

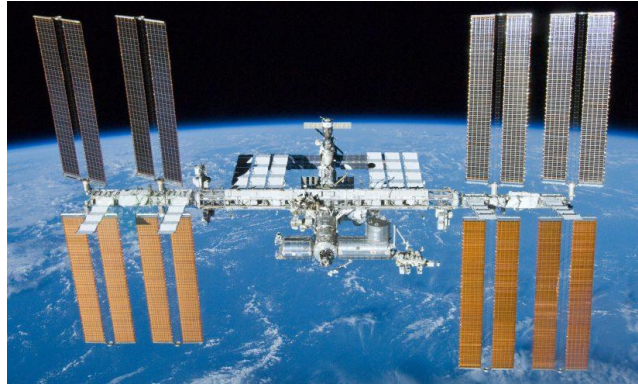
# Evaluation of anxiety in short-term microgravity: sensitivity of psychological parameter

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*International Astronautical Congress  
Bremen*

**1<sup>st</sup> October 2018**

# Global context



**Space environment**  
(e.g. ISS)

Involves



- Social demands
- Physical demands
- Psychological demands

Involve



- Adaptive capacities' modification

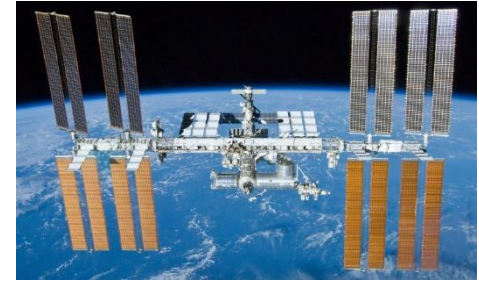
Represents



- Danger for the success of the mission

# Psychological studies in space environments

- Space environment:
  - Interpersonal conflict and cultural effects
  - Recommendations to prevent conflict during the mission



- Analog environments:
  - Recommendations to prevent psychological disorder (HDBR)
  - Affective states and anxiety (Parabolic flights)



# Psychological studies in parabolic flights



- Physiological changes related to anxiety in microgravity

- Psychological characteristics of parabonauts

- Describing affective states during task's realization

➤ No studies about affective states and anxiety in an anxiogenic situation lived in microgravity

# Purpose of this study

## Purpose:

- Know the effects of parabolic flight with gravitational changes on stress' perception

## Hypothesis:

- Affective states and anxiety are modified by an anxiogenic condition compared to control condition

# Participants and conditions



- 12 male participants
- Mean age: 33 y.o ( $\pm 9.11$ )
- Second parabolic flight
- No motion sickness in this context

## 4 experimental conditions:

Control 1g



Control 0g



Anxiogenic 1g

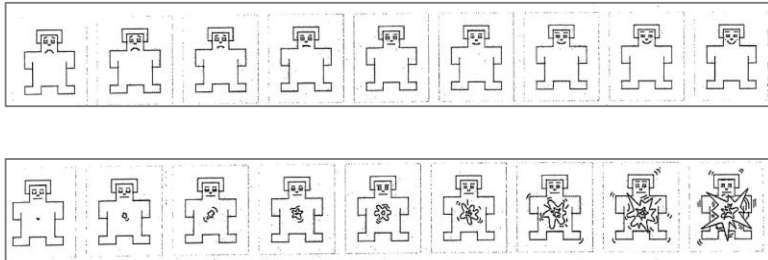


Anxiogenic 0g



95 dB, 50 ms

# Psychological questionnaires

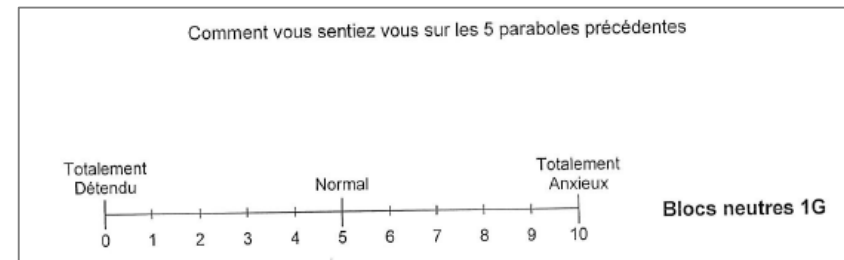


## Self-Assessment Manikin (SAM)

- Assessed valence and arousal
- Filled out twice during the flight
- Half and end of the flight

