USC Institute for Creative Technologies

Can we use a spoken Dialogue System to document Endangered Languages?

USC University of Southern California

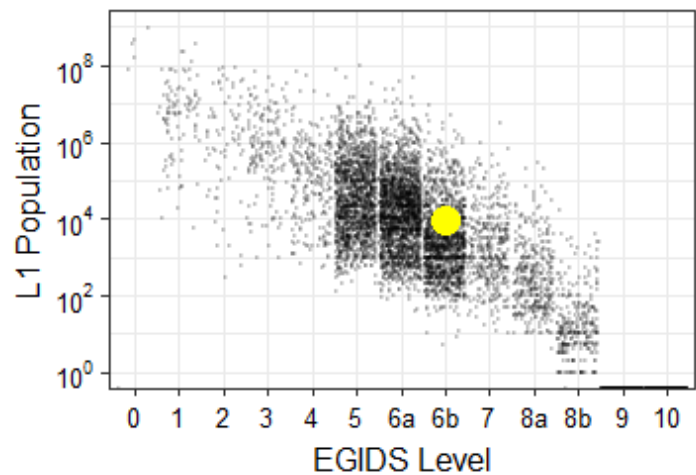Jacqueline Brixey   Seyed Hossein Alavi   David Traum

Motivation:

Humanity is facing the threat of many languages becoming extinct. With every language that dies, we lose cultural heritage and history.

The EGIDS level for the Choctaw in its primary country is 6b (Threatened) The language is used for face-to-face communication within all generations, but it is losing users.

EGIDS level: Expanded Graded Intergenerational Disruption Scale, a measurement of the status of a language in terms of endangerment or development. (see ethnologue.com for more)

Language Documentation

- It provides a means to preserve endangered languages
- It is a comprehensive record of the language and language practices of a speech community.
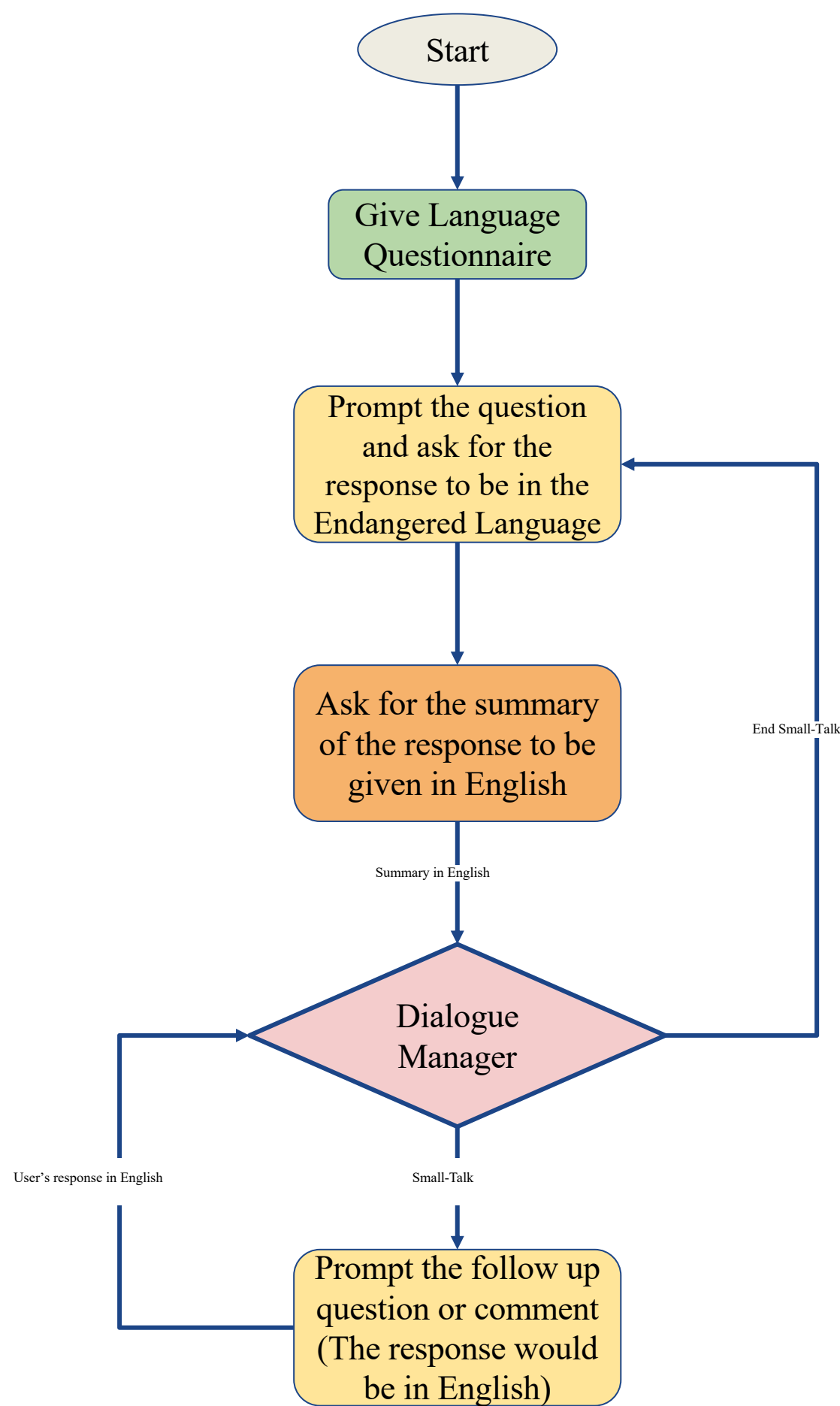
Why is it difficult?

