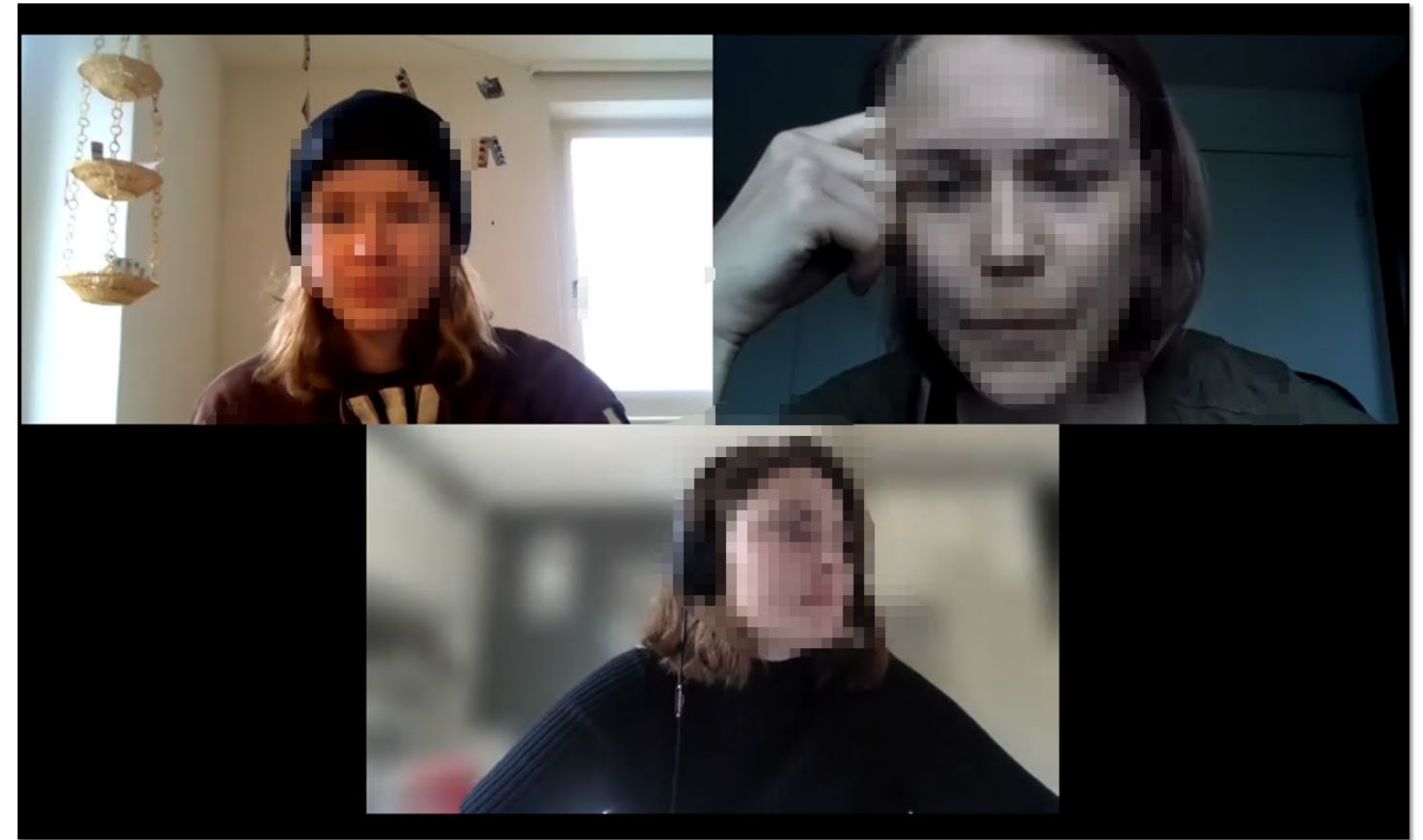
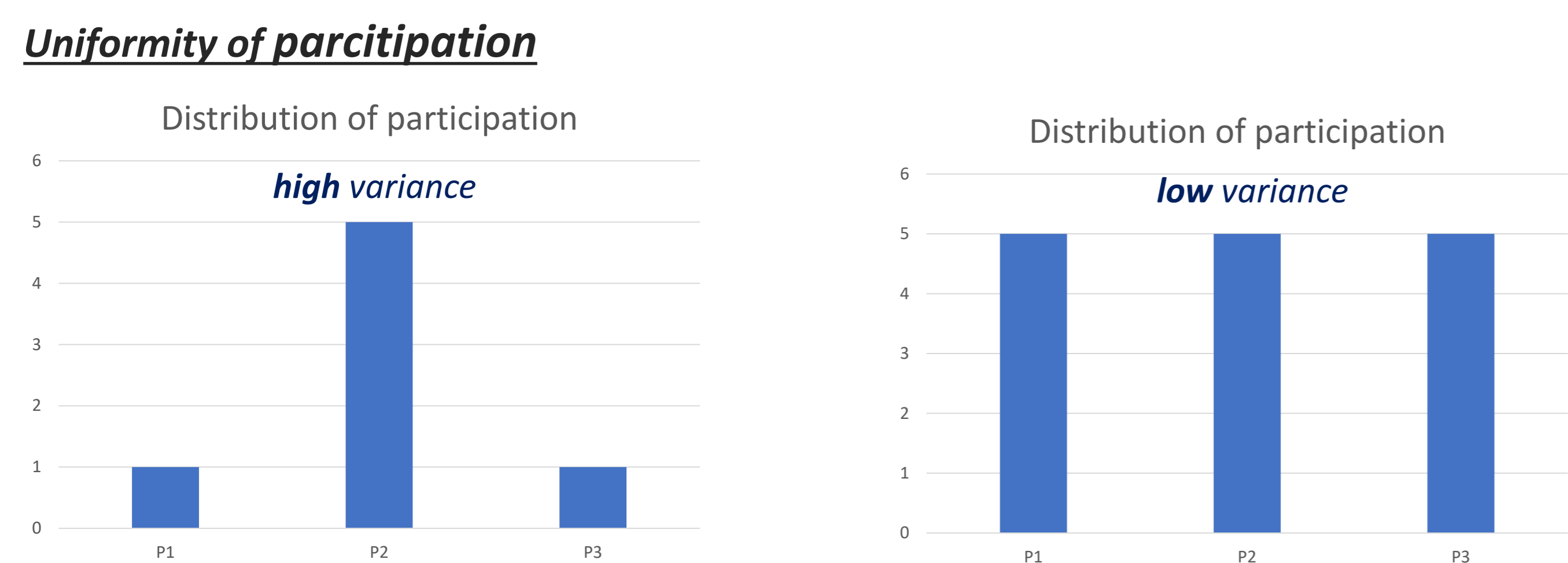