## Visual Analog Scales (VAS)

- Assessed level of anxiety (*How do you feel during the five precedent parabolas ?*)
- Filled out during each break



QUESTIONNAIRE D'AUTO-EVALUATION de C. D. SPIELBERGER et Al.  
Inventaire d'Anxiété Etat-Trait / Forme Y-A

Nom : \_\_\_\_\_ Prénom : \_\_\_\_\_  
Age : \_\_\_\_\_ Sexe : \_\_\_\_\_  
Date de passation : \_\_\_\_\_

E	T

Consignes : Un certain nombre de phrases que l'on utilise pour se décrire sont données ci-dessous. Lisez chaque phrase, puis encourez, parmi les 4 points à droite, celui qui correspond le mieux à ce que vous ressentiez A L'INSTANT, JUSTE EN CE MOMENT. Il n'y a pas de bonnes ni de mauvaises réponses. Ne passez pas trop de temps sur l'une ou l'autre de ces propositions et indiquez la réponse qui décrit le mieux vos sentiments ACTUELS.

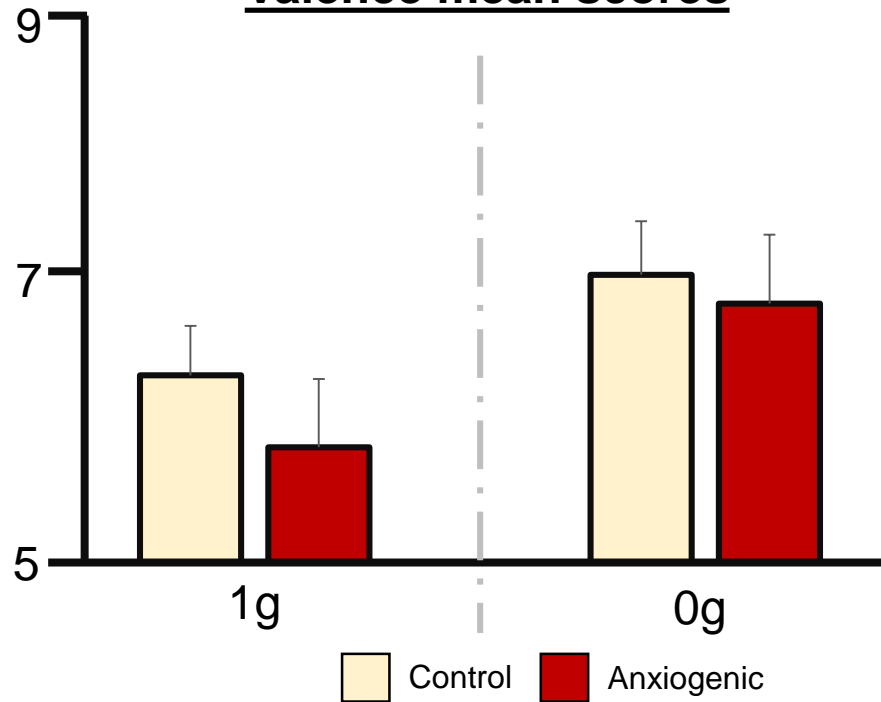
## State-Trait Anxiety Inventory (STAI)

- Assessed state-anxiety (anxiety feels on a specific moment)
- Filled out in the end of the flight

