands window or press Enter on your keyboard to run the analysis.

The output will show an entry for each instance of that word used in the transcript and it will tell you on what lines the target occurred.



If you triple click on the line that has the triple asterisks, it will take you right back to the line in the transcript. This is great for fixing mistakes if you find them at some point. KWAL the mistake, and the program will provide output that you can click to go right back the error and fix it.

COMBO

COMBO finds combinations of things that you might want to count or track; for example, if you wanted to know how often a child said “Once upon a time”, you would have to use COMBO because this is a multi-word string. Likewise, if you wanted to see how often a child used the aux with a participle in the present progressive on the %mor tier, you would use a combo command, like this:

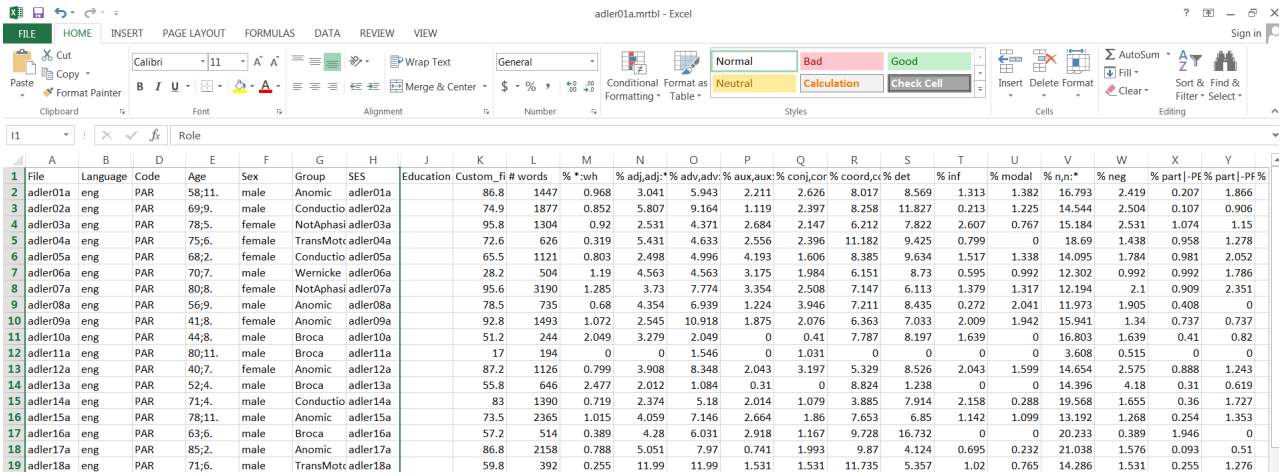
combo +t%mor +s”aux|*^part|*-PROG” *.cha

MORTABLE

Mortable will generate an excel spreadsheet that computes the proportion of particular syntactic elements (not raw counts), in a sample, quite an excellent clinical assessment or tracking ability. The command for mortable is:

mortable +t*CHI +leng <filein>

Like KIDEVAL, this output will be an Excel spread sheet. Here is a sample output, from some aphasia data (it used +u to include all the files in a directory of clients)



