Collaborative Commentary: A New and Innovative Tool for Language Commentary and Analysis

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Abstract

The goal of this article is to introduce the Collaborative Commentary (CC) tool and explain how it can be used in conjunction with the many TalkBank shared databases to enhance research and teaching in many areas of language study. The CC tool and its features are described in a detailed example of an assignment for an introductory course on language development. Students are able to join a CC group set up by their instructor, open specific transcripts in the CHILDES database, watch an interaction on video, follow the interaction in the transcript, and insert comments or codes directly into the transcript which are only available to members of that CC group. Additional examples of teaching, research, and clinical applications are given for using CC with other TalkBank shared databases such as AphasiaBank, TBIBank, DementiaBank, FluencyBank, and ClassBank. CC is an innovative tool that opens the rich resources of the TalkBank shared databases for a variety of purposes. Instructors can use CC to give students the opportunity to apply what they are learning by identifying behaviors such as those associated with typical dysfluencies versus stuttering or typical language development versus late talking that they are learning about in academic classes. Clinical instructors can have students practice scoring various tests or describe the techniques used in a particular treatment program. Researchers can use CC to debate theories on language, refine definitions of commonly used terms, establish coding reliability, and code behaviors of interests such as gestures, errors, coherence, macrostructure, and pragmatics. The CC tool can open up many exciting new ways to investigate language in many disciplines.

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[1]Introduction

It feels like a metalinguistic exercise to use language to honor Brian MacWhinney's impact on the study of language. Yet, words – even superlatives – feel inadequate to describe the breadth and depth of his unique and groundbreaking influence. His work has always been on the cutting edge of linguistic theory, science, and technology. Undoubtedly, one of his most important and impactful achievements is the TalkBank project (https://talkbank.org/), a set of shared databases of spoken language which is free and openly available to students, educators, researchers, and clinicians from all disciplines around the world. It has continued to grow and expand since its beginnings in 2002, and thousands of published articles have made use of the TalkBank shared databases and language analysis tools for a wide range of research purposes. This article will highlight a new and valuable language analysis tool recently added to the TalkBank system called Collaborative Commentary (MacWhinney & Fromm, 2023). This tool makes use of the rich resources from the TalkBank databases for purposes of shared commentary to address important research and teaching objectives.

Brian originally conceived of having a research community involved in some kind of interpretive annotation of electrical records over 20 years ago (MacWhinney, 2007). In fact, he and a group of colleagues attempted an early version of this with a large database of materials on classroom discourse (Sfard & McClain 2002). It involved a CD-ROM that accompanied articles in a special journal issue and pdf files with links to replay relevant video clips for each of the articles. With support from an NSF grant and many important advances in technical infrastructure this can now be a much more accessible, live, streaming, and interactive activity.

After a brief summary of the TalkBank shared databases, this article provides a detailed "how-to" description of Collaborative Commentary (CC) using a classroom teaching example, followed by more examples of research and teaching applications that TalkBank members have begun to use. Given the very recent development of this tool, no published literature on its use is available yet, though one article has been submitted for publication. Because of our areas of expertise, the examples provided here may be a bit outside the typical language areas covered by this journal. However, we believe it will be easy for readers to swap out the content to make the approach relevant to their work in second language or foreign language teaching and related areas.

The TalkBank System

By way of a brief summary, the TalkBank system provides online multimedia data for 14 types of spoken language data. Most of the data is in English, but all databases include corpora in a variety of languages (e.g., Cantonese, Danish, Dutch, English, French, German, Hebrew, Italian, Japanese, Mandarin, and Spanish). The databases range from conversation banks (CABank, SamtaleBank, ClassBank) to child language banks (CHILDES, PhonBank, HomeBank), multilingualism banks (Second Language Tutors, BilingBank, SLABank) and clinical banks (AphasiaBank, ASDBank, DementiaBank, FluencyBank, PsychosisBank, RHDBank, TBIBank). The media files in these databases have been transcribed in CHAT format using the CLAN program (https://dali.talkbank.org/clan/), which allows for the

transcripts to be automatically analyzed for parts of speech and grammatical relations. These CHAT transcripts are also temporally aligned to the media file at both the utterance and the word level. All of this information can be seen in the example below, which is one utterance from the transcript of a 58-year-old control participant from the Pitt corpus in DementiaBank (Becker et al., 1994) describing the Cookie Theft picture from the Boston Diagnostic Aphasia Exam (Goodglass et al., 2001).