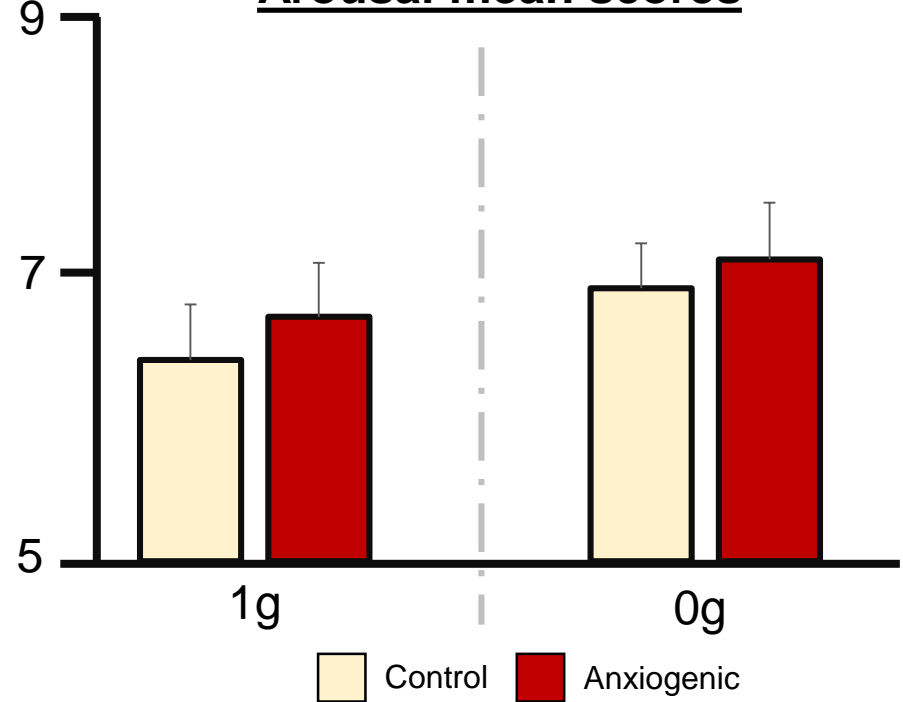
# Results

## Self Assessment Manikin (SAM)

Valence mean scores



Arousal mean scores



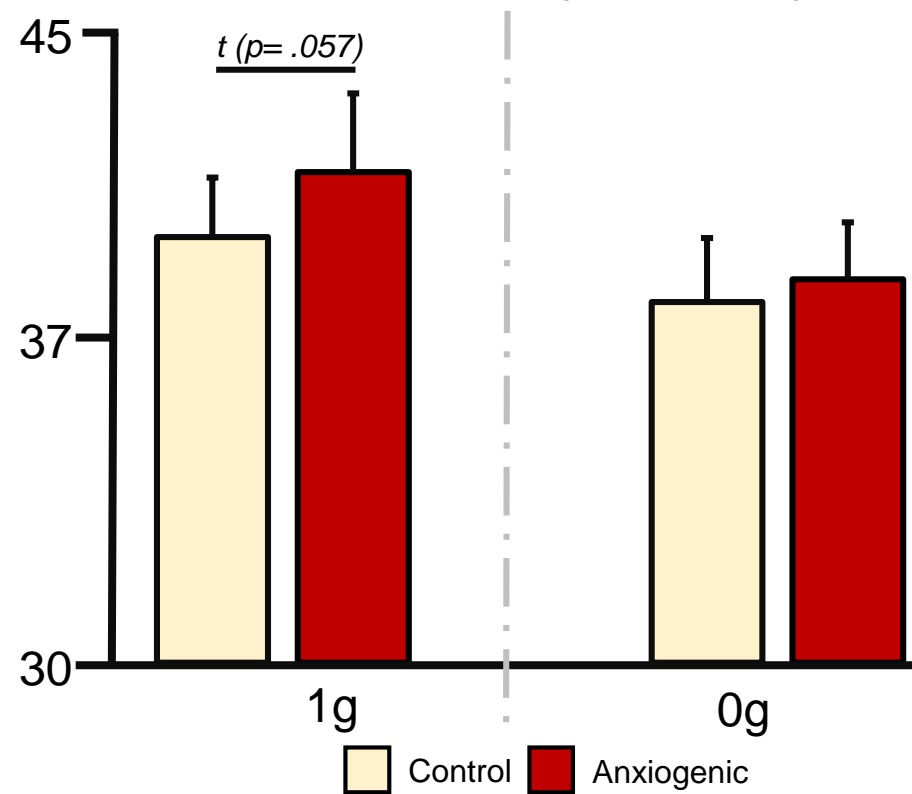
- No significant effect of anxiogenic situation on valence and arousal