adler01a.mrtbl - Excel

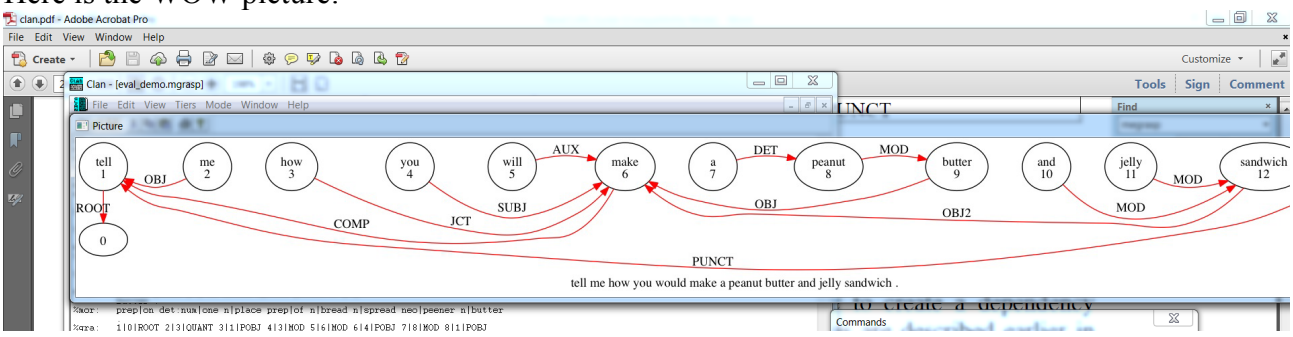
	File	Language	Code	Age	Sex	Group	SES	Education	Custom_fi	# words	% *:wh	% adj,adj:*	% adv,adv:	% aux,aux:	% conj,cor	% coord,cc	% det	% inf	% modal	% n,n:*	% neg	% part|-PE	% part|-PF %
2	adler01a	eng	PAR	58;11.	male	Anomic	adler01a		86.8	1447	0.968	3.041	5.943	2.211	2.626	8.017	8.569	1.313	1.382	16.793	2.419	0.207	1.866
3	adler02a	eng	PAR	69;9.	male	Conductio	adler02a		74.9	1877	0.852	5.807	9.164	1.119	2.397	8.258	11.827	0.213	1.225	14.544	2.504	0.107	0.906
4	adler03a	eng	PAR	78;5.	female	NotAphasi	adler03a		95.8	1304	0.92	2.531	4.371	2.684	2.147	6.212	7.822	2.607	0.767	15.184	2.531	1.074	1.15
5	adler04a	eng	PAR	75;6.	female	TransMotc	adler04a		72.6	626	0.319	5.431	4.633	2.556	2.396	11.182	9.425	0.799	0	18.69	1.438	0.958	1.278
6	adler05a	eng	PAR	68;2.	female	Conductio	adler05a		65.5	1121	0.803	2.498	4.996	4.193	1.606	8.385	9.634	1.517	1.338	14.095	1.784	0.981	2.052
7	adler06a	eng	PAR	70;7.	male	Wernicke	adler06a		28.2	504	1.19	4.563	4.563	3.175	1.984	6.151	8.73	0.595	0.992	12.302	0.992	0.992	1.786
8	adler07a	eng	PAR	80;8.	female	NotAphasi	adler07a		95.6	3190	1.285	3.73	7.774	3.354	2.508	7.147	6.113	1.379	1.317	12.194	2.1	0.909	2.351
9	adler08a	eng	PAR	56;9.	male	Anomic	adler08a		78.5	735	0.68	4.354	6.939	1.224	3.946	7.211	8.435	0.272	2.041	11.973	1.905	0.408	0
10	adler09a	eng	PAR	41;8.	female	Anomic	adler09a		92.8	1493	1.072	2.545	10.918	1.875	2.076	6.363	7.033	2.009	1.942	15.941	1.34	0.737	0.737
11	adler10a	eng	PAR	44;8.	male	Broca	adler10a		51.2	244	2.049	3.279	2.049	0	0.41	7.787	8.197	1.639	0	16.803	1.639	0.41	0.82
12	adler11a	eng	PAR	80;11.	male	Broca	adler11a		17	194	0	0	1.546	0	1.031	0	0	0	0	3.608	0.515	0	0
13	adler12a	eng	PAR	40;7.	female	Anomic	adler12a		87.2	1126	0.799	3.908	8.348	2.043	3.197	5.329	8.526	2.043	1.599	14.654	2.575	0.888	1.243
14	adler13a	eng	PAR	52;4.	male	Broca	adler13a		55.8	646	2.477	2.012	1.084	0.31	0	8.824	1.238	0	0	14.396	4.18	0.31	0.619
15	adler14a	eng	PAR	71;4.	male	Conductio	adler14a		83	1390	0.719	2.374	5.18	2.014	1.079	3.885	7.914	2.158	0.288	19.568	1.655	0.36	1.727
16	adler15a	eng	PAR	78;11.	male	Anomic	adler15a		73.5	2365	1.015	4.059	7.146	2.664	1.86	7.653	6.85	1.142	1.099	13.192	1.268	0.254	1.353
17	adler16a	eng	PAR	63;6.	male	Broca	adler16a		57.2	514	0.389	4.28	6.031	2.918	1.167	9.728	16.732	0	0	20.233	0.389	1.946	0
18	adler17a	eng	PAR	85;2.	male	Anomic	adler17a		86.8	2158	0.788	5.051	7.97	0.741	1.993	9.87	4.124	0.695	0.232	21.038	1.576	0.093	0.51
19	adler18a	eng	PAR	71;6.	male	TransMotc	adler18a		59.8	392	0.255	11.99	11.99	1.531	1.531	11.735	5.357	1.02	0.765	14.286	1.531	0.255	1.276

If you run mortable on two different files, for instance your client's baseline file and then another file some sessions later, it would allow you to compare how much more (hopefully) your client uses a target morpheme under treatment.

MEGRASP

Currently, MEGRASP isn't used by any clinical programs, although it was developed for IPSYN, another powerful child language sampling procedure with norms that KIDEVAL measures. It runs automatically when you run MOR and creates a %gra tier. If you triple click on that tier in your transcript, you will actually see a tree diagram pop up for your utterance. *This might be a fun party trick if a linguistics get-together needs something to liven it up. Or you want to help your kid with burdensome English homework* ☺ We have included it here for its WOW value. Stay tuned for more developments. CLAN develops at the speed of light. And it never costs you anything to upgrade.

Here is the WOW picture:



More information for people who want to know more/too much:

OPTIONAL TRANSCRIPTION OPTIONS

Manually adjusting bullet length:

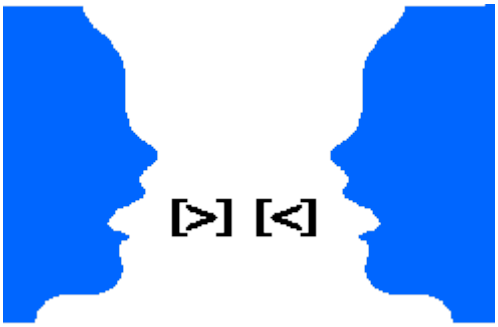
First, go to Mode menu and choose expand bullets. The control (start bullet) and alt keys (end bullet) can adjust bullet lengths up and down slightly to get full utterances on a bullet. For Mac users, it's the control and command keys. Push alt or ctrl key and right or left arrow to go up or down by 25msec intervals. This is an option as opposed to re-bulleting a finished transcript to get the bullets to align more perfectly. You can also manually change the numbers in the bullets

but you have to be very careful with that. If you accidentally delete a bullet (the dot) from either end of the open bullet, just copy and paste any other dot back in. (Again, try to suppress spending a lot of time to make them perfectly align because the bullets for most clinical work (and even research) is more to help speed transcription; it does not enter into most analyses.