- The *PAR tier indicates exactly what was said. The numbers at the end, surrounded by circles (bullets), show the time stamp in milliseconds corresponding to the media file. The *PAR tier has traditionally been entered by human transcribers but can now be generated automatically using a batchalign pipeline developed by Liu et al. (2023). The resulting ASR-generated CHAT transcript requires human review but can be completed with high accuracy and much less time and effort than creating the transcript from scratch.
- The %wor tier shows the time stamp for each word in the utterance. This is generated automatically by a batchalign program (Liu et al., 2023).
- The %mor tier shows the parts of speech and morphological parsing for each word in the utterance. This is generated automatically by the MOR command in the CLAN program (MacWhinney & Fromm, 2022).
- The %gra tier shows the pairwise grammatical relations between words and is also generated automatically by the MOR command.

CHAT Transcript Example
    *PAR: the mother seems to have nothing in the house to eat except cookies in the cookie jar . •40360_44310•
    %wor: the •40360_40760• mother •40760_40960• seems •40960_41280• to •41280_41350• have •41350_41470• nothing •41470_41710• in •41750_41810• the •41810_42000• house •42000_42150• to •42150_42250• eat •42250_42520• except •42520_42760• cookies •42860_43260• in •43260_43320• the •43320_43540• cookie •43540_43810• jar •43810_44310• .
    %mor: det:art|the n|mother cop|seem-3S inf|to v|have pro:indef|nothing prep|in det:art|the n|house inf|to v|eat prep|except n|cookie-PL prep|in det:art|the n|cookie n|jar .
    %gra: 1|2|DET 2|3|SUBJ 3|0|ROOT 4|5|INF 5|3|COMP 6|5|OBJ 7|6|NJCT 8|9|DET 9|7|POBJ 10|11|INF 11|6|XJCT 12|11|JCT 13|12|POBJ 14|13|NJCT 15|17|DET 16|17|MOD 17|14|POBJ 18|3|PUNCT

In the CHAT transcript example, the participant produced the utterance in a fluent, grammatically intact, error-free manner. Of course, that is not always the case, especially with young children and speakers who have a variety of communication impairments. The CHAT transcription system includes consistent ways to mark such things as revisions, repetitions, fillers, sound fragments, dysfluencies, non-verbal behaviors (e.g., laughing, sighing, gesturing), unintelligible segments, target replacement words for errors, and error coding. The use of these consistent markings allows for automatic tabulations and searches of these features. Some of these markings will be seen in the examples described in the upcoming

section. All are described in the CHAT manual (https://talkbank.org/manuals/CHAT.pdf) and the SLP manual (https://talkbank.org/manuals/Clin-CLAN.pdf).

The information from all of these tiers (*PAR, %wor, %mor, %gra) is used for many of the automatic discourse analyses that can be done with CLAN. While those analyses are not the focus of this article, interested readers can learn more about TalkBank tools for language sample analysis from other articles (e.g., Fromm et al., 2020; Gabarino et al., 2020; MacWhinney et al., 2020; MacWhinney & Fromm, 2022; Ratner & MacWhinney, 2020). In addition, the main TalkBank webpage includes manuals and tutorial screencasts that explain and demonstrate many of these functions. The remainder of this article focuses on how these CHAT transcripts can be accessed and used by individual groups (e.g., classes, research personnel, clinical trainees) for a variety of educational and research purposes using a new and innovative tool.

