**Explanation storage data files**

With

*Age differences in routine formation: the role of automatization, motivation, and executive functions* Irene van de Vijver, Lotte Brinkhof, & Sanne de Wit

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# GENERAL PARTICIPANT INFORMATION

See AgingPills\_PPinfo\_Scores\_processed.xlsx, sheet ‘General’

Columns:

Ppnr: Participant number

Condition: Condition: 1=goal intention, 2=implementation intention

Group: 1=younger, 2=older

Age: Age in years

Gender: 1=male, 2=female, 3=other

Participants in gray font were excluded from all analysis.

Reasons for exclusions are reported in AgingPills\_exclusions.xlsx

# PILL INTAKE

**Average and weekly values:** see AgingPills\_PPinfo\_Scores\_processed.xlsx, sheet ‘Pill\_intake’

Columns:

Ppnr: Participant number

Pills\_total: Total number of pills taken during the pill-taking phase

Pills\_wk1: Number of pills taken in the 1st week of the pill-taking phase

Pills\_wk2: Number of pills taken in the 2nd week of the pill-taking phase

Pills\_wk3: Number of pills taken in the 3rd week of the pill-taking phase

Pills\_wk4: Number of pills taken in the 4th week of the pill-taking phase

Pills\_regularity: Standard deviation of pill intake times

Pills\_twice: Number of days on which the pill bottle was opened more than once

Pill\_group: 1=low-intake group, 2=high-intake group

**Raw data:** see AgingPills\_pill\_intake\_raw.xlsx

Each row is a registered opening of a pill container.

Columns:

Ppnr: Participant number

MEMS\_ID: MEMS caps identifier

Year, month, day, hour, minute: One moment that the pill bottle was opened

# SRBAI

**Weekly values:** see AgingPills\_PPinfo\_Scores\_processed.xlsx, sheet ‘SRBAI’

Columns:

Ppnr: Participant number

SRBAI0: Average of the four SRBAI questions at day 1 of the pill-taking phase

SRBAI1: Average of the four SRBAI questions at day 7 of the pill-taking phase

SRBAI2: Average of the four SRBAI questions at day 14 of the pill-taking phase

SRBAI3: Average of the four SRBAI questions at day 21 of the pill-taking phase

SRBAI4: Average of the four SRBAI questions at day 28 of the pill-taking phase

**Raw data:** see AgingPills\_WeeklyQ\_SRBRAI\_intention\_motivation.xlsx

Each sheet contains the answers to 1 weekly questionnaire.

Columns:

Ppnr: Participant number

SRBAI\_Q1-Q4: SRBAI questions 1-4

Intention: Intention as remembered at that moment

Motivation: Motivation to take the pill at this moment (1-7, 7 is highest)

Participants in gray font were excluded from all analyses.

Note that the folder Qualtrics\_export\_weekly\_questionnaires contains the specific questions and answer options as they were presented in Qualtrics (in Dutch).

# NEUROPSYCHOLOGICAL TESTS: NLV, O-SPAN, WAIS matrices

**Overall scores:** see AgingPills\_PPinfo\_Scores\_processed.xlsx, sheet ‘NeuroPsychTests’

Ppnr: Participant number

NLV: Total score on the *Nederlandse Leesvaardigheidstest*

O-Span: Total score on the Operation-Span task

WAIS-raw: Total score on the WAIS matrices

**Raw data:** The NLV, O-Span, and WAIS matrices tests were administered and scored in a paper-and-pencil version. Scans of the raw data will be made available upon request.

# MEASURES OF PERSONALITY

**Coding of personality questionnaires**

NEO-FFI conscientiousness

* 12 questions, scored from 1 point – 5 points
* Current data: for all questions a score of 1 indicates ‘completely agree’ and a score of 5 indicates ‘completely disagree’.
* Questions that need to be rescored (5-1 points instead of 1-5): 3, 6, 9, 11
* After rescoring, sum the scores on all questions, total score can range between 12-60 points

Prospective and Retrospective Memory Questionnaire

* 16 questions, scored from 1 point – 5 points
* Current data: for all questions a score of 1 indicates ‘never’ and a score of 5 indicates ‘very often’.
* No rescoring necessary for this questionnaire
* PRMQ retrospective memory score: sum score on items 2, 4, 6, 8, 9, 11, 13, 15
* PRMQ prospective memory score: sum score on items 1, 3, 5, 7, 10, 12, 14, 16

