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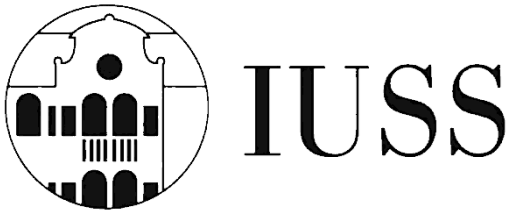

INTRODUCTION TO APHASIABANK FOR BEGINNERS, BY A BEGINNER

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Contents

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To Lyse, for simply being yourself, and to Sirio, just because it's you—your presence in my life adds joy and lightness that support me through the toughest days. To my loving grandparents, Perrine and Christian, I am inching closer each day to fulfilling the promise I made to you. Please stay long enough to see it come to fruition; your endurance is my hope.

Above all, I am profoundly thankful to the Lord Almighty for His infinite grace and the countless blessings He has showered upon me. It is by His will that all things are possible, and this work is a testament to His merciful guidance.

ABSTRACT

Objective: This master's thesis, “Introduction to AphasiaBank for Beginners, by a Beginner”, simplifies entry into aphasia research by providing a structured introduction to AphasiaBank and its coding systems. The goal is to make the complex elements of AphasiaBank's database and transcription protocols accessible to novices, and to foster their active participation in the aphasia research community.

Methods: This thesis summarizes information from existing AphasiaBank manuals into a more accessible format, featuring a newly designed reference table. It details the processes for installing and configuring the CLAN software, and outlines essential codes and data manipulation techniques, drawing primarily from the TalkBank Manuals by MacWhinney (2000).

Results: By simplifying the technical aspects of CLAN software and data access, the thesis guides newcomers from theoretical understanding to practical application, enhancing their ability to handle linguistic data. The approach aims to broaden AphasiaBank's application in linguistic and health-related research, emphasizing its potential impact on neurodevelopmental healthcare in Central Africa.

Conclusion: The thesis underscores AphasiaBank as a crucial tool for individual researchers and broader linguistic research initiatives. It serves as a narrative of the author’s personal learning experience, motivating new researchers and highlighting the transformative potential of mastering these research tools.

Keywords: AphasiaBank, transcription techniques, CLAN software, aphasia research, data manipulation, TalkBank manuals, linguistic analysis, neurological disorders, healthcare, Central Africa

Welcome to AphasiaBank

Welcome to this introductory guide to the fascinating world of AphasiaBank, an essential platform for anyone interested in studying Aphasia. It was founded by Brian MacWhinney, Audrey Holland, Leonard LaPointe, and Martin Ball. It is more than just a database; it is a vibrant community that advances our understanding of language disorders by analyzing detailed language samples.

This thesis represents a significant effort to provide a clear and comprehensive pathway for beginners eager to engage with and contribute to this thriving ecosystem. Here, we explore the vital role of carefully curated language samples in deepening our insights into Aphasia and the unique challenges they present.

The guide aims to make transcribing aphasia-affected speech accessible and rewarding for beginners, even those with no prior background in Transcription, linguistics, or related fields.

Through this document, I share the culmination of a personal journey through the extensive documents, guides, and papers related to AphasiaBank and CLAN transcription. This guide aims to consolidate these resources into one manageable and comprehensive resource, sparing you the daunting task of navigating through extensive materials independently. Hopefully, it will ☺.

Your participation is crucial as we present this roadmap. If you find any areas in need of improvement or have suggestions, please do not hesitate to email me.

Disclaimer

This guide draws primarily from the TalkBank Manuals (MacWhinney, 2000), available at https://talkbank.org, which are fundamental for learning transcription tools and using AphasiaBank effectively. It condenses and organizes the material deemed most helpful in understanding these tools. Any incidental similarities are justified based on the source material. For additional details or points not covered here, please refer to the latest versions of the manuals. Thank you for your engagement, and best of luck in your learning journey! ❀❀.

1 INTRODUCTION TO APHASIABANK

1.1 Aphasia Decoded

Aphasia is a complex language disorder caused by damage to specific brain regions responsible for language functions. It results in a range of speech, comprehension, and literacy deficits. Ischemic strokes, traumatic brain injuries, or degenerative diseases can cause this condition. It significantly disrupts communication, impacting individuals' personal lives and social interactions. Studying Aphasia provides insight into the intricate neural processes that underlie our language capacity.

Wernicke's Aphasia: Neuroanatomical and Functional Insights

Wernicke's Aphasia arises from lesions primarily in the posterior section of the superior temporal gyrus, encompassing Brodmann area 22 in the superior temporal gyrus (Matchin et al., 2022) (Javed, Reddy, Das, & Wroten, 2023). This region is pivotal for integrating auditory and linguistic information and facilitating spoken and written language comprehension. Damage within this area engenders a disconnection between linguistic sounds and their meanings, leading to fluent speech yet devoid of semantic coherence. Patients exhibit a propensity for producing nonsensical speech, including neologisms and paraphasias, while struggling significantly with language comprehension.

The condition's hallmark of fluent yet incomprehensible speech, combined with severe comprehension deficits, poses substantial communication barriers. A person might say, “I walked the dog bread” instead of “I walked the dog” or “apple chair” instead of “apple tree”, demonstrating difficulty in finding the correct word. Facing confusion in daily conversations due to difficulty following conversations, individuals may feel isolated due to misunderstandings.

Evaluation may include activities that assess verbal comprehension and the ability to generate coherent language, such as interpreting and responding to complex instructions. For example, the Token Test requires individuals to follow spoken instructions for manipulating tokens of various shapes and colors, which highlights challenges in comprehension.

Broca's Aphasia: Neuroanatomical and Functional Insights

Broca's Aphasia is associated with damage to the posterior inferior frontal gyrus, particularly affecting Brodmann areas 44 and 45 in the inferior frontal gyrus (Siegmund et al., 2014). This region is crucial for speech production and the processing of complex syntax. Impairment in Broca's area reduces speech fluency and sentence grammatical structure, resulting in agrammatism and effortful speech, although spoken language comprehension is relatively preserved.

Individuals face challenges in expressing themselves verbally, which can lead to simplified and laborious speech. For instance, a person may struggle to say “I am going to the store”, and instead say “Go store”. These difficulties often lead to frustration and impact individuals' confidence and social interactions. Diagnostic tasks often focus on language production, like picture description exercises. In these tasks, individuals describe a scene to assess their ability to construct sentences and convey information despite challenges in fluency and grammar.

Conduction Aphasia: Neuroanatomical and Functional Insights

Conduction aphasia is caused by disruption to the arcuate fasciculus. This crucial white fiber tract connects Broca's area with Wernicke's, facilitating information exchange between language comprehension and production centers (Salisbury et al., 2020). Conduction aphasia is characterized by difficulty repeating words and phrases despite having relatively intact spontaneous speech and comprehension. This difficulty reflects a breakdown in the auditory feedback loop necessary for accurate language reproduction.

When asked to repeat, “The quick brown fox jumps over the lazy dog”, a patient might say, “The quick brown... jumps over the... dog”. Patients exhibit a keen awareness of their errors but face challenges in correction, affecting their ability to engage in reciprocal communication.

The assessments can include repetition exercises to gauge the patient's ability to accurately repeat words, phrases, and sentences of varying complexity, pinpointing any dissociation between comprehension and spoken language reproduction.

1.2 AphasiaBank History and Purpose

TalkBank is a significant advancement in linguistic research, providing the world's largest open-access repository of spoken language data (MacWhinney, 2018). It was established in 2002 as an evolution from the Child Language Data Exchange System (CHILDES), initiated

by Brian MacWhinney and Catherine Snow in 1984. TalkBank is crucial in facilitating the comprehensive annotation, analysis, and sharing of language corpora. It supports transforming raw linguistic data into formats compatible with various analytical tools such as **Praat**, **Phon**, **ELAN**, and **others**. This versatility proves that the databases within TalkBank are essential for linguistic research, as demonstrated by the extensive citation of CHILDES in over 7,000 published articles.

The TalkBank ecosystem comprises various databases (e.g., Clinical Bank, Multilingualism Bank, Conversation Bank…) tailored to different linguistic inquiries. These include:

- **AphasiaBank**: Dedicated to studying language in Aphasia. It covers multiple languages and provides resources for clinicians and researchers.
- **CHILDES**: This resource is essential for studying child language acquisition. It contains data in 42 languages from various developmental stages.
- **DementiaBank**: For the study of language in dementia.
- **FluencyBank**: Analyzes patterns of fluency and disfluency, offering insights into stuttering and other speech disorders (MacWhinney & Fromm, 2022).
- **HomeBank**: Utilizes speech recognition to analyze untranscribed recordings from everyday environments, providing insights into naturalistic language use.
- **PhonBank**: This site focuses on phonological development and facilitates the study of speech sounds in children across multiple languages.

The TalkBank portal provides access to additional databases such as **ASDBank**, **BilingBank**, **CABank**, **ClassBank**, **RHDBank**, **SamtaleBank**, **SLABank**, and **TBIBank**, which cover specialized areas of language research. Each resource has protocols, test batteries, and data, all following high data collection and availability standards. Access all these resources through the TalkBank portal at https://talkbank.org .

AphasiaBank, part of TalkBank's efforts to address specific linguistic challenges, is a multimedia database designed to study and educate about language loss due to Aphasia, a condition affecting a significant part of the adult population globally. The database contains 402 hour-long interviews with individuals with Aphasia and 220 age-matched control participants, as well as videos and transcripts linked at the utterance level (MacWhinney, 2019).

These resources are invaluable for researchers analyzing discourse patterns and recovery processes, educators teaching about Aphasia, and clinicians informing assessment and treatment planning. All research, teaching, and clinical practice resources are accessible through the TalkBank browser.

1.3 Database Conception and Structure

AphasiaBank was established to create a centralized data repository for aphasia research and clinical practice. It aims to gather diverse data, such as video recordings, linguistic analyses, and demographic details, into one accessible platform. This integration enables a comprehensive examination of Aphasia, leading to advancements in diagnosis, therapy, and theoretical frameworks. The database's design reflects an interdisciplinary approach, recognizing the complex interplay between linguistic capabilities and cognitive functions in individuals with Aphasia.

Structure of AphasiaBank

AphasiaBank's structure is organized into different sections, each serving a specific purpose within the research and clinical landscape. The database's architecture is divided into several components, each with its focus and utility

- **The foundational layer** sets **AphasiaBank's** operational framework, including the ground rules for data use, protocols for joining and contributing to discussions, adherence to the Institutional Review Board (IRB) guidelines, and guidance on contributing new data. It also provides practical hints on downloading the data for research use.
- **Database:** The database component is the heart of AphasiaBank, hosting the browsable database that allows easy navigation and data access. It includes protocol and non-protocol databases, with sections dedicated to English and other languages, enabling comprehensive linguistic analyses across different linguistic and cultural backgrounds.
- **Programs:** Users can find specialized software tools such as the TalkBankDB database search and the CLAN (Computerized Language Analysis) program. Additionally, tutorial screencasts offer guidance on how to utilize these programs effectively.

- **Protocols:** This section presents various discourse protocols in English and other languages, along with a specialized Famous People Protocol. These standardized protocols ensure consistent data collection across different research studies. They include personal narratives, picture descriptions, story retelling, and procedural discourse.
- **Teaching:** AphasiaBank provides rich teaching resources, including Grand Rounds for students, and videos illustrating examples of Aphasia, and classroom activities designed to enhance learning and teaching experiences in communication disorders.
- **Manuals:** The CLAN Manual, CHAT Manual, and the SLP's Guide to CLAN offer detailed instructions and guidelines for using the software and understanding the transcription system (MacWhinney, 2000).
- **Results:** The results section allows researchers to access the test results and demographics of the participants. This section also houses publications, posters, and presentations related to AphasiaBank and serves as a repository of outcomes derived from the database.
- **Topics:** This section includes videos about Aphasia, tributes to notable figures in the field, like Audrey Holland, and links to related websites. It also provides resources for discourse and gesture analysis, reflecting the wide range of research interests that AphasiaBank supports.
- **Other:** The "Other" section includes a Codes Cheat Sheet for transcription and coding conventions. It also covers derived datasets and specialized collections formatted for specific research purposes.

1.4 Protocol Explained

The AphasiaBank protocol is meticulously structured to ensure uniformity and comparability across studies. The protocols are available in the Aphasia protocols and English protocol sections. The protocol consists of four primary discourse elicitation tasks designed to prompt narrative and procedural discourse:

1. **Personal Narratives:** The narratives capture the essence of individual experiences, offering profound insights into the lived experiences of stroke and recovery

(MacWhinney et al., 2011). People with Aphasia (PWAs) are asked about their speech, their stroke, their recovery, and any essential event in their lives (MacWhinney et al., 2011). Control participants discuss an illness or injury, their recovery, and their experiences with individuals who have communication difficulties (MacWhinney et al., 2011).

2. **Picture Descriptions:** Participants in these tasks are shown black-and-white drawings and asked to describe a story with a beginning, middle, and end (MacWhinney et al., 2011). The illustrations depict scenarios such as a child breaking a window with a soccer ball, and a cat stuck in a tree (MacWhinney et al., 2011). These tasks evoke descriptive narratives and provide insight into cognitive-linguistic storytelling processes.

3. **Storytelling:** Participants will use a picture book of Cinderella with the words covered (MacWhinney et al., 2011). They will review the book and then retell the story from memory after removing it (MacWhinney et al., 2011). This task leverages familiar tales to delve into memory and narrative structure, providing a rich source of spontaneous language.

4. **Procedural Discourse:** This task demonstrates the relationship between language and daily activities: participants provide instructions for making a peanut butter and jelly sandwich (MacWhinney et al., 2011). A different simple food preparation task can be substituted for non-U.S. test sites (MacWhinney et al., 2011).

The protocol is conducted in a single session and recorded on video with high-quality audio and video, following specific guidelines (MacWhinney et al., 2011). Investigators use a script to ensure consistent prompts and minimal verbal interaction to avoid influencing the participants' responses. Secondary prompts and troubleshooting scripts are provided for participants who need additional cues. Participants are given ample time to respond, and nonverbal encouragement is provided.

Demographic and extensive clinical data are collected for each participant and are accessible to AphasiaBank members (*AphasiaBank*, n.d.) (Demographics Collection).

The protocol assesses language aspects through standardized tests, including:

1. **AphasiaBank Repetition Test:** Evaluates word and sentence repetition skills.

2. **Boston Naming Test - Second Edition, Short Form:** Assesses lexical retrieval via picture-based noun naming.
3. **Verb Naming Test:** Part of the Northwestern Assessment of Verbs and Sentences-Revised focusing on action naming (Fromm et al., 2021).
4. **Western Aphasia Battery-Revised (WAB):** Offers standardized aphasia type and severity metrics (Aphasia Quotient).
5. **Complex Ideational Material-Short Form:** Sentence comprehension task from the Boston Diagnostic Aphasia Examination.
6. **Sentence Comprehension:** The Philadelphia Comprehension Battery assesses understanding of complex sentences.

Control participants undergo additional cognitive screenings to exclude cognitive impairment and depression, using tools like the Mini-Mental State Exam or Geriatric Depression Scale. All assessments, except the WAB, are video recorded for in-depth communicative ability analysis. Test results are shared with AphasiaBank members via a master spreadsheet on their website: Test Results Collection.

2 NAVIGATING CLAN: INSTALLATION TO COMMUNITY ENGAGEMENT

This chapter provides an essential guide to installing and configuring the CLAN software, enhancing understanding and effective use of AphasiaBank resources, and engaging with the user community. We begin by discussing the importance of Transcription in linguistic research (Section 2.1) and then guide you through the installation and initial configuration of the CLAN software, including specific adjustments for Mac users (Section 2.2). Next, we explore how to access and make the most of the extensive resources available in AphasiaBank, focusing on educational tools and community support (Section 2.3). Section 2.4 offers practical advice on managing files within the CLAN framework, and Section 2.5 provides a detailed walkthrough for starting transcription projects. We conclude with an overview of community engagement and user support structures (Section 2.6).

Disclaimer and Sources

The chapter is based on "*A Clinician's Complete Guide to CLAN and PRAAT*" and the second volume of TalkBank manuals, "Tools for Analyzing Talk: The CLAN Program". These sources have been updated to reflect the latest developments and user feedback. The procedures and recommendations primarily come from the initial five chapters of the TalkBank manual, serving as a primer on CLAN functionalities.

For Further Reading and Guidelines, Refer to:

- Bernstein Ratner, N., Brundage, S. B., & Fromm, D. (2023). *A Clinician's Complete Guide to CLAN and PRAAT*. Retrieved from https://talkbank.org/manuals/Clin-CLAN.pdf.
- MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk* (3rd ed.). Lawrence Erlbaum Associates. Available at https://doi.org/10.21415/T5G10R.

2.1 Why Transcribe?

The Computerized Language Analysis (CLAN) software is indispensable for those utilizing the AphasiaBank database, as it automates the computation of crucial linguistic metrics such as Mean Length of Utterance (MLU), Type-Token Ratio (TTR), Developmental Sentence Scoring (DSS), and the Index of Productive Syntax (IPSyn). For clinical practitioners, CLAN is pivotal

in conducting in-depth linguistic analyses to tailor treatments and monitor patient progress. Researchers utilize CLAN's robust capabilities for handling expansive datasets and conducting sophisticated linguistic analyses, thereby contributing to a deeper understanding of language impairments.

Transcription with CLAN ensures a standardized method for analyzing speech, maintaining consistency across studies, and permitting reliable comparisons with the vast corpus of data in AphasiaBank. This methodological rigor provided by CLAN transcription is critical, as it allows for precise measurement of language rehabilitation outcomes and advancement of research into aphasic disorders.

Mastering CLAN is essential for anyone intending to fully exploit AphasiaBank's resources, as it underpins clinical applications and linguistic research.

2.2 Installation and Configuration of CLAN software

Prepare the computer environment for Transcription by ensuring it is powered on, connected to a stable internet connection, and configured to save downloaded files to the Desktop for easy access.

Downloading CLAN

Start by downloading the software from the official TalkBank download page to set up CLAN. Make sure to choose the version compatible with your operating system (Windows or macOS). Follow the instructions carefully, especially if you are updating an existing installation. Before updating, be sure to close any active instances of the software.

2.2.1 Workspace Organization

Setting Up Your Workspace

A well-organized workspace is conducive to efficient transcription work. Users should utilize the dedicated subfolders `'LIB'` and `'WORK'` located within the `'TalkBank/CLAN'` **directory on PCs.** Mac users should similarly organize their files within the `'CLAN'` folder. It is recommended that all audio and video files be stored within the `'WORK'` subfolder. This streamlines the transcription process by centralizing all necessary resources.

2.2.2 Initial Configuration of CLAN

Configuring Basic Settings

Upon successful installation, CLAN requires initial configuration. Launch CLAN from the Applications folder or the specified installation path. Select **'Edit'** and then **'Select F5'** within the CLAN menu bar. Here, users should choose the option **'Bullet on every tier'** and then finalize the settings by clicking 'OK' (Bernstein Ratner, Brundage, & Fromm, 2023). Although this configuration is normally set by default, a verification step is crucial as it establishes the foundational settings for the transcription environment.

Setting CLAN Options

To further customize CLAN, you can access the **'Edit'** menu after selecting **"File" > "New Document/Open"**, then choose **"CLAN Options"**. This section allows the user to define the frequency of autosaves by specifying it in the **'Autosave Delay'** field, which is instrumental in preventing data loss. For disambiguation purposes, the user must specify the tier in the designated box, typically **'%MOR:'**. If available, the options **'Use Newfile's window Position and size for all files'** and **'Restore cursor on file open'** should be checked to streamline the workflow, followed by clicking 'OK' to apply the changes.

Locating the Dependency File

Make the Commands window visible to locate the dependency file. Go to the menu bar, select **'Windows'**, then **'Commands'**, or use the shortcut **'⌘-D'** on Mac or **'CTRL-D'** on PC (MacWhinney, 2000). Or go to **'Edit' > 'CLAN Options'** and select **'Open Commands Window at startup'**.

2.2.3 Linguistic Analysis Tools: MOR

Downloading Tools

First, put all files for analysis into one folder. Next, open the CLAN program and click the **'Working'** button in the CLAN Commands window to set the working directory to the folder with the analysis files. Then, under the **'File' menu,** select **'Get MOR Grammar'** and choose the language for analysis. Note that an active internet connection is required at this point. By default, the MOR grammar file will be **downloaded to your Desktop**. This folder should then be placed in the **/CLAN/work** folder or a designated folder on your hard drive (Fromm et al.,

2021). Once you have moved the MOR grammar file, use the **'Mor Lib'** button in the Commands window to inform CLAN of its new location.

