# Gemini listens:
## Analyzing speaking tasks


JALTCALL 2025
Paul Daniels, Kochi University of Technology

# Prosody

- Melody of speech
- Pitch
- Stress
- Rhythm

# Research on AI assessment

## Writing

Agreement of 84.72% (AI & human) https://doi.org/10.1080/09588221.2024.2371395

Agreement with humans is achievable, sufficient for low-stakes, formative assessment https://doi.org/10.1016/j.caeai.2024.100255

ChatGPT excels in grammar, spelling, sentence structure, relevance, and supporting evidence, but with thematic consistency, human evaluators outperform AI. https://doi.org/10.1007/s44217-024-00320-6

Grammar scores of human raters and the ChatGPT positively correlated, $r(152) = .55$, $p < .001$. DOI:10.5281/zenodo.10402530

## Speaking

Research mainly focuses on how AI can help learners improve speaking skills. https://doi.org/10.1016/j.system.2024.103254

# Speaking skill Assessment

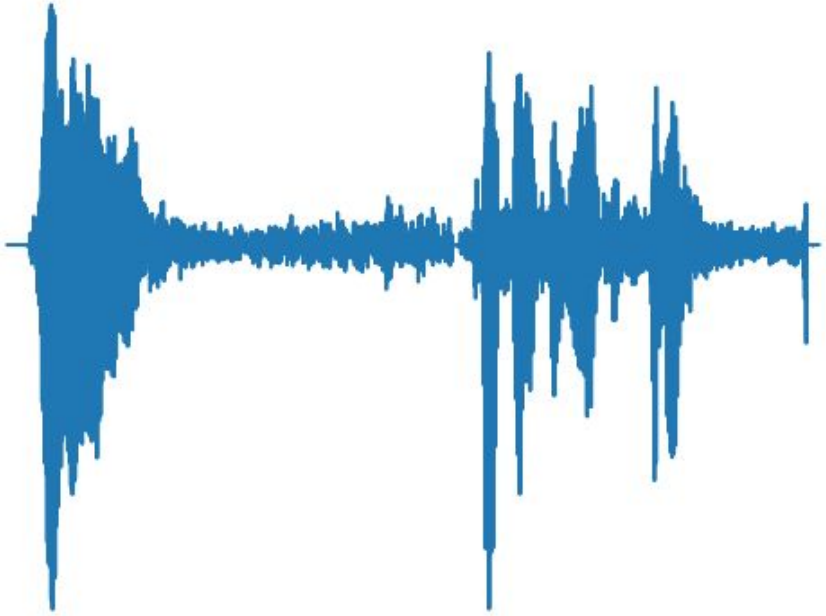
## Text

- Word & sentence count
- Vocabulary assessment
- Grammar assessment

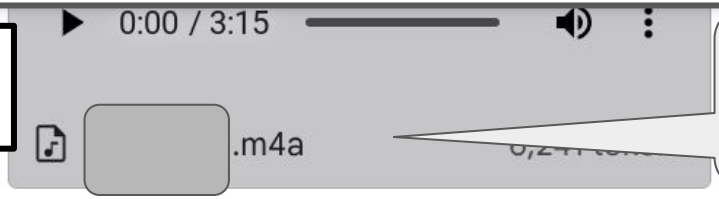
## Sound

- Intonation
- Stress, rhythm, loudness
- Fluency


Gemini



aistudio.google.com




media

Please rate the fluency and prosody of the speaker in this audio file on a scale of 1 to 100.

Prompt

I'd rate the speaker's fluency around 60/100 and their prosody around 55/100.

Fluency:

- There are frequent pauses and hesitations, disrupting the flow of speech.
- Some words are mispronounced or repeated.
- The speaker sometimes struggles with grammatical structures, leading to slightly unnatural phrasing.

