

Setting Physical Activity Goals with a Virtual Coach: Vicarious Experiences, Personalization and Acceptance

Overview of Steps to Reproduce Analyses

Author: Nele Albers **Date:** December 2022

This is the overall README-file to give you an overview of reproducing our analyses. All code was written and run by the first author Nele Albers and/or the second author Beyza Hizli. The third author, Bouke L. Scheltinga, checked the code and data and filled in a checklist (see the file "ChecklistDataRepositoryReview_BLS.pdf"), based on which the code and documentation were improved.

Types of Analyses

Below we describe how you can reproduce our results for the different types of analyses.

Before you can do so, you need to download some data from 4TU.ResearchData: <https://doi.org/10.4121/20047328.v1>. Specifically, the files "data/prolific_data_AB.xlsx," "data/post_questionnaire_C.csv," and "data/questionnaire_data_AB.xlsx." Place these files in the "Data"-folder in the directory that this README-file is in. Please do NOT download any other data files.

Data Preprocessing

Run the file "preprocess_data.py" to:

- re-create the files "AB_data.csv" and "B_ratings.csv" needed for reproducing the prediction model and reported participant characteristics,
- re-create the files "df_acceptance.csv," "df_ratings.csv," "df_se.csv," and "df_se_plots.csv" needed for the Bayesian analyses for the four hypotheses,
- re-create the files "df_acceptance.csv," "df_ratings.csv," and "df_se.csv" needed for the exploratory Bayesian analysis of correlations,
- re-create the file "pre_C.csv" needed for the Bayesian comparison of the two conditions with regards to participant characteristics as well as the reporting of the participant characteristics,
- compute the Cronbach's alpha value for the two index measures for the ratings of example types (i.e., personalized or generic) on perceived motivational impact reported in the "Data Preparation and Analysis Strategies"-section, and
- re-create the files "qualitative_analysis_coder1.xlsx" needed for reproducing the figure with the code frequencies per condition.

Prediction Model

Navigate to the folder "Prediction_Model" and follow the instructions in the corresponding README-file to reproduce our results regarding:

- the prediction model from Table 1 and how we got to this model.

Participant Characteristics as well as Cohen's Kappa and Code Frequencies

Navigate to the folder "Participant_Characteristics_and_Cohens_Kappa" and follow the instructions in the corresponding README-file to reproduce our results regarding:

- the participant characteristics from Table 2,
- the characteristics of the example people from Table 4 in the Appendix,
- the Cohen's kappa value reported in the "Data Preparation and Analysis Strategies"-section of the paper, and
- the Figure with code frequencies per condition (Figure 6).

Bayesian Comparison of the Conditions

To reproduce our results from a Bayesian comparison of the two conditions with regards to participant characteristics reported in the "Participants"-section, navigate to the folder "Bayesian_Comparison_Conditions" and follow the instructions in the corresponding README-file.

Bayesian Analyses for H1, H2, H3 and H4

To reproduce our Bayesian analysis results for our four hypotheses, navigate to the folder "Bayesian_Analyses" and follow the instructions in the README-file therein. This will allow you to reproduce:

- the values from Table 3, and
- the Cronbach's alpha value for the acceptance index measure reported in the "Data Preparation and Analysis Strategies"-section.

Bayesian Analysis of Correlations

To reproduce our Bayesian analysis of the correlations between the stage of change and outcome measures, navigate to the folder "Correlations" and follow the instructions in the README-file therein. This will allow you to reproduce:

- the values from Table 7 in the Appendix.

Explanation of Files

This directory contains the following files:

- Bayesian_Analyses: Code to reproduce our results from Table 3 and the Cronbach's alpha value from the "Data Preparation and Analysis Strategies"-section,
- Bayesian_Comparison_Conditions: Code to reproduce our comparison results from the "Participants"-section,
- Correlations: Code to reproduce our correlation results from Table 7 in the Appendix,
- Data: Folder to store the non-preprocessed data from questionnaires and Prolific profiles as well as the condition assignment and qualitative analysis codes,
- Participant_Characteristics_and_Cohens_Kappa: Code to reproduce our participant characteristics from Table 2, characteristics of the example people from Table 4 in the Appendix, the Cohen's Kappa value from the "Data Preparation and Analysis Strategies"-section, and the code frequencies from Figure 6,
- Prediction_Model: Code to show how we arrived at our prediction model shown in Table 1,
- ChecklistDataRepositoryReview_BLS.pdf: Checklist for the code and data filled in by the third author, Bouke L. Scheltinga,

- preprocess_data.py: Code to preprocess the data from questionnaires, Prolific profiles, and the qualitative analysis,
- preprocess_data_output.txt: Output of the above file when run by us (contains Cronbach's alpha values for indices such as physical activity identity and need for cognition), and
- README.md/README.pdf: This README-file.