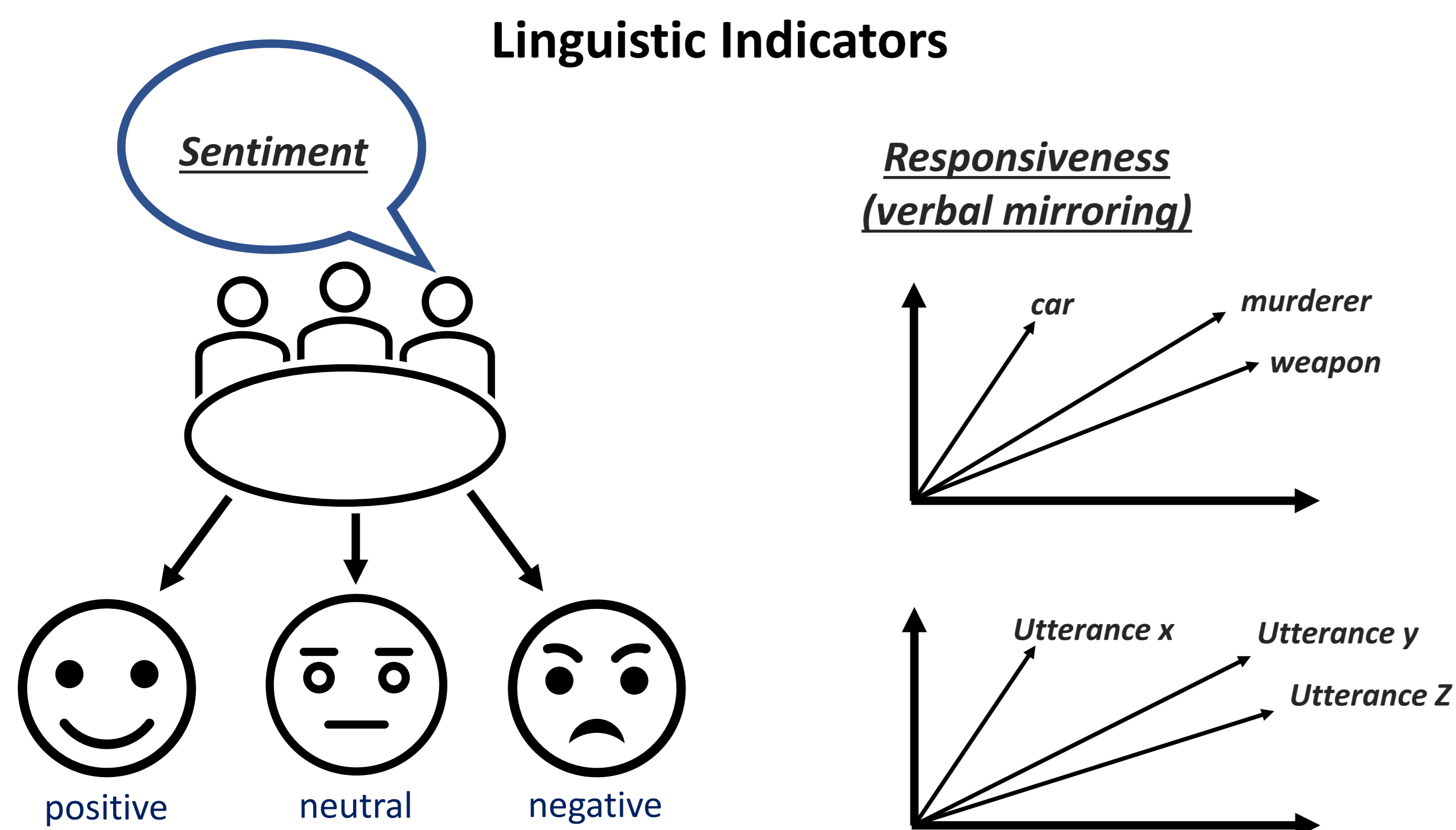