Results

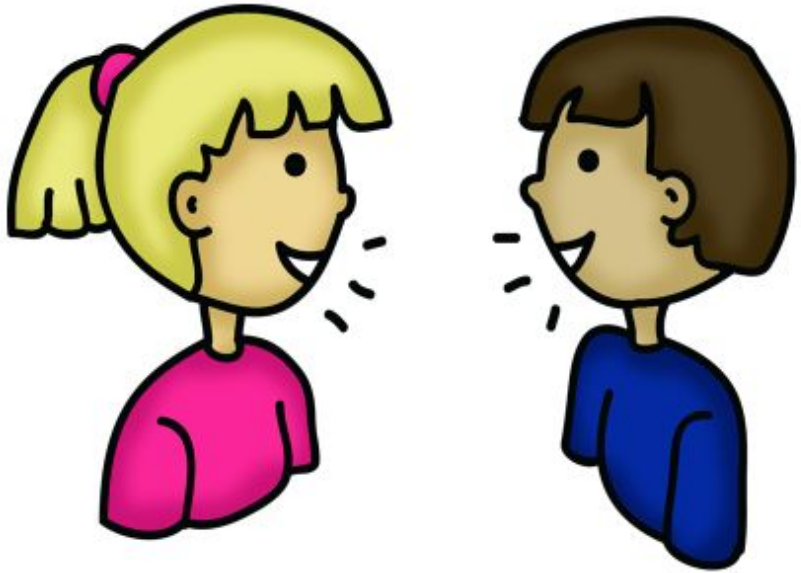
# Gemini Prompt

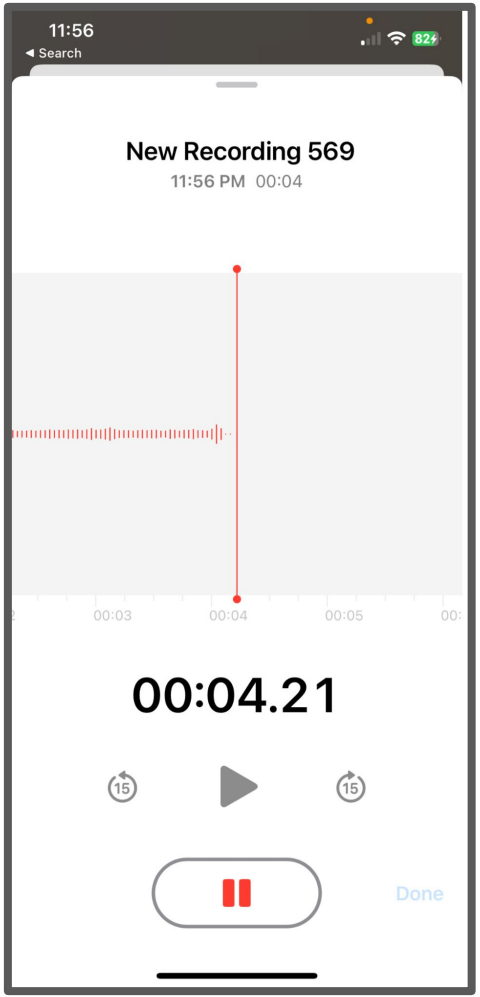
**Rate the fluency & prosody of the speaker in this audio file on a scale of 1 to 100. (speak smoothly) (rhythm / intonation)**

I would rate the fluency & prosody 60/100.

- There are frequent **pauses** and hesitations, disrupting the flow of speech.
- Some words are **mispronounced** or repeated.
- The speaker sometimes struggles with grammatical structures, leading to slightly unnatural phrasing.
- The overall **pace** is quite **slow**, which contributes to the impression of disfluency.
- The **intonation** is relatively **flat** and monotonous. There isn't much variation in pitch or rhythm, making the speech sound less engaging.
- **Stress** placement is sometimes **inaccurate**, which can affect the clarity and meaning of the sentences.
- There's a lack of expressive phrasing; it sounds as if the speaker is **reading** rather than conveying a message with enthusiasm or naturalness.