Collaborative Commentary (CC)

Collaborative Commentary is a tool that allows groups to collaboratively code and comment on transcripts in the TalkBank databases. This tool facilitates a new and highly transparent, interactive way of understanding communication and finding evidence to support or refute theories about communication. Using CC, researchers, clinicians, and students can access video and audio recordings of spoken language interactions in the TalkBank Browsable Database (https://sla.talkbank.org/TBB), watch the video (or listen to the audio), follow along with the linked transcript, and enter codes or comments that directly attach to the utterances in the transcript. These codes or comments are then visible to everyone in the commentary group, which may be a class, a research group, or clinical trainees.

Eight short tutorial screencasts (https://talkbank.org/screencasts/) demonstrate the steps involved in using CC, such as registering as a new user, joining a CC group, inserting tags and comments, searching, creating tag sets, and managing group permissions. Also, the CC manual (https://sla.talkbank.org/CCmanual/) has simple, straightforward instructions with screenshots.

To start up Collaborative Commentary, you can click on "The CC Project" link at the main TalkBank webpage or click on any of the "Browsable Database" links from the home page of any of the 14 language banks. In the TalkBank Browser, you then click on the blue "Collab" button in the top right corner (Figure 1a), which brings up a login screen for already registered or new users (Figure 1b). Next, a detailed example is provided for using CC as a teaching tool. The example is presented in a step-by-step fashion with screenshots to illustrate the process for both instructors and students. Following that, more examples of the tool's application for teaching and other purposes are described, but in less detail.

Figure 1a

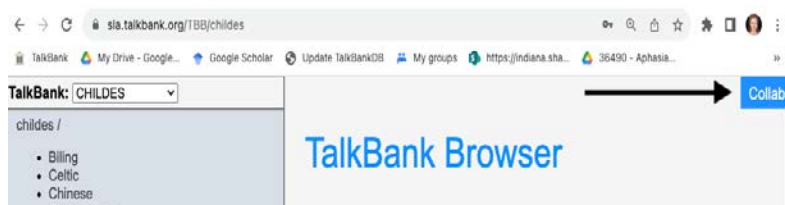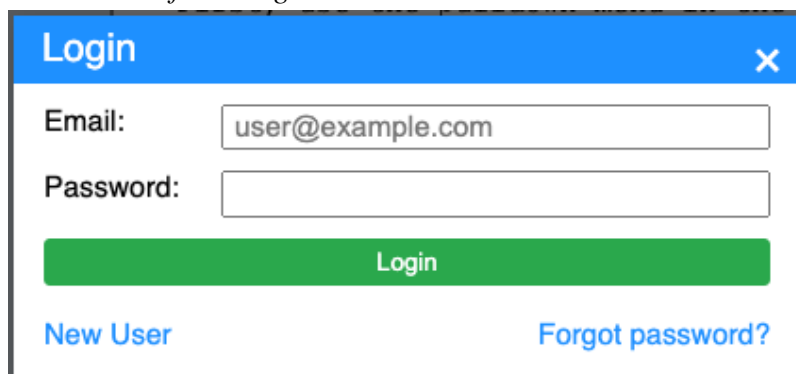*Screenshot of "Collab" Button in TalkBank Browser*

Figure 1b

Screenshot of CC Login Screen

Teaching Example

If an instructor wants her students to find speech and language behaviors in 2-year-old speakers that indicate typical development versus late talking, she could create a group within CC and give it a name (e.g., C-2). Then she would tell her students to register as CC users and request to join the C-2 group. She would need to give her students her email address (the one associated with her CC registration) so they could look up her groups and request to join the relevant one.