Quick insert of speaker tiers:
When you are on an empty bulleted tier, go to "tiers", use the pull down menu to click on the speaker you want to insert and either click on it or use the hot key option that is listed next to that speaker.

"Lazy GEMS":
Use this command to mark different activities in one interaction. Suppose you have different activities in one session, and you don't want KIDEVAL or another program to include some of them. You can use lazy gems to mark the beginnings of different activities, e.g. @G: talking, @G: reading (which you don't want, because it is not spontaneous language), and run your programs using the option to do only "talking" gem sections.

We think this is more than enough to get you started using CHAT media-linked transcription and CLAN. We hope you like it, will use it, and will provide us with feedback. We are also here to help. Enjoy![4]



[4] With thanks to the US NIH, for its support of CHILDES, Aphasia Bank and Phon and NSF for its support of TalkBank.

APPENDIX 1

Reference values for children's MLU

MLUw and MLUm (From Rice et al., 2010)

Table 4. Means and standard deviations for mean length of utterance in words (MLU_w) and morphemes (MLU_m) per group.

		MLU_w			MLU_m		
Age range	*n*	*M*	*SD*	Cohen's *d* effect size	*M*	*SD*	Cohen's *d* effect size
				Affected			
2;6–2;11	6	2.37	0.32	0.93	2.59	0.39	0.90
3;0–3;5	15	2.84	0.38	0.97	3.07	0.48	1.07
3;6–3;11	24	3.10	0.75	1.04	3.36	0.80	1.09
4;0–4;5	54	3.31	0.70	1.22	3.64	0.80	1.22
4;6–4;11	72	3.60	0.62	0.95	3.95	0.70	1.01
5;0–5;5	84	3.72	0.61	1.05	4.09	0.70	1.10
5;6–5;11	97	3.95	0.60	0.85	4.34	0.67	0.89
6;0–6;5	108	3.98	0.70	0.90	4.38	0.75	0.92
6;6–6;11	94	4.18	0.71	0.79	4.63	0.79	0.84
7;0–7;5	103	4.15	0.62	0.69	4.56	0.69	0.72
7;6–7;11	100	4.33	0.88	0.57	4.77	0.96	0.60
8;0–8;5	94	4.36	0.75	0.86	4.80	0.83	0.89
8;6–8;11	61	4.49	0.86	0.72	4.97	0.93	0.68
				Unaffected			
2;6–2;11	17	2.91	0.58		3.23	0.71	
3;0–3;5	29	3.43	0.61		3.81	0.69	
3;6–3;11	38	3.71	0.58		4.09	0.67	
4;0–4;5	49	4.10	0.65		4.57	0.76	
4;6–4;11	74	4.28	0.72		4.75	0.79	
5;0–5;5	78	4.38	0.63		4.88	0.72	
5;6–5;11	77	4.47	0.61		4.96	0.70	
6;0–6;5	70	4.57	0.66		5.07	0.75	
6;6–6;11	63	4.70	0.66		5.22	0.71	
7;0–7;5	51	4.72	0.83		5.22	0.91	
7;6–7;11	47	4.92	1.03		5.45	1.13	
8;0–8;5	41	5.08	0.84		5.67	0.97	
8;6 – 8;11	18	4.99	0.71		5.51	0.79	

Type-Token Norms

Total Number Of Words And Different Words In T-Unit Sample Based On 50 Utterances					
Age	Words	Conversation		Narrative	
		Mean	SD	Mean	SD
3	Total	160.53	33.91	194.26	49.97
	Different	76.35	16.86	83.41	17.84
4	Total	195.78	60.68	257.19	48.17
	Different	92.07	24.41	108.26	17.75
5	Total	254.48	45.79	277.82	54.75
	Different	114.91	18.97	110.12	15.47
6	Total	251.83	59.93	325.31	80.25
	Different	112.95	20.53	121.44	21.11
7	Total	287.05	62.04	379.46	78.64
	Different	124.89	17.94	132.97	20.53
9	Total	311.70	66.61	419.41	73.43
	Different	133.48	21.48	133.26	25.11
11	Total	342.41	99.39	465.44	84.24
	Different	141.70	29.12	168.70	24.69
13	Total	330.15	78.92	447.96	72.02
	Different	139.00	24.92	159.11	21.17

Miller, J., Long, S., McKinley, N., Thormann, S., Jones, M.A., and Nockerts, A. (2005). *Language sample analysis II: The Wisconsin guide (pp. 21-22). Madison, WI: Wisconsin Department of Public Instruction.*

Appendix 2: norms for TTR

Appendix 3: Reference values for NDW

TABLE 4. NDW in 100- and 200-token samples.

