

BACKGROUND



Speech and language analysis provides sensitive markers for investigating adult-acquired neurological speech and language disorders



The Codes for the Human Analysis of Transcripts (CHAT) format and the Computerized Language Analysis (CLAN) software, both developed within the CHILDES/TalkBank framework, provide a standardized and widely adopted approach for systematically transcribing and quantitatively analyzing connected speech.



The application of CHAT and CLAN to Italian adult neurological populations still poses some challenges: certain linguistically and clinically relevant features of Italian are not yet systematically captured within the current framework.

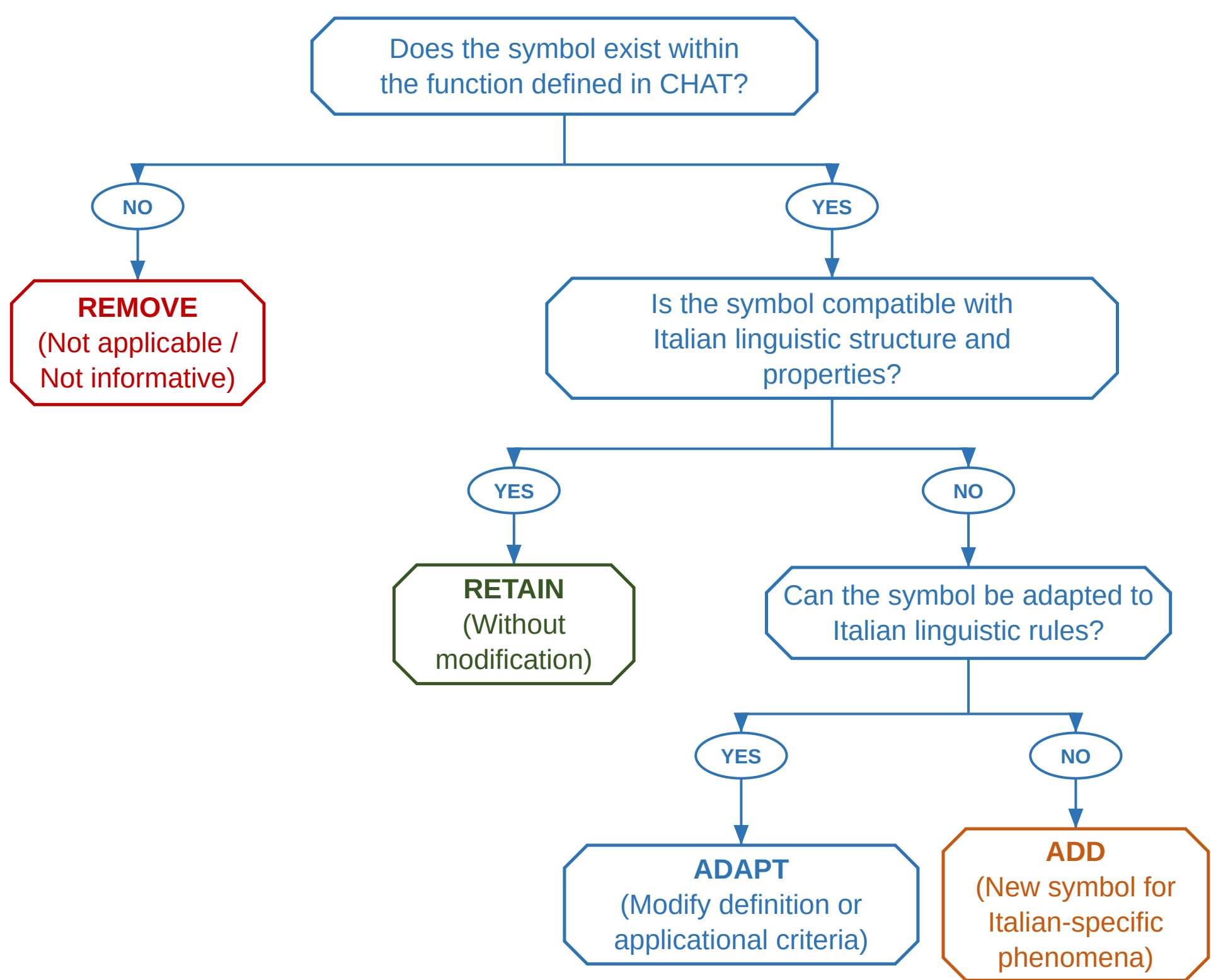
AIM



To develop the Italian CHAT Toolkit, ensuring linguistic appropriateness for Italian and clinical relevance for adult neurological populations, and provide a framework for future cross-linguistic adaptations.