The instructor could set up the task in two ways. She could either create a set of codes within the C-2 group for the students to use to identify specific features in the child's utterances in the transcript (Figure 2), or she could have the students enter open comments into the transcript identifying features of typical language development or late talking. As part of the assignment, she should make a list of specific files from the CHILDES database to use. By going to the CHILDES webpage (https://childes.talkbank.org/) and clicking on *Index to Corpora*, and then *Clinical-Eng* (if the instructor is interested in English speaking children with and without language disorders), the instructor could see all the possible corpora along with information on ages and media. Figure 3 shows the first third of the list of possible corpora from that page. The Ellis-Weismer corpus would provide good material for this assignment: the ages are right, there are typically developing children and late talking children, and there are audio files. Clicking on the *Ellis-Weismer* link brings up the corpus page which has a description of the corpus as well as a link to the *Browsable Database* where the files can be accessed. Clicking on that link brings up the Browsable database (Figure 4), where you see the groups of LT (late talkers) and TD (typically developing talkers) listed on the upper left. If you click on *TD*, you see another list of the participants grouped by age (in months) and examiner-child (ec) or parent-child (pc) interactions (Figure 5). Clicking on *TD* brings up the full list of participants (Figure 6). Clicking on any of those filenames brings up that child's transcript,

which can then be heard and read in the transcript by pressing the arrow to the right of the speaker line.

Figure 2

Screenshot of Example 1 Assignment Codes

Figure 3

Screenshot of Clinical-Eng Corpora in CHILDES Database

Figure 4

Screenshot of Ellis-Weismer Corpus at Browsable Database
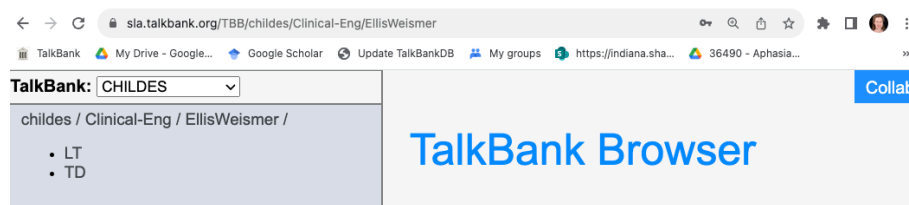
Figure 5

Screenshot of Expanded TD Files
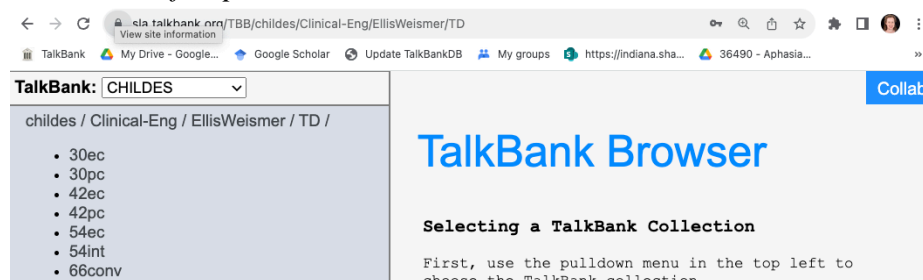
Figure 6

Screenshot of Files in the TD 30ec Folder
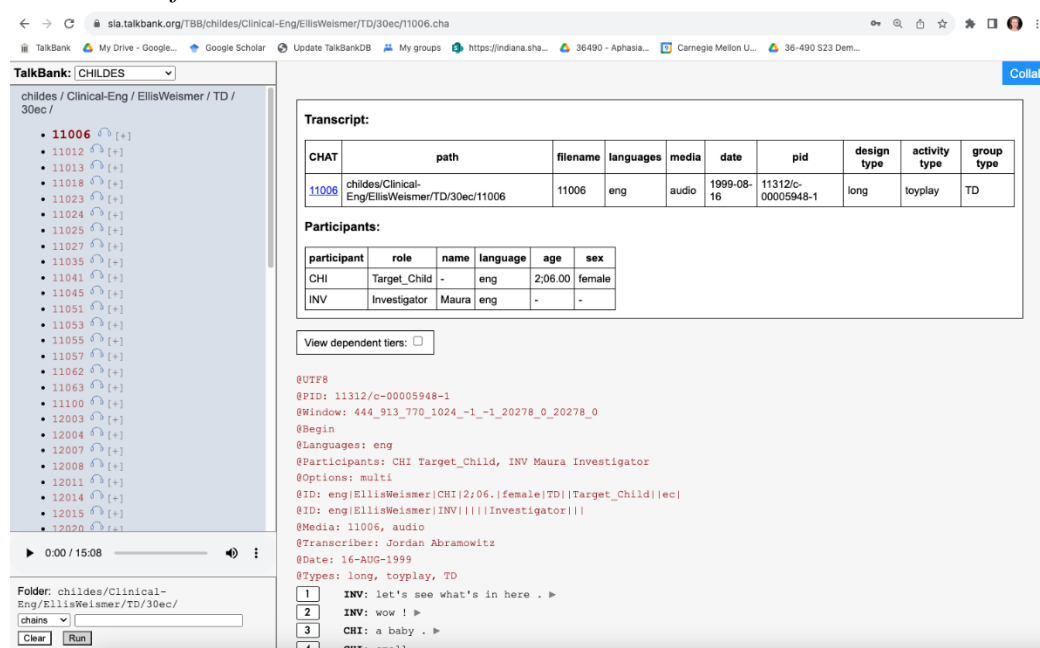
Finally, the instructor needs to decide what type of permission to give to the group members: "Read only", "Write only", or "Read and Write". "Write only" means that the students could enter their codes/comments without being able to see other students' entries; "Read and Write" means that students could enter their input AND see what other students have entered. The instructor would use the "Manage Permissions" option in the CC menu to set these preferences and could change them (e.g., from "Write only" to "Read and Write" or "Read only") for class review after the assignment is completed.