	Group			*F*
	SLI	**LE**	**AE**	**(2,72)**
NDW 100-tokens	53_a (6)	53_a (8)	60_b (8)	6.74*
NDW 200-tokens	82_a (9)	84_a (11)	93_b (8)	10.24*

Note. Group means are reported, with standard deviations in ( ). Means with different subscripts differ significantly using Tukey HSD contrast.
*$p < .05$

Comparison values for NDW (100 word sample); note: LE = language-age peers for SLI sample; AE is age-matched peers.

Age in months (sd): SLI 59.12 (4.96) LE 38.84 (3.01) AE 59.08 (5.04)

(from Watkins, R. V., Kelly, D. J., Harbers, H. M., & Hollis, W. (1995). Measuring Children's Lexical Diversity: Differentiating Typical and Impaired Language Learners. *Journal of Speech, Language, and Hearing Research*, *38*(6), 1349-1355.)

Appendix 4: Reference values for DSS

From Lee, L. L. (1974). *Developmental sentence analysis: A grammatical assessment procedure for speech and language clinicians*. Northwestern University Press. Page 230.

TABLE 7. DSS MEANS AND STANDARD DEVIATIONS OF 200 SUBJECTS BY ONE-YEAR AGE GROUPS

Age Group	N	Mean DSS	Standard Deviation
2–0 to 2–11	40	3.73	1.28
3–0 to 3–11	40	6.64	1.00
4–0 to 4–11	40	8.04	1.64
5–0 to 5–11	40	9.19	1.90
6–0 to 6–11	40	10.94	2.26

Table 8 shows the ranges and percentiles of the average DSS sentence score for the two hundred children by one-year age groups. The 10th-, 25th-, 50th-, 75th- and 90th-percentile values for the over-all DSS within each age group were computed (Friedman 1971). Comparison of children's clinical DSS measures with percentile rankings for children of the same chronological or mental age is discussed in Chapter IV.

TABLE 8. RANGE AND PERCENTILES OF DSS SCORES FOR 200 SUBJECTS BY ONE-YEAR AGE GROUPS

Age Group	N	Range	Percentiles				
			10th	25th	50th	75th	90th
2–0 to 2–11	40	1.50–6.70	2.30	2.98	3.73	4.48	5.16
3–0 to 3–11	40	4.60–8.60	5.38	5.98	6.64	7.30	7.89
4–0 to 4–11	40	4.86–12.94	6.01	6.97	8.04	9.10	10.06
5–0 to 5–11	40	6.04–13.40	6.72	7.89	9.19	10.49	11.66
6–0 to 6–11	40	6.64–15.84	8.11	9.43	10.94	12.43	13.78

Appendix 5: Interpretation of IPSYN

The following table is from Oetting, J. B., Newkirk, B. L., Hartfield, L. R., Wynn, C. G., Pruitt, S. L., & Garrity, A. W. (2010). Index of Productive Syntax for Children who speak African American English. *Language, Speech, and Hearing Services in Schools*, *41*(3), 328-339, p 336.

Table 5. Across-study comparison of IPSyn totals by sample size and child age.

Sample size and study	*2½ years*		*3½ years*		*4 years*		*6 years*	
	M	SD	M	SD	M	SD	M	SD
75 utterances								
African American English, Horton-Ikard et al. (2005)	52.27	5.16	70.19	8.52	—	—	—	—
Mainstream English, Scarborough (1990)[a]	52.73	10.13	72.20	7.23	80.53	5.48	—	—
100 utterances								
African American English, Current study	—	—	—	—	83.75	5.39	81.91	9.04
Mainstream English, Scarborough (1990)[a]	58.80	10.67	79.53	6.37	85.80	4.21	—	—
100+ utterances								
African American English, Current study	—	—	—	—	91.10	5.24	87.69	10.96
Southern White English, Oetting et al. (1999)	—	—	—	—	84.00	5.67	89.63	5.23
African American English, Oetting (2005)	—	—	—	—	85.92	9.49	91.75	11.69

[a]This study reflects a longitudinal design; others listed are cross-sectional.

a) Reference values for Kindergarteners with and without Specific Language Impairment. Hewitt, L., Hammer, C., Yont, K. & Tomblin, J.B. (2005) Language sampling for children with and without SLI… *Journal of Communication Disorders*, 38, 197-213.

Table 1
Syntactic and semantic language measures for kindergarten children with and without SLI

	SLI			ND		
	Mean	S.D.	Range	Mean	S.D.	Range
Total number of utterances	98	30.3	52–152	105	33.9	63–182
IPSyn nouns Score	20.11	1.18	17–22	20.51	0.89	18–22
IPSyn verbs Score	27.33	3.86	19–33	29.00	2.56	23–33
IPSyn sentences score	26.77	3.93	19–34	29.40	3.55	21–37
IPSyn total score	74.48	7.64	62–88	79.14	5.08	69–87
MLU-m	5.82	1.32	4.24–8.96	6.86	0.74	5.26–8.13
NDW-50	122.7	20.1	78–162	137.8	15.2	97–164

Note: IPSyn: index of productive syntax (Scarborough, 1990); MLU-m: mean length of utterance in morphemes; NDW-50: number of different word roots in 50 utterances.

