**GABA stressor pilot results, 5/24/17**

12 participants participated in the stressor pilot, which took place in the mock scanner at McLean.

Morning participants all had the MAST at 10am, afternoon participants varied between 1pm and 3:30pm.

Saliva samples were taken at 4 time points:

1. baseline (2 mins after arrival)
2. mock scanner baseline (in mock scanner, before stressor)
3. 20 mins post stress induction
4. 40 mins post stress induction

The stressor: The MIST MAST MIST or 3M:

* 3 min block of “easy” math problems
* 10 min MAST stressor procedure involving hand immersion in cold water and serial subtraction with 2 evaluators (1 male, 1 female)
* 3 min block of “easy” math problems
* 3 min block of “hard” math problems with visual feedback of sub-standard performance
* Verbal feedback from evaluators that performance needs to improve for data to be included
* 3 min block of “hard math problems

**Cortisol data**

A paired t-test on the cortisol data (ug/dL) from all participants (collapsed over morning and afternoon) showed a significant increase in cortisol from time 2 (mock scanner baseline) to time 3 (post stress induction) (p=.040, one tailed, see fig.1). Splitting the data by session time (morning, afternoon), a paired t-test showed a weak trend (p.09, n=6) for the morning group and was non-significant (p=.134, n=6) for the afternoon group. Individual responses for the morning (fig.2) and afternoon (fig.3) groups are shown below. 4/6 morning participants showed a response and 3/6 afternoon participants showed a response.

Fig 1. Cortisol response data to stressor, all data (n=12)

Fig 2. Cortisol response to stressor, morning only data (n=6)

Fig 3. Cortisol response to stressor, afternoon only data (n=6)

Comparing to healthy control data from the Early Life Stress (ELS) study, which also used the MAST (in a sit-down EEG setting rather than lying down in a scanner), they had a higher success rate with 12/16 participants showing a response (see Fig. 4).

In addition we looked at healthy control data from the MIDAS study (n=34), which used the MAST (outside of scanner. They also had a higher success rate with 27/34 responders (see Fig 5).

We discussed possible sampling differences as ELS take samples at 12 mins after MAST onset and 28 mins after MAST onset, which is where they see peak increase. We may be missing the actual peak between 20 and 40 minutes in our pilot design.

Both ELS and MIDAS had their stressor in the afternoon.

Fig 4. ELS cortisol response to stressor, afternoon only (n=16)

Fig 5. MIDAS cortisol response to stressor

**Heart rate data**

Heart rate data was additionally collected over the course of the stressor and at each saliva sample time point. The timeseries shows increases in heart rate during the serial subtraction sections of the MAST and during the post-negative feedback “hard” math problems (fig. 6). These were more pronounced during the afternoon.

Fig 6. Heart rate changes pre, during and post stressor

**Self-report data**

As with previous pilot, the stressor had significant effects on self-report measures, with increased state anxiety, decreased positive affect and increased negative affect (all p<.01, see fig.7-9). Visual analogue mood scales showed significant increases in tenseness (p=.02) and hostility(p=.001) post stressor, however, sadness only showed a weak trend increase (p=.09) (see fig.10). Finally, qualitative data were collected on the participants’ expectations and experience with the task and its believability (see fig.11 and table 1).

Fig 7. State anxiety response to stressor, only 1 non-responder in morning group

Fig 8. Positive affect changes in response to stressor

Fig 9. Negative affect changes in response to stressor

Fig 10. Visual analogue mood scale changes in response to stressor

Responders

relaxed/ tense: 5/6 AM, 4/6 PM , 51% increase overall

hostile/ friendly: 12/12, 25% decrease overall

sad/ happy: 4/6 AM, 3/6 PM, 9% decrease overall

Fig 11: Threat challenge questionnaire responses



Table 1. Qualitative data from participants

\* not very aversive 1 - 10 very aversive

\*\* not very difficult 1 – 10 very difficult