Analyzing Files

Enter **'mor *.cha'** in the **Commands window** to analyze all . cha' files in the current directory. Make sure the "**working**" and "**output**" directories are set to the exact location in the "**Commands**" window so MOR can run correctly.

2.2.4 Configuring Function Keys for Mac Users

1. To modify key functions, click the Apple icon at the top-left corner of your screen to access System Preferences (Fromm et al., 2021). Then, open System Preferences from the drop-down menu and select 'Keyboard.

2. To reconfigure shortcut assignments:

   - **In 'Keyboard Shortcuts', go to 'Function Keys'** and deselect the option **'Use all F1, F2... keys as standard function keys'**(Fromm et al., 2021)**. It will turn off** their default special features, like media control, and allow the keys to function as their intended F-number assignments.

   - In the **'Keyboard Shortcut' tab**, click on the **'-'** sign to delete any preset option that could conflict with CLAN's operations, especially those related to Mission Control or Dashboard functionalities. Make sure function keys like F9 are not assigned to these features.

3. Review the Keyboard setting to ensure that everything compromising has been turned off and save your preference.

2.3 Accessing AphasiaBank Data

TalkBank and AphasiaBank offer resources to support research and education in communicative disorders. These resources cover language interactions, transcription conventions, software usage, and aphasia applications.

2.3.1 Overview of TalkBank and AphasiaBank Resources

TalkBank Community Resources

- **Ground Rules for Use:** TalkBank emphasizes the significance of academic integrity by requiring all users to cite the data sources obtained from their repositories correctly. This practice ensures the acknowledgment of contributors and upholds the scholarly value of the data.
- **Contributing New Data:** Researchers looking to enhance their collective knowledge base can contribute their projects to TalkBank. The platform provides structured guidelines to help configure new research projects for eventual inclusion, ensuring they align with the standardized formats and are accessible to the broader community.
- **IRB Principles:** TalkBank's IRB Principles address ethical considerations in research involving human subjects. They provide a framework for creating consent forms that outline the appropriate confidentiality and data protection levels for each project per ethical standards.
- **Programs and Manuals:** The heart of TalkBank's usefulness lies in its software suite and accompanying manuals, which are crucial for analyzing language data. They can be found under “manual” on the TalkBank and AphasiaBank websites. The online versions are recommended due to their regular updates and search functionality. This includes:
    - The **CHAT Manual** details the guidelines and rules for CHAT transcription, which is a system used to code the structure and content of spoken interactions (MacWhinney, 2000).
    - The **CLAN Manual** introduces users to the suite of CLAN computer programs. These programs facilitate the Transcription, annotation, and analysis of language interactions (MacWhinney, 2000).
    - The **MOR Manual** provides detailed guidance on morphosyntactic analysis. It helps users create lines for morphological and grammatical dependency analysis in transcripts (MacWhinney, 2000).

The AphasiaBank Teaching Tools and Resources include:

- **Grand Rounds and Examples:** The AphasiaBank webpage features two valuable resources. The first is “Grand Rounds”, an online tutorial that provides insights into different types of aphasia and their effects on language tasks (Fromm, Forbes, Holland, & MacWhinney, 2020). The second resource, “Examples”, offers short video clips showcasing common features from the connected speech of individuals with aphasia. Both resources are useful for educational and clinical settings (Fromm, Forbes, Holland, & MacWhinney, 2020).
- **Classroom Activities:** Downloadable resources with clinical assessment and treatment planning exercises. They are designed to foster a hands-on understanding of discourse analysis, catering to both individual and group educational settings.
- **Group Treatment Videos (Examples):** A collection of group treatment videos demonstrating various treatment methods and the positive impacts of group therapy for individuals with Aphasia.
- **Tutorial Screencasts:** Over 40 screencasts offering concise tutorials on various functions of the CLAN software.
- **Posters:** Based on data derived from AphasiaBank, these visually engaging posters cover a range of topics and provide access to cutting-edge research.

To integrate these resources into academic or clinical practice, follow these steps:

- Familiarize yourself with the TalkBank system, including downloading the CLAN software and the CHAT manual for transcription norms.
- Progress to the CLAN manual and engage in the tutorials to understand the software fundamentals.
- Transcribe a small dataset and use the CHECK utility to ensure accurate coding.
- Use CLAN's analysis tools to identify those that align with your specific research or clinical objectives.

The direct links where one can find the cited information:

- TalkBank Ground Rules: https://talkbank.org/share/
- Contributing to TalkBank: https://talkbank.org/share/contrib.html
- TalkBank IRB Principles: https://talkbank.org/share/irb/

- CHAT Manual: http://talkbank.org/manuals/CHAT.pdf
- CLAN Manual: http://talkbank.org/manuals/CLAN.pdf
- MOR Manual: http://talkbank.org/manuals/MOR.pdf
- AphasiaBank Grand Rounds: https://aphasia.talkbank.org/education/class; https://aphasia.talkbank.org/education/videoDownload.html
- AphasiaBank Examples: https://aphasia.talkbank.org/education/examples/
- TalkBank Screencasts: https://talkbank.org/screencasts/
- AphasiaBank Posters: https://aphasia.talkbank.org/posters/
- CLAN Program Download: https://talkbank.org/software/clan.html
- AphasiaBank Home: https://aphasia.talkbank.org/
- Browsable Database: https://sla.talkbank.org/TBB/aphasia
- Protocol Database: https://aphasia.talkbank.org/access/Protocol.html

2.3.2 Accessing and Using the AphasiaBank Database

To access and use the resources in the AphasiaBank Database, one must be a member of the AphasiaBank consortium. The database is password-protected, and access is restricted. If a researcher, educator, or clinician is interested in Aphasia, following the Ground Rules set by AphasiaBank is necessary. After that, an email should be sent to macw@cmu.edu with contact details, institutional affiliation, and a brief description of how the data will be used (*AphasiaBank*, n.d.). Faculty advisors should ensure that their students have a membership to access the database. If you cannot obtain access from your university or supervisor for any reason, you can create an account to gain access to the APROSCA-access database. However, to gain complete access, you must contact Brian MacWhinney.

Upon acquiring membership, individuals can access the AphasiaBank Database by navigating to http://talkbank.org/AphasiaBank . Alternatively, they can visit http://talkbank.org/ and select **AphasiaBank**. The database interface presents members with two distinct pathways to access the data: the Browsable and Protocol databases. Each pathway caters to user needs and preferences, ensuring members can navigate and utilize the database efficiently.

Using The browsable Database

Accessing and utilizing the Browsable Database of AphasiaBank, a TalkBank division, allows consortium members to interact with and analyze media linked to transcripts. This tool is

designed for an immersive review of language data, coupling the spoken word with its written form through real-time playback within the browser.

To begin using the Browsable Database, members should first acquaint themselves with the navigation instructions on the Browsable Database page. These guidelines will assist in maneuvering through the media and transcripts. Selecting a specific pathway, which typically follows the steps: **Aphasia> Language > Transcription file**, prompts a login dialogue, where members enter their credentials to proceed.

Successful authentication grants access to the database. It is important to note several features to enhance the user experience:

- Video/audio files can be downloaded by clicking the `'more'` or settings icon, represented by three vertical dots adjacent to the file.
- Playback control is straightforward: click on the media to pause or start or use the "`s`" key to start the audio/video.
- Initiate playback from the transcript by clicking the right arrow next to a transcript line in the CHAT file.
- Transcripts are available for download by clicking the file name under the CHAT section.
- The CHAT file format begins with headers followed by the dialogue, with lines linked to the corresponding video segments.
- To review a specific segment, click on the right arrow beside the line of interest. There may be a brief connection time before playback begins, but it should proceed smoothly once started.

Using the Protocol Database

Utilizing the Protocol Database on the AphasiaBank platform provides an organized index of data collected using the AphasiaBank Protocol across multiple languages. It complements the Browsable Database, offering a structured approach to data retrieval. The Protocol Database features contributions from individuals with aphasia and control groups across Cantonese, Croatian, English, French, German, Greek, Italian, Japanese, Mandarin, Romanian, and

Spanish (*AphasiaBank*, n.d.). This diversity reflects the broad international collaboration and research efforts within the AphasiaBank community.

From the data access options, select the desired language and participant group. The user can then choose the specific corpus of interest—for example, **English > Aphasia > Adler Corpus**. This selection presents an overview of the chosen study, detailing the number of participants, study type, location, and the media type utilized, with video being a standard format. A DOI (Digital Object Identifier) is provided for citation and referencing purposes, which is essential for academic use.

Moreover, the database page offers links to browsable and downloadable transcripts and access to a media folder. Access to these resources requires user authentication; after successful login, selecting the transcript or media folder link will initiate a download to the user's computer, typically appearing on the Desktop or in the specified downloads folder.

The CLAN software has an "Example" subfolder that contains pre-loaded transcripts, including the Adler Corpus. Users can start working with the Adler Corpus immediately without downloading separate files, making the research process more efficient. It is important to note that only transcripts are provided, and no videos are included.

2.4 Folder Tips

Two necessary subdirectories are created after installing the CLAN software: `LIB` and `WORK`. The `LIB` subdirectory contains linguistic tools and standardization files needed for processing transcripts. The location of these files must be accurate for CLAN to verify transcript standards effectively.

Keep project files, such as audio and video files, transcripts, and related documents, organized within the `WORK` subdirectory for efficient access and processing by CLAN. It is advantageous to store the English MOR Grammar folder in **the `/CLAN/work`** directory for direct access by CLAN. However, if properly configured, one can consider setting up a separate dedicated folder on the hard drive. Maintaining order and compatibility within the CLAN directory structure is essential. Adhere to a consistent file naming convention and avoid spaces using underscores or hyphens. To prevent data loss, it is important to regularly back up the "WORK" folder. Cloud storage or external drives are ideal for this purpose.

2.5 Getting Started: the beginner step-by-step

Attention

- Listen to the audio or video when transcribing and type out what you hear in the CHAT file. At this stage, you do not need to use bullets; write down the words.
- If you are linking (adding bullets), you are marking where each piece of speech starts and ends in the audio or video.
- For both transcribing and linking, I will propose the following methods based on the already published manuals by Fromm et al. (2021) and MacWhinney, B. (2000) .

Step 1: Initial Setup

1. Initial steps

- **Launch CLAN:** Open the CLAN program on your computer and start a new file.
- **Obligatory Headers:** These headers are essential for organizing the content of your transcript and providing critical information.

2. Creating Obligatory Headers

The first few lines at the top of your document contain crucial information about your transcript. Headers, which function like book titles and chapter names, organize the content. They are formatted precisely.

- `@Begin`: This is always the first line in your file, signaling the start.
- `@Languages`: Specify the language of the transcript using the three-letter ISO code (e.g., **eng** for English).
- `@Participants`: List the speakers using codes (e.g., `PAR` for Participant, `INV` for Investigator) and their roles.

Example:

```
@Begin
@Languages:  eng
@Participants:     PAR Participant, INV Investigator
```

3. Adding ID header

After the opening lines, provide more details about each person speaking. Here is how you might format it:

- **`@ID:eng|corpus|code|age|gender|group|socioeconomicstatus|role|education|custom field|`**

This line is like filling out a form about the speaker. Each part between the vertical lines (|) provides specific information. The rest of the spaces are filled with information relevant to your study or left blank if not applicable. Only use the **`'Tab'`** key to mark a new line's beginning and separate the information after colons and vertical bars in your headers.

Example:

```
@ID: eng|Adler|PAR|30;6.|male|||Participant|||
@ID: eng|Adler|INV|||||Investigator|||
```

Inserting the ID headers: Tips

- **Option A: Copy from previous Transcripts.**
  - Select and copy the ID lines from an existing transcript template. Modify the copied template to include the new participant's details.
  - Alternatively, employ the template AphasiaBank provided under Other: “Codes Cheat Sheet” on their website.
- **Option B: Use the CLAN menu.**
  - Go to the **CLAN menu**, click **`'Tiers'`**, and then select **`'ID Headers'`**(Fromm et al., 2021).
  - Fill in the fields with the appropriate information, (Fromm et al., 2021):
    - **Language**: eng
    - **Corpus name**: Adler
    - **Age**: (years; months)
    - **gender**

        - **Group**: (WAB-type)
        - **Role**: Participant
        - **Education**: (leave blank)
        - **Custom field**: (WAB-AQ)
    - Once finished, click **'Done'**.
- **Option C: Insert automatically,** from Fromm et al.(2021)**.**
    - Place your cursor at the end of the **@Participants** line.
    - Press the **'Esc'** key followed by the **'L'** key on your keyboard, one after the other. Alternatively, use the CLAN menu: click **'Mode'** and select **'Check opened file'**. This should display something like:

      ```
      @ID:        eng|change_me_later|PAR|||||Participant|||
      @ID:        eng|change_me_later|INV|||||Investigator|||
      ```

4. Linking Media Files

The **@Media** line connects the transcript to the corresponding audio or video file.

- **Locate the Media File**: Ensure you know where the audio or video is saved on your computer. It should be in an accessible folder.
- **To ensure compatibility, please check the file format**. CLAN supports various media formats, but it is best to use standard formats such as .mp4 for video or .wav for audio to avoid issues.
- If you have a video or audio file related to the transcript, please indicate it: **@Media: filename, media type** or **@Media: studyvideo1, video**
- Ensure that the file name matches exactly, and if your file has an extension (e.g., **.mp4** or **.wav**), include it in the header as well.
- **Save and check**: After adding the media header, check and save your .cha file in the same folder as your media file. It will make it easier for the program to link them.

5. Additional headers

- **Date and Task Markers**: Include the recording date and markers for specific tasks within the transcript.
    - **@Date:** Use the format **DD-MMM-YYYY**.
    - **@G:** Use this code to prefix task names and differentiate between various activities or important events in the transcript.

Example:

```
@Date: 05-JUN-2024
@G: NamingTask
```

6. Saving the template

Here is what the top of your CLAN file might look like before you start transcribing:

```
@Begin
@Languages:  eng
@Participants:      PAR John Participant, INV Sarah Investigator
@ID:   eng|StudyName|PAR|35;10.|male|group1||Participant|||
@ID:   eng|StudyName|INV|||||Investigator|||
@Media:      studyvideo1, video
@Date: 05-JUN-2024
@G:    NamingTask
```

You can save this as a template or download and use the “code cheat sheet” under 'other' on the AphasiaBank Main page. Name your file with a. cha extension, like **my_first_transcript.cha**, and save it to your desired folder (e.g., in the WORK folder).

Step 2: Using the Walker controller mode

1. Select Walker controller

With the CHAT file open, **go to the 'CLAN menu'**, click on **'Windows'** and then choose **'Walker Controller'**(Fromm et al., 2021).

2. Load Your Media File

In the Walker Controller, click the 'Open media' button and select the audio or video file you want to transcribe on your computer. Alternatively, you can access the media file by going to the **'Clan menu'>'File'> 'Select media'**.

3. Configure the Walker Controller settings

Browse your computer's directory to find and select the audio/video file you will transcribe (Fromm et al., 2021).

- Decide on the length of the audio/video segments you wish to transcribe at a time, i.e., the segment playtime. It is the **'Walk length'** (e.g., start with **2000** milliseconds).
- Set **'Loop number'** to determine how often a segment will repeat. Starting with one is recommended; two are recommended for repetition, adding accuracy (Fromm et al., 2021).
- **'Backspace'** is the rewind interval before the next segment plays. 500 milliseconds is the usual setting. Please keep it to avoid overlaps.
- If transcribing audio, **'Walk pause length'** is the break between loops and segments. It adjusts the time between loops (Fromm et al., 2021).
- **'Playback speed'** can be adjusted to slow down the playback for clarity.

4. Transcribe and insert Bullets

- **Control playback**: Use the following key as you transcribe.
    - **F5 + spacebar**: to insert the bullet
    - **F6**: Play or resume the media
    - **F7**: Rewind the previous if you need to hear something again (step backward).
    - **F8**: play the current step
    - **F9**: Skip forward if you want to move to the next segment (step forward).
- **Feel free to adjust the settings as much as you need to**.

- **Start transcribing**: Play the video/audio by pressing F6. Listen and type what you hear into the CLAN file. Attention: Follow the transcription conventions:
    - Utilize shortcuts for speaker IDs in the `'Tiers'` section under the CLAN menu: **`Clan > Tiers > Update ⌘1 & ⌘2.`**
    - Ensure each utterance you transcribe starts on a new line, indicated by an asterisk, followed by the speaker's ID, a colon, and a tab. For example: To automatically write `*PAR`, press **`⌘1`** and write `*PAR: mother is washing the dishes.`
    - Please use capital letters for proper nouns and the word “I” only.
    - End each transcription line with punctuation (period, question mark, or exclamation mark).
    - The last line of your transcript should be “`@End`” without any punctuation. Save your transcription.
- **Insert bullets for synchronization**: Press `F5` to start the video. Press the spacebar at the end of each utterance to mark it with a bullet in the audio/video timeline.
    - Example: `*INV:  really? tell me more about it. *`

5. Correct Mistakes

- **Transcription mistake**: Use **`backspace`** to correct the text as you normally would.
- **Bullet mistake**: If you insert a bullet incorrectly, you can stop (**`F6`**), delete the incorrect bullet, rewind a bit (**`F7`**), and start playing (**`F6`**) to insert the bullet again at the right spot.

Step 3: Use the F5 mode for Transcription

1. Load your file

Verify that the media file name matches the data file name to ensure that the media is properly linked to the transcription file.

2. Play the Media

Press **F5** on your keyboard or select **'Transcribe Sound or Movie'** from the **'Mode' menu**. It will start playing the audio or video file you will transcribe.

3. Transcribe and mark the end of utterances

- As you listen to the playback, transcribe the speech directly into the CLAN file and hit the spacebar to insert bullets at the end of each utterance.
- **Play/Resume Playback**: Use **F5** to pause and resume the media while transcribing.
- **Play specific segments**: Press **F4** or choose play bullet media. After inserting a bullet with the spacebar or manual editing, this is helpful for rewinding to review or correct specific segments.
- Use **Esc-8** for continuous playback and **Esc-9** for continuous skip play, to review the transcript.

4. Correct Mistakes

- **Immediate correction**: If you press the spacebar too early or late, stop the playback (**F5**), delete the incorrect bullet (remove the space or bullet symbol you inserted), and replay from a bit before the mistake (**F5 again**) to insert the bullet at the correct moment.
- **Manual bullet editing** After using F5, it's more common to directly interact with the text and timings in the transcript. To manually edit a bullet's timing:
    - Press **Esc**, then **A** to show timing (to expand the bullets)
    - Edit the start and end times directly in the transcript.
    - **Press F4** to listen to the segment for accuracy.

Step 5: Save your work progress regularly

- **Manually**: Hit **COMMAND-S** / **⌘-S** (on Mac) or **Ctrl-S** (on Windows) often to save your work.

- **Automatic saving**: In the CLAN menu, select **'Edit' > 'CLAN Options' > 'Autosave Delay'**. In the box, enter a time interval or a number of keystrokes. This determines how often the program will save. Click 'Close' to confirm the settings.

Step 6: Final Review

Please do a final review of your work to ensure that all bullet points are correctly placed and all errors are corrected. Save the final version of your transcript.

Example:

```
@Begin
@Languages: eng
@Participants: PAR Participant, INV Interviewer
@ID: eng|university|PAR|21|male|||Participant|
@ID: eng|university|INV|35|female|||Interviewer|
@Media: conversation, audio
*PAR: it was quite an adventure, you know? *
*INV: really? tell me more about it. *
*PAR: we ended up getting lost for a bit. *
*INV: oh no, that sounds stressful. *
*PAR: it was, at first. but then we saw it as part of the experience. *
@End
```

Following these steps, you can effectively link your transcript to the corresponding audio/video file using the Walker Controller or the F5 method. Remember to insert bullet marks at the end of each utterance in the transcript to synchronize it with the media. Manual adjustments are there to refine this process, and the Check function is your tool to verify that the transcript is error-free. Save frequently to avoid losing any changes.

