Analysis of Language Change in Collaborative Instruction Following

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Findings of EMNLP 2021
Language Change in Collaborative Interactions

• Previously studied in reference games: as players build common ground, their utterances tend to decrease in complexity

• CerealBar is collaborative language instruction game

• Unlike reference games: speakers can specify multiple goals in an instruction to get more done

How does language change manifest in CerealBar?
CerealBar

[Suhr et al. 2019]

A situated collaborative game with sequential natural language instruction
CerealBar Community Analysis

- Data: 1,202 human-human games collected by Suhr et al. 2019
- Games are long: ~19.9 instructions each
- To analyze how language changes over community development, we partition games chronologically into deciles of equal size
Example Instructions

• **Decile 1**: get the card in front

• **Decile 5**: Collect the green square card in front of you.

• **Decile 10**: turn around on the trail, go straight and get 2 green circles, continue straight on the trail to the right side of the glacier and get 1 black triangle
Language Change

• Unlike reference games, previously-used metrics indicate no decrease in complexity
• Leaders require fewer words to describe each card event
• Instructions increasingly deliver more information
Conclusion

• Language and behavior change over time in the community
  • Illustrates the dynamic nature of users and language in interactive systems
  • Language does not simplify over time, in contrast to convention formation results on reference games

• Hypothesis: different incentives in reference games vs. CerealBar
  • Reference games: fixed utility (i.e., tasks) per utterance
  • CerealBar: flexible utility (i.e., card goals) → speakers leverage increased expertise to specify more tasks using more complex language