# Exploring Linguistic Indicators of Social Collaborative Group

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## Example of transcript of a group's conversation translated from German

*Person 2:* Yes... and hasn't he been there before? Well, he didn't just come at half past ten, he was there before that actually...

*Person 1:* oh...

*Person 3:* he was there at 6 and at 7 he seems to have heard loud car noises

*Person 2:* mhm..

*Person 3:* And that actually coincides with the statement of the kiosk, where everything around 7 found the wallet, I do not know if you also read that?

*Person 1:* Yes, at the kiosk I just have to look again, but it looks familiar.

*Person 2:* The kiosk is in the direction of the tennis court....

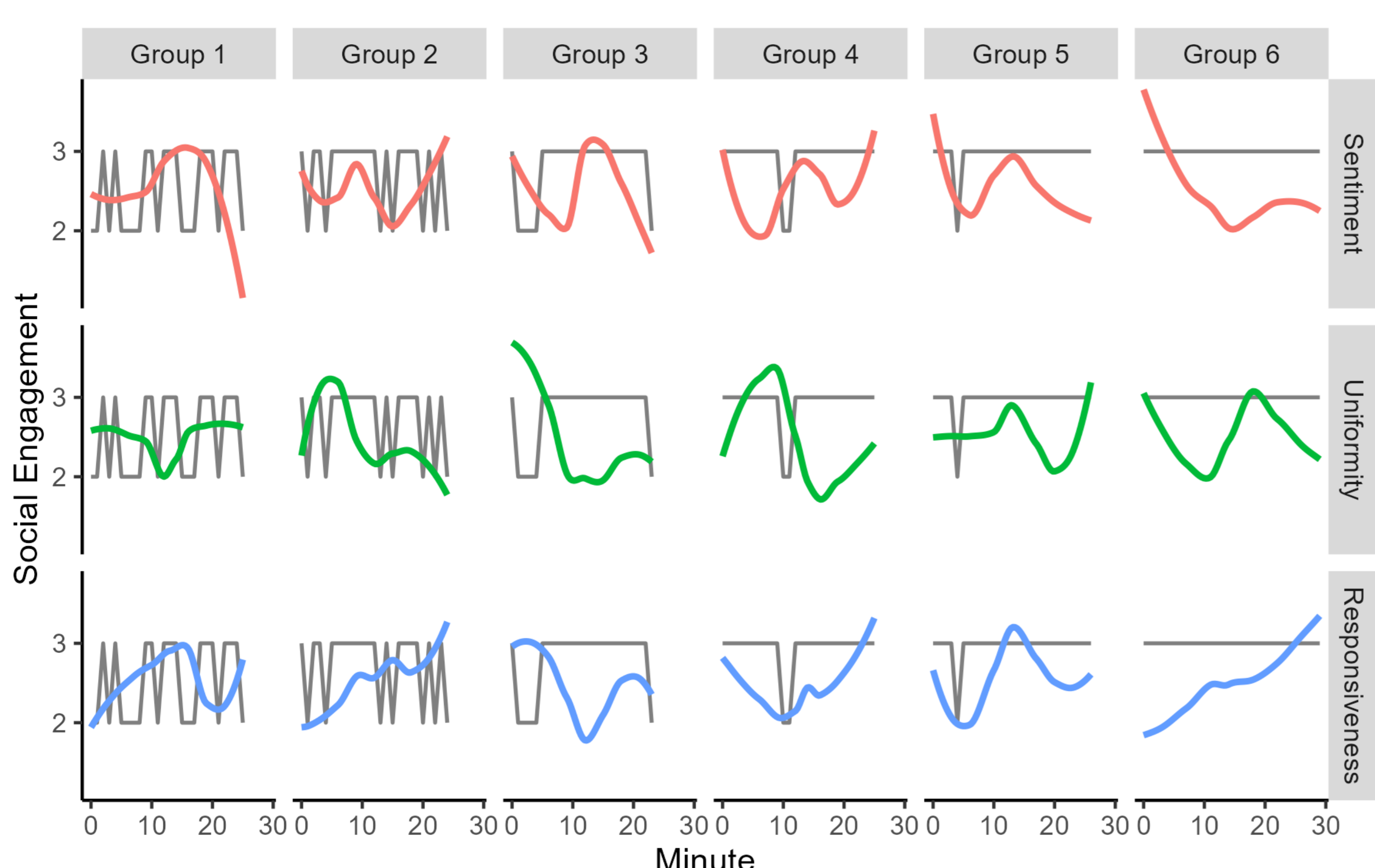
*Person 3:* mhm..