METHODS

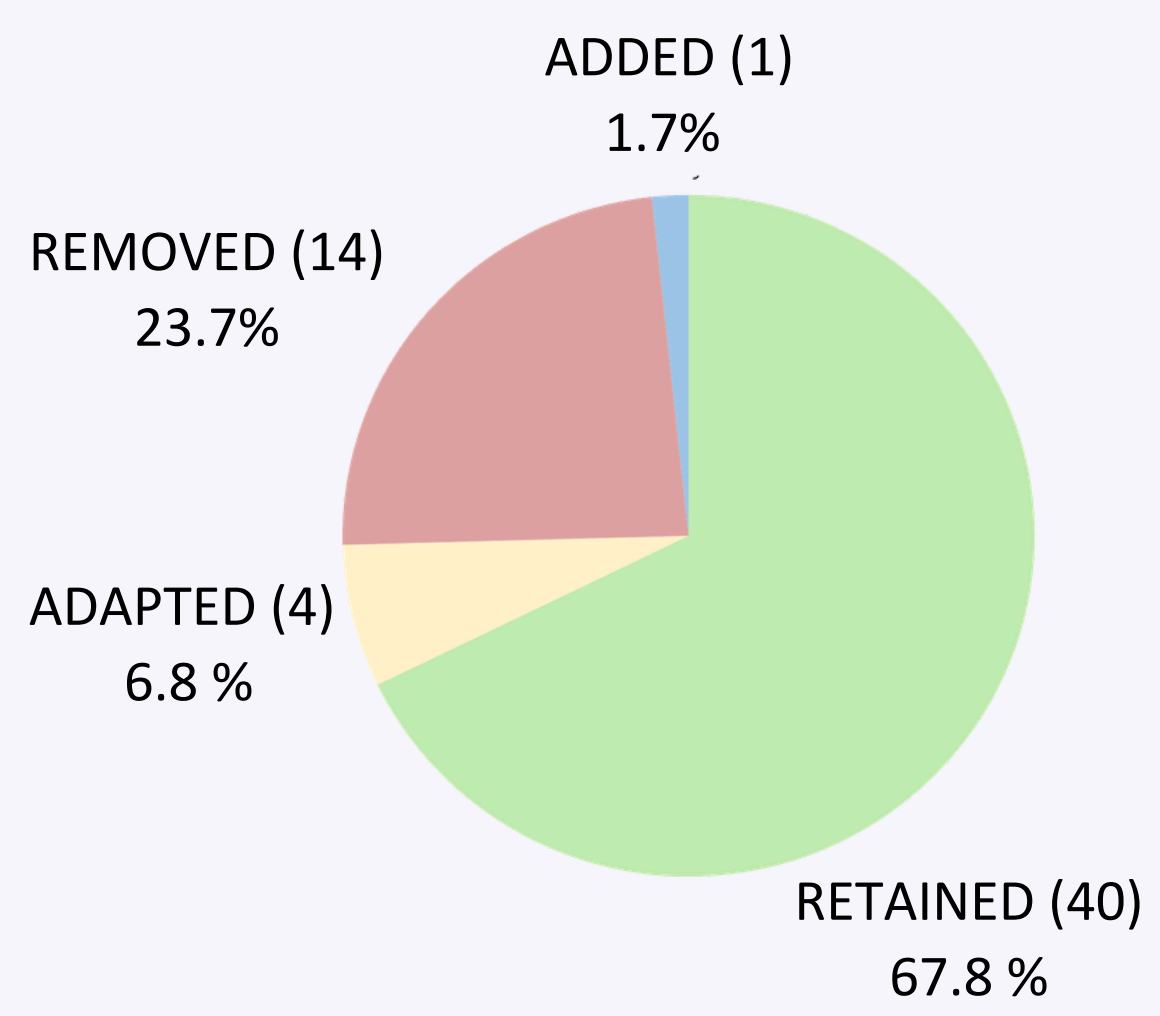
The study followed a structured, stepwise decision-making framework for selecting and adapting CHAT symbols to Italian. Each symbol described in CHAT Transcription format was evaluated against a set of predefined decision criteria that guided its retention, elimination, adaptation, or the introduction of a new symbol.



