Interreality in the Management and Treatment of Stress-related Disorders

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INTERSTRESS

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INTERSTRESS VIDEO
I. What is Stress?

According to JAMA (S. Cohen, D. Janicki-Deverts, G.E. Miller (2007) Psychological Stress and Disease, JAMA, 298:1685-1687) “Psychological Stress” occurs when an individual perceives that environmental demands tax or exceed his or her adaptive capacity.
Stress is influenced by:

• **The person’s appraisal of the stimulus**: When faced with a stimulus, a person evaluates the potential threat (primary appraisal). Primary appraisal is a person’s judgment about the significance of a stimulus as stressful, positive, controllable, challenging or irrelevant.

• **The personal, social and cultural resources available**: The secondary appraisals address what one can do about the situation (subject’s coping resources and options).

• **The efficacy of the coping efforts**: the subject starts a problem management phase aimed at regulation of the external stimuli.

• **The level of motivation**: the higher the motivation in a given situation, the higher the level of frustration the subject will accept.
The project approach: objective vs. subjective challenges/skills ratio

- We identify how to cope with stress by comparing objective and subjective evaluations:
  - **Objective:** assessing the user’s behaviour using virtual experiences and biosensors
  - **Subjective:** assessing the challenges/skills - subjective evaluation using diaries and self-report
II. Managing Stress
Treating stress is difficult...

• **ACCEPTANCE**: help subject to accept what he/she is going through.

• **COGNITIVE RESTRUCTURING**: support subject in questioning and revising stressor-related schemas and interpretations.

• **EDUCATION**: teach subject useful coping responses (management skills) to stressors.

• **EMOTIONAL MANAGEMENT**: support subject in overcoming fear of trauma-related (failures) memories.
The gold standard: CBT

According to the Cochrane Database of Systematic Reviews (Bisson and Andrew, 2005; Rees et al., 2004; Thomson & Page, 2007), the best validated approach covering both stress management and stress treatment is the Cognitive Behavioural Therapy (CBT) approach.
The CBT approach

(1)

- Typically, this approach may include both individual and structured group interventions (10 to 15 sessions) interwoven with didactics.

- It includes:
  - in-session didactic material and
  - experiential exercises and out-of-session assignments (practicing relaxation exercises and monitoring stress responses).

- The intervention focuses on:
  - learning to cope better with daily stressors (psychological stress) or traumatic events (post traumatic stress disorder)
  - and optimizing one's use of personal and social resources.
The problems...

The trouble with stress is that it is so *very personal*. It depends a great deal on how the person experiencing a stressor faces it —psychologically and physically.
III. The Interreality approach
Improving CBT

• The Interreality approach tries to improve three critical limitations of CBT:

• The focus of the therapy is more on the top-down model of change (from cognitions to the experience) than on the bottom-up (from the experience to cognitions) => More Experience

• The protocol is not customized to the specific characteristics of the patient => Understand the patients and adapt the protocol to them

• Virtual and real experiences are not connected => Connect them
Feature I.

Use experiences, not words
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• **immersive** (VR in the health care centre)

• **non immersive** (at home - PC - or outside - Mobile)

• **role-playing experiences** in which one or more users interact.
THE VIRTUAL WORLDS

3D Individual and/or Shared Virtual Worlds (3DWs)

organized around three different but interconnected islands/areas:
the Learning Island, the Community Island and the Experience Island.
CHALLENGES
Experiences, not words

• **identify** the right experiences

• **tune them** to the *specific features* of the different technologies

• **connect them** in a coherent way (*protocol*)

• **adapt them** to the different contexts (*subject and environment*)
Feature II.
Understand the user
Feature II.
Understand the user

• **Bio and activity sensors** (Personal Biomonitoring System – PBS) and **Behavioral Analysis** are used to:

  • **track** the **emotional/health status** of the user and

  • **influence** his/her experience (aspect, activity and access)
Feature II. Understand the user

- Independent lycra-based wearable bands for the examination of the physiological and behavioural signs.
CHALLENGES.
Understand the user

- identify the right sensors

- identify the specific features of the parameters to understand the user (emotions and behaviors)

- understand how to integrate different parameters in a meaningful evaluation (data fusion)

- use this evaluation to adapt the offered experiences
Feature III. Provide 24-hour support to the user
• The **portability** of this technology guarantees the availability of the contents anytime and everywhere:

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  creating a **bridge between virtual and real worlds** *(interreality)*

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  **user** is monitored **continuously** throughout the **virtual and real experiences**

  **the data** is constantly used to improve both the **appraisal** (evaluation) and the coping **skills** (adaptation) of the **patient**
1) Mobile Stress Monitoring

- *PsychLog*, a smartphone app, to administer self-report questionnaires randomly throughout the day

- On user’s command, the app can automatically collect heart rate and activity information from a wireless ECG equipped with a 3-axial accelerometer
2) Mobile Stress Management

The user can practice stress management exercises “on the move” by using:

- mobile physiological monitoring & feedback app
- mobile relaxation app
Mobile Stress Management Applications: Goals

1. **Raise Patient’s awareness about physiological signs of stress**

2. **Provide means to exercise relaxation and physiological monitoring & feedback to improve stress coping skills in real life situations**
CHALLENGES. Provide 24-hour support to the user

- **connect** real and virtual worlds
- **identify** features of the behavior that allow us to understand the user (emotions and intentions)
- **connect** them with biosensor data
- **use** data to offer short-term support to the user
- **use** data to offer long-term support to the user