

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA19102

Grantee name: Lina Mavrina

Details of the STSM

Title: How Memory Cues Prevent Decay of Knowledge Established in Dialogue Interactions: The Long-Term Perspective

Start and end date: 09/10/2023 to 27/10/2023

Description of the work carried out during the STSM

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

During the stay, we primarily focussed on the development of the measuring instrument and implementation and start of the empirical study. In cooperation with my STSM partner Amelie Robrecht and the partners from the DI_Lab at TU Delft (Catharine Oertel and her PhD students Morita Tarvirdians and Deborah van Sinttruije), the study design proposed in the original application was changed. First, we included the DI_Lab's research on values and their importance for retaining information from explanations. Additionally, I proposed some changes to the long-term aspect of the study to investigate different dynamics of knowledge decay and see whether the testing effect² known from literature on word learning can be observed when it comes to more complex information, too. The revised hypotheses and conditions of the study can be found in our pre-registration published on OSF before the data collection started: <https://osf.io/akz4c>

During the first week of the STSM, we finalised the explanation texts for all conditions which amounted to 10 versions of the same basic explanation of large language models (the domain we chose for its complexity and relevance in the current media landscape) differing in the cues used. While Amelie then was concentrating on the creation of the measuring instrument, writing questions referring to different types of cued and uncued information from the explanation, I was implementing and testing the framework for the pre-study that we wanted to conduct to evaluate the instrument, as well as setting up the necessary infrastructure (hosting on Bielefeld University servers, data storage, Git repositories). The pre-study corresponded to the design of the baseline condition of the main study, but had additional questions for each item from the instrument regarding the complexity of task instructions, difficulty of the task and relevance of the explanation to completing the task.

¹This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

²Delaney, P. F., Verkoijen, P. P. J. L., & Spigel, A. (2010). Spacing and Testing Effects: A Deeply Critical, Lengthy, and At Times Discursive Review of the Literature. In *Psychology of Learning and Motivation* (Vol. 53, pp. 63–147). Elsevier. [https://doi.org/10.1016/S0079-7421\(10\)53003-2](https://doi.org/10.1016/S0079-7421(10)53003-2)

During the second week, Amelie was writing scripts for the analysis of the pre-study data, while I was implementing and testing the framework for the main study. We also evaluated the results of the pre-study. The sample size was too small to conduct statistical analysis, however, we were able to revise some questions, e.g., one open question nobody was able to answer was changed to include a selection of multiple response options from a list with confounders based on the wrong answers people gave in the pre-study.

At the end of the second week, we had started the online data collection which is currently ongoing and will be finished in the beginning of November. In the third week, we were supervising the running study, conducting further literature research and writing down our methodology in preparation for the upcoming publication.

In November, we will be able to begin with the analysis of the collected data and once that is done, we will put our results together and start working on the model of established knowledge decay in an explanation dialogue setting.

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

Overall, I believe the STSM was a big success. We were able to rework our study design based on considerations from literature and the input from our partners. We created and evaluated the instrument for measurement of the objective knowledge. We implemented, conducted and evaluated the pre-study. We implemented, pre-registered and started the main study and even finished the data collection for some conditions. Of course, the work related to the promised deliverables is still ongoing, as data analysis takes time. Nevertheless, we are planning to publish our results in either one journal paper or several conference papers next year and we also want to make the guidelines on creating the measuring instruments and the model of knowledge decay part of those publication(s).

As written in the application, we see our contribution in relation to the key topics of the LITHME WG 8 (Language Variation, Pragmatics and Interaction). We believe that research on strategies to establish knowledge in dialogue and facilitate understanding/recall of that knowledge is important for increasing the quality of human-machine interaction. With the upcoming publication, we hope to start a discussion on generalisable models and guidelines in dialogue systems (research). The work of our TU Delft partners on aligning dialogue explanations to people's values might be also of interest to WG 6 (Ideologies, beliefs and attitudes) and offer some insights with wide-reaching ethical implications.

A big part of the success of the STSM can be attributed to the fact that Amelie and I were working on the same study together. We could divide our responsibilities to play to our strengths and support each other. Also, we had a great time at TU Delft, gaining the opportunity to connect with people and discuss each other's research, attend meetings and presentations here, as well as a PhD thesis defence which gave us great insight into local university culture. We believe that this stay was beneficial to make any future cooperation between our department at Bielefeld University and DI_Lab more accessible for both us and our colleagues.