Appendix 6: Interpretation of VocD

From Duran, P., Malvern, D., Richards, B., & Chipere, N. (2004). Developmental Trends in Lexical Diversity. *Applied Linguistics*, *25*(2), 220-242.

Table 2: Descriptive statistics for D *(stem forms) at each age*

Age (months)	*N*	Mean	Std. Dev.	Median	Min.	Max.
18	18	14.80	10.31	13.60	1.48	36.99
21	20	21.49	16.70	19.09	2.60	67.24
24	28	27.44	20.52	25.41	2.50	84.64
27	29	34.77	17.70	31.16	7.48	65.76
30	29	41.53	16.93	45.59	4.05	69.67
33	29	43.67	15.45	45.47	10.38	73.88
36	29	47.83	13.97	47.14	13.26	69.95
39	30	49.48	15.41	49.08	11.22	80.78
42	29	53.12	13.55	53.80	10.57	73.54
60	15	64.02	8.46	63.48	50.83	83.30

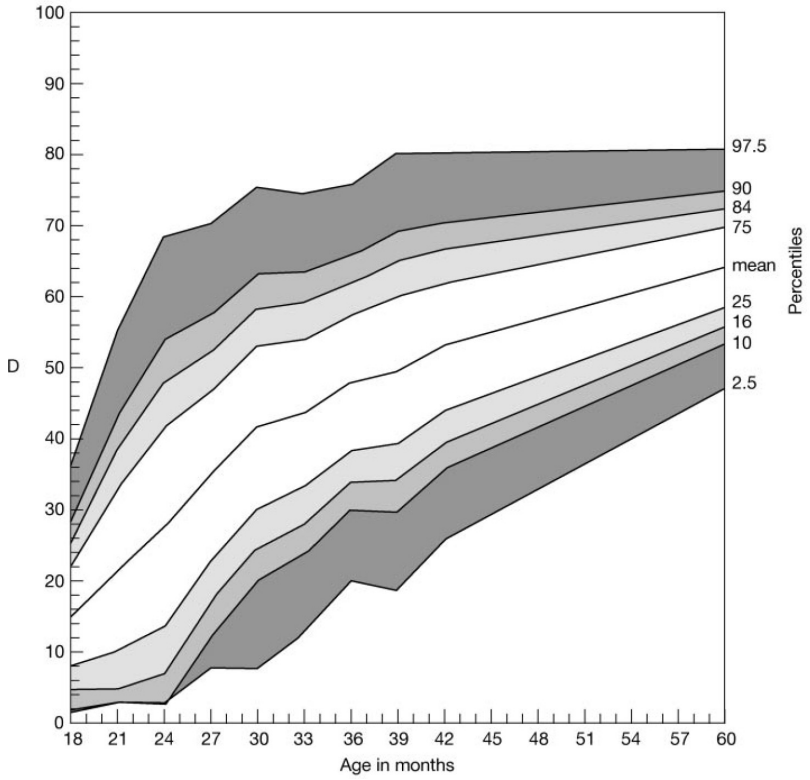


Figure 2: Values of D *against age for selected percentiles derived from the Bristol cohort*

APPENDIX 7: Coding Stuttering and Other Fluency Behaviors

A new set of codes has recently been developed for stuttering behaviors and will be included in all new issues of CLAN. The two new symbols are in Unicode and have shortcut combinations that work when you are transcribing in CLAN[5]. The complete list of stuttering/disfluency codes are:

Stuttering behavior	**Code**	**Example**	**Notes**
Prolongation	:	s:paghetti	Place after prolonged segment
Broken word	^	spa^ghetti	New code
Block	Unicode2260 ("not equal to" sign); *shortcut:* hold F2 and =	≠butter	This example illustrates a block before word onset
Repeated segments	21AB (curly left arrow); *shortcut:* hold F2 and /	↫r-r-r↫rabbit OR like↫ike↫	The curly left arrow brackets the repetition but leaves a recognizable target for mor; iterations inside of the sequence are marked with hyphens
phonological fragment	&+	&+sn dog	Changes from "snake" to "dog"
other non-word strings	&	&gara	Word play etc.
Typical Disfluencies			
Whole word repetition	follow word with [/]	butter [/] butter	Repeated word counts once
Multiple whole word repetition	indicate number of repetitions in brackets	butter [x 7] x space N	Indicates that the word 'butter' was repeated seven times
Phrase repetitions	<> [/]	<that is a> [/] that is a dog.	Repeated phrase counts once
Phrase revisions	<> [//]	<what did you> [//] how can you see it ?	Revised phrase counts once
pause	(.) or (..) or (…)	(.)	Counts the number of short, medium, long pauses
pause duration	(2.4)	(2.4)	Adds up the time values, if marked
Filled pauses	&-	&-um &-you_know	Note: multiword fillers should be connected with an underscore to avoid wrong word count

[5] **In CLAN**, to see short cuts for any phonetic, prosodic or fluency codes (in case you lose this ☺), go to WINDOW → Special Characters, and a drop down menu will appear that you can scroll through to find the short cut. Please note that these key stroke combinations work inside CLAN and are **not** the key combos for typing in Word or other programs.