2.6 Community Engagement and Support

To stay updated on the latest developments and engage with a community of practice, please join the Google Group associated with TalkBank and AphasiaBank. This platform facilitates discussions, provides support, and offers updates on new resources and tools, fostering a collaborative environment for researchers, educators, and clinicians. Explore the possibility of joining the Google Group for discussions and updates here:

- TalkBank Groups (Google Group): https://talkbank.org/share/email.html

- AphasiaBank Google group: https://aphasia.talkbank.org/email.html

3 Transcription Techniques

Chapter 3 condenses transcription techniques from " Tools for Analyzing Talk Part 1: The CHAT Transcription Format to serve as an in-depth manual, providing a structured approach to various transcription techniques and practices. The chapter begins by addressing the basic elements of file formats and headers (Sections 3.1 and 3.2), then progresses to the detailed transcription of words (Section 3.3) and utterances (Section 3.4). We continue examining scoped symbols that cover paralinguistic features and error marking (Section 3.5) and explain the application of dependent tiers for data synchronization (Section 3.6). The discussion then moves to the analysis of disfluencies (Section 3.7) and speech acts (Section 3.8), followed by an exploration of error codes (Section 3.9), which are critical for analyzing and understanding linguistic deviations in aphasia.

A summary of key transcription techniques is included in the annex to provide a quick reference for users, highlighting the most important aspects discussed.

Disclaimer and Sources

The content of this chapter draws heavily on the first volume of the TalkBank manual, "***Tools for Analyzing Talk Part 1: The CHAT Transcription Program***". The conventions discussed primarily draw from Chapters 5, 7-14, and 16-18 of the TalkBank manual.

Yes, it goes beyond what a beginner might initially need, but the transcription field is vast and exciting! I couldn't help but dive deep, so I decided to include all the transcription techniques available—so we both could make our own "subway" through this complex terrain ^_^ .

For Further Reading and Guidelines, Refer To:

- MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk* (3rd ed.). Lawrence Erlbaum Associates. Available at https://doi.org/10.21415/3mhn-0z89

3.1 Min-CHAT: Review of 2.5 Getting Started

1. Document Initialization and Termination

Begin the document with an `@Begin` line to indicate the start. Conclude with an `@End` line, marking the document's closure.

2. Language and Participants

- Specify the transcription language immediately after the `@Begin` line with `@Languages:` followed by the ISO 639-3 code.
- List participants using `@Participants`. Include a three-letter code, the participant's name or ID (with underscores for spaces), and their role. Detail each participant's demographic information under `@ID` headers. Provide detailed speaker information with `@ID` headers for each participant, indicating age, sex, role, etc. This information can be auto generated through the CLAN interface.

3. Media File Linking

- Use `@Media` to associate the transcript with its corresponding audio or video file, excluding the file extension. This is particularly useful for synchronizing the transcript with playback in analysis software.

4. Main Lines and Dependent Tiers

- **Transcription Conventions**
    - **Main Lines**: Start with an asterisk (`*`) followed by the speaker code (e.g., `CHI` for children, `PAR` for adults), **a colon, a tab**, and then the **utterance**. Each utterance should start in the ninth space to align text uniformly.
    - **Dependent Tiers**: Use a percent sign (`%`) for annotations related to the main utterance, specifying the type of annotation in a three-letter code in lowercase letters (e.g., `%com`); a colon; and then a tab where the text begins (MacWhinney, 2000). These should directly follow the main line they annotate.

- `%com:` Stands for “comment” and is used as a dependent tier that follows a main line. This tier provides valuable insights into the non-verbal cues, actions, and background context accompanying spoken utterances.

5. Content Formatting

- **Carriage Returns**: Ensure each line ends with a carriage return for clear separation.
- **Indentation and Speaker Codes**: Do not indent main lines or dependent tiers. Use uppercase letters for speaker codes to maintain consistency and clarity.
- **Utterance Representation**: Represent single utterances per line. Use appropriate annotations or dependent tiers for complex utterances or when representing nuanced phonetic details.
- **Capitalization and Punctuation**: Capitalize only proper nouns and the pronoun “I”. To clearly define its end, each utterance should end with proper punctuation (period, exclamation mark, or question mark). A space may precede them, though it's optional. Attention: words shouldn't contain numbers except to indicate tones.
- **Unintelligible words**: Any words that cannot be understood or heard in the audio should be marked with “xxx”. Example: `*CHI: I saw a xxx in the sky`. Phonetic or non-standard spellings should be used judiciously, with standard forms provided where necessary.
- **Incomplete/unclear phonological sequence**: When transcribing phonological sequences that are not intelligible, represent them with an ampersand followed by an approximation of the sound, for example, “`&~muda`”. This denotes the uncertain segments of speech.
- **Incomplete words are indicated by parentheses enclosing the omitted material, which helps** in language analysis. For example, “running” transcribed as “`runnin(g)`” suggests the speaker's intention to complete the word despite the speech being cut off.

6. MinCHAT example

```
@Begin
@Languages:  eng
@Participants:     CHI Child, MOT Mother
@Options:    dummy
@ID:   eng|corpus|CHI|2;06.00||||Child|||
@ID:   eng|corpus|MOT|36;09.12||||Mother|||
@Media:      session1, audio
*CHI: I want a cook(ie) .
%com: child tries to say 'cookie' but only says 'cook.'
*MOT: you can have one after &~dinn.
%com: parent starts to say 'dinner,' but the word is cut off. The
approximation '&~dinn' represents the unclear part.
*CHI: but I xxx now.
%com: child says something unintelligible.
*MOT: dinner will be ready xxx, just a little longer.
%com: part of the parent's utterance is not audible.
*CHI: o(kay) .
%com: child starts to say 'okay,' but the end of the word is cut off.
@End
```

Starting with minCHAT: A Strategic Approach

For us newcomers to CHAT and CLAN, it's recommended to :

1. **Data Entry**: Input a small sample into a CHAT file first.
2. **Accuracy Check**: Use the CHECK command in the editor to ensure the file's accuracy.
3. **Code Development**: Learn basic codes that align with the CLAN commands needed for your analysis.
4. **CLAN Commands**: Run the appropriate CLAN commands to check your analysis's validity.

Adopting this meticulous approach from the outset should save us countless hours and ensure the success of our analytical work.

3.2 Structuring File Headers:

The CHAT format includes essential file headers that detail key elements like recording date, participant details, and context. Marked with an "@", headers come in various types, such as "**@Begin**", "**@Languages**", "**@Participants**", "**@ID**", and "**@End**", with additional headers for more detail. CHAT features five header categories: Hidden, Initial, Participant-Specific, Constant, and Changeable. For a list of these headers and their components, as well as main lines and dependent tiers, users can reference the **'depfil.cut'** file within the CLAN program's library.

3.2.1 Hidden Headers

CHAT format utilizes hidden headers (i.e., behind-the-scenes instructions) to ensure transcripts are compatible with CLAN software. Essential headers include **@PID**, **@ColorWords**, **@Window**, **@Font**, with **@UTF8** being mandatory. Each header serves a distinct purpose for functionality within CLAN.

1. @UTF8

The CHAT format ensures transcripts use UTF-8 encoding to accurately display all characters from various languages, which is crucial for data integrity in multilingual research. This header guarantees that texts remain readable and correctly represented in CLAN, regardless of the language. All files in the database are marked with the **@UTF8** header to indicate UTF-8 encoding. If a file lacks this header, CLAN will flag it, prompting the user to convert the file to UTF-8 using the CP2UTF program.

2. @PID (Persistent Identifier)

The **@PID** header follows the **@UTF8** header, declaring the transcript's value within the Handle System, which facilitates persistent identification and location of digital objects, important for academic research.

3. @ColorWords

This header enables color coding of text in transcripts, aiding visual data analysis by highlighting key terms or phrases, thus streamlining pattern recognition and thematic analysis. This header records user-defined color values from the Color Keywords dialog for easy reference.

4. @Window

The **@Window** header records the transcript window's size and screen position, customizing the user interface for the researcher's convenience and enhancing workflow efficiency during data analysis. This detail is useful in corpus development but is removed for files in the permanent TalkBank databases.

5. @Font

The **@Font** header specifies a default font for transcripts, ensuring text consistency and readability across platforms. In its absence, CLAN defaults to Arial Unicode. TalkBank transcripts don't use this header, presuming Arial Unicode is used, but users can customize font settings via Open **Clan > Format > Show Fonts.**

3.2.2 Essential Initial Headers

CHAT files use structured headers for transcript clarity and data integrity. Essential headers include **@Begin**, **@Languages**, **@Participants**, **@Options**, **@ID**, and **@Media**, sequentially placed at the start, while **@End** marks the file's conclusion.

@Begin

The **@Begin** header marks the start of a CHAT transcript file, confirming the transcript begins there with no prior content omitted. It stands alone, without additional data or a colon.

@Languages

The **@Languages** header in CHAT transcripts identifies the languages present, following ISO 639-3 standards. The full list of ISO 639-3 codes is available in the CLAN program under **'lib > fixes > ISO-639.cut'**. Given the evolving nature of language and the ISO standard, it's crucial to refer to the latest TalkBank manual for accurate and up-to-date coding practices, especially for handling special considerations (e.g., tone languages like Mandarin or scripts like Arabic), multilingual data, and specific annotation needs like code-switching.

In multilingual transcripts, languages are listed in descending order of use. French and English would be notated as "**@Languages:** `fra, eng`", with French being predominant. In the dialogue, a switch to a less dominant language is marked by a preceding code, such as "`[-ISO]`". An example is "`*CHI: [-eng] this is my jouet@s`", where "`@s`" signals a switch to English. Conversely, if "**@s**" appears without the **[-ISO] tag**, it denotes a return to the primary language.

The following table displays sample languages along with their corresponding ISO 639-3 codes extracted from Wikipedia contributors, (2024):

Language	Code	Language	Code	Language	Code
Afrikaans	afr	**Danish**	dan	**German**	deu
Arabic	ara	**Dutch**	nld	**Greek**	ell
Basque	eus	**English**	eng	**Hebrew**	heb
Chinese	Zho	**Estonian**	est	**Hungarian**	hun
Cree	crl	**Farsi**	fas	**Indonesian**	ind
Croatian	hrv	**Finnish**	sun	**Irish**	gle
Czech	ces	**French**	fra	**Italian**	ita

@Participants

The **@Participants** header is a crucial component in transcripts analyzed using the CLAN software. It identifies the speakers within a transcript, employing a specific format to maintain consistency and clarity across different studies. Creating a **@Participants** header for CLAN software is simple:

1. **Speaker ID**: Start with an asterisk (*) and use an abbreviation like CHI for a child or PAR for an adult, followed by a number for each person (e.g., ***CHI1**, ***PAR1**).
2. **Role/Name**: Add the participant's role or a pseudonym next to their Speaker ID. For longer roles or names, use underscores to link words, like ***PAR1** Alex Investigator. Could also list participants using their ID and role or pseudonym, such as: **@Participants: PAR1 Participant, INV Investigator**.
   Prioritize roles over names for informative purposes and specify names in the **@ID** dialogue header.

The table below shows examples of participants' roles/names extracted from MacWhinney, B.(2000):

3-Letter Code	Standard Role
ADU	Adult
CAR	Caretaker
CHI	Target Child
DOC	Doctor
FAT	Father
FEM	Female
FND	Friend
INV	Investigator
MAL	Male
MOT	Mother
NUR	Nurse
OTH	Other
PAR	Participant
SIB	Sibling
STU	Student
TAR	Target Adult
TEA	Teacher
UNC	Uncertain
VIS	Visitor

@Options

The **@Options** header isn't required in transcripts created with the CLAN program, but it can be very helpful. It sets references that influence tools like CHECK for format accuracy against CHILDES standards and XML validators for document structure and rule compliance.

The **@Options** header in CLAN transcripts includes options for specific functions:

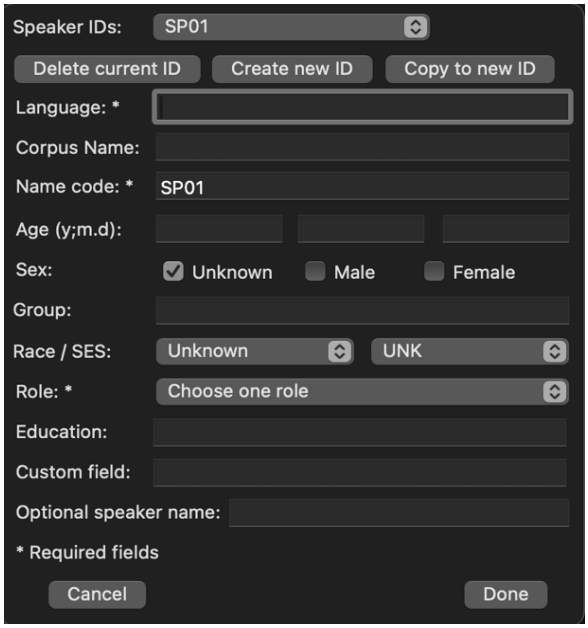
- **IPA**: Indicates use of the International Phonetic Alphabet for phonetic notations. Allows IPA notation in the transcript/main lines. It's for writing down sounds exactly as they're spoken, allowing for the representation of phonetic and phonological notations.
- **CA**: This adjusts the transcript for Conversation Analysis methods, omitting standard utterance terminators, making writing about how people really talk easier.
- **CA-Unicode**: For Conversation Analysis with East Asian scripts, switch to Arial Unicode MS font for compatibility with non-Latin scripts.
- **multi**: Signals transcripts with multiple annotations per line, like time-stamped data from software like Praat, telling tools to expect and properly interpret these (MacWhinney, 2000). To use this option tells CHECK and Chatter to expect multiple bullets on a single line (MacWhinney, 2000).
- **bullets**: This allows flexibility in time-stamp sequencing, useful when precise sequential timing isn't necessary. It also makes transcript annotation more flexible. Timestamps no longer need to be placed in order.
- **dummy**: It is used as a placeholder for incomplete transcripts or those awaiting transcription, indicating pending work on the associated media file.

@ID

The **@ID** header in language studies catalogs participant details, enhancing data organization and analysis. It follows this structure:

```
@ID: language|corpus|code|age|sex|group|eth,SES|role|education|custom|
```

For creating `@ID` headers, a dialog system in the Tiers menu provides customization, ensuring accurate and systematic participant information recording. Here's the illustration of the dialog box, with a summary of the key features of `@ID` to its left:



- **Language**: ISO codes.
- **Corpus**: Single-word, lowercase.
- **Code**: Three-letter, uppercase.
- **Age: years;months.days** format, use periods for unknowns.
- **Sex**: “male” or “female” in lowercase.
- **Group**: Abbreviated single-word label.
- **Eth, SES**: Ethnicity, Socioeconomic Status; defaults to White if omitted.
- **Role**: Defined by @Participants line.
- **Education**: Level of education (or parents for children).
- **Custom**: Additional project-specific info.

@Media

The `@Media` header links transcripts to media files in the CLAN framework for TalkBank databases, adhering to these rules:

1. **Naming Convention**: Transcript and media filenames must match, excluding file extensions, to enable easy pairing.
2. **One-to-One Linkage**: A strict one-to-one correspondence between each transcript and media file ensures streamlined database management.
3. **Media Declaration**: The header denotes the media file name (extension excluded), its type (audio/video), and optionally, its status (missing, unlinked, no trans) to reflect the media's availability or transcription state.

4. **@Options: dummy** signifies the media file is awaiting transcription or linkage.

@End

Like the **@Begin** header, it does not use a colon and requires no additional information. It is positioned at the file's conclusion, serving as the final line. Remember to check your work and save your file ☺.

3.2.3 Participant-Specific Headers

The participant-specific headers are crucial for detailing individual-specific information in language transcripts. These headers come **after the general identification headers (@ID)** and include:

- **@Birth of #** marks the participant's date of birth, where "#" is replaced with the individual's unique identifier. It's structured as **@Birth of PAR1: dd-mmm-yyyy**
- **@Birthplace of #** records the place of birth for the participant, with "#" denoting the participant's unique code; as **@Birthplace of PAR1: City, Country**.
- **@L1 of #** indicates the first language of the participant, with "#" representing the participant's identifier, structured as: **@L1 of PAR1: ISO-639**

These details are vital for segmenting and analyzing the data based on demographic factors like age, geographic origin, and linguistic background.

3.2.4 Optional Constant Headers

Following the participant information, the documentation features optional constant headers. These headers enrich the recording data with context, quality, and specific details to enhance understanding of the interaction's circumstances. The list of constant headers is in the CLAN folder under **lib > depfile.cut**.

Category	Structure	Intended Use
@Location:	City, State/Province, Country	Specifies the geographical location of the recording event.
@Number:	x	Indicates the number of participants in the recording.

Category	Structure	Intended Use
@Recording Quality:	1-5	Rates the recording quality (i.e., audio/video) on a 1 to 5 scale, with 5 indicating the highest quality (MacWhinney, 2000).
Room Layout:	Description	Outlines the recording environment's layout to contextualize participant interactions.
@Tape Location:	tape ID, side, footage or counter number/timestamp	Details the physical location of the recording on an analog tape for retrieval purposes.
@Time Duration:	`HH:MM: SS-HH:MM: SS`	Logs the recording's duration and specific start and end times, facilitating content navigation and supporting various CLAN commands such as `C-NNLA`, `C-QPA`, `EVAL`, `SCRIPT`, `SUGAR`, `TIMEDUR` and `LENA2CHAT` (MacWhinney, 2000)
@Time Start:	`HH:MM: SS`	Notes the precise start time of the recording, important for unlinked transcripts.
@Transcriber:	Name	Acknowledges the individual(s) who transcribed the recording.
@Transcription:	Level of detail	Specifies the transcription's detail level, from exact verbatim to general summaries, including categories like "`eye_dialect`", "`partial`", "`full`", "`detailed`", "`coarse`", and "`checked`" (MacWhinney, 2000).

Category	Structure	Intended Use
@Types:	Design, Activities, Group	Tags recordings for child language research by design, activity, and group to support data comparison in KidEval and TalkBankDB.
	Design examples	Cross-sectional (**cross**), Longitudinal (**long**), Observational (**observ**)
	Activity examples	Telling stories (**narrative**), Talk during mealtime (**meal**), describing actions in pictures (**pictures**), activities across the day (**everyday**), structured tests (**tests**) etc (MacWhinney, 2000).
	Group examples	Autism Spectrum Disorder (**ASD**), Specific Language Impairment (**SLI**), Adults who stutter (**AWS**) (MacWhinney, 2000) etc.
@Videos:	Description of camera setup	Details camera arrangement, quantity, placement, and other pertinent recording specifics.
@Warning	Description of potential issues	Alerts users to potential issues/limitations with the recording or transcription that may affect analysis.

Illustration

```
@Begin
@Languages:  eng, fra
@Participants:     PAR1 Alex Investigator, PAR2 Sam Participant
@Options:     multi, CA, CA-Unicode, dummy
@ID:   eng|Study_1|PAR1|23;05.20|male|||Investigator|||
@ID:   fra|Study_1|PAR2|18;05.23|female|||Participant|||
@Birth of PAR1:    17-AUG-1994
@Birthplace of PAR1:     Manchester, England
```

```
@L1 of PAR1: eng
@Birth of PAR2:    18-OCT-2000
@Birthplace of PAR2:     Lyon, France
@L1 of PAR2: fra
@Media:      session1, audio
@Location:   Paris, Île-de-France
@Number:     2
@Recording Quality:      5
@Room Layout:      classroom; desks arranged in U-shape, whiteboard on south
wall, bookshelf on east wall
@Tape Location:    tape05, side a, 015
@Time Duration:    00:10:00-00:20:00
@Time Start: 09:00:00 (9 hours, 0 minutes, 0 seconds)
@Transcriber:      Theresia MB
@Transcription:    Full
@Types:      long, narrative, biling
@Videos:     wo angles; Camera1 facing whiteboard, Camera2 capturing student
desks
@Warning:    minor background noise from adjacent classroom
*PAR1: I'm good, thanks.
*PAR1: et toi@s, comment ça va@s?
*PAR2: oui, à l'heure habituelle.
*PAR2: let's say around two pm ?
*PAR1: okay then, see you
*PAR1: by the way have you seen the latest project updates
*PAR2: yes, i have c'est très intéressant@s
*PAR1: i thought so too its going to be a busy month.
*PAR1: 中文
@End
```

3.2.5 Changeable Headers

Changeable headers in CHAT format document dynamic details throughout a file, marking shifts in context or activities. They can appear anywhere, including the start, and are accessible in **`CLAN/Lib/depfile.cut`** along with other header types.

