

## Statistical Hypothesis

1. Can too much cognitive exercise affect the person's interest?
2. Is the estimated emotional state of the older person correlated with the outcome of the cognitive exercises?
3. Is the attitude to use a verbal interface correlated with the results of the exercise?
4. Is confidence in the machine correlated with exercise outcomes?
5. Does the result of the cognitive exercises affect the state of mind?
6. Does the state of mind change after the cognitive exercises ?

## Research Hypothesis

1. If the person responds positively to the stimulus, is it reasonable to increase the exercise on that basis (by emotionally reading the user's positive responses)? Or should we let the person decide before we begin? (This requires a question like "How many exercises would you like to do today?" )
2. Can we rank the cognitive exercises in terms of difficulty or usefulness, i.e., after the exercise, a better feeling is assessed in Oliver? (It requires more cognitive exercises and Oliver or questions about feelings before and after the exercises)
3. Are there any statistical significant differences between the estimated sentiment of a person and the ability to correctly perform the exercise? If yes, which sentiments (e.g., anxiety, happiness, ...) reduce or augment the success rate?
4. Is there a change between the initial opening interaction (greeting) and the closing interaction after performing the cognitive exercises? If so, in a positive or negative way? (This will require a sentiment analysis or questionnaire)
5. Are there any differences between the time spent to perform an exercise and the relative success rate? If yes, shorter exercises are more probable to be correct?
6. Are there any statistical significant differences between the person's sentiments estimated before and after an exercise.
  - If yes, are there any further statistical significant differences with respect to a successfully or wrongly performed exercise?
  - If yes, which sentiments changed the most after that the exercise has been performed?