Personal Need for Structure Scale

* 12 questions, scored from 1 point – 7 points
* Current data: for all questions a score of 1 indicates ‘strongly disagree’ and a score of 5 indicates ‘strongly agree’.
* Questions that need to be rescored (7-1 points instead of 1-7): 2, 5, 6, 11
* After rescoring, sum the scores on all question, total score can range between 12-84 points

Beck Depression Inventory (younger adults only)

* 21 questions, should be scored from 0 point – 3 points
* Current data: all questions scores 1-4 from least bad to worst
* First rescore all questions from 1-4 to 0-3 points
* No other rescoring necessary for this questionnaire
* Sum the scores on all questions, meaning of the total score:
  + *0–13: minimal depression*
  + *14–19: mild depression*
  + *20–28: moderate depression*
  + *29–63: severe depression*

Geriatric Depression Scale-15 (older adults only)

* 15 questions, should be scored 1=yes, 0=no
* Current data: for all questions a score of 1 indicates ‘yes’ and a score of 2 indicates ‘no’.
* First rescore all questions from 1-2 to 1-0 points
* Questions that need to be rescored (0=yes, 1=no): 1, 5, 7, 11, 13
* After rescoring, sum the scores on all question, total score can range between 0-15 points
* *A score of 6 or higher indicates a possible depression.*

**Overall scores:** see AgingPills\_PPinfo\_Scores\_processed.xlsx, sheet ‘Personality’

Ppnr: Participant number

NEO: Total score on conscientiousness questions of the NEO-… personality questionnaire

PRMQ\_P: Prospective memory score, Prospective and Retrospective Memory Questionnaire

PRMQ\_R: Retrospective memory score, Prospective and Retrospective Memory Questionnaire

PNS: Total score Personal Need for Structure questionnaire

SRMa\_S2: Total score Social Rhythm Metric short form, adapted version, during Session 2

(item 2 excluded)

BDI: Total score Beck Depression Inventory (younger adults only)

GDS: Total score Geriatric Depression Scale (older adults only)

SRHI: Total score Self-Report Habit Inventory

SRMa\_S3: Total score Social Rhythm Metric short form, adapted version, during Session 3

(item 2 excluded)

**Raw data:** see folder Questionnaires\_lab\_session\_raw\_data

Note that for all files the raw values have not been recoded yet.

Younger adults, session 2: AgingPills\_session2\_Personality\_qs\_younger.xlsx

Columns:

Nr: Participant number

Pers\_NEOConsc\_1 - Pers\_NEOConsc\_12: NEO-FFI conscientiousness scale questions

Pers\_PRMQ\_1 - Pers\_PRMQ\_16 : Prospective and Retrospective Memory Questionnaire

Pers\_PNS\_1 - Pers\_PNS\_12: Personal Need for Structure questionnaire

Pers\_SRM\_Q1a - Pers\_SRM\_Q5b : Social Rhythm Metric short form, adapted

Pers\_BDI\_Q1 - Pers\_BDI\_Q21: Beck Depression Inventory

Older adults, session 2: AgingPills\_session2\_Personality\_qs\_older.xlsx

Columns:

Nr: Participant number

Pers\_NEOConsc\_1 - Pers\_NEOConsc\_12: NEO-FFI conscientiousness scale questions

Pers\_PRMQ\_1 - Pers\_PRMQ\_16 : Prospective and Retrospective Memory Questionnaire

Pers\_PNS\_1 - Pers\_PNS\_12: Personal Need for Structure questionnaire

Pers\_SRM\_Q1a - Pers\_SRM\_Q5b : Social Rhythm Metric short form, adapted

Pers\_GDS\_1 - Pers\_GDS\_15: Geriatric Depression Scale 15

Session 3, pill taking: AgingPills\_session3\_Strategy\_pilltakingphase.xlsx

Columns :

nr: Participant number

SRHI\_Q1\_1 - SRHI\_Q12\_1 : Self-Report Habit Inventory

SRM\_q1a - SRM\_q5b : Social Rhythm Metric short form, adapted

Note that the folder Qualtrics\_export\_questionnaires\_lab\_sessions contains all the specific questions and answer options as they were presented in Qualtrics (in Dutch).

# MOTIVATION

**Overall scores:** see AgingPills\_PPinfo\_Scores\_processed.xlsx, sheet ‘Motivation’

Columns:

Ppnr: Participant number

Session 2: Motivation as indicated during Session 2

Mot\_Wk0: Answer to motivation questions at day 1 of the pill-taking phase

Mot\_Wk1: Answer to motivation questions at day 7 of the pill-taking phase

Mot\_Wk2: Answer to motivation questions at day 14 of the pill-taking phase

Mot\_Wk3: Answer to motivation questions at day 21 of the pill-taking phase

Mot\_Wk4: Answer to motivation questions at day 28 of the pill-taking phase

**Raw data weekly scores:** see AgingPills\_WeeklyQ\_SRBRAI\_intention\_motivation.xlsx

Each sheet contains the answers to 1 weekly questionnaire.