Category	Intended Use	Example	Additional Information
@Activities	To document specific events or actions within the situation.	@Activities: opening presents, playing games, eating cake at a birthday party.	-
@Bck	Adds contextual or background information to clarify circumstances.	@Bck: the room was dark, and the child was searching for the light switch.	-
@Bg and @Eg (Gem)	The @Bg and @Eg markers are always used in pairs. Nesting is permitted to a single level. Initiating a new pair before closing the existing one is allowed, but only up to two concurrent beginnings.	"@Bg" to start "@Eg" to end a segment analyzing complex sentence usage.	"Gems" are specific data segments that are marked for detailed analysis. These markers help describe the segments and make them easy to find later.
@Blank	Signifies a blank line or new paragraph, distinguishing structural elements in a document. Created by the TEXTIN program. "@Blank" to indicate a pause in a narrative or a shift to a new topic.	@Blank	Used in written text analysis, not for spoken language transcripts.

Category	Intended Use	Example	Additional Information
@Comment	Allows inclusion of any type of comment that adds context or clarifies the data.	`@Comment: the child has been learning new words rapidly this month.`	Use "`%com`" for comments on specific utterances and "`@comment`" for general file material.
@Date	Indicates the date of interaction, crucial for tracking the timing of recordings.	`@Date: 15-MAR-2024`	Always use two digits for days in date entries. Consistent for documentation in longitudinal studies or multi-day records.
@G (Lazy Gem Marker)	The `@G` marker indicates the start of a data segment for targeted analysis and is compatible with the GEM program. It can be used alone or with a colon and additional code for precise later retrieval.	"`@G: joy`" to tag a segment where joy is expressed.	Used when no nesting or overlapping of gems occurs; considered a "lazy" gem marker due to its simplicity (MacWhinney, 2000).
@New Episode	The header signals the start of a new recording segment or episode, automatically denoting transition without specifying the end.	`@New Episode`	it's a "bare" header, used without a colon as it requires no additional information (MacWhinney, 2000).
@Page	Refers to the page number of text being analyzed, useful in document-based studies.	`@Page: 34`	Not applicable to spoken text transcripts.

Category	Intended Use	Example	Additional Information
`@Situation`	Describes the overall setting or context of the interaction, offering rich contextual information.	`@Situation: family dinner at home” to set the scene of the interaction.`	Sets the interaction scene, detailing participants, activities, and key ethnographic information for user clarity.

3.3 Word-Level Transcription

Words form the foundation of sentences and discourse. Exploring word usage unlocks insights into syntax, discourse, morphology, and conceptual frameworks. For robust computational analysis, consistency, especially in spelling, is crucial. CHAT analysis aims for methodological precision and reduced inconsistency. This section outlines simple rules to maintain word-level consistency, covering learner variations, unidentified materials, incomplete words, formulaic expressions, and standard spellings.

Comprehensive MOR grammars for languages like English, Spanish, and Japanese provide definitive standards for word usage and demonstrate these principles in detail. It is advisable to consult these lexical resources for a more nuanced understanding of the guidelines presented.

To check the spelling of specific words, refer to the **`'0allwords.cdc'`** file (MacWhinney, 2000). This file is in the 'MOR' grammar folder for each language, or according to the file structure, **`'Clanc/Work/Mor/language/0allwords'`** if you've arranged your files this way. The words in the file are sorted alphabetically (MacWhinney, 2000).

3.3.1 Formatting Main Lines

In CHAT transcriptions, each utterance is recorded on a “main line”, which reflects the speaker's exact words. This line is identifiable by its structure:

- It begins with an asterisk (*) to denote the start of a new speaker's utterance.
- Following the asterisk, a three-letter code represents the speaker's ID.

- A colon and a tab follow the speaker ID, with the transcription starting in the ninth column. This alignment is due to the tab stop being set at the eighth column in the transcription editor.

The transcription predominantly comprises words, each delineated as a contiguous series of American Standard Code for Information Interchange (ASCII characters), which include letters, numbers, and specific symbols (MacWhinney, 2000). Spaces separate these to form meaningful phrases. For clarity, words starting sentences are lowercase except for proper nouns, the pronoun "I", and its contractions. Transcriptions follow standard dictionary spelling (MacWhinney, 2000).

As per CLAN software guidelines, Punctuation within CHAT includes a standard set of marks: "`!., []>`"(MacWhinney, 2000). These marks, along with spaces, are external to words, aiding in their demarcation. Exceptions to this rule exist in specific coding lines like `%pho` and `%mod`, where punctuation plays a unique coding role(MacWhinney, 2000).

Special non-letter characters are used to denote particular meanings in word transcription, following the codes outlined for Conversation Analysis:

- "+" to indicate a connected form,
- "_" for marking unspoken or uncertain segments,
- "-" for hyphenated words or to break up compound terms,
- "@" for indicating non-standard words or sounds,
- "(" and ")" for encasing comments or non-verbal sounds.

3.3.2 Special Form Markers

Unique form markers, indicated by the symbol "@" at the end of a word in language transcripts, are used to classify non-standard words like dialect-specific variations. They ensure that these words are treated as complete lexical items, not fragments, essential for accurately documenting language learning and use. Look for those markers in the "**sf.cut**" file in the MOR program directory.

The table below compiles standard transcription markers, as proposed by the manual.

Marker	categories	Usage	POS
@a xxx	**Addition**	To include unintelligible strings as words in %mor lines, MOR can recognize formats like xxx@a or xxx@a$n as w|xxx. However, this doesn't permit sentences with such words to be included in MLU and DSS calculations, due to their rules. Typically, researchers mark unintelligible forms simply as xxx, without adding @a.	**w**
@c	**Child-invented form**	Children sometimes create words from existing ones, make sound variants, or invent words of unclear origin, which they believe have meaning. These creations, often used confidently by the child, may also be adopted by adults, suggesting a perceived significance.	**chi**
@d	**Dialect form**	To note dialect forms, though its use is minimized to keep transcripts readable, with general patterns of phonological variation	**dia**
@e [+ imit] postcode	**Echolalia, repetition**	For marking echolalia at the word level, use the **"[+ imit]**" postcode for echoed utterances.	**skip**
@f	**Family-specific form**	These forms, originating from child speech, older family members, or another language, encompass "caregiverese" not widely recognized outside specific families or regions. They are used by both adults and children within families.	**fam**
&-um	**Filled pause**	Previously, "@fp" was used, but now "&-um" is adopted to exclude entries from grammatical analysis.	**skip**
@g	**General special form**	Use a general special form marker only as a last resort; marking with "@" alone is not permitted by CHECK and should generally be avoided.	**skip**

Marker	categories	Usage	POS
@i	**interjection, interaction**	Interjections are indicated by "@i", though its use is often unnecessary with standard transcription conventions, which already accommodate interjections.	**co**
@k	**Multiple letters**	To treat sequence of. Letters as one unit.	**n:let**
@l	**Letter**	It's used for individual letters, as when spelling out words letter by letter. In lexical analysis, tools like CLAN can struggle with English inconsistencies like irregular spellings and colloquialisms. The "@l" and "@k" markers help ensure tools like FREQ and COMBO work correctly by maintaining consistent spelling. For correct spellings, refer to the **'0allwords.cdc' file**.	**n:let**
@lp	**Letter plural**	Marks the plural of a letter name. Earlier forms like a@l-s are no longer used.	**n:let**
@n **@n$v** **with** **%mor**	**Neologism**	In the AphasiaBank corpus, neologisms—words without real-world counterparts, typical in jargon aphasia—are identified. To specify a neologism's intended part of speech, a notation like 'neologism@n$v' signifies 'neologism' as an intended verb, according to the '%mor coding' method. Detailed classifications are further outlined in the error coding chapter	**neo**
@o	**Onomatopoeia**	Including animal sounds and attempts to imitate natural sounds (MacWhinney, 2000).	**on**

Marker	categories	Usage	POS
@p	**Phonology consistent form**	Indicates phonologically consistent forms (PCFs), early speech elements with consistent sound patterns but ambiguous meanings, frequently referred to as protomorphemes—precursors to fully developed morphemes.	**phon**
@q	**Metalinguistic use/reference**	Used to cite or quote standard words or unique child-specific forms (MacWhinney, 2000).	**meta**
@s:*	**Second-language form**	Marks second-language words, using @s followed by the ISO-639 code for the language, e.g., @s:zh for Chinese words in an English sentence.	**L2**
@s$n	**Second-language noun**	Marks the part of speech for words in a second language using @s$, e.g., "cane@s$n" indicates "cane" as a noun in Italian (MacWhinney, 2000).	**n|**
@si	**Singing**	Mark singing with @si, using underscores for connected words or nonwords, like "lalaleloo@si". For longer sung passages, transcribe as speech and note singing through a comment line.	**sing**
@sl	**Signed language**	Indicates sign language use.	**sign**
@sas	**Sign & speech**	Marks the use of sign and speech simultaneously.	**sas**
@t	**Test word**	Test words, or nonce forms, are invented by researchers to assess a child's ability to apply grammatical rules.	**test**
@u **@pho**	**Unibet transcription**	Unibet transcriptions are now secondary to direct IPA; use a @pho line for multiple instances. CLAN treats @u as lexical items on the main line; an initial & denotes non-lexical forms, making @u unnecessary.	**uni**

Marker	categories	Usage	POS
@wp	**Word play**	Word play in children over two years old is marked as full lexical items on the main line in CLAN. If prefixed with &, the form is not a full word and doesn't require @wp.	wp
@x:*	**Excluded words**	To mark excluded forms, potentially followed by a user-defined code (MacWhinney, 2000). These forms will be tagged as "unk" by MOR (MacWhinney, 2000).	unk
@z:xxx	**User-defined code**	Followed by up to five letters of a user-defined code (MacWhinney, 2000). MOR will ignore or "skip" the user code and process the word (MacWhinney, 2000).	**N/A**

3.3.3 Handling Ambiguous Speech

In transcriptions, placeholders such as xxx, yyy, or www denote unclear speech, obscured sounds, or unknown languages, indicating areas of audio that are unidentifiable. These are cataloged in the accompanying table for reference:

Marker	Type	Usage
xxx	**Unintelligible Speech**	Used when speech is present but unclear due to weak audio, background noise, or distorted speech. MLU and MLT commands ignore the 'xxx' symbol (MacWhinney, 2000)., which represents indiscernible words. Use multiple 'xxx' symbols for multiple unclear words.
yyy	**Phonological Coding**	For phonological analysis, when transcribers recognize sounds but can't identify them as words, especially in cases of non-standard speech or unclear articulation (i.e., uninterpretable utterances):
www	**Untranscribed Material**	Use this symbol on the main line to mark audio segments intentionally not transcribed, such as irrelevant or unknown content, or off-topic discussions. It used in conjunction with the %exp tier.

3.3.4 Processing Fragments and Fillers

Markers like &+, &-, and &~ indicate non-standard elements, including disfluencies and planning sounds. Specific CLAN commands will ignore material following the ampersand symbol, such as the Mean Length of Utterances (MLU) and the FREQ command. To include these markers in specific analysis, you must add a switch before them.

Below is a table summarizing these markers:

Marker	Type	Usage
&+	**Phonological Fragments**	&+ indicates a speaker's attempt to start a word but switches to another, like "&+g game" for an interrupted "go", often followed by a retrace mark. Unlike stutters marked with ↫ (e.g., "↫s-s-s↫sun"). &+ is not used for fillers, exclamations, or near-complete words.
&-	**Fillers**	Transcribing speech fillers involves using specific codes; for common English fillers use: &-uh, &-um, &-er, &-ehand avoiding variations like &-uhm or &-erh (MacWhinney, 2000). Sounds like "uhuh" or "umhum" serve distinct functions and are classified as communicators (MacWhinney, 2000). Phrases such as "like" and "you know" are transcribed as &-like and &-youknow if used for speech planning, though their classification as fillers is subjective (MacWhinney, 2000).. In other languages, fillers differ, reflecting the need to adapt to linguistic nuances.
&~	**Nonwords**	Marks nonwords not classified as fillers or phonological fragments, without a special form marker. It's a catch-all for any non-standard speech element not covered by the other, help in analyzing speech elements that don't serve a clear communicative or linguistic function.

3.3.5 Techniques for Anonymization

To ensure compliance with Institutional Review Board (IRB) guidelines and the General Data Protection Regulation (GDPR) (MacWhinney, 2000), de-identification of transcripts involves:

1. **Recording Practices**: Avoid capturing personal details (e.g., names, addresses, or specific institutional identifiers).
2. **Audio Editing**: Utilize software (e.g., Amadeus Pro, Audacity) to delete or mute parts of the audio with personal information.
3. **Text Anonymization**: In transcripts, replace personal data with placeholders like "Lastname" or "Cityname".
4. **Pseudonyms**: Assign and securely store pseudonyms for any personal information.

Despite participant consent, IRB and GDPR standards mandate these precautions to protect privacy, with interpretations varying by institution.

3.3.6 Compound Words and Linkages

In linguistics, understanding how words combine into larger lexical items is fundamental. Two key processes in this domain are the formation of compounds and linkages. Compounds are words formed by combining two or more words to create a new meaning (e.g., "birdhouse"). At the same time, linkages represent phrasal combinations that maintain a close association without forming a standard compound (e.g., "Mayonnaise_On_An_Escalator"). Forming larger lexical items in languages can involve various methods, such as compounds, linkages, and hyphenated forms. The distinction between these processes and their notation, especially in linguistic software like CLAN and the MOR program, is crucial for accurate analysis.

The table below summarizes the notation and usage of compounds, linkages, and other related forms, providing a clear guide to their application in linguistic studies.

Indicator	Type	Description
None (previously "+").	**Compounds**	The MOR program now automatically identifies standard compound words, so there's no need to use a "+" sign. For instance, it recognizes 'birdhouse' and 'babysitter' as compounds.
Underscore (_)	**Linkages**	Use underscores for phrasal combinations that are not standard compounds but still closely linked. This applies to proper nouns, non-standard phrases, multiword English glosses on the `%mor` line, and within acronyms to show separation or association. Underscores can also denote book titles, songs, appellations, or places. However, no underscores are needed for recognized acronyms like 'TGV' or 'CIA', which are already identified as proper nouns
Hyphen (-)	**Hyphenation**	Words typically written with hyphens, like 'mother-in-law' and 'co-worker', are transcribed exactly as such. You can find them listed in the **`'n-hyphen.cut'`** file within the English MOR folder. On the %mor line, hyphens are changed to en-dashes (–) to avoid mix-ups with suffixes.

3.3.7 Capitalization and Acronyms

The MOR program recognizes proper nouns by starting with a capital letter. Standard acronyms are written in uppercase (e.g., "GPS", "LED"), while complex ones may use underscores (e.g., "`A_one_B_two`"). Common nouns in acronyms are in lowercase (e.g., "GPS", "led") and noted in the "**`n-acronym.cut`**" or "**`n-abbrev.cut`**" file within the "**`lex`**" folder of the MOR folder. For spoken acronyms, capitalize only the first letter (e.g., "Nasa") without internal periods to distinguish them from punctuation.

3.3.8 Notating Numbers and Titles

When writing, spell out numbers as they are pronounced, including currency, percentages, and time. In academic writing, titles should precede names. "Dr." becomes "`Doctor`", "Mr." becomes "`Mister`", and "Mrs." becomes "`Missus`" for formality and clarity.

3.3.9 Family Relationship Terms: Kinship Forms

Kinship forms in Standard American English feature a mix of formal titles and affectionate nicknames, highlighting the intricacies of family relationships and cultural expressions. These terms, documented in resources like Webster's Third New International Dictionary and various online platforms, capture traditional and evolving family dynamics. Some examples are provided on TalkBank .

3.3.10 Abbreviations and Incomplete Words

Transcribing spoken language involves capturing word "shortenings", where speakers omit sounds or syllables. Omitted parts are enclosed in parentheses for analysis, e.g. b(e)longs. This technique is crucial for transcription software and morphological analysis, especially for challenging English contractions like possessives or past-tense forms.

For morphological analysis, contractions akin to 'John's' or 'you'd' in English should be transcribed to reflect their full forms, like `'John (ha)s'` and `'you (woul)d'`, enhancing the efficiency of programs like MOR (MacWhinney, 2000). Dictionaries provide standardized representations for shortenings across languages. Mastering this transcription method is essential, particularly in the CHAT format, which handles these as spelling variations for readability and phonological detail.

Incomplete words are also marked with parentheses, e.g., "`sit(ting)`". Use parentheses for partial omissions when the intended meaning is clear, inserting the missing material within them (MacWhinney, 2000). Analysis programs like CLAN and FREQ consider these to be full words. CLAN allows the inclusion or exclusion of this material based on the analysis objectives.

3.3.11 Assimilation and Cliticizations

Understanding spoken languages involves recognizing how words often contract or blend in everyday conversation. This blending or changing occurs through two primary processes: **cliticizations and assimilations**. TalkBank and other linguistic databases focus on transcribing natural speech, often using clitic and assimilation forms while being mindful of the context. These forms are not listed in Webster's Third New International Dictionary, but some examples are listed on TalkBank

Cliticizations

Cliticizations occur when words contract or merge, often changing their forms to fit more seamlessly into the flow of spoken language. This typically involves auxiliary verbs and other words or morphemes. For clarity, here's how some standard phrases contract:

- **Mod~Aux Standard**: “should have” to “shoulda”.
- **Mod~Inf Standard**: “has to” to “hasta”.
- **V~Inf Standard**: “want to” to “wanna”.

Standard forms are preferred in situations where contracted forms may obscure meaning, such as indicating specific actions or necessity. Examples of cliticization are documented in the “**`v-mod-have.cut`**” and “**`v-mod-to.cut`**” files in the MOR lexicon folder.

Assimilations

Assimilations refer to the process where words or sounds within words change to resemble their neighboring sounds more closely, facilitating smoother transitions in speech. These changes can significantly alter a word's pronunciation and occur frequently in informal settings. Consider these examples:"**have to**" to "**hafta**", or "**going to**" to "**gonna**". Unlike cliticizations, the range of possible assimilations is almost endless, and they can't ALL easily be categorized by part of speech. Some examples are available in the **v-clit.cut file** in MOR.

When transcribing these forms for linguistic analysis, using specific notations to indicate the original phrases alongside their spoken forms is helpful. For example, to capture the assimilation like "let us" to "let's" , you might write: `*PAR: assimilation [: standard] = *PAR: let's [: let us].` This notation allows analysis programs like MOR to recognize and process the material as "let us", despite being presented in the contracted form. A simpler way to indicate these changes, especially for minor omissions, involves using parentheses to show which letters are dropped: "**gimme**" can be written as "`gi(ve) me`"; "**lemme**" as "`le(t) me`" or "**do you**" as "`d(o) you`" (MacWhinney, 2000).

3.3.12 Communicators and Interjections

In linguistic analysis, communicators and interjections, which express emotions or hesitations, are grouped as 'communicators' despite varied phonological forms. The English MOR lexicon provides standardized forms in files like `'co.cut'`, `'co-rhymes.cut'`, `'co-under.cut'`, and `'co-voc.cut'` in the lexicon folder (MacWhinney, 2000). This ensures consistent analysis across different phonetic expressions. Variants close to the standard form must follow these norms.

The table lists examples of communicators and filled pauses, extracted from MacWhinney., (2000):

Type	Forms	Notes
Communicators	uh, nope, ugh, gosh	Standardized forms are used; variations like vowel length are represented accordingly.

Type	Forms	Notes
Filled Pauses	&-ah, &-eh, &-er, &-ew, &-hm, &-mm, &-uh, &-uhm, and &-um.	Any material marked with "`&-`" is ignored during analysis

3.3.13 Spelling Variants

During transcription, common alternative spellings for certain words are recognized, e.g., "altho" for "although". The English MOR grammar specifies preferred spellings to maintain uniformity. It's advised against using apostrophes in simple words (monomorphemic) that do not need them, reserving them mainly for contractions that combine multiple parts of speech (multimorphemic contractions).

3.3.14 Colloquial Forms

The MOR lexicon in the CLAN software features a range of informal and slang expressions typically used in conversation. These are included to aid in accurately transcribing and interpreting spoken language. However, some colloquial terms used in transcriptions may be listed outside formal dictionaries like Webster's Third New International Dictionary.

3.3.15 Dialectical Variations

When transcribing speech, consider how to represent dialect variations, which are deviations from the standard language in pronunciation, grammar, or vocabulary:

1. Link dialect variations to standard equivalents using "**`[: replacement]`**" notation.
2. For strong dialects, opt for a phonological transcription of the entire text linked to the corresponding CHAT-formatted audio recording.
3. Alternatively, you can transcribe in Standard English, ignoring dialect differences. Clearly state this approach in the readme file.