After registering as a new user, and requesting to join the C-2 group, students would use the directory at the upper left of the TalkBank Browser to navigate to one of the assigned files (let's say file 11025, for example) and click on it to see the transcript. They could then listen to the language sample by clicking on the gray arrow to the right of the utterance (Figure 7) starting at line 1 with "little table". (Note: In the browser, the default mode is to show transcripts with only the main speaker tiers. To see the other tiers described above, such as %mor, check the box next to "View dependent tiers" just above the start of the transcript.") To enter a code and/or comment for the first utterance, the student just clicks twice on the utterance number "1". The student can then enter a comment in the box that appears and can select a tag from the drop-down menu of codes the instructor prepared (Figure 8). (A full list of the tags with descriptions can be seen by clicking on the tag icon next to the blue "Collab" button, as seen in Figure 9.) After selecting a tag, the student clicks the "Tag" button. After selecting as many tags as needed and entering a comment if desired, the student clicks on "Submit". A circled "C" then appears on that line, indicating that it contains comments or codes (Figure 9). Clicking on the circled "C" opens up the comments or codes, as seen in Figure 10 where the utterance on line 7 was coded as a 3-word utterance and the student commented that the child gave a command, "wash your hands". When multiple people enter comments or codes for a given line, they will all be listed when the circled "C" is opened (unless the "Write only" option is in place). Also, one can enter a comment or code that applies to a series of utterances rather than just one utterance by first clicking on the first utterance number and then clicking on the last utterance number, instead of clicking twice on the same number.

Figure 7
Screenshot of 11025 Transcript for Coding

Figure 8
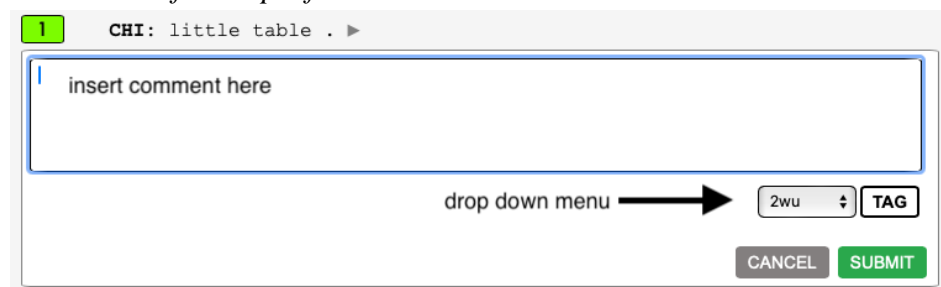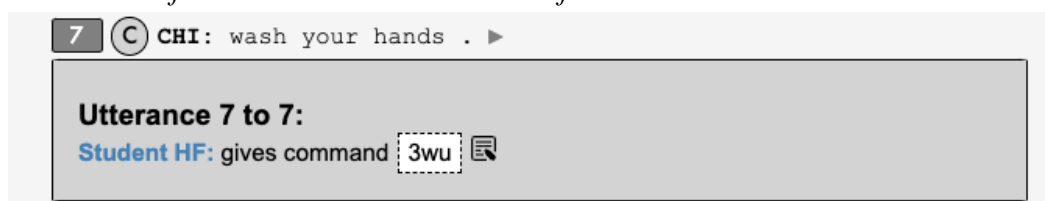*Screenshot of Prompts for Comments and Codes*