Tallying stuttering behaviors
Using the above codes insures that when you transcribe, and analyze your transcript, neither FREQ nor MOR (the syntactic program) will include filled pauses as words (stuttered words will be counted as intended words, which is correct).

SEE PAGE 29 for the current command to tally disfluencies.

To get %stuttered words, FREQ your file, and then the **output of the fluency tally** can be put over the **token total** to give you %blocks, %prolongations, etc.

To tally fluency behaviors, CLAN uses a file that looks like this [fluency-sep.cut], in the LIB folder, inside its Fluency folder, with these symbols, one per line[6]:
&-*
↫
≠
^
·
[/*] or </*> depending on whether you are counting occurrences of repetitions or words themselves.
[x *]

The only reason why we are reprinting it here is that some people want to either track or NOT track certain behaviors. You can add a behavior, such as hesitations, or fillers, by simply adding lines to this file and saving it. You can also remove a behavior if you don't think it is relevant to your fluency work.

NOTE: Remember that you can insert the symbol codes from the Windows (in the CLAN menu bar) drop down option list using "special characters"; if you are typing or inserting and the block or repetition code enters as something other than what you want (for example, a box, rather than the curly arrow), you need to set your default CLAN font so it accesses Unicode. Go to View, and set font, and click a specific font. The best option is Arial Unicode or CA font, but if you don't see those, any font followed by Unicode (Lucida) will do.

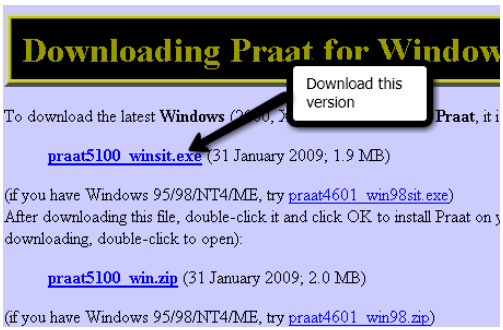
[6] The asterisk is very powerful, and is a wild card that allows the program to find the code regardless of what letter combination it is next to. CLAN uses a lot of asterisks, as do many computer programs, and search routines, such as those in PubMed, EBSCO, etc. Try it if you haven't ever done this.

ACOUSTIC ANALYSIS

One of the more amazing talents that CLAN has is the ability to go straight from a linked transcript (audio or video) to acoustical analysis that many clinicians would probably gladly do if it were easy enough (to look at properties of sound segments, intonation contour of utterances, rate calculations, etc. It is a completely seamless interface. This next section shows how to do this.

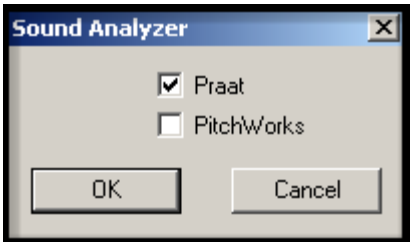
PRAAT

In order to run the acoustic analysis, you will need to download PRAAT. This can be done at http://www.fon.hum.uva.nl/praat/ . Click "Windows" (or MAC) in the upper right hand corner and then click on the first download option on the next page. Instructions for how to install are listed on that page. There is also a PRAAT tutorial for CLAN in the tutorial series at the CHILDES web site (file 13; PRAAT pdf); you should probably read that as well.

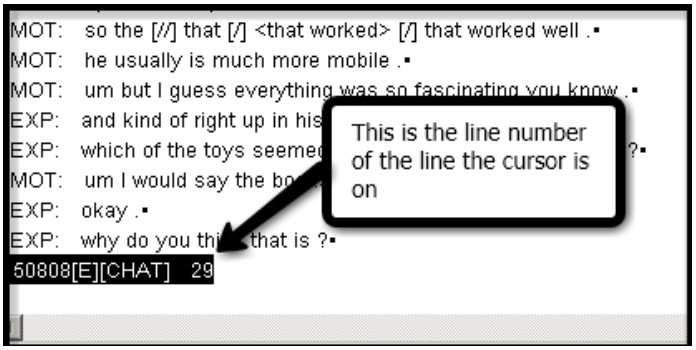


From CLAN to PRAAT

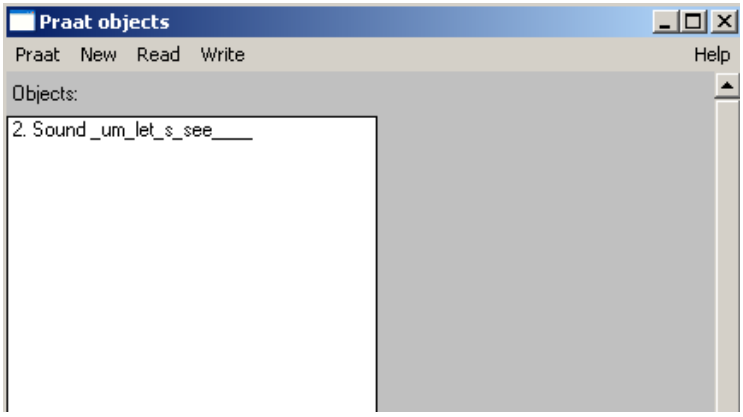
The bullets in CLAN can be sent directly over to PRAAT, but you'll have to set it up to do this. First, open both programs. PRAAT MUST be open first in order to use it with CLAN. When you open PRAAT, you can close the window labeled PRAAT Picture and leave open the window labeled PRAAT Objects. In CLAN, you can close the Commands window. Then, in CLAN, go to Edit → Select Sound Analyzer. In the new window, click the box next to PRAAT and make sure the other box is unchecked. Once you have set this, the setting will remain this unless you change it. You don't need to do this step every time.