These strategies help navigate dialectal differences not captured by dictionaries like Webster's. Here's a table with dialectical variants and their standards, as presented in the manual:

Dialectical Variant	Standard English
caint	can't
hows about	how about
da	the
nutin	nothing
dan	than
sumpin	something
dat	that
ta	to
de	the
tagether	together
dese	these
tamorrow	tomorrow
deir	their
weunz	we
deirselves	themselves
whad	what
dem	them
wif	with
demselves	themselves
ya	you
den	then
yall	you all
dere	there
yer	your
dey	they
youse	you all

Dialectical Variant	Standard English
dis	this
yinz	you all
dose	those
younz	you all
fer	for
ze	the
git	get
zis	this
gon	going
zat	that
hisself	himself

3.4 Utterances Transcription Techniques

This section shifts focus from the transcription of individual words and morphemes to the delineation and transcription of complete phrases and distinct utterances in conversational analysis.

3.4.1 Documenting Adult Utterances

Language segmentation for older children and adults must adhere to several principles to ensure accurate grammatical analysis and consistency in language profiling. Here's a concise overview of these principles with examples:

Principle	Example	Description
Main Clause Requirement	The cat (subject) sits (verb).	Ensures that utterances include a main clause typically necessitating a subject and a main verb.

Principle	Example	Description
Null subject Language	French: "Parle!" ("Speak!"), where "you" is the understood subject.	Exceptions allowed for imperative forms and languages permitting subject omission.
Inclusion of Modifiers	The cat sits (main clause) on the mat (adjunct).	Complete utterances can include dependent clauses, adjuncts, and adverbial phrases.
Separation of Conjoined Clause	"I called but nobody answered". Treated as two utterances: I called. Nobody answered.	Conjoined clauses should be segmented into separate utterances for clearer analysis, except when "and" connects noun/verb phrases within a single clause.
Handling Incomplete Utterances	Ellipsis: "Want to go?" (Omitting "Do you") Trailing Off: "I think we should..."	Accounts for utterances made incomplete by ellipsis (deliberate omission of words that are understood from the context) or trailing off (when speech decrease in volume or becomes less clear, suggesting hesitation or prompting the listener to deduce ending).

3.4.2 Using Satellite Markers

Satellite markers are pivotal in conversation flow and clarity, signal intentions, and structure speech. Crucially, for accurate analysis by MOR (Morphological Analysis) and GRASP (Grammar and Syntax Parsing), they must be isolated with spaces to ensure correct processing as separate word forms, enhancing the depiction of speech patterns. These markers are divided into two main categories based on their position within speech, which significantly aids in segmenting speech for detailed syntactic analysis, thereby enriching our understanding of language use in real-life interactions:

1. **Initial Satellites**: Positioned at the start of an utterance, initial satellites include vocatives (names or titles to address participants) and words like "well", "but", "sure", and "gosh". Their functions are to catch the listener's attention, indicate a shift

in conversation, or soften the delivery of the message. They act as bridges, introducing new topics or linking segments of discourse.

2. **Final Satellites**: Located at the end of an utterance, final satellites encompass question tags (e.g., “okay?”, “right?”), sentence-final particles (particularly prevalent in Asian languages), and various communicators. They aim to confirm understanding, seek agreement, or mark the end of a speaking turn. In Asian languages, sentence-final particles play a crucial role in expressing questions, emphasis, mood, or politeness, making accurate transcription essential for capturing the nuances of spoken discourse.

This table categorizes details on satellite markers:

Marker	Type	Position	Usage	Example
‡	**Prefixing Interactional Marker**	Before a main sentence	To indicate responses or reactions in dialogue, use the marker ‡ to signify that the utterance directly relates to what was previously said	`*PAR: well ‡ I don’t want to eat that`
„	**Suffixing Interactional Marker**	After the main sentence	To add emphasis or seek confirmation.	`*PAR: what do you say „ okay?`

- **For Mac**: Press `Control-Command-Space` to open the punctuation section, then select the double dagger (‡) or the double low-9 quotation mark („) (*How to Type Double Low-9 Quotation Mark*, n.d.).
- **For Windows**: Hold down the `Alt` key and type `0135` on the numeric keypad for the double dagger (‡), or type `0132` for the double low-9 quotation mark („) (*How to Type Double Low-9 Quotation Mark*, n.d.).

3.4.3 Repetition In Speech

In discourse analysis, it's crucial to recognize the distinct meanings of repeated phrases despite interruptions. Identifying these nuances ensures accurate analysis and prevents misinterpretation of data. While noting lexical repetition is essential, it shouldn't affect other quantitative evaluations.

3.4.4 C-Unit and Utterances vs Sentences.

In speech analysis, “sentence” is rarely used because it suggests written text. Instead, “utterance” and “C-unit” are preferred. A C-unit includes a main clause and its dependents, but unlike a written sentence, it may be unfinished and have irregularities like disfluencies. Traditional transcription often combines a speaker's words into one long sentence, complicating grammar analysis. Utterances should contain only one main clause. When a participant uses multiple “and” to connect thoughts, each should start a new line. If other conjunctions besides “and” are used, then treat the connected clauses as part of the same utterance.

3.4.5 Basic Utterances Terminators

The basic punctuation marks for ending chat utterances are the period (`.`) for declarative statements, the question mark (`?`) for inquiries, and the exclamation mark (`!`) for commands or statements with strong emphasis. Each line in CHAT should contain a single utterance ending with one of these punctuation marks. Commas do not serve as terminators. An utterance can span multiple lines; the subsequent line must start with a `tab`. The CLAN analysis software has a 2000-character limit for each line, whether a main utterance, a dependent utterance, or a header. For software accuracy, avoid periods in abbreviations (e.g., use “`Dr`” not “`Dr.`”) and do not capitalize the first word of sentences.

3.4.6 Indicating Tone and Intonation

In CHAT, traditional tone markers like -? and -! have been replaced by symbols ↑ for rising and ↓ falling intonation, aligning with standard notation. Like Conversation Analysis (CA), CHAT interprets a final question mark as a rising intonation, an exclamation mark as an emphatic intonation, and a period as a final fall (MacWhinney, 2000). Additionally, CHAT mandates that each utterance concludes with a delimiter (MacWhinney, 2000). Here's a concise table summarizing the key points:

Marker	**Description**	**Example**
↑	Rising intonation	`Can we go ↑?`
↓	Falling intonation	`I think so ↓.`
↑↓	Final rise then fall intonation	`Really ↑↓?`

Marker	Description	Example
↓↑	Final fall then rise intonation	`Are you sure ↓↑?`
?	Indicates a question, typically rising tone	`Are you sure?`
!	Indicates an exclamation, emphatic intonation	`Watch out!`
.	Ends declarative sentences, falling tone	`We'll see.`
↓?	Question not ending in a rise	`Are you going to the store ↓?`

3.4.7 Capturing Prosodic Features

CHAT includes codes detailing speech nuances like word stretching, internal pauses, stress, and pitch changes. Transcribers use a combination of CHAT and conversational analysis (CA) markers, as described in the CA coding section of the manual. CHAT also adds extra symbols for accurate prosodic annotations.

Marker	Type	Usage	Example
'	**Primary Stress**	It denotes primary stress in a word and is positioned directly before the stressed syllable.	co'ffee
ˌ	**Secondary Stress**	It indicates secondary stress on a syllable and is placed immediately before it.	aˌbi'lity
:	**Lengthened Syllable**	A colon in a word extends a syllable's sound, best used with vowels or continuous sounds since sharp consonants, like 't' or 'p', can't be drawn out.	hel:lo
^	**Pause**	Brief pause between syllables.	mag^net
&-	**Filled Pauses**	Hesitation sounds.	&-um
≠	**Blocking**	When a speaker hesitates or struggles to speak, a phenomenon often seen in speech disfluencies is known as "blocking". This is indicated by placing a 'not equal' sign (≠) before the word.	≠starting

3.4.8 Identifying Local Events

"Local events" in transcription are non-verbal actions such as sounds, gestures, and pauses within a dialogue that are crucial for capturing the full scope of communication. Classifying these events enhances the transcript's readability and analytical depth, making it easier for researchers to interpret the data.

Simple Events

CHAT uses "simple event" codes, prefixed by "&=", to efficiently record verbal and non-verbal actions like sounds and gestures. These codes, like (=&laughs) for all forms of laughter, provide a standardized method to annotate specific actions concisely. This system allows for better

organization and easier searchability within transcripts. It avoids the need for lengthy comments or detailed descriptions, maintaining the flow and readability of the transcript.

Below is a summarized table of these codes for quick reference:

Marker	Category	Example
&=	**Verbal /Nonverbal Vocalizations**	&=laughs
		&=coughs
		&=sneezes
&= action:object	**Action and Imitations**	&=imit:motor
		&=points:car
		&=reads:sign
	Compound Actions	&=walks:door
		&=hits:table
		&=eats:cookie
&=body part:action	**Body Movements**	&=head:yes
		&=hands:hello
		&=mouth:open
&=gesture:action\object	**Gesture and meaning**	&=ges:frustration
		&=ges:come

Interposed words &*

To smoothly indicate a listener's brief interjection like “yeah” or “mhm” during someone else's speech in CHAT transcription, use “&*” followed by the listener's ID and the word. This method maintains readability and is preferred for analyses and automated systems like ASR (Automatic Speech Recognition) and FA (Forced Alignment), as it accurately places the interjection without interrupting the primary speech.

Marker	Type	Example
&*ID:word	**Interposed Words**	*PAR: at the playground &*PAR:uh nope the cat scratched me

Complex Local Events

"Complex local events" are marked with **[^ text]** to insert detailed event descriptions at the exact point they occur within the speech, ensuring the narrative continues smoothly. These precise annotations are standalone and do not cover multiple events.

Marker	Type	Usage	Example
[^ text]	**Complex Local Events**	This coding can also begin utterances, detailing the context or addressee, serving as a replacement for "precodes".	`*PAR: [^ pets cat] I saw that movie yesterday.`
<text>	**Scoped events**	For annotating extended discourse or longer commentary, providing context or additional details. They encompass a wider range of elements such as vocal nuances, explanatory content, and revisions.	`*PAR: then I went <over to the slide> and climbed up.`

Pauses

Pauses, especially those not filled with speech, are coded directly in the transcription to indicate silence or breaks in speech. The length and specificity of these pauses can be detailed to the second, aiding in the precise analysis of speech timing and flow.

Code	Usage	Example
(.)	To indicate a short pause.	`*PAR: I can't (.) believe it.`
(..)	To indicate a longer pause than (.).	`*PAR: then (..) I woke up.`
(...)	To indicate a very long pause.	`*PAR: what if (...) we tried again?`
(seconds)	To specify the exact length of the pause in seconds.	`*PAR: wait just a (1.5) second.`
(minutes:seconds)	To specify pauses longer than a minute in minutes and seconds.	`*PAR: it took forever, (1:02) at least.`

Long Events

Long events are marked to document the start and end of extended occurrences, both vocal and nonvocal. This convention helps track the duration of specific actions or sounds within the interaction.

Marker	Type	Usage	Example
&{l=* description&}l=*	**Vocal events**	Denote a vocal action that occurs over a period within speech.	**&{l=sneezes &}l=snezzes**
&{n=* description &}n=*	**NonVocal events**	It uses the coding format &{n=* to mark the beginning and &}n=* to mark the end of an extended non-vocal event within the CHAT transcription system	**&{n=hits:table&}n=hits:table**

3.4.9 Special Utterances Terminators

“Special utterance terminators” enhance transcription accuracy by marking nuances like interruptions, trailing questions, and exclamations, aiding in detailed speech analysis. This table summarizes special utterance terminators, detailing their markers, uses, and examples:

Marker	Type	Usage	Example
`+...`	**Trailing Off**	It denotes a speaker trailing off before finishing an utterance, often due to a shift in attention or forgetfulness, typically leading to a conversational pause. They are treated as complete utterances analytically, affecting metrics like Mean Length of Utterance (MLU). To mark an utterance as incomplete, use “`[/-]`” instead. Avoid confusing this with pauses `(.)`, repetitions `[/]`, or retracing `[//]`.	`*PAR: I guess we could try+...`
`+..?`	**Question Trailing Off**	It's used when an utterance trails off but is intended as a question.	`*PAR: are you going to the+...?`
`+!?`	**Question with Exclamation**	It is used for questions expressed with surprise or disbelief, combining a question's structure with an exclamatory tone.	`*PAR: he said yes +!?`

`+/.`	**Uninvited Interruption**	It marks an utterance that is cut off by someone else's interruption. When followed by “+”, it indicates the original speaker has continued speaking. This helps programs like MLU count the split utterance as one, for more accurate analysis.	`*PAR1: I think... +/.`
			`*PAR2: look at this!`
			`*PA1: +, that we should go.`

+/?	**Interrupted Question**	For a question that is cut off by an interruption.	*PAR2: are we going to +/? *PAR1: where?
+//.	**Self-Interruption**	Occurs when a person stops their own speech and then begins anew. This is indicated by the "+//." symbol if the speaker abandons one line of thought and starts another. If a speaker does not continue after an incomplete utterance, use "+..."	*PAR1: we should+//. *PAR1: never mind.
+//?	**Self-Interrupted Question**	When a speaker begins to ask a question but stops themselves to shift to another idea or dismiss the question entirely.	*PAR1: is it //? *PAR1: never mind.
+.	**Transcription Break**	It is used to denote a pause at natural breaks in phrases, which is particularly useful for indicating where one speaker's words overlap with another's in conversation. This technique aids in the study of turn-taking and interruptions within dialogue without disrupting the natural flow of speech. An alternative method to represent short insertions is by using "&*", rather than splitting the utterance.	*PAR1: that might work +. *PAR2: might not+. Or *PAR1: I'll see you at &*PAR2: tomorrow?
"text"	**Quotation**	Use "to start and" to end a quotation within speech.	*PAR: then she said, "see you tomorrow".
+"/.	**Quotation Follows**	It is used to indicate that a direct quotation immediately follows an introduction, as seen in story	*MOT: the frog proclaimed +"/.

		readings. It helps to keep each utterance on a new line as per transcription rules. Use "+"/." when quoting complete clauses or sentences; for quoting a few words/ short phrase regular quotes are enough.	*MOT: +" I am the fastest swimmer in the pond. *MOT: none can outpace me +".
+".	**Quotation Precedes**	This is used before a direct quote that comes before the main part of the speaker's message. It helps to separate different parts of speech onto their own lines.	*MOT: +"I will tell you a secret. *MOT: whispered the child +".

3.4.10 Linking Speech Segments

"Utterances linkers" symbols in transcription help demonstrate the relationship between utterances, indicating how they connect or follow each other in conversation. These initiators or "linkers" showcase the flow and structure of the dialogue, highlighting quick responses, quotes, and completions.

Here's a table showcasing these linkers:

Marker	Type	Usage	Example
+"	**Quoted Material**	This symbol is used in conjunction with the +"/ and +". marks the start of a directly quoted utterance.	*PAR: +"I can't believe it!
+^	**Quick Uptake**	Used in transcription to indicate that one speaker has responded immediately to another, without the usual pause that occurs between speakers' utterances.	*PAR1: what's the time? *PAR2: +^ just 2 PM.

+,	**Self-completion**	This symbol is used at the start of a main tier line in transcription, indicates the completion of an utterance that was previously interrupted (MacWhinney, 2000).	`*PAR: we should +/.`
			`*PAR2: yeah.`
			`*PAR1: +, go to the beach.`

++	**Invited interruption /Other completion**	It is used in transcriptions when one speaker finishes the utterance of another, or to denote seamless continuation of speech, known as latching. It's a specific form of the "+" symbol and may be used when a speaker encourages their listener to complete their sentence. This is sometimes referred to as an "invited interruption".	`*PAR1: If it rains, we could go+...`
			`*PAR2: ++ go to the cinema?`
			`*PAR1: yeah, let's go.`

3.5 Use of Scoped Symbols

Scoped codes in CHAT are utilized to mark stretches of unclear speech or to annotate extended discourse. These codes serve to provide context or additional details over a broader segment of dialogue, encapsulating elements like vocal nuances, explanatory content, and revisions.

"Scoped symbols" in transcripts use square brackets ([ ]) and angle brackets (< >) to mark stretches of speech . Here's a concise explanation of their application:

1. **Descriptor Function**: The content inside square brackets ([ ]) provides commentary or description for the speech within angle brackets (< >).
2. **Application to Single Words**: If a scoped symbol applies only to a single word immediately preceding it, angle brackets (< >) are unnecessary (MacWhinney, 2000). The CLAN software automatically interprets the symbol as referring to that single word.
3. **Formatting Rules**:
   - Do not insert text between the square brackets ([]) other than the related content.

- There should be no space after the opening (<) and before the closing (>) angle bracket.
- Place a space between the closing angle bracket (>) and the following opening square bracket ([) (MacWhinney, 2000).

4. **Impact on Analysis**: The content within angle brackets (< >) associated with scoped symbols ([]) may be excluded from certain types of analysis, such as mean length of utterance (MLU) calculations (MacWhinney, 2000).

Uses: Scoped symbols ([]) mark a variety of linguistic and paralinguistic features, including negations and clarifications.

3.5.1 Timing Marks for Media

In CHAT, time marks accurately link transcript text to corresponding audio/video, enabling a detailed study of recorded exchanges. Below is a summary of CHAT's notations:

Marker	Type	Usage
·start time_end time·	**Time Alignment**	Time markers denote the start and end of a segment in a digital recording, measured in milliseconds. Usually invisible, they can be displayed using the escape-A command in the editor. Each marker spans from its start to the next marker's start, facilitating the playback of individual sections or a continuous sequence. Markers typically follow a speaker's utterance and any final punctuation. If enabled in the `@Options` field markers can be placed mid-utterance for more precise playback control. • **Single Utterance Playback**: Allows you to play the segment between two markers. (e.g., `·1234_5678·` starts at 1234 milliseconds and ends at 5678 milliseconds). • **Continuous Playback**: Enables playing through multiple segments consecutively. A dash, as in "`-3000_4500··`", signifies skipping silences,

		beginning at 3000 milliseconds and ending at 4500 milliseconds. • **Multiple Markers Within an Utterance**: If enabled, multiple markers can be used within a single utterance, dividing it into finer segments for more detailed control over playback. In the provided example, "`*PAR: hello,2500_3000· Fine, thanks. ·3500_4000·`", "`hello`" is played from 2500 to 3000 milliseconds, and "`Fine, thanks.`" from 3500 to 4000 milliseconds.

`·%pic: filename.jpg·`
 	
`@T:`
	Pic Bullet	Inserts a clickable image into the transcript, often used for visual context or as part of gesture coding. CHAT doesn't dictate the format for these images, common conventions are followed. The "`@T:`" header code is also used to denote the insertion point for a video thumbnail, representing a specific moment in the recorded interaction.

`·%txt: filename.txt·`	**Text Bullet**	Adds a clickable link to a text file within the transcript, providing further textual details or context.