Figure 9

Screenshot Indicating Comment(s) or Code(s)

Figure 10

Screenshot of Comment and Code Entered for Utterance 7

After students complete the assignment, the instructor can proceed in many different ways. She could engage the students in whole class or small group discussions on the evidence they found demonstrating typical language development versus late talking in the various transcripts. Alternatively, students could write summaries or give presentations using examples from their observations to prove why the language characteristics of particular children suggest typical development versus late talking. The instructor could instead choose to provide feedback to each student individually about codes they used correctly and incorrectly, comments they made that were on or off target, and perhaps important features they missed. She could also mark up the transcripts in the CC group with her own codes and comments for the students to review afterwards in class or independently.

In summary, the CC tool is unique in a number of important ways: it provides open web access to transcribed and spoken language interactions that are linked to media; the transcripts are in a common format (CHAT) with additional tiers of useful morphosyntactic information; the format allows for group comments to be stored separate from the main transcript database so that other users still see the unmarked transcripts; and the format also allows for a variety of coding, commenting, reading and/or writing only options. Importantly, the CC tool is part of the TalkBank system which complies with international standards for database and language technology (MacWhinney & Fromm, 2022). The novel and fundamental impact of this tool in this context is how it enhances traditional teaching about language and communication, utilizing the rich resources in the TalkBank databases.

Additional CC Features

Searching

Next to the blue "Collab" button and the tag icon is a search icon (magnifying glass, see Figure 9). Users can search within a group in three ways: by user, by documents, and by tags. If you click on the search icon you get a drop-down menu with all three of those options. If you select "user" you get a list of the users that have inserted codes or comments in that group along with a list of the files and utterances where their input is located (Figure 11). Clicking on any of those lines takes you to the relevant location. Searching for documents with comments

produces a list of the files with comments for whichever group you are currently working in. (Note: the black semicircle that can be seen in Figure 9 shows that the user is working in group C2. To change to a different group, simply click the "Collab" button and select a different group from the "My groups" or "Joined groups" drop-down lists and click the "Participate" button.) Likewise, searching by tags produces a list (filename and utterance line) of where each tag was used. Again, clicking on any of those will take you directly to the appropriate utterance.

Figure 11
Screenshot of "Search by User"
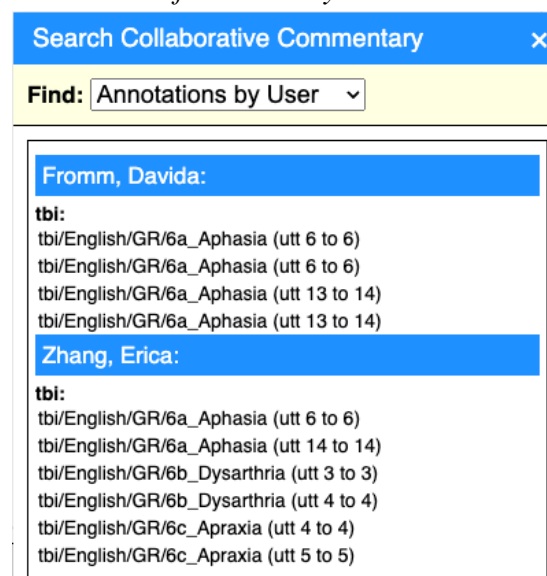
Direct Email Link
As can be seen in Figure 10, the student's name is actually a hyperlink that opens a direct email message to that student with that specific utterance and comment in the message body for reference. In this way, it is easy for the instructor to send quick and targeted feedback on a comment or code that was insightful or perhaps inaccurate. For example, it could be used to clarify the difference between certain types of phonological processing errors in children, different types of paraphasias in a person with aphasia, different interpretations of a gesture, and more.