# Automate

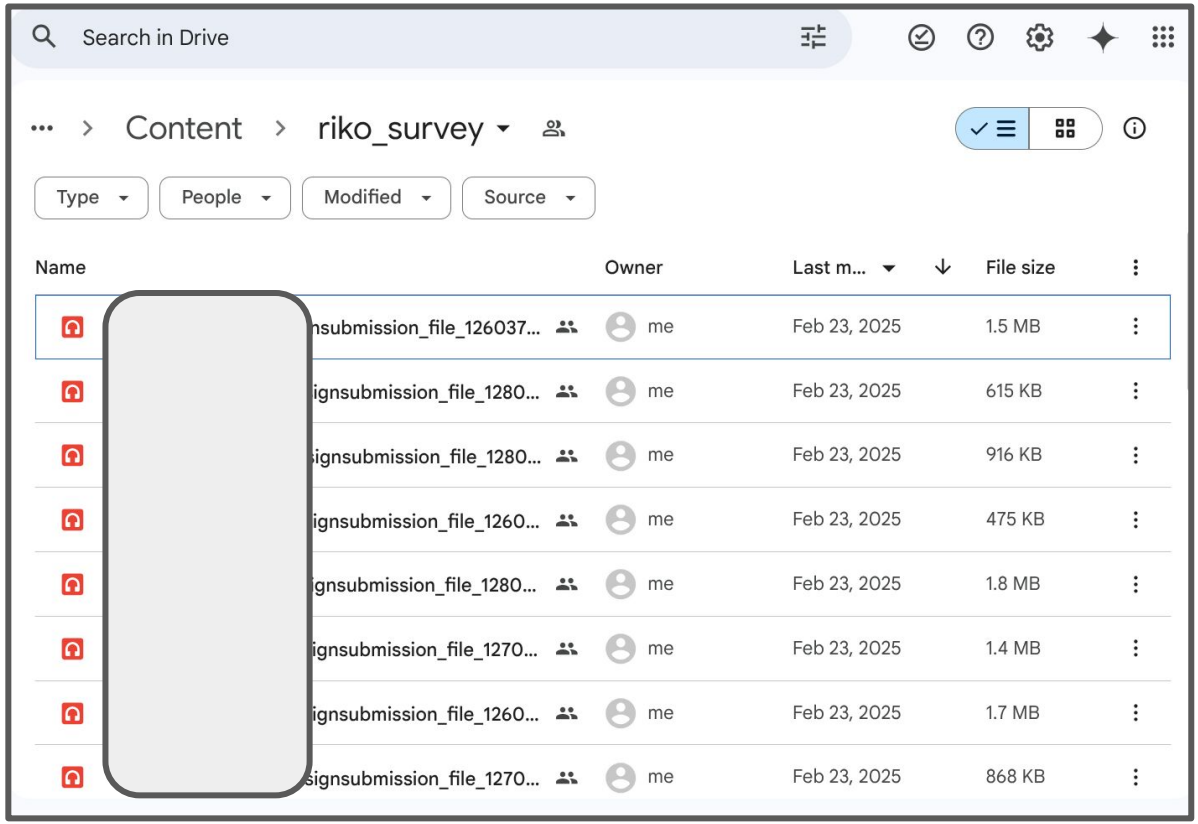



11:56
Search
82
New Recording 569
11:56 PM 00:04
00:03
00:04
00:05
00:04.21
15
15
Done