3.5.2 Notating Paralinguistic Features

Paralinguistic marking captures non-verbal sounds (e.g., sighs, throat clearing or yawns) or vocal effects (like laughing or crying). It also captures prosodic features, i.e., how something is said, for example, through shouting or whispering, which are crucial for understanding the subtleties of spoken interaction. On the other hand, duration scoping measures how long these sounds or actions last, providing context beyond the words. Here's a table detailing paralinguistic markers and duration scoping:

Marker	Type	Usage	Example
`[=! text]`	**Paralinguistic Material**	Square brackets with "=!" ([=!]) are used to indicate a non-verbal action or prosodic features occurring at a specific point in the dialogue. Angle brackets (<>) indicate that the non-verbal action spans the entirety of the phrase enclosed.	`*PAR: let's begin [=! clapping],` means the participant clapped as say begin. `*CHI: <I want it> [=! yells]`, implies that the child is yelling throughout the entire phrase "I want it".
`&=text`	**Simple Form Paralinguistic**	For silent paralinguistic events, i.e., without vocalizations.	`*PAR: &=sighs.` `* PAR: &=cries (denotes silent crying)`
`[!]`	**Stressing**	To indicate emphasis on a word or phrase in a transcript. Without angle brackets, it applies to just the preceding word. With angle brackets, it applies to the entire phrase within them.	`*PAR: I do not [!] want that.` `*PAR: <you really think so> [!]?`
`[!!]`	**Contrastive Stressing**	Denotes contrastive stress for correction or contradiction. After a single word, it emphasizes that word. If an entire phrase is contrastively stressed, it should be enclosed in angle brackets (MacWhinney, 2000).	`*PAR: I said the blue one [!!], not the green.` `*CHI: < it's a cat, not a dog>[!!]`

Marker	Type	Usage	Example
[# time]	**Duration**	Specifies how long a verbal or non-verbal actions lasts, in seconds. When this symbol follows a phrase within angle brackets, it shows how long that specific action or speech took.	*CHI: Look at <this drawing> [# 3.5]. *CHI: <Can I have juice?>[# 2]

3.5.3 Explanations and Alternatives

This notation system is designed for detailed linguistic transcription, capturing nuances in speech through specific symbols. Each symbol serves a unique purpose, from clarifying meanings to suggesting corrections and indicating uncertain transcription. Below is a concise overview of these symbols:

Marker	Type	Usage	Example
[= text]	**Explanation**	Provides brief annotations that clarify the references of objects and people within the discourse. An alternative to %exp tier.	*PAR: look at that!” [= dog]
[: text]	**Replacement**	To enable morphemic analysis of nonstandard words by the MOR program, transcribers must use a replacement format 'nonstandard [: standard]'. Simply put the nonstandard word, followed by a colon and a space, and then the standard form in brackets. Only single nonstandard words can be replaced, not phrases. If marking an error as well, add [*] code after the standard form.	*PAR: gimme [: give me] that! *PAR: he runned [: ran] [*] to the store.

Marker	Type	Usage	Example
`[:: text] [*]`	**Replacement of Real Word**	To document the incorrect usage of a real word in transcription, use "`original [:: intended]`" followed by an asterisk in brackets to denote an error. This format submits the original word to MOR for analysis, with the intended word as clarification.	`*PAR: whole peace [:: piece] [*] of cake.`
`[=? text]`	**Alternative Transcription**	Use the format "`text <alternative> [=? preferred option]`" to indicate alternatives when transcription choices are uncertain.	`*PAR: Did she <say> [=? see] the boat?`
`[% text]`	**Comment on Main Line**	This notation enables direct insertion of comments into the main transcript line, rather than using a separate `%com` line. It's useful for adding annotations seamlessly but should be used judiciously to keep the transcript clear and easy to analyze.	`*PAR: look at me go [% smiling broadly]`
`[?]`	**Best Guess**	This symbol indicates uncertainty in transcription due to audio issues, applying to the preceding word or to words within angle brackets if multiple are unclear.	`*PAR: it looks like a bear [?].` `*PAR: I need a <new pair of shoes >[?].`

3.5.4 Overlaps, Retraces, and Clauses

"Retracing, overlap, exclusions, and clauses" are transcription symbols used in conversation analysis to detail the intricacies of speech patterns, including interruptions, repetitions, and structural amendments in spoken language. Here's a table summarizing their use:

Marker	Type	Usage	Example
[>]	**Overlap Follows**	It indicates that the enclosed text is spoken at the same time as the speech of the next speaker. It must be paired with the "Overlap Precedes" symbol to indicate the start of the overlap. For instance, if two people begin talking at once, the first speaker's overlap is marked at the end of their speech.	*PAR1: we should consider <going to the> [>] cinema tonight. *PAR2: <I think we should stay> [<] home instead.
[<]	**Overlap Precedes**	This shows that the enclosed text overlaps with the end of the preceding speaker's speech (MacWhinney, 2000). It must be used together with the 'Overlap Follows' symbol (MacWhinney, 2000). When there are multiple overlaps in a dialogue, they are numbered within a single exchange (e.g., [>1], [<1], [>2], [<2]) and reset after a turn with no overlaps.	*PAR1: should we <start the project> [>1] next week? *PAR2:<that's too early> [<1], <tuesday's better> [<2]. *PAR1: tuesday, I'll bring the <plans> [>2]. *PAR2: <perfect> [<2], that works.
+<	**Lazy Overlap**	Show that two turns overlap without specifying the exact point of overlap. If you need to use additional codes for linking utterances, insert the "+<" first, followed by a space. Do not combine "+<" with "+^" (quick uptake), as they have different purposes.	*CHI: Can we get ice cream? *MOT: +< Only after dinner.
[/]	**Repetition**	Indicate the exact repetition in transcripts. If a speaker begins a	*PAR: that sounds great [/] great.

		phrase, stops, and then repeats it without changes, the original attempt which exactly matches the repeated material is encloses in angle brackets "< >" (MacWhinney, 2000). If no brackets are used, only the word immediately preceding the "[/]" is considered repeated. Include any pauses or fillers right after the "[/]" if they occur between the initial phrase and its repetition (MacWhinney, 2000). In case of multiple uninterrupted repetition, group all but the last repetition within angle brackets (MacWhinney, 2000). By default, most CLAN commands include repeated material in their analysis. Exceptions are MLU (mean length of utterance), MLT (mean length of turn), and MODREP (morphosyntactic errors) (MacWhinney, 2000). This inclusion can be modified using the +r6 switch. Write out each repetition completely to make sure the transcript matches the audio correctly.	*PAR: <that sounds great > [/] that sounds great. *PAR: I think [/] (..) &-um (.) I think it might rain. *PAR: <no no no> [/] no, I totally understand.
[//]	**Retracing**	To represent how a speaker corrects or modifies their speech while speaking. Retraced phrases are enclosed in angle brackets. If brackets are absent, only the preceding word is considered retraced. Most CLAN	*PAR: <I want >[//] I need some help. *PAR: yes, the cat are [//] the [/] the cats are

		commands include retraced material by default, though this can be altered with the +r6 switch.	sleeping on the sofa.
[///]	**Reformulation**	For a complete reformulation of a message where the speaker does not correct a specific error but entirely changes their statement. Unlike the [//] symbol, which is used for partial corrections or retracings, [///] signifies a wholesale revision of the thought being expressed.	*PAR: <I think I'll stay> [///] actually, let's all meet at the café.
[/-]	**False Start Without retracing**	When a speaker abruptly stops an utterance and begins a new, unrelated one. This indicates a full departure from the initial statement, as opposed to [/] or [//], which denote complete or partial repetition with correction, respectively. When transcribed with [/-], the entire speech segment is typically treated as a single utterance, unless the transcriber opts to separate it using the +... or +//. symbols. Default settings in CLAN software count this as one utterance in all programs except MLU, MLT, and MODREP, and this can be altered with the +r6 switch (MacWhinney, 2000).	PAR*: <Should we> [/-] Is it going to rain today?
[/?]	**Unclear Material**	Indicate unclear speech disfluencies such as filled pauses, repetitions, and	SALT: "Maybe, uh, we should go."

		retracings, when converting transcripts files from the Systematic Analysis of Language Transcripts (SALT), where these are all broadly categorized as “mazes”.	CHAT: “Maybe [/?] we should go.”
[e], [+ exc]	**Excluded Material**	[e] and [+ exc] are used in transcription to exclude irrelevant material from certain types of analysis, like when assessing task-relevant speech (MacWhinney, 2000). For example, during a picture description task, off-topic comments are marked with [e] to omit them from the analysis (MacWhinney, 2000). An entire utterance can be excluded from analysis by appending [+ exc] at the end. Marked thus, the specified material or utterance is automatically ignored by CLAN's %mor line-dependent programs such as DSS (Developmental Sentence Scoring), IPSyn (Index of Productive Syntax), VOCD (Variability of Word Duration), and GRASP (Grammar and Syntax Profile) (MacWhinney, 2000).	*PAR: the boy is <uh, off topic> [e] playing outside. *PAR: I need to take a break [+ exc].
[^c]	**Clause Delimiter**	The [^c] symbol is used to denote the end of the first clause before the sentence continues with the second clause within complex sentences, not to mark full sentences. It indicates	*PAR: I bought apples [^c] and made a pie.

		where the analysis tool should split the sentence for clause-based analysis like MLU and MLT. You don't need to mark the beginning of the clause; it's understood that `[^c]` covers the text back to the start of the sentence or the last `[^c]` used (MacWhinney, 2000). Custom markers can also be created. When using MLU and MLT, the `+c` switch is included to identify which clause markers to recognize.	

3.5.5 Error Markers

Below is a table summarizing the key markers, their uses, and examples

Marker	Type	Usage	Example
[*]	Error Marking	Marks errors in speech. Place the symbol [*] immediately after the incorrect word or phrase to indicate an error. On the main line, transcribe the form that was spoken, error included. On a separate line labeled %err, provide the intended correct form.	Main Line: she go[*] to school. %err: went
[: text]	Replacement	Use the [: correct form] format before the error symbol.	*PAR: he go [: goes] [*] to the store.
[/], [//]	Repetition/ Retracing	If the error occurs before a repetition or retracing, the [*] is placed just after the error and before the [/] or [//] marker (MacWhinney, 2000). If the error occurs in the part after retracing, place [*] after the retracing symbol [//].	*PAR: she goed[*][//] she went to school. *PAR: she goes [//] goed [*] to school. *PAR: we was [*][/] was happy to see her. *PAR: we were [/] were happy to saw[*] her yesterday.

3.5.6 Precodes and Postcodes Usage

- **Precodes [-text]** marked by a minus sign (-) and placed in square brackets at the start of an utterance, referring to the entire utterance (MacWhinney, 2000).
- **Postcodes [+text]** indicated by a plus sign (+) and placed in square brackets follow the final delimiter of an utterance. They aren't predefined and are created to meet the specific annotation requirements of a project. Postcodes always relate to the entire utterance and are useful for including or excluding utterances in analyses of turn or

utterance length measurements, like MLT and MLU (MacWhinney, 2000).. The postcodes `[+ bch]` and `[+ trn]` are used in conjunction with `-s` / `+s` switches for such analysis (MacWhinney, 2000). In translating codes from SALT to CHAT format, the SALTIN command regards them as postcodes due to their undefined scope in SALT.

Here's a table summarizing key markers and their applications.

Type	Markers	Usage
`[-ISO code]`	**`[-ISO code]`**	Indicates a language switch for identifying language use in multilingual analysis, using three-letter ISO codes from the `@Languages` header (MacWhinney, 2000).
`[+ bch]`	**`Excluded Utterance`**	The **`-s [+ bch]`** coding is applied to mark utterances that, while not contributing directly to the main conversation, serve as background acknowledgments or signals of active listening, like nods or brief affirmations (MacWhinney, 2000). This code is specifically used to flag these utterances so they can be omitted from analysis when calculating metrics such as Mean Length of Turn (MLT) or Mean Length of Utterance (MLU) (MacWhinney, 2000).
`[+ trn]`	**`Included Utterance`**	Forces inclusion of an utterance as a turn in analyses, particularly when it wouldn't normally count (e.g., non-verbal utterances). The **`+s [+ trn]`** switch with MLT commands ensures these are counted as turns (MacWhinney, 2000)..

3.6 Utilizing Dependent Tiers

CHAT transcripts incorporate ancillary details through dependent tiers to keep the main text manageable. Beginning with a percent sign (%) and in lowercase, these tiers below the main line hold extra elements like codes and comments. Each tier's label combines a percent sign with a three-letter ID, followed by a colon and descriptive details. While end punctuation is generally unnecessary, it's required for `%mor` and `%gra` tiers. Dependent tiers are not obligatory but can be critical for specific studies, such as those on aphasia. Researchers can employ

numerous dependent tiers per main line, providing extensive data annotation. Coding systems for some dependent tiers have been developed, often using codes that start with the dollar sign ($). If multiple codes are necessary, they can be arranged in a sequence, separated only by spaces.

Refer to the manual for a comprehensive tier list. Researchers are advised to craft custom tiers specific to their requirements, which should be denoted by a three-letter code beginning with an 'x'.

3.6.1 Standard Dependent Tier Usage

Marker	Type	Usage
`%add`	**Addressee Tier**	To specify who is being addressed in the conversation.
`%alt`	**Alternate Transcription Tier**	To provide alternative possibilities for unclear speech. If the alternative applies to just one word, consider using the main line format `[=? text]`
`%com`	**Comment Tier**	This tier is used for general comments and annotations. It provides valuable insights into the non-verbal cues, actions, and background context that accompany spoken utterances. For instance, it can be used to highlight the use of a particular linguistic construction. Comments should be written in plain English for clarity. If you need to use special symbols or codes, enclose them in quotation marks to ensure they are not mistakenly flagged as errors by the CHECK system.
`%err`	**Error Coding Tier**	To detail errors in speech not captured on the main line. For additional clarification on error
`%exp`	**Explanation Tier**	Identifies deictic references for objects or individuals (MacWhinney, 2000). Short explanations can also be included directly on the main line, using square brackets preceded by '=' and followed by a space, like `[=text]` (MacWhinney, 2000).

Marker	Type	Usage
%gpx	**Gestural-Proxemic Tier**	It records specific gestures and spatial interactions, distinguishing detailed actions like nodding or reaching from general activities noted on the %act line.
%gra	**Grammatical Relations Tier**	For coding syntactic dependencies and relations. Utilized in conjunction with tagging tools for grammatical analysis
%grt	**Grammatical Relations Training Tier**	This tier is for MEGRASP tagger training and has the same structure as the %gra tier for grammatical relations (MacWhinney, 2000).
%mor	**Morphological Tier**	It used for analyzing morphemic units in speech, categorizing them by their type and part of speech.
%ort	**Orthography Tier**	It's for original script in bilingual transcripts. It can present the native script when the main line uses Romanization, or vice versa. It ensures one-to-one correspondence between items on this and the main line (MacWhinney, 2000).
%pho	**Phonology Tier**	Use this tier for full utterance transcriptions in IPA. It aligns one-to-one with the main line, including all speech forms. To indicate phonological groups, use '‹' (U+2039) and '›' (U+203A) for liaisons or assimilations.
%sit	**Situation Tier**	This tier notes situational context specific to individual utterances. For broader context applicable to the entire file or large sections, use the @Situation header instead.
%spa	**Speech Act Tier**	For coding the functional use of sentences in discourse. Adopts codes from established systems for speech act analysis.

3.6.2 Synchrony Relations

For dependent tiers that apply to an entire utterance, it's important to specify if events happen before, simultaneously with, or after the utterance (MacWhinney, 2000). Here's a clarification of how to use them, from MacWhinney, B. (2000).

Marker	Type	Usage
`<bef> / <aft>`	**Occurrence Before or after utterances**	Events related to an utterance are indicated by specific codes in a dependent tier: • `<bef>`: Used in a dependent tier to denote events occurring immediately before the utterance. • `<aft>`: Used to denote events immediately after the utterance.
	No Code for Concurrent Events	If neither `<bef>` nor `<aft>` is used, the event is assumed to occur during the utterance, or the timing is not specified.

`%com`
`@Comment`
`[]`
	Event Annotations	• `%com` tier: Use this tier with <bef> or <aft> to indicate the timing of events relative to the utterance.
		• `@Comment` header: An alternative to %com, potentially offering clearer context for when events happen.
		• **Main line brackets**: Events can also be annotated directly on the main line within square brackets for clarity.

$sc=n	**Scope on Main Tier**	To specify that a dependent tier comment relates to a particular section of the main tier, indicating the scope of words involved.

3.7 Speech Disfluencies Codes

A list of disfluency codes can be found in the **"`Clanc/lib/fluency/ ALLflucodescut`"** directory. The types of disfluencies can be tracked using the FREQ and KWAL commands. CHAT requires a specific order for code combinations in the disfluency transcript (MacWhinney, 2000). Below is a table of markers that CHAT uses to identify disfluencies.

Category	Marker	Type	Usage	Example
Stuttering-like Disfluencies (SLDs)	:	Prolongation	Marks the prolongation of a segment within a word	m:moon
	^	Broken Word	Indicates a pause within a word	pi^zza
	≠	Blocking	Marks a block before word onset	≠chair
	↫	Repeated Segment	Brackets repetition; hyphens mark iterations.	↫c-c-c↫cat, happy↫ppy-ppy↫
	↫ and:	Lengthened Repeated Segment	Use pairs of ↫ symbols to mark repeated phrases, and colons for extended sounds. Can place ↫ at the end of a word to show repeated ending sounds.	↫m:-m:-m↫moon
	[/]	Word Repetition	Marks repetition of a word	look [/] look
Typical Disfluencies (TDs)	<> [/]	Phrase Repetition	Marks repeated material within a phrase	<I saw a> [/] I saw a dog.
	[//]	Word Revision	Marks revision of a word within the discourse	a cat [//] a dog
	<> [//]	Phrase Revision	Marks revision of a phrase within the discourse	<Can you> [//] Do you see it?

Category	Marker	Type	Usage	Example
	&+	Phonological Fragment	Marks a change from one word to another based on phonological similarities	&+bik bicycle
	(.), (..), (…)	Pause	Marks the number of short, medium, long pauses (MacWhinney, 2000).	(..)
	(duration)	Pause Duration	Adds up the time values, if marked (MacWhinney, 2000).	(3.5)
	&-	Filled Pause	Fillers with underscore counts as one word (MacWhinney, 2000). The &- symbol, when indicating a nonword, must always precede other markers.	&-ah, &-er &-you_know
Special Notes	&-≠	Blocking of Filled Pauses	Indicated in a specific order. Use the ≠ for blocking, but always place it after the &- symbol, not before.	&-≠ah &-≠eh_well
	Place ≠ within ↫ ↫	Blocking of Repeated Segments	Indicated in a specific order for repeated segments.	↫≠ll↫look ↫≠m↫moon

3.8 Coding Speech Acts

Speech act coding categorizes communication by purpose, examining speaker intent (illocutionary force), conversation role (interchange types), and expression method (modality). Codes are organized on the %spa tier, marked with identifiers like "x" for interchange and "i" for illocutionary force, for instance, %spa: $x:ooo (unintelligible) $i:rr (request to repeat). While custom coding schemes are common, the Inventory of Communicative Acts - Abridged

(INCA-A) system offers a simplified, adaptable framework for speech act analysis compatible with tools like Clan. Enclosed are selected INCA-A code; for the full list, see the manual or download it here.

Interchange Types

Marker	Category	Usage
CMO	**Comforting**	Expressing sympathy and understanding, important in therapeutic contexts.
DCC	**Discussing Clarification of Communication**	Discussing clarification of ambiguous verbal communication or confirming understanding (MacWhinney, 2000).
DHS	**Discussing Hearer's Sentiments**	Engaging patients in expressing feelings and thoughts.
DJF	**Discussing a Joint Focus**	Holding conversations about mutual attention, like objects or ongoing events.
DNP	**Discussing the nonpresent**	Enabling conversations about past and future events, relevant for therapy.
NIA	**Negotiating the Immediate Activity**	Focusing on immediate tasks and activities, crucial for daily interaction.
OOO	**Unintelligible**	Acknowledging attempts at communication when speech is unclear.
TXT	**Reading Written Text**	Reading or reciting written text aloud (MacWhinney, 2000).
YYY	**Uninterpretable**	Recognizing communication attempts that are not clear, maintaining engagement.

Illocutionary Forces

Marker	Category	Usage
AA	**Answer in the Affirmative**	Essential for confirming or agreeing to propositions or questions.
AD	**Agree to Carry Out an Act**	Consent to perform a requested action.
AL	**Agree to Do Something for the Last Time**	Consent to perform an action for the last time.
AN	**Answer in the Negative**	Important for expressing disagreement or negation.
CT	**Correct**	Helpful in therapeutic settings for guiding correct language use or understanding.
DR	**Dare or Challenge**	Can motivate actions or responses in therapeutic settings.
RD	**Refuse to Carry Out an Act**	Allows expression of disagreement or inability to comply, important for autonomy.
RQ	**Yes/No Question**	Fundamental for initiating simple binary-answer queries.
RR	**Request to Repeat**	Crucial for clarifying communication by asking for information to be repeated.
SS	**Signal to Start**	Useful in therapy or activities to indicate the beginning of an action or task.

3.9 Methods for Error Annotation

3.9.1 Word-Level:

Error marking instructions:

1. Place an `[*]` immediately after any incorrect word.
2. If suggesting a correction, insert `[: correction]` before the error marker.
3. When errors occur at the start of a retracing, put an `[*]` after the error and before the `[/]` of repetition, to clearly delineate the mistake from the correction process.