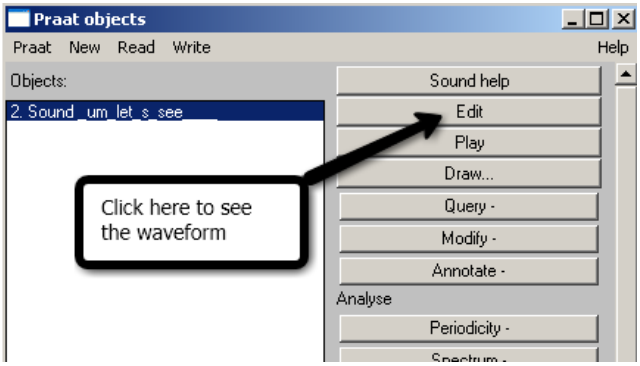
Next, open the transcript you are working on. Using the spreadsheet, look up each matched target. The spreadsheet will tell you in which transcript and on what line the target is located. The line numbers in CLAN show up at the bottom of the screen.



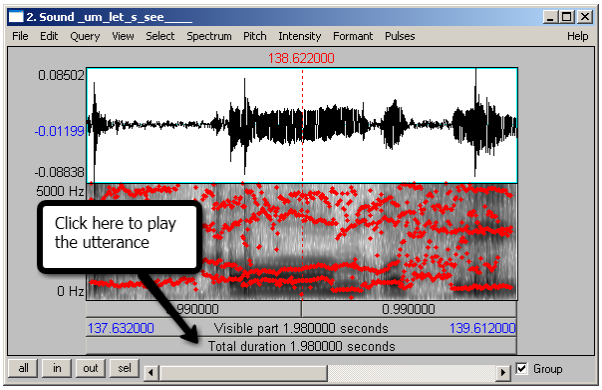
Locate the line containing the target and click your cursor on that line. Then, go to Mode → Send to Sound Analyzer. For this to work, PRAAT must already be open. Once you do this, the text from that line in the transcript will show up in the PRAAT Objects window.



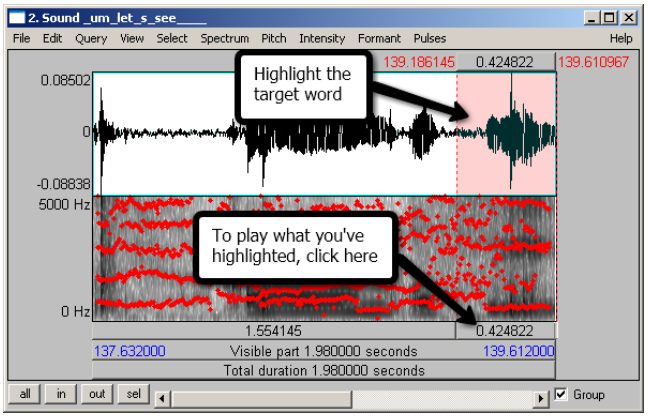
Click on the object you are analyzing and then options will show up on the right side of the window. Click Edit to see the waveform and spectrogram.



Another window will open and in that window you will see two version of the same thing. The top one is the waveform and the bottom one is the spectrogram. If you click on the bar on the bottom, the whole utterance should play.

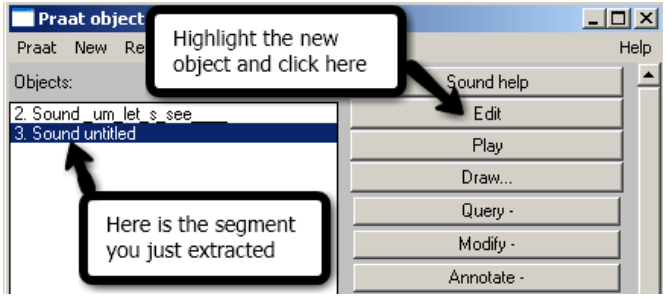


After listening to the utterance, find the section of the waveform that contains the target word and highlight it by clicking at the beginning of the word and dragging your mouse over to the end of the word. Play what you have selected by pressing on the top bar. Adjust your highlighted portion until you are satisfied that you have the whole word and nothing else. This will take some practice.

