

# Greater Decline in Reaction Time Performance on a Smartphone Application During Sleep Deprivation is Linked to Extraversion

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## INTRODUCTION

- Sleep-2-Peak (S2P)<sup>3</sup> is a reaction time (RT) test developed for smartphones and represent a short and accessible tool for repeated measures of alertness in clinical and research settings.
- The PVT-192 is a RT test that is the gold standard in sleep research and has been shown to be sensitive to both the homeostatic and circadian components of sleep.<sup>1,2,5</sup>
- There is accumulating evidence that extraversion is one of the personality traits that confers a certain vulnerability to sleep deprivation.<sup>4</sup>

## OBJECTIVE

- Examine the capacity of S2P to accurately measure the vulnerability of extrovert to sleep deprivation.

## METHOD

### Participants

- 6 men and 10 women (18 to 27 years old).

### Procedure

- 35 hours of total sleep deprivation.
- At every even hour, participants completed two RT tests, S2P and PVT-192, in a counterbalanced way.

### Dependent variable

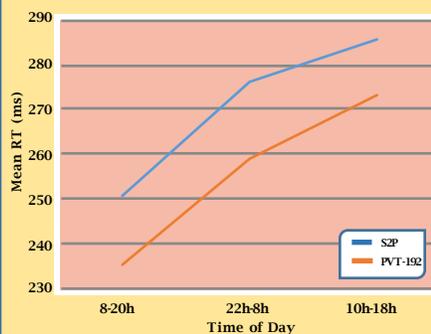
- The NEO-PI III (personality test)
- Mean RT (ms) on both S2P and PVT-192

### Analyses

1. Mean RT for both devices were grouped in 3 time clusters (8AM-8PM + 10PM-8AM + 10AM-6PM).
2. Subjects were separated in 2 equal groups of highest and lowest T scores on the Extraversion Scale of the NEO-PI III.
3. T tests were calculated on the RT increases from the first to the third time cluster between both extraversion groups on S2P and on the PVT-192.

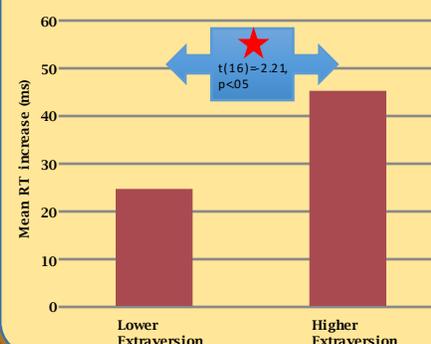
## RESULTS

### 1. Evolution of Reaction Time for the Sleep-2-peak and the PVT-192 throughout sleep deprivation



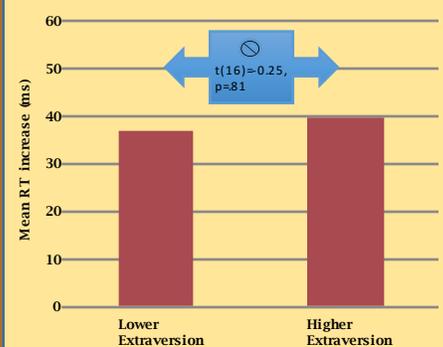
Lower Extraversion n=8	Tests	Higher Extraversion n=8
42.13 8.04	NEO-PI III Mean (T score) SD	62.38 5.73
24.96 16.83	S2P Mean increase (ms) SD	45.13 19.62
36.59 25.78	PVT-192 Mean increase (ms) SD	39.52 21.93

### 3. Difference in RT Increase on the Sleep-2-peak Between Lower and Higher Extraversion.



## RESULTS

### No Difference in RT Increase on the PVT-192 between Lower and Higher Extraversion.



## DISCUSSION

- Overall, these results show that S2P is able to distinguish the High Extroverts from the Low Extroverts during a total sleep deprivation protocol.
- These results also suggest that in a context of a relatively short period of sleep deprivation, S2P may be more sensitive than the classic PVT-192 to identify those who are more vulnerable to sleep deprivation.
- It is possible that intrinsic characteristics differences in both RT tests could explain these results (touch screen, automatic feedback, etc.).
- In conclusion, our data suggest that Sleep-2-Peak may be a better choice than the PVT-192 for some specific research and clinical settings.

## REFERENCES

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