Other Features
When you create a new group and click on the "Tag" icon to create tags, you have the option to "Import Tags" from another user if you have read or heard about a set of tags that were used that you would like to use as well. This button opens a screen that requests the email address of the group owner you want to import from. That person's groups are then listed in a drop-down menu. If you know you want Brian's CA-1 tags, for example, you select that group and then click the "Import" button for all of the CA-1 tags you want to use in your set. Depending on the permissions the other person has set for their group, you may first need to email that person to request permission to import their tags. It is worth mentioning that users will find transparent icons and prompts that allow for editing or deleting comments or codes that have

been entered. Finally, a feature that allows for downloading the results of searches and downloading the results of a group's entries to a spreadsheet is currently being completed.

Additional Examples of CC Teaching Applications

Illustrations of classroom assignments using CC are given at the CC webpage: https://talkbank.org/CC/ . In some of those cases and the examples that follow, readers should be aware that some of the materials mentioned are open access (e.g., CHILDES) and others (e.g., AphasiaBank, DementiaBank, TBIBank, RHDBank) are password protected. Faculty, licensed clinicians, and researchers can request membership; students can request access through their faculty advisor.

Using CC, students in introductory courses in communication sciences and disorders could view specific transcripts and videos to comment on characteristics of right hemisphere disorder, language changes in dementia, different types and severities of aphasia, and behaviors that distinguish typical disfluencies versus stuttering in children. Students could compare and contrast language behaviors across disorders such as right hemisphere versus left hemisphere strokes. In a course on aphasia, students could identify specific behaviors such as paraphasias, circumlocutions, and agrammatism. Students in a child language development class could comment on pragmatic skills of children at specific ages, for example, 18–24-month-old children who should be doing things like initiating pretend play, acknowledging or answering, requesting objects or actions, expressing feelings, protesting or rejecting, labeling and noticing, etc.

Brian has been using CC in his undergraduate classes now for several semesters. One of the sets of tags he created was for conversation analysis coding using specific files from CABank. The set includes tags for: alignment, dispreferred response, hedge, laughter, misalignment, overlap, adjacency pair, pause, pitch change, presupposition, preference management, turn projection, recipient design, repair, tempo, trouble, and volume change.

Three TalkBank databases have guided tutorials that include curated examples from people with various types and severities of aphasia, traumatic brain injury (TBI), and right hemisphere disorder (RHD). These can be found at the "Grand Rounds" links at the respective websites (AphasiaBank, TBIBank, and RHDBank). Students can view the videos directly from the Grand Rounds, but if they access the Grand Rounds videos and transcripts through the TalkBank Browser they can respond to the questions posed in the Grand Rounds material. For example, a question in the TBIBank Grand Rounds asks, "What cognitive difficulties did you observe and how did these impact Liam's communication?" (Elbourn et al., 2020). Using CC, students could view that 2-minute video in the TalkBank Browser and enter relevant comments.

Sample Clinical Applications

Clinical instructors could select videos and transcripts for students to learn specific clinical skills. For example, a general approach that could apply to any age group and any type of impairment is to have students comment on strategies that a speaker with a communication impairment uses successfully or unsuccessfully and suggest ideas for how/when to intervene when speakers demonstrate difficulties. What does a child do when he is experiencing moments of stuttering? What, if anything, seems to make the problem better or worse? What does a child

with intelligibility issues do when she says something that the parent could not understand? What does the parent do that is helpful in those situations?