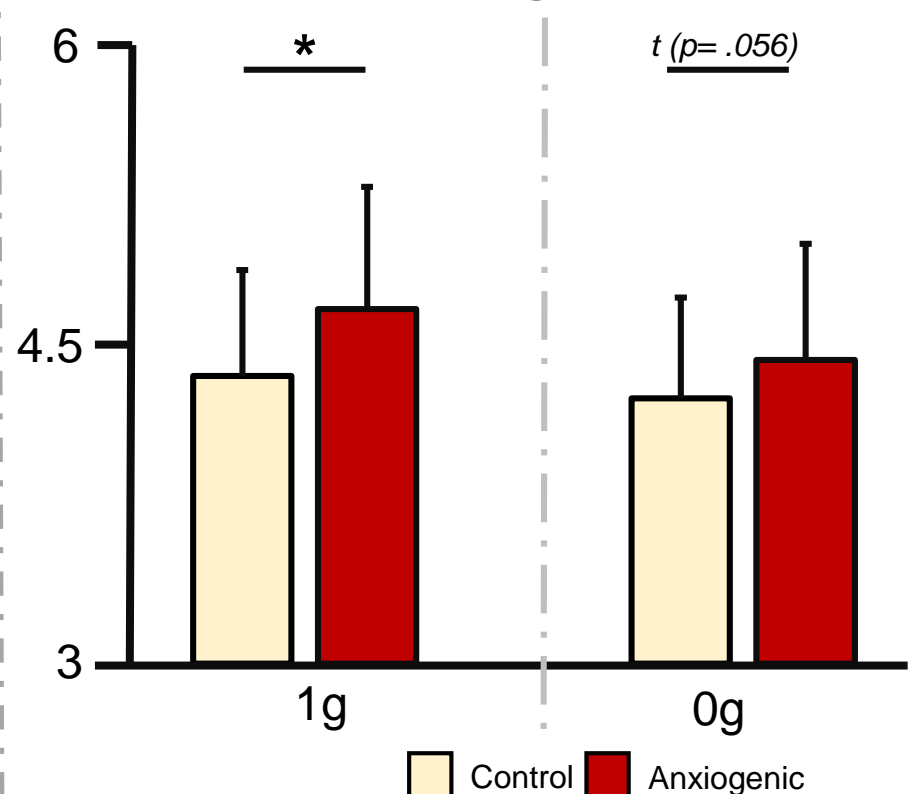
# Results

## State Anxiety

### State-Trait Anxiety Inventory



### Visual Analog Scales



- Significant effect of anxiogenic situation on the state anxiety in 1g
  - Effect of anxiogenic situation on state anxiety in 0g

# Discussion

## Purpose:

- Know the effects of parabolic flight with gravitational changes on stress' perception



### **In 1g:**

- No changes in valence and arousal
- Increases of anxiety in anxiogenic situation



### **In 0g:**

- No changes in valence and arousal
- Increases of anxiety in anxiogenic situation only with VAS

# Discussion

## Conclusion:

- Gravitational changes modify stress' perception
- Questionnaires assessing anxiety more suitable than affective states' evaluation

## Limitations:

- A few affective parameters assessed
- Participants: Volunteers, sensation seeking
- Positive bias

## Recommendations for the future:

- Choose volunteers who have a more important experience of parabolic flight
- Realize measures near to the situation

### Acknowledgements:

- CNES (French National space research centre) for funding this research
  - Novespace