Unobtrusive Monitoring of Knowledge Workers for Stress Self-regulation

Saskia Koldijk[1,3], Maya Sappelli[1,3], Mark Neerincx[2,3], Wessel Kraaij[1,3]

[1]Radboud University Nijmegen, [2]TU Delft, [3]TNO; The Netherlands

Computer logging

Video of facial expressions

Body sensors for skin conductance and heart rate

Questionnaires for subjective experience:
- Task Load (NasaTLX)
- Mental Effort (RSME)
- Emotion (SAM)
- Perceived Stress

Kinect 3D of body postures

1) Sense

2) Reason

3) Act

Problem

Stress @work:

- Knowledge workers in the office easily experience stress during their work day, due to e.g. time pressure and email interruptions.
- Long periods of stress should be prevented as they are unhealthy and can lead to burn-out.

Approach:

→ Help knowledge workers to self-regulate their stress levels.

- **Sense** data about the user and his environment with unobtrusive sensors, combined with subjective user input.
- **Reason** about this data to gain an understanding of the recent working context and mental state.
- **Act** on this information with feedback and support to help users reach their set well-being goals.

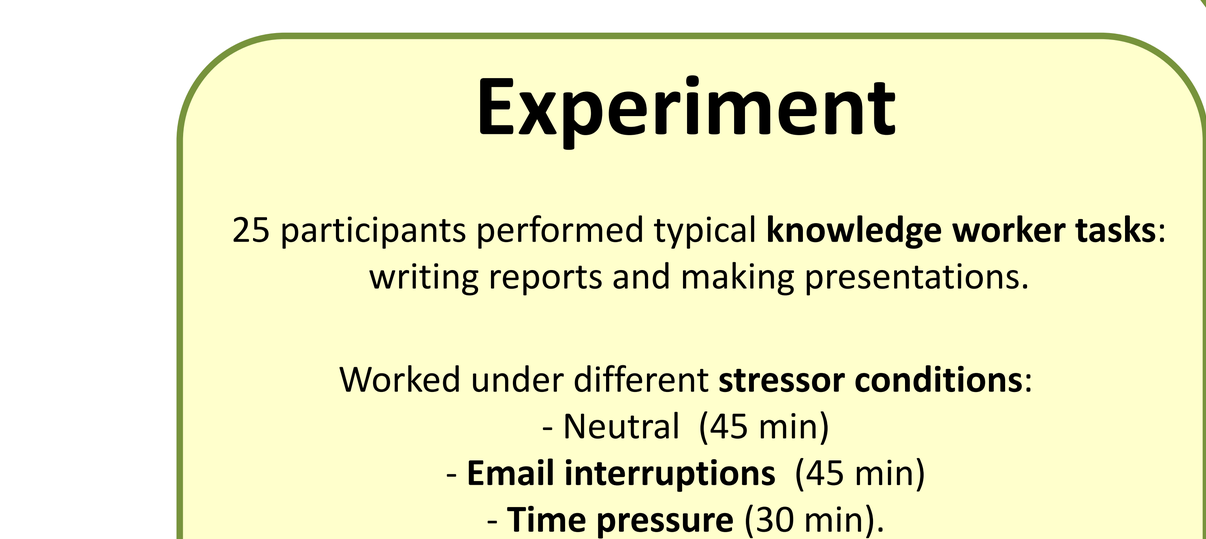
Experiment

25 participants performed typical **knowledge worker tasks**: writing reports and making presentations.

Worked under different **stressor conditions**:
- Neutral (45 min)
- **Email interruptions** (45 min)
- **Time pressure** (30 min).

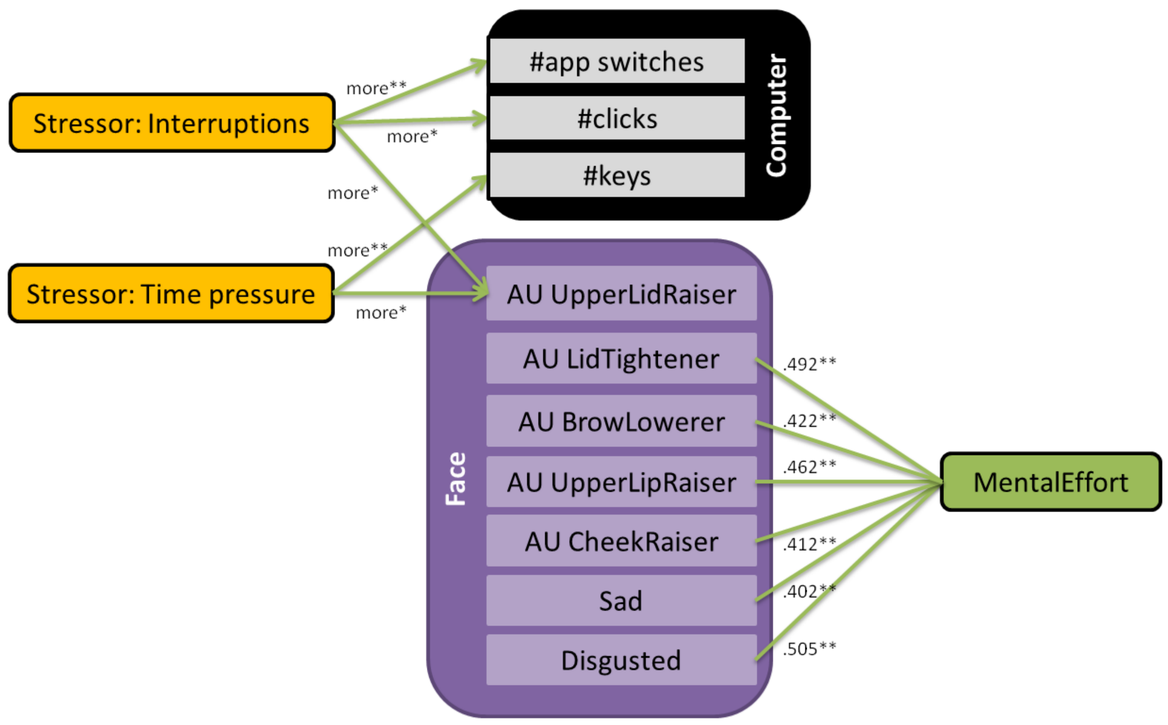
Various forms of (sensor) data were collected.

Q1: What is the effect of stressors on knowledge workers' subjective experience?



Bottom part: The stressors affected several aspects of subjective experience.
Top part: These aspects of subjective experience correlated with perceived stress.

Q2: How could stress or related aspects be measured with unobtrusive sensors?



Left part: The stressors caused differences in (computer-use) behaviour.
Right part: Mental effort correlated with our sensor data of facial expression.

Supported by the Dutch National Program: COMMIT/ SWELL

http://www.swell-project.net