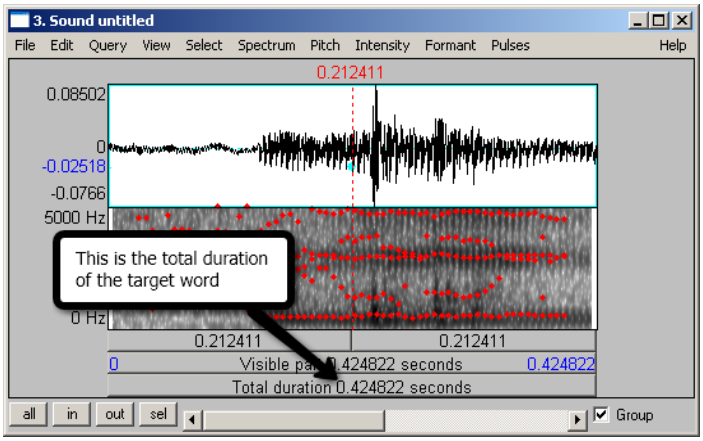


Word (or utterance) duration

Once you have isolated the target word, go to File → Extract Selected Sound (Time from 0) and close the window. This will create a new object in the Objects window. To look at a close-up version of the target word, click on the new object and click Edit.



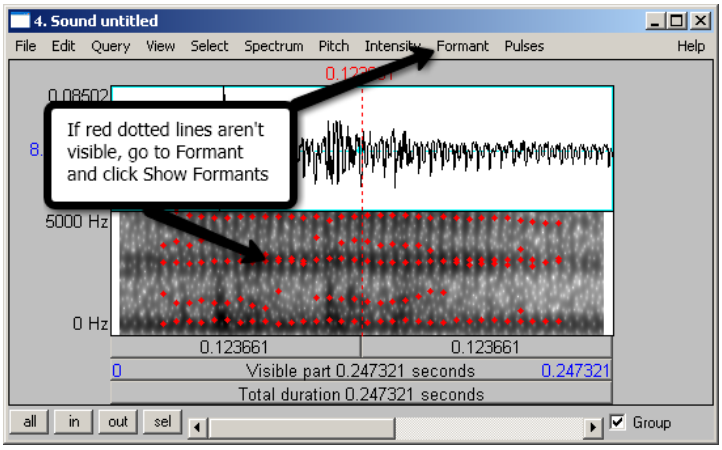
When the new waveform window opens, record the total duration of the word in seconds. You can find this value at the bottom of the window where it says Total Duration.



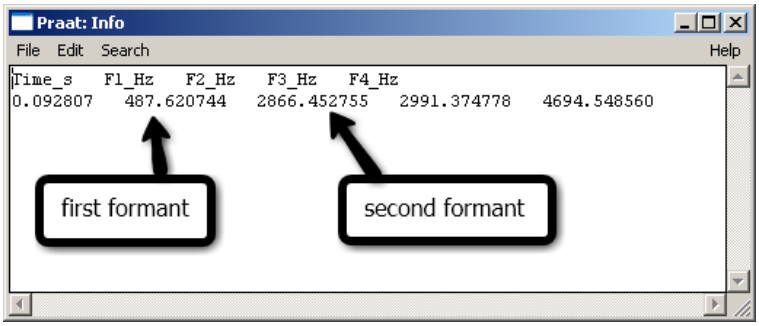
To do a much more precise measurement of speaking rate than you can with a stopwatch (☹), you can mark the beginning and end of an utterance, get its timing across the bottom window, count the number of words/syllables in the utterance (you already have them written out!), and there you go!

Formants

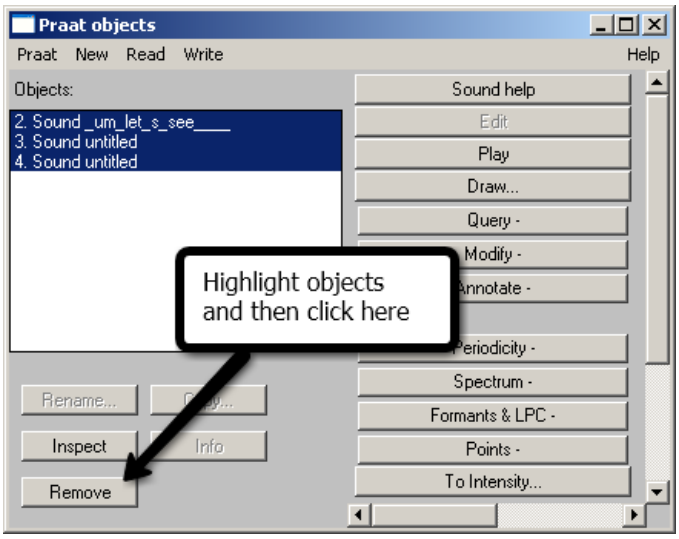
To find the first and second formants, look for red dotted lines in the spectrogram of the isolated vowel. If they are not there, go to Formant → Show Formants. This will make the dotted lines show up. Then, find a place where the formants look as stable as possible. This means they should make a straight line across a section of the vowel. Click in the middle of the most stable part.



Then go to Formant → Formant Listing. A new window will open. In this window, the formants are listed. Record the first and second formants in the appropriate columns in the spreadsheet.



Once the spreadsheet is filled in for that target, you can move on to the next one. In order to keep things uncluttered to avoid any confusion, you should remove the objects you are finished with from the Objects window before starting to work on a new utterance. To do this, highlight the unwanted objects and then click Remove at the bottom of the window.



Other typical PRAAT options are to show Intonation Contour, Intensity, etc. There are a number of PRAAT tutorials on the web for you to explore. It is possible to write scripts for some acoustic analyses that will automate the process. This is an advanced topic, but might be worth learning if you have lots of files that you wish to evaluate.