- Inherently few speakers
- Human labor
- Financial expense
- Sensitivity to outsiders

Dialogue APp for Endangered Languages (DAPEL)

Start
↓
Give Language Questionnaire
↓
Prompt the question and ask for the response to be in the Endangered Language
↓
Ask for the summary of the response to be given in English
↓ Summary in English
Dialogue Manager
→ End Small-Talk
User's response in English / Small-Talk
↓
Prompt the follow up question or comment (The response would be in English)

Example

System: What sports do you like to play or watch?

User: Pues, cuando era niño, me gustaba jugar fútbol. Pero ahora de adulto, prefiero ver fútbol americano en la televisión.

System: Could you give a summary in English of what you discussed in your recording?

User: I said that I used to like to play football, but nowadays I only watch it on the tv.

System: Oh football! My brother plays that! He isn't very good but he seems to have fun. I only like to watch football.

System: Who is your favorite team?

User: New England Patriots.

System: I hope they have a great season!

Research Questions:

Do people respond with lengthy and meaningful responses when prompted by a computer to record answers in an endangered language?

Is a summarizing act natural for the user and the dialogue flow?

Does social chat help users feel comfortable with the interaction? Are the small talk responses adequate?
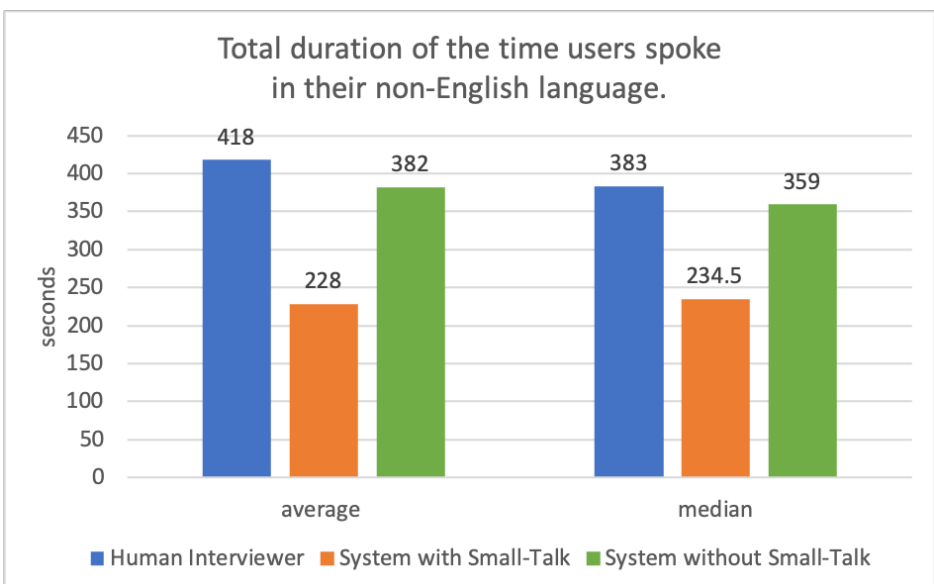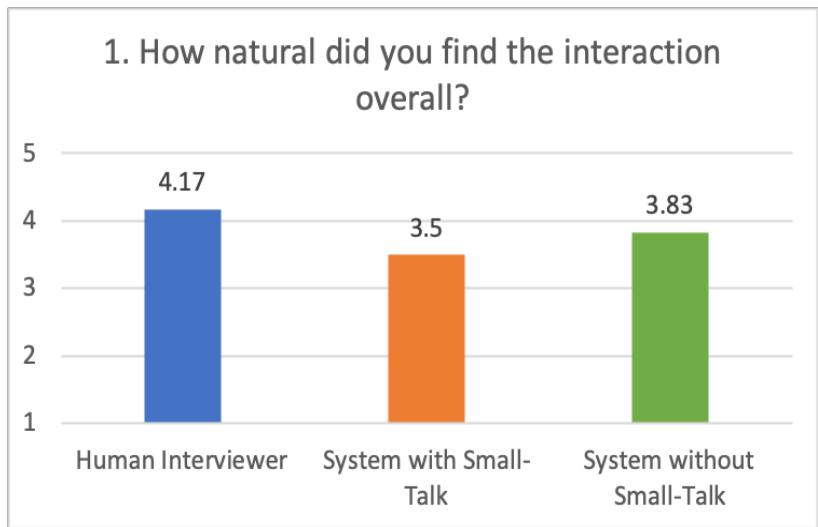
Results:

Fig 1.