PHONOLOGICAL Errors [* p]

Phonological errors occur when speech sounds are misproduced. They can affect the structure of words and their recognizable sounds. Errors are identified using the following codes:

- **`[*p:w]` (Word)**: Occurs when the erroneous output is still a recognizable word, e.g., "slipper" instead of "flipper".
- **`[*p:n]` (Non-word)**: Results in a non-word due to phonological errors, e.g., "flapper" for "flipper".
- **`[*p:m]` (Metathesis)**: Involves a reversal of sounds within words, e.g., "flirper" for "flipper".

Criteria for classification

1. **Single-Syllable Words:**
    - Consists of **an onset** (initial phoneme or phonemes), **a vowel nucleus** (a central component of a syllable, typically a vowel that forms the syllable's peak of prominence), and **a coda** (final phoneme or phonemes) (MacWhinney, 2000).
    - An error qualifies if two elements match the erroneous and the target word (e.g., onset plus vowel nucleus, vowel nucleus plus coda, or onset plus coda) (MacWhinney, 2000).
    - Substitutions, additions, or omissions in any part of the syllable are considered.
    - For words lacking an onset (e.g., "ape") or a coda (e.g., "go"), the absence of these components in the erroneous word counts as a match (MacWhinney, 2000).
2. **Multi-Syllabic Words:**
    - To be identified as having a phonological error, all of the word's syllables must be pronounced correctly with the exception of one (MacWhinney, 2000). For instance, Butterfly" mispronounced as "butterfy-l" demonstrates **metathesis**.
    - The syllable that includes the phonological error must conform to the criteria set for single-syllable words. For instance, "television" without the middle syllable, said as "televson", is an **omission** and "Stream" with an extra sound, said as "sutream", is an **addition**.

Additional Considerations

For coding phonological errors, if an error shares over 50% of its sounds with the correct word, it might still be recognized as closely related to the correct pronunciation. This could impact how errors are categorized, even if they include some incorrect elements. Pronouncing "calculator" as "cal-tu-lator" retains over 50% of the correct phonemes, potentially leading to a more lenient error classification due to significant overlap.

SEMANTIC Errors [* s]

Semantic errors in language processing involve the incorrect use of words or phrases that do not fit the intended meaning or context. These errors can be categorized based on whether the incorrect word is related to the target word (known or unknown to the speaker) or unrelated, and further distinctions can be made based on the nature of the relationship (e.g., wrong preposition, partial segment of the target, derivational errors). Additionally, grammatical errors, which involve incorrect usage of language rules such as verb tense, subject-verb agreement, or sentence structure, can also be coded with more specific markers.

Refer to the table below for a detailed classification:

Marker	Category	Subcategory	Detailed Usage	Example
`[*s:r]`	**Related Word**	-	This error occurs when a word related to the known target is mistakenly used.	-
`[*s:r:prep]`		**Incorrect Preposition**	The error involves using an incorrect preposition that doesn't fit the context.	"under" instead of "over"; "beside" instead of "between"
`[*s:r:seg]`		**Partial Segment**	Occurs when a partial segment of the target word is mistakenly used as the complete response.	"sand" for "sandwich"

Marker	Category	Subcategory	Detailed Usage	Example
[*s:r:der]		**Derivational Error**	This error involves using a derivationally related word that inaccurately represents the intended concept.	"react" for "reaction", "happiness" for "happy"
[*s:ur]	**Unrelated Word**	-	Involves using a word that is completely unrelated to the known target word.	"chair" for "table"
[*s:uk]	**Unknown Target Word**	-	This error includes using a word when the target is unknown or the speaker appears confused.	"I go clock"
[*s:per]	**Perseveration**	-	Involves unnecessary repetition of a word or part of a sentence.	"she wore a dress dress to the party"
[*s:r:gc]	**Grammatical Category**	-	Errors involving grammatical categories such as number, case, definiteness, or gender (MacWhinney, 2000).	-
[*s:r:gc:art]		**Article Errors**	Incorrect use of articles (definite, indefinite, zero articles) in different contexts.	"a" instead of "the", or "the" for "a"

Marker	Category	Subcategory	Detailed Usage	Example
[*s:r:gc:pro]		**Pronoun Errors**	Misuse of pronouns, using one pronoun in place of another, leading to grammatical inconsistency.	"they" for "he", "ours" for "theirs", "its" for "their"
[*s:r:gc:der]		**Derivational Errors**	Derivational errors in grammatical categories, often involving misuse of derived forms.	"runner" for "running"

NEOLOGISM [* n]

Neologisms are newly created words or expressions introduced into a language, often not yet widely recognized. They stem from creative language use or language processing disorders, indicating intentional innovation or unintentional deviations. These terms are categorized based on whether their meanings are known or unknown and whether they involve stereotypy or derivational changes. The following table categorizes various types of neologisms by their target and usage characteristics:

Marker	Category	Usage	Example
[*n:k]	**Known Target**	Coining a new word for a known concept, used in an unconventional way.	"Integrativity" instead of "integration"
[*n:uk]	**Unknown Target**	Creating a new word for an unspecified concept, leading to ambiguity in its meaning.	"Splendiferous" for an undefined splendid and wonderful quality.
[*n:k:s]	**Target, Stereotypy**	Repeatedly using a coined word that has a specific, recognized meaning within its context.	"Froodle" repeatedly for a friendly noodle character

Marker	Category	Usage	Example
`[*n:uk:s]`	**Unknown Target, Stereotypy**	Repeatedly using a coined word whose meaning is not defined or understood.	"Quizzle" used repeatedly for an unspecified action or object
`[*n:k:der]`	**Known Target, Derivation**	Creating a new word by modifying an existing one to add or alter its meaning.	"Unfriendify" (derived from "unfriend")

MORPHOLOGICAL ERRORS [* m:a]

Morphological errors occur when incorrect word parts are used, similar to mismatching pieces in a puzzle, altering the intended meaning.

These errors are classified for clarity:

1. **Missing Morphemes**: Omitting necessary parts.
2. **Substitutions**: Using incorrect parts.
3. **Overregularizations**: Regular patterns wrongly applied.
4. **Superfluous Marking**: Adding unnecessary parts.
5. **Double Marking**: Repeating a grammatical feature.
6. **Agreement Errors**: Failing to match grammatical terms.

For coding these errors, the following abbreviations are essentials:

- **-ing**: Progressive aspect
- **-3s**: Third person singular
- **-ed**: Past tense
- **-en**: Perfective aspect
- **-s**: Plural
- **-'s**: Possessive singular
- **-s'**: Possessive plural
- **-er**: Comparative
- **-est**: Superlative

Category	Marker	Subcategory	Usage	Example
Regular Forms Missing Suffixes	**[*m:0]**		Where a word is missing its necessary suffix, leaving the base form unchanged/ without the appropriate ending	
	[*m:0ing]	Progressive	Missing progressive suffix	he play [*m:0ing] basketball on weekends
	[*m:03s]	3rd Person Singular	Missing 3rd person singular suffix	she walk [*m:03s] to school every day.

Category	Marker	Subcategory	Usage	Example
	[*m:0ed]	Past	Missing regular past suffix	they talk [*m:0ed] on the phone last night.
	[*m:0s]	Noun Plural	Missing regular plural suffix	all the cat [*m:0s]]are sleeping.
	[*m:0’s]	Possessive	Missing possessive suffix	the teacher [*m:0’s] book is on the desk.
	[*m:0s’]	Possessive Plural	Missing possessive plural suffix	the managers [*m:0s’] meeting room is occupied.
Substitutions of the base form	**[*m:base:*]**		Indicate errors involving the incorrect use of irregular forms, where the base form is substituted but lacks the proper morphological marking	
	[*m:base:s]	Plural Irregulars	Substitution for plural irregulars	look at all the mouses [*m:bas:s].
	[*m:base:ed]	Irregular Past	Substitution for irregular past	he thinked [*m:base:ed] about the answer.

Category	Marker	Subcategory	Usage	Example
	[*m:base:en]	Perfective Irregulars	Substitution for perfective irregulars	she must have speak [*m:base:en] to the manager.
	[*m:base:er]	Comparative	Incorrect comparative form	this one is more worser [*m:base:er] .
	[*m:base:est]	Superlative	Incorrect superlative form	he's the goodest [*m:bas:est]player on the team.
Substitutions of the base form for irregulars	**[*m:irr:*]**		Indicates errors where an irregular form is incorrectly substituted in place of another form.	
	[*m:irr:s]	Plural for Singular	Using plural irregular for singular	the sheeps [*m:irr:s] are grazing.
	[*m:irr:ed]	Past for Present	Past irregular used incorrectly	yesterday I finded [*m:irr:ed] a lost puppy.
	[*m:irr:en]	Perfective for Base	Perfective irregular used incorrectly	he's already ate [*m:irr:en]his lunch.

Category	Marker	Subcategory	Usage	Example
Substitutions between past and perfective irregulars	`[*m:sub:*]`		Denotes errors where there is a substitution between past and perfective forms of irregular verbs.	
	`[*m:sub:ed]`	Past for Perfective	Past for perfective irregular swap	`I had drinked [*m:sub:ed]]too much coffee.`
	`[*m:sub:en]`	Perfective for Past	Perfective for past irregular swap	`he had began [*m:sub:en]the work yesterday.`
Overregularization of irregulars	`[*m:=*]`		Errors where an irregular form is replaced with an incorrectly applied regular suffix.	
	`[*m:=ed]`	Past	Incorrect regular past suffix	`I goed [*m:=ed]to the store yesterday.`
	`[*m:=en]`	Perfective	Incorrect perfective suffix	`he breaked [*m:=en]the glass.`
	`[*m:=s]`	Plural	Incorrect plural suffix	`there were many foots [*m:=s]in the park.`

Category	Marker	Subcategory	Usage	Example
Superfluous markings	**[*m:+]**		where an unnecessary morphological marker is added to a word. This can occur across various grammatical aspects.	
	[*m:+ing]	Progressive	Unneeded progressive	I am liking **[*m:+ing]** to read books.
	[*m:+3s]	3rd Person Singular	Unneeded third person singular -s suffix	she like to goes [*m:3+s]to school.
	[*m:+ed]	Past	Unneeded regular past	I walkeded [*m:+ed]to the store yesterday.
	[*m:+en]	Perfective	Unneeded perfective	I have eaten[*m:+en] my breakfast already this morning.
	[*m:+s]	Plural	Unneeded plural	there were many sheeps [**m**:+s]in the field.
	[*m:+'s]	Possessive	Unneeded possessive or plural possessive	this is John's[**m**:+'s] his book.

Category	Marker	Subcategory	Usage	Example
Double marking of regulars and irregulars	**[*m:++]**		Where a word has been given a grammatical marker twice, resulting in an excessive and incorrect form	
	[*m:++ing]	Progressive	Excessive progressive	I was runninging[*m:++ing] fast.
	[*m:++3s]	3rd Person Singular	Excessive third person singular	he loveses [*m:++3s]his job.
	[*m:++ed]	Past	Excessive past tense	she lookeded [*m:++ed]at me.
	[*m:++en]	Perfective	Excessive perfective	they have eatenened [*m:++en]their dinner.
	[*m:++s]	Plural	Excessive plural	many catses [*m:++s]are in the yard.
	[*m:++’s]	Possessive	Excessive possessive	it is James's's [*m:++’s]book.
Double marking of irregulars	**[*m:++*: i]**		Indicates a double marking error on irregular verb or noun form.	

Category	Marker	Subcategory	Usage	Example
	[*m:++ed:i]	Irregular past	Excessive past tense marker on an irregular verb	he tooked [*m:++ed:i]the book.
	[*m:++en:i]	Irregular perfective	Excessive perfective marker on an irregular verb	he had takenen [*m:++en:i]the test.
	[*m:++s:i]	Irregular plural	Excessive plural marker on an irregular noun	there were many feets [*m:++s:i].
Agreement Errors (Irregulars)	**[*m:v*:a]**		Signals an error where there is a mismatch between the subject and the verb form, particularly with irregular verbs that do not follow standard conjugation patterns.	
	[*m:vsg:a]	Incorrect Singular 3rd Form Used for Plural	Indicates the use of a singular verb form with a plural subject	they has [*m:vsg:a]a car , instead of “have”

Category	Marker	Subcategory	Usage	Example
	[*m:vun:a]	Incorrect Unmarked Verb Form Used for 3rd Singular	Signals the use of a plural or base form of a verb when a singular marked form is required.	`he are [*m:vun:a]happy`
Agreement Errors (Regulars)	**[*m:*s:a]**		Denotes agreement errors with regular verbs and nouns, highlighting mismatches in number between the subject and the verb or noun form.	
	[*m:03s:a]	Missing 3rd Person Singular	Missing third person singular suffix used incorrectly	`he want [*m:03s:a]to go.`
	[*m:+3s:a]	Unneeded 3rd Person Singular	Unneeded third person singular suffix added mistakenly	`we goes [*m:+3s:a]to school`
	[*m:0s:a]	Singular for Plural	Singular noun used instead of required plural	`two dog [*m:0s:a]were barking.`
	[*m:+s:a]	Plural for Singular	Plural noun used when singular is needed	`this cats[*m:+s:a] are cute.`

Category	Marker	Subcategory	Usage	Example
Allomorphy Errors	`[*m:allo]`	Stem/Base Changes	Incorrect stem or base form used for irregular verbs	`he goed [*m:allp]to the park.`
			Incorrect plural form based on stem change for irregular nouns	`foots[*m:allo] were visible.`

Dysfluencies [* d]

Dysfluencies disrupt speech flow and are key indicators in speech disorder diagnostics. They can take the form of repetitions of sounds, syllables, or words; prolongations of a single sound; or disruptions that occur within words.

Marker	Category	Usage	Example
`[*d]`	General Dysfluency	Includes repetitions and prolongations in speech.	Repetition: “I-I-I saw it.” Prolongation: “Ssssee that bird?
`[*d:sw]`	Within-Word Dysfluency	Interruptions occurring inside a word.	“Insuhside” for “inside”.

Missing Words

In language studies, transcribing missing words is key as it can significantly change sentence meaning, yet identifying omitted words remains challenging.

To code an omission in the text tier, follow these guidelines:

1. **Zero Symbol**: Place the zero symbol (`0`) before the omitted word.
2. **Full Omission**: Always code a full omission with the zero symbol, not with parentheses (used for partial omissions such as shortenings and incomplete words).

3. **Part of Speech**: If the focus is on the part of speech rather than the specific word, follow the zero symbol with a code representing the part of speech.
4. **Best Guess**: The identity of the omitted word is always an educated guess. Place your best guess on the main line (MacWhinney, 2000).
5. **Agrammatic and Jargon Aphasic Speech**: It's best to mark what's missing without conjecture using the postcode `[+ gram]`.

Omitted words are excluded from the Mean Length of Utterance (MLU) count (MacWhinney, 2000).

Examples of coding omitted parts of speech:

Marker	Category	**Usage**	**Example**
`0:det`	Determiner	To mark the omission of a determiner.	"`[0:det] apple was eaten.`" (The determiner "the" is missing.)
`0:aux`	Auxiliary Verb	To mark the omission of an auxiliary verb.	"`she [0:aux] going to school.`" (The word "is" is missing.)
`0:verb`	Main Verb	To mark the omission of a main verb.	"`he [0:went] to the store.`" (The verb "went" is missing.)

General Considerations

Marker	Type	Usage	Example
[:text]	Non-Word Error	When the error is a non-word and the correct word is known (MacWhinney, 2000). It allows the MOR program to correctly identify and analyze the intended word.	*PAR: yes, I was to their new hou [: house] yesterday
[:text] / [::text]	Real Word Error	When the error involves using an incorrect real word, it should be marked with either a single colon [:text] or a double colon [::text] (MacWhinney, 2000). The single colon indicates the intended correct word for analysis, while the double colon specifies that the MOR program should analyze the actual erroneous word used (MacWhinney, 2000). Both markings are compatible with other programs like FREQ (MacWhinney, 2000).	PAR: she opened the boot [: book] or [:: book] [p:w] to read a chapter
-rep	Repeated Error	Add "-rep" to the error code if the same error occurs more than once (MacWhinney, 2000)., such as [*p:w-rep]	"PAR: as soon as she opened the boot [:book] [p:w],she said she enjoyed it the boot [:book] [p:w-rep]."
-ret	Revised Error	Use "-ret" (retraced) if the error is corrected during the speech.	PAR: you remember the boob [:book] [p:w-ret], she read last time? She just finished the saga
Multiple codes	Multiple Error Types	Apply multiple codes to detail each type of error for semantic, phonemic, or other linguistic inaccuracies.	*PAR : he felt a sting [: string] [s:t] [* p:w] on his hand.

3.9.2 Utterance-Level: Postcodes

Several codes can apply to a single utterance, reflecting the complexity of speech errors. These codes include:

Grammatical error [+gram]

Identifies sentences that show incorrect use or arrangement of words, covering two specific types:

1. Agrammatic speech

Often appears as 'telegraphic speech', where key words such as nouns (things), verbs (actions), and adjectives (descriptors) are present, but many smaller linking words like articles ('the'), prepositions ('in'), and conjunctions ('and') are omitted. It's akin to how telegrams were written to be brief.

2. Paragrammatic speech

Features obvious mistakes in how words are ordered (syntax), how sentences are structured, or in the endings of words (morphology).

3. Examples

- `*PAR: more milk want I. [+ gram]`. Missing function words and mixed-up order, showing telegraphic and syntax errors.
- `*PAR: she books reads. [+ gram]`. Wrong order and form, highlighting errors in syntax and morphology.

Jargon [+ jar]

Used for fluent speech and sounds correct in terms of rhythm and inflection (prosody), yet it is largely meaningless. It frequently includes paraphasia (incorrect word substitutions), neologisms (made-up words), and unintelligible strings, all while maintaining the syntax (sentence structure) and inflection of English. The result is speech that seems well-structured but makes no logical sense, often peppered with non-existent words. For example: `*PAR: circular branches drift over the square moon. [+ jar]`.

Empty Speech [+ es]

Refers to grammatically correct speech that lacks substantial meaning, often because it uses vague terms like 'thing' or 'stuff' instead of more specific words (MacWhinney, 2000). Differentiating between 'empty speech', 'jargon', and 'grammatical errors' can be difficult since they may all appear meaningless in context (MacWhinney, 2000). Consider this instance: `*PAR: he did the thing at that place with some stuff. [+ es]`

Perseveration [+ per]

Involves the repetition of an utterance or part of it when it is no longer contextually appropriate (MacWhinney, 2000).

Circumlocution [+ cir]

This error involves talking around a concept or word, often in an attempt to describe or define it without directly naming it (MacWhinney, 2000). It can indicate difficulty retrieving specific lexical items. An example might include an elaborate, indirect description of an object or concept instead of a straightforward identification.

4 Personal Insights and Future Directions

This section marks a significant departure from the technical depths of transcription techniques and software navigation. It illuminates the vibrant human side of scientific exploration, offering a unique blend of personal stories, reflections, and aspirations that shape and drive this fascinating field of aphasia research and neuropsychology.

1. Introduction to Personal Experience

Born and raised in Gabon, I was immersed in a culture where traditional beliefs often overshadowed scientific explanations, particularly regarding neuro-related and psychiatric disorders. These were sometimes dismissed as outcomes of witchcraft, obscuring their medical realities. This perspective profoundly influenced my understanding of such conditions from an early age.

My interest in the field began with my great-grandmother, whose behaviors and memory issues were attributed to old age until a posthumous diagnosis revealed a neurodegenerative disease. This experience planted early questions in my mind about conditions often dismissed as mere 'old age.'

The plot thickened with my brother's learning difficulties, which many mistook for laziness. Observing his struggles made me aware of the frequent misjudgments surrounding learning disorders. This misinterpretation and the harsh judgment he faced were eye-opening.

My engagement deepened when my sister was diagnosed with Attention-deficit/hyperactivity disorder (ADHD) and my youngest brother with autism. Living abroad, I became involved in seeking diagnoses and explaining these conditions to my parents. This was especially challenging for my youngest brother, whose language impairment made communication difficult since we could only connect via phone.

Being involved in my siblings' diagnosis process was enlightening, but it also highlighted the substantial gaps in medical infrastructure and expertise in Gabon. The costs and the need to seek specialists abroad underscored the global disparity in healthcare resources, fueling both my gratitude for European resources and my guilt for being away from home.

Driven by a strong sense of responsibility as the eldest of seven children, I decided to study neuropsychology to better support my family and others facing similar challenges. I focused initially on adult language disorders, as these presented a more straightforward entry point for transcription and study, making it practical for a beginner like me.