Columns:

Ppnr: Participant number

SRBAI\_Q1-Q4: SRBAI questions 1-4

Intention: Intention as remembered at that moment

Motivation: Motivation to take the pill at this moment (1-7, 7 is highest)

Participants in gray font were excluded from all analyses.

# OTHER QUESTIONNAIRES

Session 3, pill taking: AgingPills\_session3\_Strategy\_pilltakingphase.xlsx

This file also contains the raw data of all questions about

* Strategy use and use of intentions during pill-taking phase
* Information about being away
* Subjective prospective memory complaints
* Medication use

Session 3, final questions: AgingPills\_session3\_Final\_qs.xlsx

This file also contains the raw data of all questions from/about:

* Pittsburg Sleep Quality Index
* Final motivation questions

# STATIC OUTCOME REVALUATION TASK

**Average scores:** see AgingPills\_SORT.xlsx

Sheet 1: Training

Columns:

Ppnr: Participant number

Group: Age group, 1=younger, 2=older

Train\_acc\_GO\_Bl1-16: Average scores for stimuli associated with a valuable outcome that

required a response in block 1-16

Train\_acc\_NOGO\_Bl1-16: Average scores for stimuli associated with a non-valuable outcome

that did not require a response in block 1-16

Sheet2: test

Ppnr: Participant number

Group: Age group, 1=younger, 2=older

Test\_acc\_SV: Accuracy on all trials that belonged to the still-valuable condition

(outcome valuable during training, valuable during test)

Test\_acc\_DV Accuracy on all trials that belonged to the devalued condition

(outcome valuable during training, not valuable during test)

Test\_acc\_UP Accuracy on all trials that belonged to the upvalued condition

(outcome not valuable during training, valuable during test)

Test\_acc\_SN Accuracy on all trials that belonged to the still not valuable condition

(outcome not valuable during training, not valuable during test)

Sheet 3: baseline test

Ppnr: Participant number

Group: Age group, 1=younger, 2=older

Bltest\_acc\_SV: Accuracy on all trials that belonged to the still-valuable condition

(stimulus valuable during training, valuable during test)

Bltest\_acc\_DV Accuracy on all trials that belonged to the devalued condition

(stimulus valuable during training, not valuable during test)

Bltest\_acc\_UP Accuracy on all trials that belonged to the upvalued condition

(stimulus not valuable during training, valuable during test)

Bltest\_acc\_SN Accuracy on all trials that belonged to the still not valuable condition

(stimulus not valuable during training, not valuable during test)

**Raw data:** see folder SORT\_raw\_data

There are 4 files per participant:

sSSG\_ppXXX\_train.txt => data of the training phase

sSSG\_ppXXX\_test.txt => data of the test phase

sSSG\_ppXXX\_baseline.txt => data of the baseline test (stimuli devalued instead of outcomes)

sSSG\_ppXXX\_SOtest.txt => test of explicit knowledge S-O relations

Meaning of the column headers in **training, test, and baseline phase files**:

DateTime: Date and Time

DemoReal: 1 = practice, **0 = real task**

TrainTest: 1 = training phase, 2 = test phase

Block

Trial: Trial within block

TrainRespreq: Was a response required for the current stimulus in the training phase?

1 = yes, 0 = no

TestRespreq: Was a response required for the current stimulus in this block of the test phase?

1 = yes, 0 = no; 999 = irrelevant (in training phase)

Trainingcond: 1 = go, 2 = no-go (actually same as TrainRespReq)

Setnr: Which set of stimuli to use (just for programming convenience, irrelevant)

Stimulus: Which specific stimulus was presented on this trial

Outcome: Which outcome was coupled to this stimulus

Response: Response given by the participant

RT: Reaction time of the response; 0 if no response

FB: Feedback, did the participant acquire the outcome? 1=yes, 0=no

Correct: Was the correct response (press/no press) given? 1=yes, 0=no

Currpoints: Points earned on this trial

Blockpoints: Points earned so far in this block

Totalpoints: Points earned so far in total

Note: late responses were not specifically registered as such, but can be found as trials on which there is a response (1 in Response column) but the feedback is negative (0 in FB).