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graph TD; Q1{Does the symbol exist within the function defined in CHAT?} -- NO --> R[REMOVE<br/>(Not applicable /<br/>Not informative)]; Q1 -- YES --> Q2{Is the symbol compatible with<br/>Italian linguistic structure and<br/>properties?}; Q2 -- YES --> R2[RETAIN<br/>(Without modification)]; Q2 -- NO --> Q3{Can the symbol be adapted to<br/>Italian linguistic rules?}; Q3 -- YES --> A[ADAPT<br/>(Modify definition or<br/>applicational criteria)]; Q3 -- NO --> B[ADD<br/>(New symbol for<br/>Italian-specific phenomena)];
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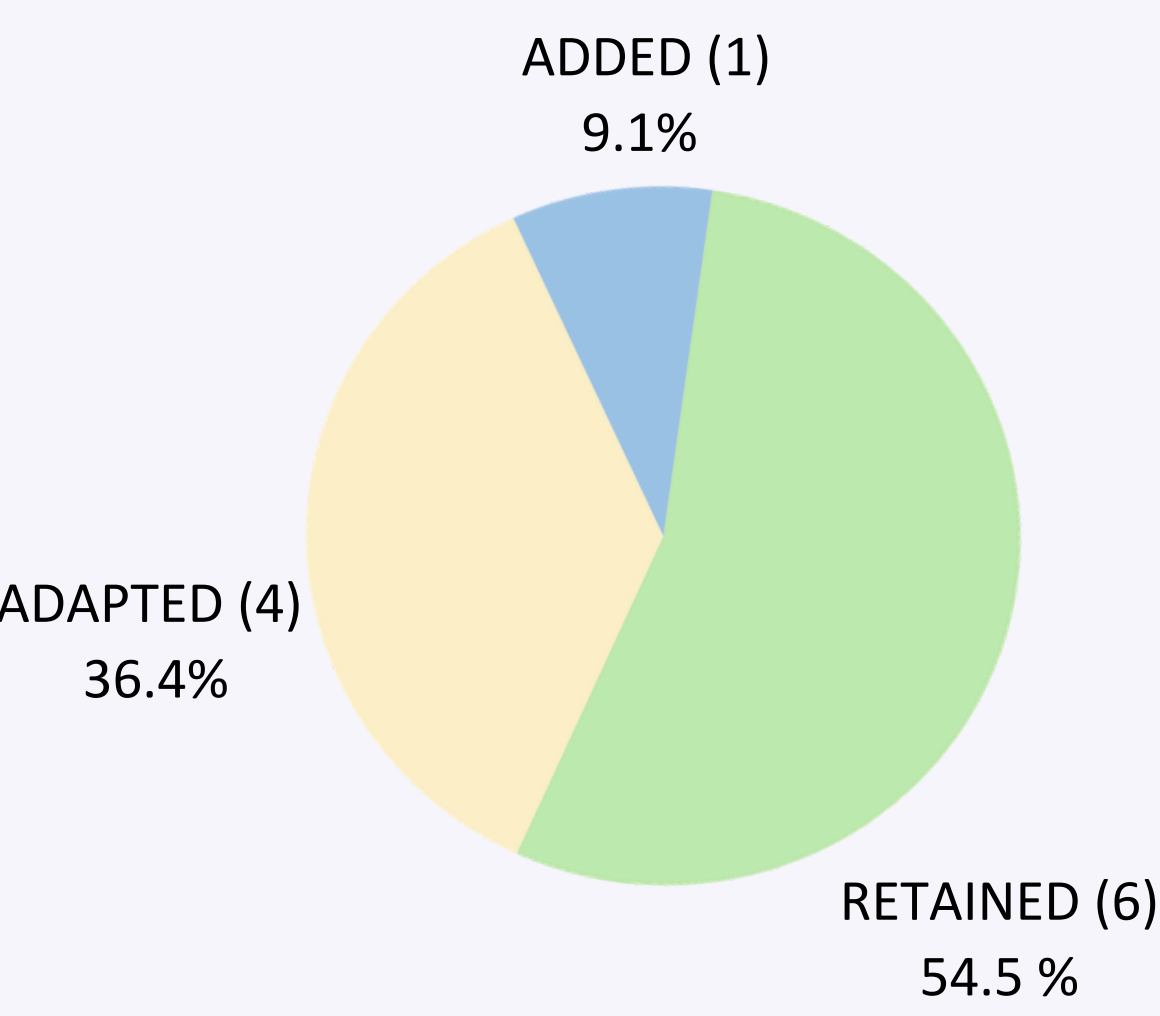
RESULTS