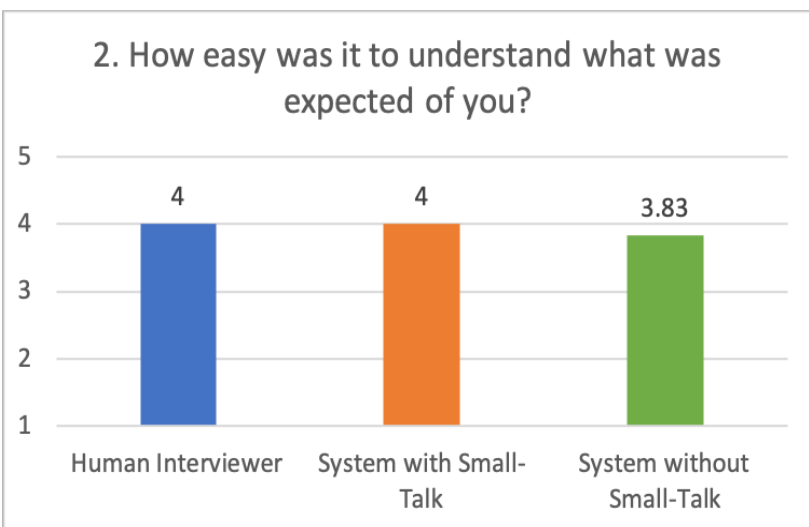Fig 2. 1 is extremely unnatural and 5 is extremely natural.

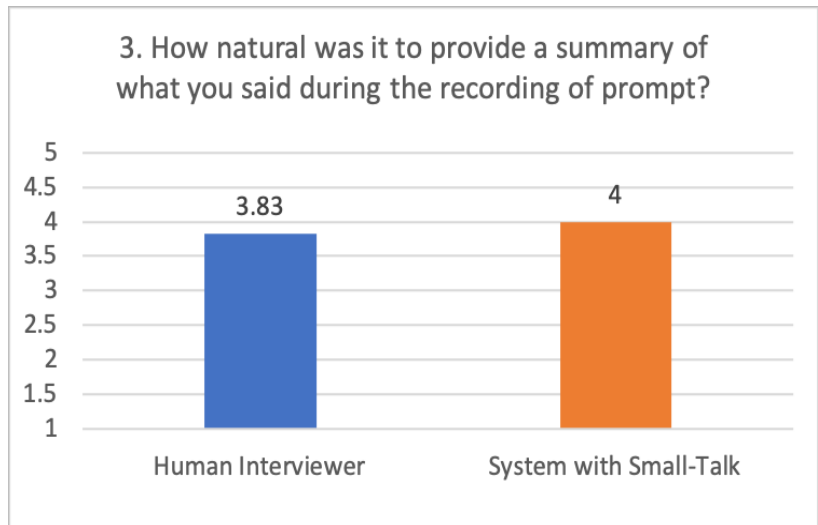Fig 3. 1 is extremely hard and 5 is extremely easy.

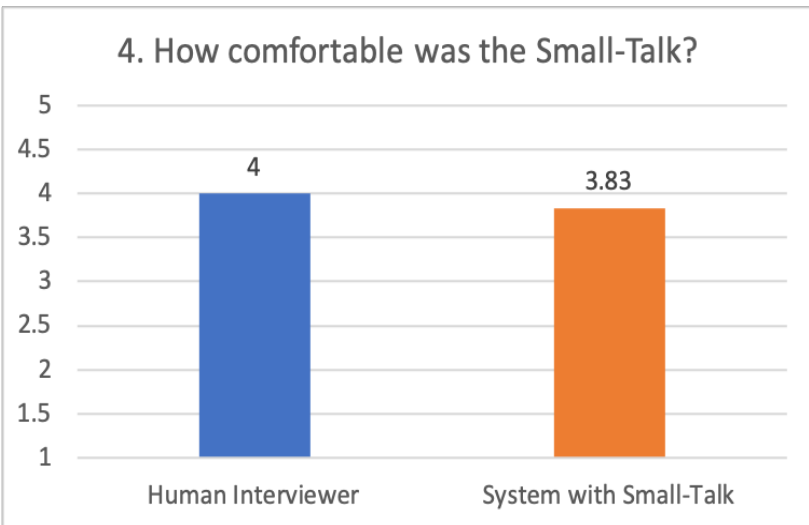Fig 4. 1 is extremely unnatural and 5 is extremely natural.

Fig 5. 1 is extremely uncomfortable and 5 is extremely comfortable.

Discussion:

- The results in Fig 1 demonstrate that users will interact with a multilingual system, and give recorded responses in their respective languages.

- Fig 2 shows that participants in the experiment did not find the summarizing act unnatural and users are accepting of systems that ask them to perform this action.

- The participants did not find the system's small talk unnatural and all of them reported feeling neutral, positive or extremely positive about that.

- Users are willing to speak in two languages with a system, as well as disclose information about their language and culture.

- Users are willing to engage in summaries and small talk with a dialogue system so long as the small talk responses are engaging and appropriate.

Future Work:

- Implement as a mobile app or web application
- Test deployment capabilities with endangered languages
- Improve the small-talk facility to include a wider range of feedback
- Test whether the automated NLU and dialogue management will be able to engage appropriately.