*Person 2:* I think that's more interesting because of Michael Meier... Would we have something about Erwin Bergmann?

## Rating scheme to assess Social Collaborative Engagement (Sinha et al., 2015)

Rating	Indicators of Social Collaborative Engagement	Derived Linguistic Indicator
Low	Disrespectful or highly critical exchanges	<i>Sentiment</i>
	Ignoring or lack of integration of contributions	<i>Uniformity</i>
	Low group cohesion, individual working on the task, use of "I", or dominant group member	<i>Responsiveness</i>
Moderate	One or two group members dominate	<i>Uniformity</i>
	Mild to moderate disrespectful interaction	<i>Sentiment</i>
	Group cohesion is mixed	<i>Responsiveness</i>
High	Contributions acknowledged and incorporated	<i>Responsiveness</i>
	Everyone's ideas considered	<i>Uniformity</i>
	Tools, materials and tasks are used collaboratively	<i>Responsiveness &amp; Uniformity</i>

## Social Collaborative Engagement and the Linguistic Indicators visualized



## Introduction and methods

We present preliminary findings focusing on the prediction of social engagement within an observational study of CSCL-learning groups through Natural Language Processing (NLP). In this study, 6 groups of 3 to 4 members (N = 20) in an online learning setting were tasked with solving a hidden profile assignment. Possible linguistic markers compared with ratings of collaborative group engagement (Sinha et al., 2015) that were segmented in 1-minute sequences.

## Results and discussion

The Figure (left) shows social engagement and linguistic markers for each group. Spearman correlations within groups were calculated to measure predictive potential. Sentiment varied ( $r = .10$  to  $r = -.19$ ), not consistently related to social engagement. Uniformity had consistently negative associations ( $r = -.06$  to  $r = -.43$ ), indicating lower variance in words corresponded to higher ratings. Responsiveness showed mixed results ( $r = .22$  to  $r = -.28$ ), not consistently predicting engagement ratings.

Preliminary results show limited associations between human ratings of social group engagement and linguistic markers in CSCL-learning groups. Factors such as small sample size, coarse measurement of social engagement, and limited variance in ratings may have contributed. Finally, the linguistic markers used in this study represent only one of several possible implementations of sentiment, uniformity, and responsiveness. Consequently, we conclude that there is considerable opportunity for future research to investigate and improve NLP-based approaches to predicting social and other dimensions of group engagements.

## References

Sinha, S., Rogat, T. K., Adams-Wiggins, K. R., & Hmelo-Silver, C. E. (2015). Collaborative group engagement in a computer-supported inquiry learning environment. *International Journal of Computer-Supported Collaborative Learning*, 10(3), 273–307. <https://doi.org/10.1007/s11412-015-9218-y>