Transcription (n=59):



Category	Count	Percentage
ADDED	1	1.7%
REMOVED	14	23.7%
ADAPTED	4	6.8%
RETAINED	40	67.8%

Error Coding (n=11)



Category	Count	Percentage
ADDED	1	9.1%
ADAPTED	4	36.4%
RETAINED	6	54.5%

Error-coding symbols were grouped into four linguistic domains.

CLINICAL EXAMPLE

Patient G.B. (64y, female, nvfPPA; CDR 0.5, PASS 3.5); speech elicited via the 'Summer Time' picture description task (SAND battery). Transcription using both the Italian adapted toolkit and the original English CHAT conventions.

Italian (adapted Toolkit)	English (original CHAT)
PAR: sulla spiaggia c'è una signora <che> &+o &+e [] [* w] che è stesa al sole che legge. *PAR: ha gli occhiali da sole. (..) *PAR: &-eee [*] [* d] vicino alla <u>signore</u> [: <u>signora</u>].[*] [* m:a] c'è un cane che <u>scavo</u> [: <u>scava</u>] [*] [* m:v] nella sabbia. [+ gram].	*PAR: on the beach there is a lady who <che> &+o &+e is lying in the sunreading. *PAR: <u>Osubj</u>.she has sunglasses [+ gram] (...) *PAR: &-eee [*] [* d] near the lady there is a dog digging on the sand

New [*w] marker captures articulatory distortions absent from English CHA

Italian permits null subjects (pro-drop) → no [+gram] where English requires Osubj

Agreement [*] [* m:a] and verb-inflection [*] [* m:v] errors are captured only in the Italian version

CONCLUSIONS

The Italian CHAT Toolkit is:

Clinically relevant:



- Captures language features associated with acquired neurological disorders.
- Supports clinically meaningful characterization of speech and language impairments.

Linguistically grounded:



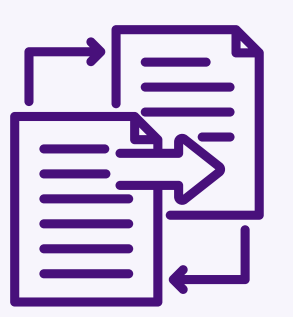
- Accounts for Italian-specific linguistic properties
- Provides direct measures of linguistic complexity, improving the identification of language impairment patterns.

Compatible with TalkBank:



- Preserves the core CHAT/CLAN framework while introducing targeted adaptations for Italian.
- Enables standardized analysis and comparability across datasets and research groups.

Replicable



- Provides a transparent decision-making framework for retaining, adapting, removing, or adding coding conventions.
- Offers a model for future adaptations of CHAT to other languages and clinical populations.

REFERENCES

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García A.M. et al. (2023). *Speech markers for cognitive and neurological disorders: a multilingual and equitable perspective*. *Brain*, 146(12), 4870–4879.



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