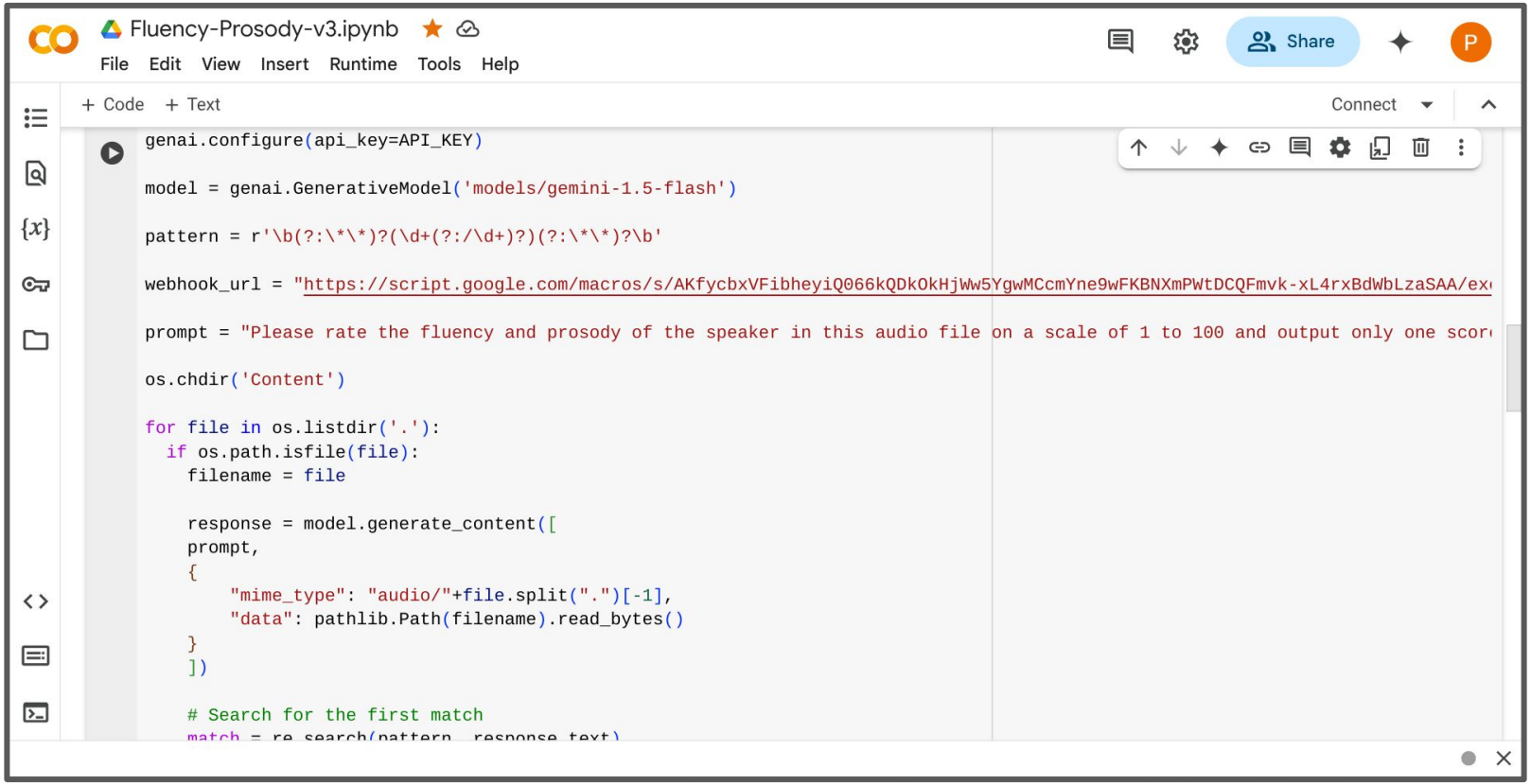
# Submit Audio

Google Drive

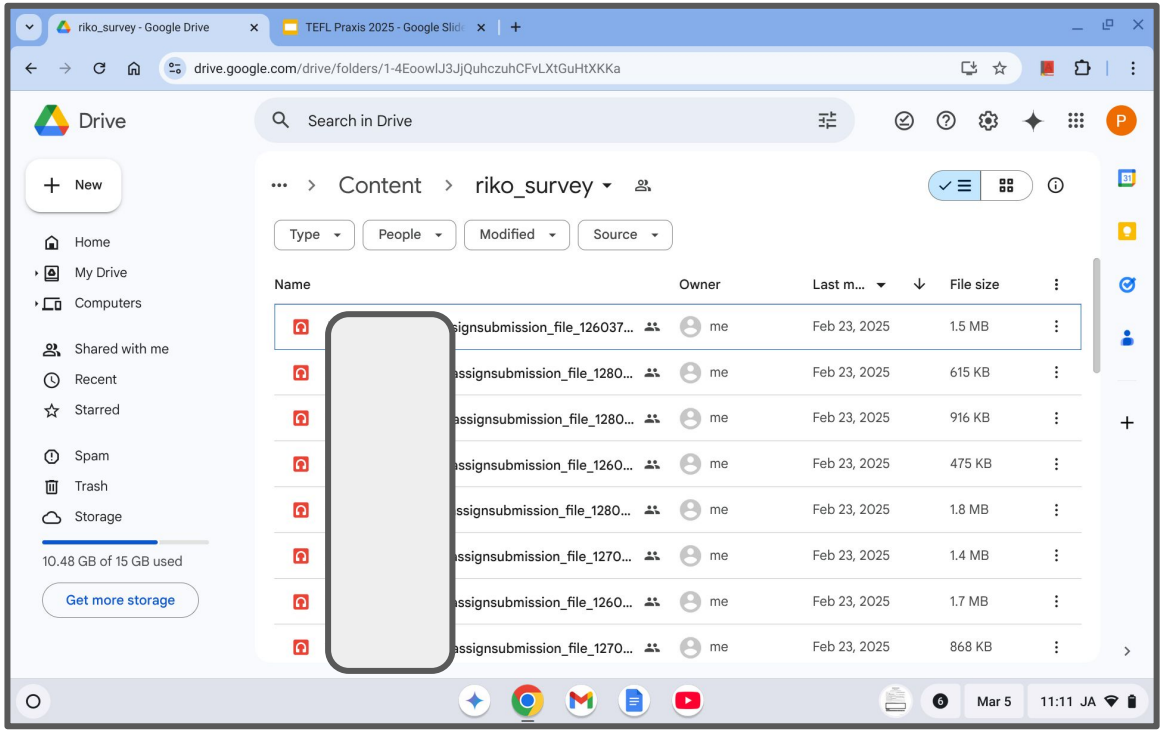
Dropbox



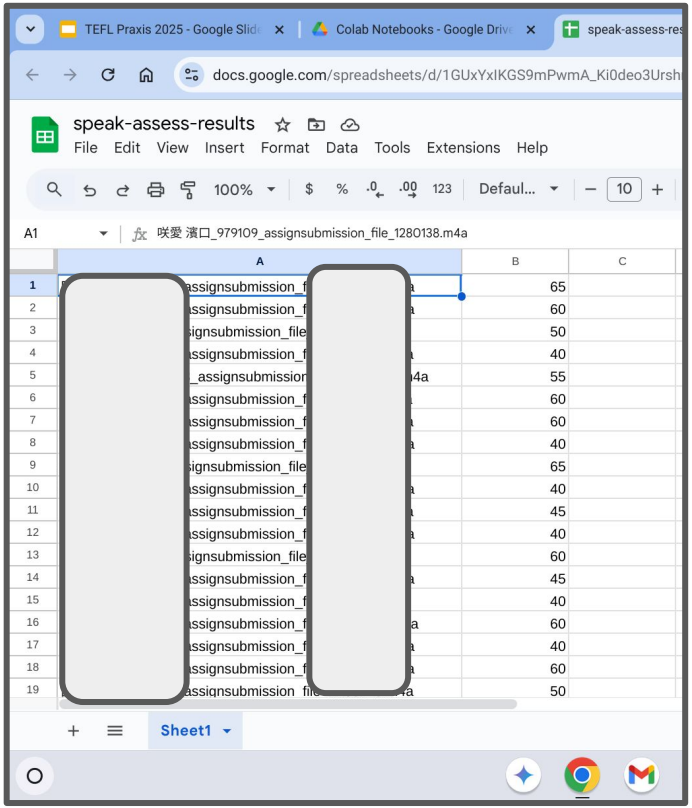
# Google Colab & Gemini API



# Google Drive




# Google Sheets



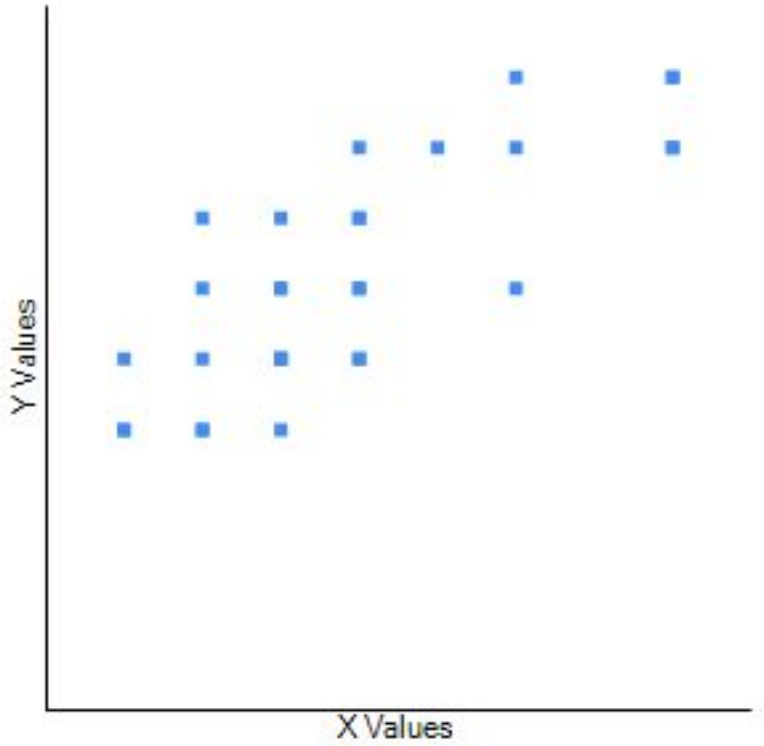
# Score verification

Verify low scores

Verify high scores

| | |
|---|---|
| 30 | 35 |
| 30 | 25 |
| 25 | 30 |
| 20 | 20 |
| 15 | 20 |
| 50 | 45 |
| 30 | 25 |
| 25 | 20 |
| 30 | 30 |
| 15 | 25 |
| 50 | 40 |

# Human & AI scores




R = 0.7953
N = 31

Positive correlation

# AI Fluency & prosody scores

4/5

2/5

# Wrapping it up …….

- Frequent HUMAN score verification
- Student feedback
- Student check
- Prompt tuning
- Sound & text analysis

# Thank you!

daniels@kochi-tech.ac.jp

Abstract

Generative AI is transforming language teaching and learning in areas such as translation, feedback, and evaluation. This presentation examines AI's ability to analyze speaking tasks in the language learning classroom. Most generative AI tools, such as ChatGPT, first convert speech to text and then analyze the transcript—an approach that overlooks important prosodic features. However, Google's Gemini can process raw audio directly, capturing intonation, stress, rhythm, and loudness without relying on text-based transcription. This study compared the accuracy and efficiency of human and AI ratings of pair-work speaking tasks, focusing on Gemini 2.0's multimodal ability to analyze natural prosody and intonation. The findings revealed a moderate positive correlation between human and AI ratings of speaking tasks, indicating that Gemini 2.0 aligns well with human judgments of intonation and rhythm in language learner speech.