The relation of mood, working memory, & sleep to spontaneous thoughts (#19145)

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
H1: Compared to neutral mood, sad mood will increase a) task-unrelated thoughts and b) spontaneous thoughts and reduce c) performance on working memory test and d) effort in concentrating on the task.
H2: The association between working memory and spontaneous thoughts will be more negative in the sad mood condition (compared to the neutral mood condition).
H3: Sleep disturbances will predict more a) task-unrelated thoughts and b) spontaneous thoughts.

3) Describe the key dependent variable(s) specifying how they will be measured.
Task-unrelated thoughts and spontaneous thoughts are measured 20 times each with binary thought probes. Effort in concentrating will be measured with a continuous 5-point scale administered 20 times as well.
D prime score ((PROBIT(hit rate)-PROBIT(false alarm)) of the working memory test will be used as working memory performance outcome, whereas operation span (OSPAN) score (partial hits) will be used as predictor. To prevent using the PROBIT function on 0 or 1 we will add 1 target trial and 4 control trials (as they have a 1:4 ratio) each with a score of 0.5.

4) How many and which conditions will participants be assigned to?
Participants will be asked to complete the 2-back test with thought probes before and after mood induction (within-subject), but they will be randomly assigned to three mood inductions conditions (happy, sad, neutral; between-subjects).

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will conduct multilevel analyses with unstructured covariance structure (full maximum likelihood).
We will compute separate analyses for task-unrelated thoughts (binary), spontaneous thoughts (binary), effort in concentrating (continuous), and working memory performance outcome (continuous). The predictors will be the same for each of these analyses, namely:
Sleep disturbances (Patient-Reported Outcomes Measurement Information System [PROMIS])
Social desirability bias (Social Desirability Scale-16)
Working memory capacity (OSPAN)
Sad group
Sad group * Induction
Happy group
Happy group * Induction
OSPAN * Happy group * Induction
OSPAN * Sad group * Induction

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
We will exclude participants who provide inaccurate responses to either of 2 control items (e.g., "please select alternative 3 here"), but tolerate 1 missing response on these. We will treat OSPAN score as missing if performance on secondary task is lower than 85% and all 2-back variables (incl. probes) as missing if D prime score is negative (i.e., below-chance performance).

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We aim to collect data online from 600 individuals.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
We will also produce a correlation matrix with the 2-back variables (task-unrelated thoughts, spontaneous thoughts, effort in concentrating on the task, and d prime score), within-person (block-level) and between-person.
And we will also explore whether sleep disturbance interact with the sad mood induction on task-unrelated and spontaneous thoughts, respectively.