I chose AphasiaBank for my thesis because it is a platform that offers members access to a wealth of data, facilitating practical analysis and profiling of language patterns. Although AphasiaBank is a member-only resource, its structured approach to language disorders makes it an invaluable tool for my studies. It allows me to build a solid foundation in adult language disorders while keeping the door open to exploring the dynamic processes of children's language in the future.

2. Reflections on Learning about AphasiaBank

Simplifying AphasiaBank: A Beginner's Perspective

Embarking on my journey into aphasia research with the help of AphasiaBank has been both challenging and enlightening. Reflecting on my progress, I realized early on that more resources needed to be digestible for beginners. This spurred me to simplify the complex ideas associated with aphasia research, making them accessible and relatable to others just starting.

Initial Overwhelm and Simplified Strategies

When I started exploring aphasia research, I was overwhelmed by complex linguistic terms and concepts from academic texts and detailed manuals. I implemented a systematic approach to manage this: setting daily reading goals and summarizing key points to break down the information into manageable segments. This approach facilitated my understanding and prepared me to share these insights more straightforwardly with other beginners.

Practical Tools and Techniques

Utilizing tools like the tutorial screencasts and the browsable database on AphasiaBank was crucial in my learning. These resources allowed me to engage with the material hands-on, linking directly to transcriptions and enabling real-time corrections. This practical approach helped demystify the coding and transcription processes, making the abstract aspects of academic texts tangible.

Navigating Linguistic Complexity and the MOR Command

The MOR command, crucial for analyzing morphological aspects of speech, posed a significant challenge due to its complexity. As I continue to learn and practice, I plan to create a visual aid, like a cheat sheet in a tabular format, to make learning this command more approachable for beginners.

Balancing Academic Demands

Balancing the demands of my thesis with other academic responsibilities required effective time management. I set specific, achievable goals for each study session and broke down larger tasks into smaller segments, which helped maintain focus and prevent being overwhelmed.

Overview of My Thesis and Its Educational Purpose

My thesis compiles and summarizes existing manuals on AphasiaBank, presented in a more accessible format through a table designed for easier reference and learning. While not new tools, these aids help demystify complex coding and linguistic elements for beginners.

Closing Thoughts: Supporting Other Learners

My work is intended to serve as a foundational resource, helping to cultivate a community where we can all grow and enhance our understanding of aphasia together. I encourage you to take full advantage of Aphasia Bank's structured resources. Reflecting on my journey, if I could advise my earlier self, it would be to overcome shyness and engage in study groups or community forums for support. Maintaining a research diary is also beneficial for tracking progress and reflecting on learning experiences, reinforcing growth and mastery over time.

The learning process varies for everyone, and my path continuously evolves. Patience is essential; for instance, it took me about nine months to confidently transcribe a medium-length conversation. As you delve into the complexities of AphasiaBank, prepare for a challenging yet rewarding journey that will significantly enhance your capabilities as a practitioner.

3. Specific Learning Outcomes for Readers

My thesis is an introductory guide to AphasiaBank and its associated coding tools, summarizing and explaining the essential codes and data manipulation techniques available. It is designed to make the initial steps in aphasia research more accessible. However, the

achievement of the following specific learning outcomes is contingent upon each reader's involvement and motivation:

1. **Recognizing Symptoms**: Gain a basic understanding of aphasia symptoms through curated, browsable video data, aiding in early recognition.
2. **Day-to-Day Challenges**: Learn about the everyday communication challenges faced by those with aphasia, fostering empathy and awareness.
3. **Therapeutic Approaches**: Introduce basic therapeutic strategies and tools used in aphasia treatment, emphasizing their practical application.
4. **Community Support and Advocacy**: Encourage readers to support community initiatives and advocate for better healthcare policies through increased knowledge and understanding of aphasia.

For further resources, please visit AphasiaBank Education, where additional materials are available to aid students and clinicians in improving their comprehension of aphasia.

To enhance your understanding and research engagement in aphasia, I invite you to explore the following resources available at AphasiaBank:

1. **Videos about Aphasia:**
    - Discover a variety of educational videos by visiting Aphasia Videos.
2. **Discourse Analysis:**
    - Learn about different approaches to discourse analysis focusing on AphasiaBank protocol tasks and explore results from past studies. Access this resource at Discourse Analysis.
3. **Related Sites:**
    - **Informational Sites:**
        - Join the aphasia communities for continuously updated resources at Aphasia Community Resources.
        - Connect with FOQUSAphasia, a group dedicated to improving spoken discourse research and therapy in aphasia at FOQUSAphasia.

- **Software Tools:**
    - Use the Aphasia Software Finder to discover useful apps and software for individuals with aphasia and professionals at Aphasia Software Finder.
    - Access a comprehensive bibliography of technology for therapy at Technology for Therapy.
- **International AphasiaBank Branches:**
    - Explore resources specific to Japanese speakers at Japanese AphasiaBank and Cantonese speakers at Cantonese AphasiaBank.

4. **Gesture Analysis:**
    - Gain insights into the role of gestures in discourse analysis by visiting Gesture Analysis.

4. Addressing Neurodevelopmental Healthcare Gaps in Central Africa through ASLA Techniques

Background and Context in Central Africa

Gabon, a key example in Central Africa, confronts significant healthcare challenges, especially neurological health. With healthcare infrastructure primarily concentrated in urban areas like Libreville, vast rural regions remain underserved. This is particularly problematic for managing conditions such as aphasia. The healthcare system faces several issues:

- **Limited Healthcare Resources**: There is a shortage of specialized facilities and professionals in neurology, which is affecting the availability of critical services.
- **Training and Awareness**: There is a lack of sufficient training for healthcare professionals on neuropsychological disorders, resulting in delayed diagnoses and treatments.
- **Infrastructure Deficiencies**: While general healthcare infrastructure has improved, specialized facilities for neurodegenerative disorders are still rare, especially outside major urban areas.

Cultural and Socioeconomic Factors

Cultural perceptions and socioeconomic factors play a crucial role in the recognition and treatment of neurodegenerative disorders in Central Africa. These conditions are often stigmatized and misunderstood, with some cultural groups attributing them to supernatural causes. Moreover, access to healthcare is primarily available to higher socioeconomic groups in urban areas, which further marginalizes rural and economically disadvantaged populations.

Implementing ASLA Techniques: Relevance and Challenges

ASLA (Automated Speech and Language Assessment) offers a viable, cost-effective alternative to traditional diagnostic methods such as imaging and cerebrospinal fluid analyses, particularly suitable for low-resource settings. ASLA (García et al., 2023) provides objective, examiner-independent assessments through brief oral production tasks, analyzing speech timing, pitch variability, syntactic complexity, and semantic specificity (García et al., 2023). These are crucial for early identification and monitoring of neurodegenerative diseases, where speech and language impairments often serve as early indicators such as Alzheimer's and Parkinson's (García et al., 2023).

Combining ASLA with TalkBank enhances our understanding of neurodegenerative diseases in linguistically diverse regions like Central Africa. TalkBank allows for the storage and analysis of speech samples across various languages and conditions, facilitating the comparison of linguistic data across different cohorts and conditions. This robust framework supports comprehensive research and diagnosis.

This approach is particularly relevant in Gabon, which offers a unique opportunity for cross-linguistic research due to its rich linguistic landscape. Gabon is home to over fifty vernacular languages, and following its entry into the Commonwealth, it has added English as an official language alongside French. These factors make Gabon an ideal setting for deploying ASLA and TalkBank methodologies.

The **careful implementation of ASLA techniques** involves and requires:

1. **Establishing Research Collaboration**: Forming a multidisciplinary team and collaborating with international networks, such as the Alzheimer's Disease Neuroimaging Initiative, to leverage expertise and resources.

2. **Utilizing Existing Resources**: Integrating data from established databases like AphasiaBank and TalkBank, focusing on French-speaking and English-speaking cohorts and complementing this with additional data collected from local vernacular languages.
3. **Data Collection and Analysis**: Employing cross-linguistically comparable stimuli for research consistency, conducting comprehensive speech recordings, and using advanced data analysis techniques to extract meaningful insights.
4. **Developing Cross-Linguistic Protocols**: Designing research protocols that accommodate linguistic variations across different language speakers, ensuring that these protocols maintain high construct validity.
5. **Community Engagement and Training**: Training local healthcare providers in the latest diagnostic and treatment techniques and engaging with communities to raise awareness about neurodegenerative disorders and the importance of early detection and intervention.

Overcoming Challenges and Solutions

However, realizing these outcomes necessitates careful consideration of expected challenges, such as:

- **Financial Constraints**: Proactively seeking trans-regional funding schemes and international grants to support the initiative financially.
- **Cultural Differences**: Incorporating cross-cultural measures to account for non-linguistic factors that influence health outcomes, ensuring that interventions are culturally sensitive and effective.
- **Linguistic Diversity**: Develop robust protocols to manage the linguistic variability present in Central Africa and ensure accurate data collection and analysis, accommodating multiple languages and dialects.
- **Phased Rollout**: Concentrating initial implementation efforts in urban centers allows for the refinement of approaches and methods before a broader rollout. This phased approach helps to better understand and address the challenges in a controlled environment.

Contributing to such a significant milestone in Gabon and the broader scientific community requires an enormous amount of dedication and training before establishing any strategic partnerships and implementing culturally sensitive approaches

CONCLUSION: From Beginner to Aspirant Advocate

In the words of a Yipunu proverb:

"Tsoli a ji purumugē kedi, duvangu tsisigë."

meaning "The bird that flies during the day prepares at night", reflects the importance of thorough preparation and perseverance. From my mother tongue, this proverb aptly summarizes the essence of this thesis, "Introduction to AphasiaBank for Beginners by a Beginner".

Key Points to Remember: Summary of Key Contributions

1. AphasiaBank Overview

This thesis comprehensively introduces AphasiaBank, emphasizing its role as a crucial resource for aphasia research. By detailing the structure and functionality of this database, it aims to make it accessible to newcomers in the field.

2. CLAN Software Guidance

Detailed, step-by-step instructions for installing and configuring the CLAN software are included, ensuring that even those with minimal technical expertise can effectively use the necessary tools for transcription and analysis.

3. Transcription Simplification

Complex transcription techniques have been simplified into an easy-to-understand format. A newly designed reference table aids in navigating the coding and data manipulation processes, facilitating accurate and efficient transcription.

4. Practical Application and Impact

By bridging theoretical understanding with practical application, this thesis enhances the ability of beginners to manage and analyze linguistic data. This not only broadens the scope of AphasiaBank's application in research but also highlights its potential impact on neuro-related healthcare, particularly in Central Africa.

5. Community and Collaboration

The importance of community support and collaboration is emphasized throughout the thesis. Sharing personal insights and strategies encourages new researchers to engage actively with the aphasia research community.

Personal Reflections and Future Directions

My experiences, from growing up in Gabon, where traditional beliefs often overshadow scientific explanations, to witnessing various neuro-related issues within my family, have profoundly shaped this work. These experiences underscore the necessity of patience, understanding, and scientific inquiry in addressing neuropsychological conditions.

The methodologies mentioned and insights discussed here provide a foundation for further research. Expanding these approaches to accommodate linguistic and cultural diversity, particularly in underserved regions, remains a significant goal.

Final Thoughts

This thesis aims to serve as a comprehensive, accessible guide on the technical aspect of using AphasiaBank software. By simplifying complex processes and fostering a collaborative research community, it hopes to inspire and empower new researchers to make meaningful contributions to the field of aphasia and neuropsychology.

However, this thesis does not present new tools; it aids in demystifying already existing tools for beginners. It also does not cover all possible nuances of AphasiaBank (such as the CLAN Analysis Program or automatic morphosyntactic analysis).

Ladies and gentlemen, esteemed professors, and fellow students, as I conclude, I extend an invitation to every dreamer interested in joining this transformative quest. A close bond, indeed, holds the canoe together, signifying the strength in unity and perseverance. Thank you for your engagement and support in this endeavor ❀.

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APPENDIX

Summary of Key Transcription Techniques

Category	Subtypes	Types	Markers
Headers	**Initial Header**	`@Begin` & `@End`	
		`@Languages`	**ISO-639 codes**
		`@Participants`	**List the speakers using codes and their roles**
		`@ID`	`language:|corpus|code|age|sex|group|eth,SES|role|education|custom`
		`@Media`	**filename, media type**
Utterances terminators			
	Basic utterances Terminators	period	**.**
		Question	**?**
		Exclamation	**!**
	Special Utterances Terminators	Pauses	**(.), (..), (…) (seconds), (minutes:seconds)**
		Intonations	↑ (rising intonations)
			↓ (falling intonations)
			↑↓ (Final rise then fall intonation)
			↓↑ (final fall then rise intonation)

			↓? (question not ending in a rise)
		Syntax and Semantic Criteria	A sentence is usually an utterance unless prosody indicates otherwise. Grammatical correctness is not required for utterances, and semantic criteria should not strictly define their boundaries in this population.
Words-Level Transcription			
	Special form marker	Neologism	**@n**
		Multiple letters	**@k**
		Letter	**@l**
	Ambiguous Material	Unintelligible speech	**xxx**
		Untranscribed material	**www**
	Fragments & Fillers	Phonological fragments	**&+**
		Filler	**&-**
		Nonwords	**&~**
	Others	Partial omission / shortening	**()**
		Omitted word/article/verb	**0word /0det/0aux…**
		Capitalization	**Proper nouns / I**

		Numbers and titles	**Spell numbers and titles as pronounced**
	Rules to know	• Acronyms, Anonymization • Assimilation & Cliticizations, • Communicators & Interjections, • Compound and Linkages, • Colloquial form, • Dialectical Variations, • Kinship Forms, • Spelling variants.	
Utterances Transcription Techniques			
	Adult utterances	Ensure main clause integrity, Incorporate related elements, Conjoined clause division, Recognition of incompleteness.	

	Requirements for C-Units	Utterances contain only one main clause. If participant uses multiple "and" to connect thought, each should start a new line If participant uses another conjunction, treat the connected clauses as part of the same utterance.	
	Main line special characters	Linkage (e.g., within acronyms to show separation or association)	**Underscore (_)**
		Break up compound terms or words with hyphen	**hyphen**
		Indicate connected form	**Compound** words, previously "+"
		Non-standard words or sounds	**@**
		Encase comment or non-verbal sounds	**()**
		Lengthened syllable	**:**
		Blocking	**≠**
		Brief pause between syllables	**^**

		Others	**< > / []** (provide commentary for speech withing angle brackets
	Identifying Local Events	Simple local event (&=): verbal / non-verbal events and gestures	**&=body part:action**
			&= action:object
			&=gesture:action\object
		Interposed words	**&*ID:word**
		Complex local events	**[^ text]**
		Long Events	**&{l=* description&}l=* (vocal event)**
			&{n=* description &}n=* (non vocal events)
	Special utterance terminators	Trailing off	**+...**
		Question trailing off	**+..?**
		Question with exclamation	**+!?**
		Uninvited Interruption	**+/.**
		Interrupted Question	**+/?**
		Self-Interruption	**+//.**
		Self-Interrupted Question	**+//?**
		Transcription Break	**+.**

		Quotation	**“text”**
		Quotation Follows	**+”/.**
		Quotation Precedes	**+”.**
	“Utterances Linkers”	Quoted Material	**+”**
		Quick Uptake	**+^**
		Self-completion	**+,**
		Invited interruption.	**++**
	Utterances level error coding	Grammatical error	**[+gram]:**
		Jargon	**[+ jar]:**
		Empty Speech	**[+es]**
		Preservation	**[+per]**
		Circumlocution	**[+cir]**
Scoped symbols			
	Paralinguistic scoping	Paralinguistic material	**[=! text]**
		Stressing / contrastive stressing	**[!] , [!!]**
		Duration	**[# time]**
	Explanation and Alternatives	Explanation	**[= text]**
		Replacement (transcribe target word)	**[: text]**

		Replacement of Real Word (to transcribe incorrect usage)	**[:: text] [*]**
		Alternative Transcription	**[=? text]**
		Comment on Main Line	**[% text]**
		Best Guess	**[?]**
		Error	**[*]**
	Retracing, Overlaps, Clauses	Lazy Overlap	**+<**
		Repetition	**[/]**
		Retracing	**[//]**
		Reformulation	**[///]**
		False Start without retracing	**[/-]**
Dependent Tiers		Explanation Tier	**%exp**
		Comment Tier	**%com**
		Morphological Tier	**%mor**
		Error Coding Tier	**%err**
Disfluency transcript			
	SLDs	Prolongation	**:**
		Broken Word	**^**
		Blocking	**≠**
		Repeated Segment	**↫**
		Lengthened Repeated Segment	**↫ and:**

	TDs	Phrase Repetition	<> [/]
		Phrase Revision	<> [//]
	Special codes	Blocking of Filled Pauses	&-≠
		Blocking of Repeated Segments	**Place ≠ within ↫ ↫**
Phonological Errors			[* p]
		Words	[*p:w]
		Non-words	[*p:n]
		Metathesis	[*p:m]
Semantic Errors			[* s]
	Related word		[*s:r]
		Incorrect Preposition	[*s:r:prep]
		Partial Segment	[*s:r:seg]
		Derivational Error	[*s:r:der]
	Unrelated Word		[*s:ur]
	Unknown Target Word		[*s:uk]
	Perseveration		[*s:per]
	Grammatical Category		[*s:r:gc]
		Article Errors	[*s:r:gc:art]
		Pronoun Errors	[*s:r:gc:pro]
		Derivational Errors	[*s:r:gc:der]

Neologism			**[* n]**
		Known Target	**[*n:k]**
		Unknown Target	**[*n:uk]**
		Target, Stereotypy	**[*n:k:s]**
		Unknown Target, Stereotypy	**[*n:uk:s]**
		Known Target, Derivation	**[*n:k:der]**
Morphological errors			**[* m:a]**
	Regular Forms Missing Suffixes		**[*m:0]**
		Progressive	**[*m:0ing]**
		3rd Person Singular	**[*m:03s]**
		Past	**[*m:0ed]**
		Noun Plural	**[*m:0s]**
		Possessive	**[*m:0's]**
		Possessive Plural	**[*m:0s']**
	Substitutions of the base form		**[*m:base:*]**
		Plural Irregulars	**[*m:base:s]**
		Irregular Past	**[*m:base:ed]**
		Perfective Irregulars	**[*m:base:en]**
		Comparative	**[*m:base:er]**
		Superlative	**[*m:base:est]**
	Substitutions of the base form for irregulars		**[*m:irr:*]**

		Plural for Singular	`[*m:irr:s]`
		Past for Present	`[*m:irr:ed]`
		Perfective for Base	`[*m:irr:en]`
	Substitutions between past and perfective irregulars		`[*m:sub:*]`
		Past for Perfective	`[*m:sub:ed]`
		Perfective for Past	`[*m:sub:en]`
	Overregularization of irregulars		`[*m:=*]`
		Past	`[*m:=ed]`
		Perfective	`[*m:=en]`
		Plural	`[*m:=s]`
	Superfluous markings		`[*m:+]`
		Progressive	`[*m:+ing]`
		3rd Person Singular	`[*m:+3s]`
		Past	`[*m:+ed]`
		Perfective	`[*m:+en]`
		Plural	`[*m:+s]`
		Possessive	`[*m:+'s]`
	Double marking of regulars and irregulars		`[*m:++]`
		Progressive	`[*m:++ing]`
		3rd Person Singular	`[*m:++3s]`
		Past	`[*m:++ed]`
		Perfective	`[*m:++en]`
		Plural	`[*m:++s]`

		Possessive	**[*m:++'s]**
	Double marking of irregulars		**[*m:++*: i]**
		Irregular past	**[*m:++ed:i]**
		Irregular perfective	**[*m:++en:i]**
		Irregular plural	**[*m:++s:i]**
	Agreement Errors (Irregulars)		**[*m:v*:a]**
		Incorrect Singular 3rd Form Used for Plural	**[*m:vsg:a]**
		Incorrect Unmarked Verb Form Used for 3rd Singular	**[*m:vun:a]**
	Agreement Errors (Regulars)		**[*m:*s:a]**
		Missing 3rd Person Singular	**[*m:03s:a]**
		Unneeded 3rd Person Singular	**[*m:+3s:a]**
		Singular for Plural	**[*m:0s:a]**
		Plural for Singular	**[*m:+s:a]**
	Allomorphic Errors	Stem/Base Changes	**[*m:allo]**
Dysfluencies		General dysfluency	**[*d]**
		Within-Word Dysfluency	**[*d:sw]**