CC could be used to have student clinicians learn how to score assessment instruments. The AphasiaBank database includes videos of administrations of the Boston Naming Test (BNT, Kaplan et al., 2001), the Verb Naming Test (Cho-Reyes & Thompson, 2012), the picture description task from the Western Aphasia Battery (Kertesz, 2007), and the Quick Aphasia Battery (Wilson et al., 2018). It is simple to create a set of tags for scoring any of those tests based on the test manual. For instance, responses to the BNT are scored as 0 or 1 (incorrect or correct) and then coded for each of the nine possible errors (circumlocution, multi-word paraphasic error, perceptual misnaming, etc.). A clinical instructor could create a set of those BNT scoring tags, have student clinicians score a number of pre-selected files, and use the results of the students' scoring to clarify any concepts that were not scored accurately. AphasiaBank also contains videos of some legendary, expert clinicians such as Audrey Holland and Nancy Helm-Estabrooks. In the Holland2 corpus, a video of "Jean" provides a master class in Audrey's clinical expertise with a woman whose expressive output contained a lot of jargon. Students could identify the specific clinical strategies Audrey employs such as providing cues, using closed questions, and suggesting and modeling strategies. They could also comment on other relevant aspects of her conversational and clinical style in the interaction, such as giving time, slowing the pace, using humor, and commenting on improvement.

The Lanzi corpus in the DementiaBank database includes two small group sessions of external memory aid treatment for individuals with mild cognitive impairment (Lanzi et al., 2019). Students could identify specific aspects of the clinical intervention, noticing how and when the clinician asks questions, requests elaboration, provides explanations, gives feedback, introduces new information, and so on.

CC Research Applications

For research teams, CC can be helpful in establishing reliability for coding a wide variety of behaviors. The possible uses here seem infinite: gestures, global coherence, local coherence, agrammatism versus paragrammatism, fluency, apraxia of speech features, correct information units, conversation analysis, and more. Disagreements about how something was coded could be resolved with the research team looking at the videos and the transcripts together and discussing reasons for having scored or coded something a certain way. As a result, the coding scheme may need to be refined to improve reliability, the training materials may need to be improved, or the coder may need further mentoring by a more experienced coder.

Among specialists within a particular field, for example aphasiologists, a group could collectively evaluate behaviors such as hesitations, repairs, false starts, silent pauses, filled pauses, repetitions, and agrammatism that are lumped into terms like "fluent", "dysfluent", or "nonfluent". It could function like a collaborative forensic examination of fluency behaviors in aphasia. This approach could be applied to behaviors used to diagnose apraxia of speech, anomia, or agrammatism as well as any number of possibly fuzzy terms used in other fields. In the TBIBank database, researchers have used CC to analyze the macrostructure and organization of discourse samples in a longitudinal study of recovery from traumatic brain injury. In the APT (Academically Productive Talk) corpus of the ClassBank database, researchers developed coding systems using CC to measure academically productive talk in

teachers and students (Al-Adeimi & O'Connor, 2021). That system could provide a model for research in bilingual classrooms.

Theoretical debates could take place in a CC group, where supporters of a particular theory could identify evidence that supports their theory and refutes competing theories. Again, the potential applications here using the many shared databases and wide range of available corpora seem almost endless. The rich collections in the SLABank and BilingBank databases were not even tapped for examples of the myriad ways the Collaborative Commentary tool could be used for teaching, clinical, and research applications in those areas.

Summary

This has been an introduction to one new tool from a vast array of tools available through TalkBank and an equally vast amount of linguistic wisdom Brian MacWhinney has shared over the years through his teaching, invited lectures, workshops, presentations, articles, chapters, and books. In addition to this being a new tool, it is also a tool that allows for something that has been very important to Brian throughout his career: collaboration. He has created the world's largest open access integrated repository for spoken language data and an international community of people interested in language with the simple, fundamental goal of advancing the science of understanding language. Brian's collaborators span not only a huge range of disciplines, but also a broad range of specialties within those disciplines. If we can learn from each other through collaborative, evidence-based, transparent enterprise – whether we are students or experienced researchers – we can make more meaningful progress and be more effective in our respective fields. We hope that readers will be inclined to experiment with this tool and add to the literature and knowledge base in their respective areas of study.

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