Meaning of the column headers in the **SOtest files**:

DateTime: Date and time

Stim\_tr: Trial

O\_Pic1-4: Outcome pictures presented in locations 1-4, from left to right (same for all stimuli per participant)

Stimulus: Stimulus presented on this trial

Corr\_resp: Response that would have been correct

Resp: Actual response given by the participant

RT: Reaction time

Accuracy: Was the response correct or not? 1 =yes, 0=no

Confidence: Confidence rating on a scale of 0-400

RT\_confidence: Reaction time of confidence rating

# PROSPECTIVE MEMORY TASK

**Average scores:** see AgingPills\_ProspectiveMemoryTask.xlsx

Columns:

Ppn: Participant number

Group: Age group, 1=younger, 2=older

LDT\_acc\_BL1-3: Accuracy on Lexical Decision Task in Block 1-3

LDT\_rt\_BL1-3: Reaction times on Lexical Decision Task in Block 1-3

CorrSpacePress\_BL1-2: Correct press on Space bar for PM cues during PM blocks 1-2 (= task blocks 2-3)

RTSpacePress\_BL1-2: Reaction times of Space bar presses for PM cues during PM blocks 1-2 (= task blocks 2-3)

CorrChoiceRelatedAction\_BL1-2: Correct choice of actions associated with the PM cues PM cues during PM blocks 1-2 (= task blocks 2-3)

RTChoiceOfAction\_BL1-2: Reaction times for choice of actions associated with the PM cues PM cues during PM blocks 1-2 (= task blocks 2-3)

**Raw data:** see folder PMtask\_raw\_data

There is 1 file per participant.

Meaning of the column headers:

Cond: Condition (1-16), related to how response buttons were randomized and which specific PM cues and actions were used in which block

BlockType: Which block, 1=training, 2=LDT only, 3-4=LDT + PM cues

Trial: Trial within this block

WordNonw: Was a word or a non-word presented? 1=word, 2=non-word, 3=PM cue

Wordnr: Which word/non-word was presented

CorrResp: Response to the word/non-word that would have been correct; 1=PM cue, 2/3=word/non-word

Resp: Actual response given by the participant

Acc: Accuracy, was the response correct or not? 1=yes, 0=no

RT: Reaction time

CorrAct: If a PM cue was presented as the word on this trial, which of the two associated actions should have been chosen? (4/5=left/right buttons)

Action: Actual action chosen by the participant

ActAcc: Accuracy of the chosen action, 1=yes, 0=no

ActRT: Reaction time of the action choice

# TASK-SWITCHING TASK

**Average scores:** see AgingPills\_TaskSwitchingTask.xlsx

Columns:

Ppn: Participant number

Group: Age group, 1=younger, 2=older

let\_acc: Accuracy in letter-task only blocks

let\_rt: Reaction times in letter-task only blocks

num\_acc: Accuracy in number-task only blocks

num\_rt: Reaction times in number-task only blocks

reg\_stay\_acc: Accuracy on stay trials in regular switch blocks

reg\_stay\_rt: Reaction times on stay trials in regular switch blocks

reg\_switch\_acc: Accuracy on switch trials in regular switch blocks

reg\_switch\_rt: Reaction times on switch trials in regular switch blocks

irr\_stay\_acc: Accuracy on stay trials in irregular switch blocks

irr\_stay\_rt: Reaction times on stay trials in irregular switch blocks

irr\_switch\_acc: Accuracy on switch trials in irregular switch blocks

irr\_switch\_rt: Reaction times on switch trials in irregular switch blocks

single\_acc: Overall accuracy in single-task blocks

reg\_acc: Overall accuracy in regular switch blocks

irr\_acc: Overall accuracy in irregular switch blocks

single\_rt: Overall reaction times in single-task blocks

reg\_rt: Overall reaction times in regular switch blocks

irr\_rt: Overall reaction times in irregular switch blocks

**Raw data:** see folder TStask\_raw\_data

There is one file per participant.

Meaning of the column headers:

Cond: Condition (1-8), related to how response buttons were randomized and which font color was associated with which task (letter/number)

Block

BlockOrder: Type of block, 1=letter, 2=number, 3=switch regular, 4=switch irregular

BlockCounter: How manieth block of this type

Trial: Trial number within block

Task: Respond to number or letter, 1=letter, 2=number

CueLeft, CueRight, CueL, CueN: These four columns together indicate the specific letter and number that were presented in this trial, and the side that they were presented on

CorrResp: Response that would have been correct

Resp: Actual response given by the participant

RT: Reaction time

Acc: Accuracy, was the response correct? 1=yes, 0=no

Blocktot: Points earned so far in this block

Total: Points earned so far in total