

# 'HET GROOT NATIONAAL STRESS ONDERZOEK'

## Or in other words: *The influence of daily stress and stress sensitivity on attention and memory*

Anke Sambeth<sup>a</sup>, Aimee Capello<sup>a</sup>, Charlie Bonnemayer<sup>a</sup>, Michiel Vestjens<sup>a</sup>, & Silke Conen<sup>ab</sup>

<sup>a</sup> Department of Neuropsychology and Psychopharmacology

<sup>b</sup> Neuroscience and Psychiatry Unit, University of Manchester, Manchester, UK

### Background

Over the past few decades individuals seem to have become more stressed which, amongst others, might be caused by the evident economic recession which causes an overall increase in worrying about the future. Research focusing on both chronic and acute stress has shown that stress can both positively and negatively affect physical and mental health and can also affect attention and memory. Additionally, research has shown that individual differences such as gender and age can affect how stress-sensitive individuals are.

Hardly any research has so far been performed into the affect daily hassles have on our attention and memory, although almost everybody at least to some extent experiences these. Therefore, in this study the effects of daily stress on attention and memory were investigated as well as the role of stress-sensitivity in this.

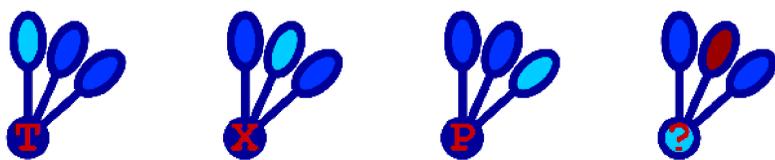


Figure 1. An example trial in the working memory paradigm. Participants first see three letters appearing one by one in the three 'leaves', a 'T', 'X', and 'P'. Finally, the '?' appears in one of the leaves and the participant must type the letter that was presented in this leaf. In case of a correct response, next time one leaf is added to the trial.

### Methods

An internet study was conducted measuring:

- Current stress level by means of a daily hassles questionnaire.
- Stress sensitivity by means of neuroticism scores.
- Episodic memory by means of a verbal learning test.
- Working memory by means of a digit span test (Figure 1).
- Selective attention by means of visual-match-to-search (Figure 2).
- Reaction time scores by means of a traffic light test.

3.500 participants completed the online test-battery.

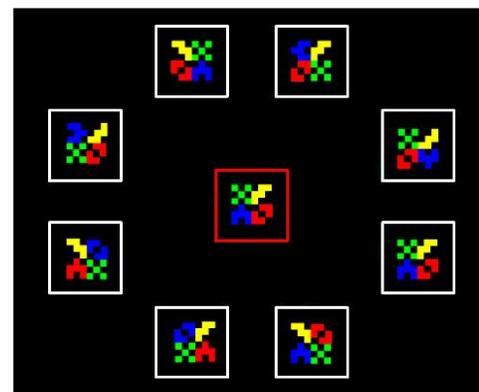


Figure 2. The visual-match-to-search task, which was kindly provided by Cambridge Cognition (UK). Participants were presented with a picture in the middle of the screen and eight surrounding boxes, 2, 4, or 8 of them being occupied with a pattern similar to that in the middle of the screen. In each trial, the participant has to choose the pattern that exactly matches.

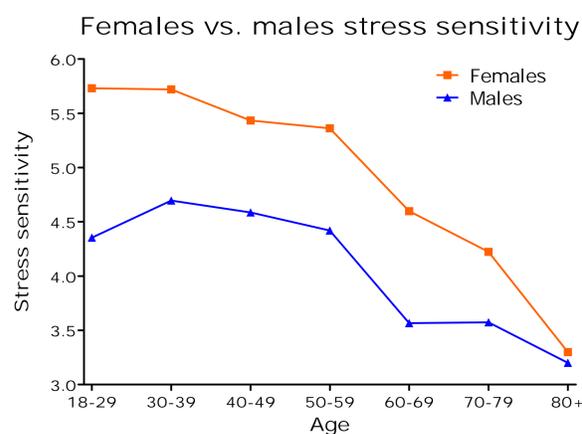


Figure 3. Level of stress sensitivity for each gender and age group. It can be seen that females have higher stress sensitivity than males, but in both groups the stress sensitivity decreases with age and then the gender difference disappears.

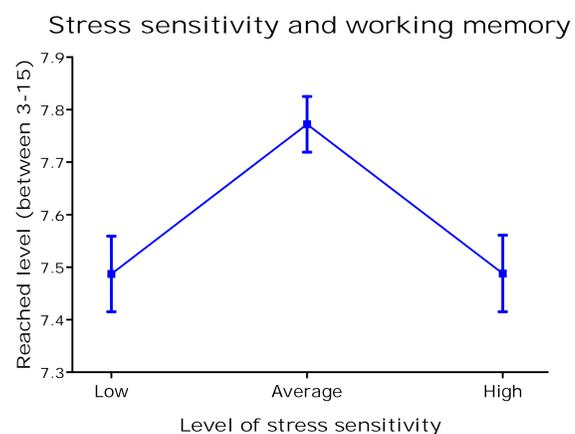


Figure 4. Working memory score for low, average and high stress sensitive participants. It can be seen that performance is best in the group with an average stress sensitivity. There is no difference between the low and high stress sensitivity groups.

### Results and Conclusion

We replicated various findings known from literature, for instance: 1) females performed better on the episodic memory test than males, although there was no difference in working memory capacity, 2) females had higher stress sensitivity and showed more daily hassles than males, and 3) young participants performed better on all measures than elderly. This shows the good applicability of online testing in cognition research.

We found that stress sensitivity was only higher in younger females, but this difference disappeared with age (See Figure 3). Furthermore, daily stress and increased stress-sensitivity do not positively or negatively affect attention and episodic memory. However, low and high stress sensitivity can negatively affect working memory (see Figure 4), emphasizing the beneficial role of moderate day-to-day stress on well-being.

In other words, being too responsive to stress is not good, but not showing stress at all is just as bad. A little 'tension' is good for your working memory span!

In collaboration with and sponsored by:



Netherlands Organisation for Scientific Research

Correspondence to:  
Anke Sambeth

anke.sambeth@maastrichtuniversity.nl  
www.sambeth.nl

Dept of Neuropsychology and Psychopharmacology

T +3143 388 1757  
F +3143 388 4560

Maastricht University

P.O. Box 616  
6200 MD Maastricht, The Netherlands