

Experiential Cognitive Therapy (ECT) for the Treatment of Panic Disorder with Agoraphobia: a controlled clinical Trial

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VR for psychological therapies

For psychological therapies,
3D immersive environments' potential is
to design and use "planned experiences".



VRET

Computer-generated virtual environment-based psychotherapy, also known as

VRET

Virtual Reality Exposure Therapy

consists in enabling the patient to interact with a feared stimulus, seen within a virtual environment (VE) containing anxiogenic elements.

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Panic Disorder and Agoraphobia

- **Panic disorder** is defined by:
 - Recurrent unexpected panic attacks;
 - A cluster of physical and cognitive symptoms.
- **Agoraphobia** is defined by:
 - Fear of being in places/situations from which escape may be difficult/embarassing
 - Avoidance of public places

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The Treatment of Panic Disorder

- Many studies demonstrated the effectiveness of a multicomponent approach:
 - **Exposure therapy**: both in imagination and in vivo;
 - **Interoceptive exposure**: panic-like reactions induced by hyperventilation, cardiovascular exercise and/or spinning in a chair
 - **Cognitive restructuring**: alternative interpretation, label shifting and cognitive countering
 - The duration of the traditional protocol is **fifteen sessions**

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Virtual Reality Assisted Therapy

We proposed a new approach:
Cognitive Behavioral Therapy Virtual Reality Assisted (CBT-VRA)

- A **multicomponent approach**;
- The **use of VR** for exposure therapy, interoceptive exposure, cognitive restructuring;
- An **experiential approach**: the patient faces feared situations
- The duration of the CBT-VRA is **eight sessions**

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Session 1

- Description of the etiologic model of PDA according cognitive behavioral approach.
- Connection between the model and a recent PDA of the patient.
- Introduction to **Virtual Environments**.
- **Graded exposure** to virtual environments and set a hierarchy of virtual stimuli.
- Homework: diary of panic attacks.

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Session 2

- Homework review
- **Cognitive assessment** assisted through graded exposure to virtual environments
- Introduction and scheduling of **in vivo Self-Exposure**
- Homework: diary of panic attacks, in vivo Self-Exposure

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Session 3

- Homework Review.
- **Cognitive Restructuring** assisted through Graded Exposure to virtual environments.
- Homework: diary of panic attacks, in vivo Self-Exposure.

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Session 4

- Homework Review
- **Graded exposure** to virtual environments
- **Cognitive Restructuring** face to face
- Homework: panic attacks diary, in vivo Self-Exposure

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Session 5

- Homework Review
- **Interoceptive Exposure**
- **Interoceptive Exposure** assisted through Graded Exposure to virtual environments
- Homework: in vivo interoceptive exposure, panic attacks diary

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Session 6

- Homework Review
- **Interoceptive exposure** assisted through graded exposure to virtual environments
- **Cognitive Restructuring** face to face
- Homework: in vivo interoceptive exposure, diary of panic attacks.

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Session 7

- Homework Review
- **Interoceptive Exposure** assisted through Graded Exposure to virtual environments.
- **Cognitive Restructuring** face to face.
- Homework: in vivo interoceptive exposure, diary of panic attacks.

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Session 8

- Homework review
- **Cognitive restructuring** and **relapse prevention**
- Follow-up session schedule
- Retest

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Advantages of VR assisted therapy

- Remission of symptomatology (follow-up after 3 months)
- **8 weeks-therapy vs 15 weeks-therapy**
- The opportunity for the patient to experience the change during the sessions
- The opportunity for the therapist to directly experience the same environmental happenings that the patient is experiencing

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Experiential-Cognitive Therapy

The preliminary treatment protocol for Panic Disorder and Agoraphobia, named Experiential-Cognitive Therapy (ECT), was developed at the Applied Technology for Neuro-Psychology Lab of Istituto Auxologico Italiano, Verbania, Italy, in cooperation with the Psychology Department of Università Cattolica of Milan, Italy.

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Experiential-Cognitive Therapy

The current version included the efforts of researchers from the Center for Advanced Multimedia Psychotherapy, California School of Professional Psychology, San Diego (CA), USA, from the Seoul Paik Hospital, Inje University, Seoul, Korea, and from Department of Psychology, Université du Québec - Hull, Canada.

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VEPDA

VEPDA (Virtual Environments for Panic Disorders with Agoraphobia – VEPDA) is a 4-zone virtual environment developed using the GS6 graphic engine.

The four zones reproduce different potentially fearful situations - an elevator, a supermarket, a subway ride and a large square.



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VEPDA

In each zone the therapist defines by a set-up menu the conditions of the anxiety-related experience.

In particular the therapist can

- **define the duration** of the virtual experience,
- fire different **sound effects**
- vary the **number of virtual agents** (from none to a crowd) in the zone.

