

Revealing the Secret to Successful Virtual Meetings

What is the relation between lexical alignment and group involvement in online meetings?

1 - Background

- Increase in online meetings due to covid-19.
- Involvement is a good way to look at the active participation in online meetings.
- Lexical alignment in conversation occurs when individuals repeatedly use the same terms to refer to something [1].
- Lexical alignment has been shown to be correlated to involvement [1].

2 - Research Questions

1. Does lexical alignment have a positive influence on group involvement?
2. Can lexical alignment predict group involvement in online meetings?

3 - Methodology

MEMO CORPUS

- Groups of 4-6 people (including a moderator) in an online meeting, conversing about Covid-19
- 15 groups, each with 3 sessions, between 40 and 60 minutes in duration

ANNOTATION

Definition of group involvement:

- “The perceived degree of interest or involvement of the majority of the group.” [2]

Definition of conversational engagement:

- “The process by which interactors start, maintain, and end their perceived connections to each other during an interaction.” [3]

5 second timeframes

Likert scale 1-5

5 minutes per session, randomly stratified

10% overlap

EXPERIMENTATION SETUP

Other-repetition: A speaker repeats one or several words said previously by another speaker

Other-repetitions were counted after removing stopwords and lemmatizing for each 5 second timeframe and was correlated to involvement using Linear Regression

This was analyzed for repetitions within 10, 20, ..., 60 seconds

4 - Results & discussion

- The first research question examined the influence of lexical alignment on involvement. However, no linear correlation was found between the two parameters.
 - High Mean Squared Error (MSE) and negative R2 values
- The second research question investigated whether lexical alignment could predict involvement in online meetings. Given the lack of correlation found in the first question, the answer to this question is also negative within the scope of this research.
- Possible reasons for this misalignment:
 - More repetition does not guarantee more involvement.
 - Lexical alignment may vary between dyadic and group conversations.
 - Individual involvement does not necessarily indicate group involvement.
- Biases:
 - Annotation stratification was not perfect, luckily there was still enough overlap, but it does create more bias.
 - Annotating between the 4 annotators was farther apart than expected
- Limitations
 - Definition of conversational involvement is hard to annotate randomly stratified segments with.
 - It was hard to use the annotation data as the annotators annotated differently, this made it hard to trust the data.

5 - Future Work

- Looking at word categories (e.g. emotion), do repetitions of certain words correlate to higher involvement?
- Looking at timing of the repetition, is there any buildup of involvement through multiple repetitions?

References

- [1] Campano, S., Durand, J., & Clavel, C. (2014). *Comparative Analysis of verbal alignment in human-human and human-agent interactions*. <http://www.cis.uni-muenchen.de/>
- [2] Gatica-Perez, D., McCowan, L., Zhang, D., & Bengio, S. (2005). Detecting group interest-level in meetings. *ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 1*. <https://doi.org/10.1109/ICASSP.2005.1415157>
- [3] Sidner, C. L., Lee, C., and Lesh, N. (2003). Engagement when looking: behaviors for robots when collaborating with people. *Diabrock: Proceedings of the 7th Workshop on the Semantic and Pragmatics of Dialogue (Saarbrücken: University of Saarland), 123–130*.

Time in between repetitions (s)	LR Coefficient	MSE	R2
10	0.0234136	4.35	-17.80
20	-0.03123905	3.90	-10.04
30	0.00200735	3.67	-7.53
40	0.01328554	3.49	-5.77
50	-0.00388725	3.44	-5.06
60	0.02068029	3.29	-4.21

Table 1: Results of the linear regression analysis

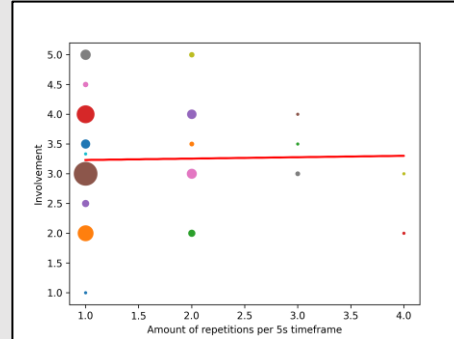


Figure 1: Plot of involvement in relation to the amount of repetitions within 10 seconds per 5 second timeframe

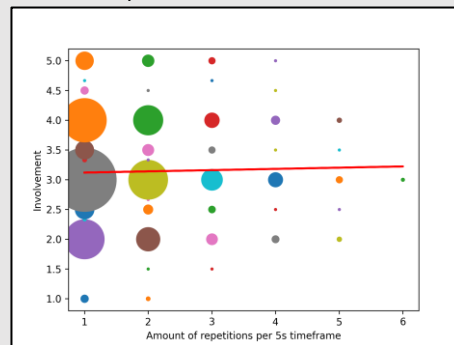


Figure 2: Plot of involvement in relation to the amount of repetitions within 60 Seconds per 5 second timeframe