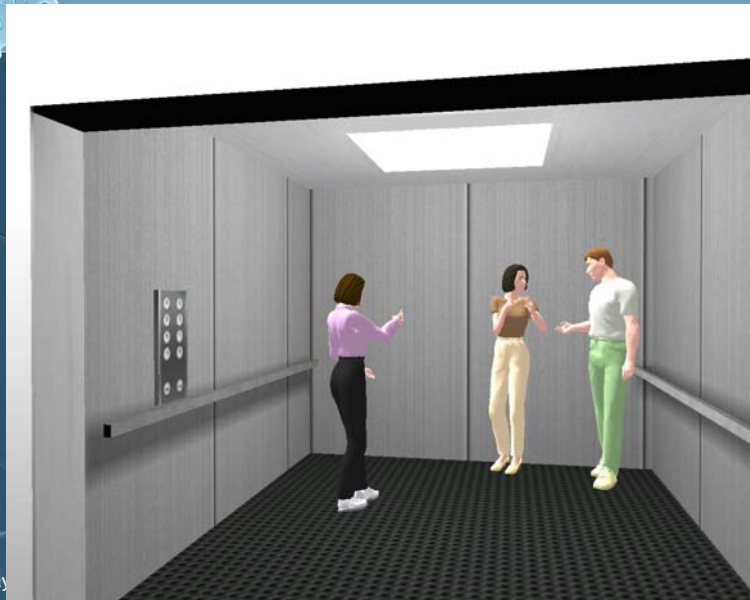
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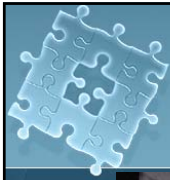


VEPDA: elevator



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VEPDA: square



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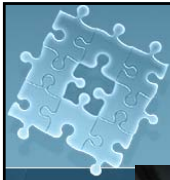


VEPDA: subway



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VEPDA: supermarket



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Sample

- Subjects are 51 patients, seeking treatment in one of the institutions involved in the study; they meet DSM IV criteria for panic disorders and agoraphobia for a minimum of 6 months as determined by an independent clinician on clinical interview, according to the SCID model.
- **Sample:**
 - Age: 22-55 (mean: 42,8)
 - Sex: 36 F , 15 M
 - Education: 5-17 ys (mean: 11)

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Conditions

- The selected subjects have been randomly divided in three groups:
 - **ECT group**, that have experienced the Cognitive Behavioral Therapy-Virtual Reality assisted treatment;
 - **CBT group**, that have experienced the traditional Cognitive Behavioral approach
 - **A waiting list control group.**

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Results

The statistical analysis showed:

- **Significant differences** between CBT and waiting list (WL) control group
- **Significant differences** between ECT and waiting list (WL) control group
- **No significant differences** between CBT and ECT groups

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BDI-II

Beck Depression Inventory

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-8.24	1.213	.000
ECT	WL	-8.54	1.213	.000
CBT	ECT	.50	1.213	1.00

- There are significant difference between CBT and WL ($p < .01$)
- There are significant difference between ECT and WL ($p < .01$)
- There aren't significant difference between CBT and ECT ($p < .01$)

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STAI

State-Trait Anxiety Inventory (State subscale)

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-9.47	2.564	.002
ECT	WL	-8.74	2.564	.004
CBT	ECT	-.74	2.564	1.00

- There are significant difference between CBT and WL ($p < .01$)
- There are significant difference between ECT and WL ($p < .01$)
- There aren't significant difference between CBT and ECT ($p < .01$)

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STAI State-Trait Anxiety Inventory (Trait subscale)

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-9.18	2.676	.004
ECT	WL	-11.71	2.676	.000
CBT	ECT	2.53	2.676	1.00

- There are significant difference between CBT and WL ($p < .01$)
- There are significant difference between ECT and WL ($p < .01$)
- There aren't significant difference between CBT and ECT ($p < .01$)

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ACQ Agoraphobic Cognitions Questionnaire

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-4.79	1.476	.006
ECT	WL	-5.26	1.476	.003
CBT	ECT	-.47	1.476	1.00

- There are significant difference between CBT and WL ($p < .01$)
- There are significant difference between ECT and WL ($p < .01$)
- There aren't significant difference between CBT and ECT ($p < .01$)

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FQ

Fear Questionnaire

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-6.26	2.564	.489
ECT	WL	-10.29	2.564	.072
CBT	ECT	4.03	4.421	1.00

- There aren't significant difference between CBT , ECT and WL ($p < .01$)



PRS

Panic Rating Scale - Avoidance behavior

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-1.41	.390	.002
ECT	WL	-1.59	.390	.001
CBT	ECT	.18	.390	1.00

- There are significant difference between CBT and WL ($p < .01$)
- There are significant difference between ECT and WL ($p < .01$)
- There aren't significant difference between CBT and ECT ($p < .01$)



PRS

Panic Rating Scale - Panic Attack

Treatment		Mean difference	Std. Error	Sig.
CBT	WL	-.74	.311	.066
ECT	WL	-.74	.311	.066
CBT	ECT	.00	.311	1.00

- There aren't significant difference between CBT , ECT and WL ($p < .01$)



Interpretation

Although results showed that ECT and traditional CBT therapy can effectively treat panic disorder with agoraphobia and there are not significant differences between them,

ECT could be preferred because it has the advantage of a **shorter therapy**.



Further Investigation

Some investigation is being conducted:

- A **follow-up test** has been planned
- An **improved version** of VEs is under development, with more realistic stimuli and more interactive environment

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Conclusion

Using VR software, it is possible to re-create, together with the subject undergoing treatment, a hierarchy of situations corresponding to reality, which he may experience in an authentic way thanks to the involvement of all his sensorimotor channels.

VR constitutes a highly flexible tool which makes possible to plan an enormous variety of procedures of intervention on psychological distress.

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Conclusion

Structuring a large amount of controlled stimuli and, at the same time, monitoring responses generated by the patient offer a considerable increase in therapeutic effectiveness and personalization, as compared to traditional procedures.