

Mobile Narratives to improve the quality of life: an experimental research



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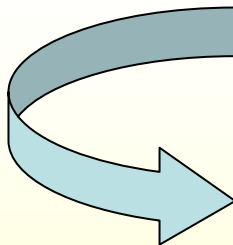


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Next generation Mobiles

- New generation mobiles bringing together many functionality: PDA; camera, gaming device and media player
- Hardware accelerated mobile devices joined by a suite of emerging 3D engines: Java 3D
- New communication protocol: UMTS



Developers will create interactive and multimedia contents and applications with high speed connection



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Mobile narratives

Mobile narratives are defined as interactive multimedia experiences implemented on mobile devices, in which the narrative component is critical to create a feeling of presence and engagement



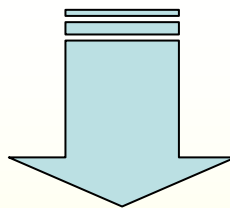
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Mobile Narratives



Mobile narratives, linking the feeling of presence and emotional state, may be used to improve the mood state of the users



Mobile narratives may be used for both modifying the user's mood and helping him to relax



RELAXATION

- *Analytic method* → Physiological starting point – Progressive Muscular Relaxation as physical techniques (Jacobson, 1938)
- *Global method* → Psychological starting point – Authogenic Training as cognitive techniques (Schultz, 1969)

Durand & De Bousinger, 1973; Davidson & Schwartz, 1976



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THE STUDY

We want to test if
mobile narratives
will offer some
advantages in
commuters
relaxing.



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Objective

The main goal of this study is to analyse the effectiveness of mobile narratives in improving relaxing state in a commuters' sample.

Narratives are used to guide videos experiences and to perform relaxation exercises aimed at inducing emotional changes.

Another goal is to study the link between emotional changes and the sense of presence perceived by the users, during experimental treatments.



Hypothesis

1. Providing on mobile phones videos with narratives created to induce relax (mobile narratives: VRnar) will induce higher emotional improvement and higher relaxation as compared to an audio-visual experience without narrative (DVD) and control group
2. Providing on mobile phones videos with narrative and visual stimuli created to induce relax (VRnar) will induce higher sense of presence as compared to audio-visual experience without narrative (DVD)



Questions

1. Are there differences in anxiety reduction and emotional changes in time, separately for VRnar, DVD and Control group?

2. Is there reduction in anxiety and emotional state in treatments, among the three groups?

3. Is there a **significant** difference in the **sense of presence** comparing VRnar and DVD conditions?



EXPERIMENTAL DESIGN

3 (Vrnar vs DVD vs Ctrl) x2 (pre vs post treatment)

Conditions factor (between subject design)

Condition 1: Mpg4 video based on Virtual Relaxation Island images with narrative that guide subjects in performing relaxing exercises (VRnar)

Condition 2: Mpg4 video based on a commercial relaxation DVD with images and sounds of tropical beaches (DVD)

Condition 3: Control Group

Time factor (within subject design)

Pre treatment measurement

Post treatment measurement



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PARTECIPANTS

Ninety (90) commuting students, aged between 20-25 years old, 45 females and 45 males, will be recruited on the trains that goes from the section Varese-Milano, north of Italy.

The subjects will randomly assign to the three conditions.

At the moment the study is in progress. The analysis was conducted on 34 subjects ($M=23.83$ $sd=0.72$), 17 female and 17 male, randomized as follows

	VRnar condition	DVD condition	CTRL condition
Pre-Post treatment	11	11	12



MEASURES

the measures for Anxiety and State Emotions

- **Stai state** (STAI- *Spielberger, Gorsuch, Lushene, Vagg and Jacobs, 1983*)
- **Positive and Negative Affect Scale** (PANAS - *Watson et al., 1988*)
- **Visual Analogue Scale** (VAS - *Gross e Levenson, 1995*)

the measures of sense of presence

- **ITC–Sense of Presence Inventory** - ITC-SOPI (*Lessiter et al., 2001*)
- **UCL Presence questionnaire** (*Slater et al, 1994*)

additional self-report measures

- **Trait Anxiety Inventory** (STAI- *Spielberger, Gorsuch, Lushene, Vagg and Jacobs, 1983*)
- **General Self-Efficacy Scale** (GSES - *Matthias Jerusalem & Ralf Schwarzer, 1981*)



MATERIAL & INSTRUMENTS

Hardware

- 2 Motorola A925 UMTS phones 240x320 pixel display with audio and headphones
- 1 Motorola V975 UMTS phone 240x320 pixel display with audio and headphones
- 1 Motorola E1000 UMTS phone 240x320 pixel display with audio and headphones

All the movies were converted from MPEG4 to 3GPP format, to be visualized on the mobile phones

N.B.

We decided to compare movies extracted from a Virtual Reality Island with a commercial tool (DVD).

The two conditions are different for the level of reality showed (higher for DVD tool) and for the interactive role of the user that is invited to explore the island and to perform some relaxing exercises, guided by a narrative voice (for VRnar videos only)



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4 DVD videos

are characterized by fixed images of Caribbean beaches showing the movements of waves and accompanied by sea sound

Each video lasts 10 minutes, 2 of them are in day scenario, the other two in night scenario.



4 Virtual Island videos

Present an exploration of the Virtual island (each video last 10 minutes) and are supported by a narrative voice that guides the subject to practise some relaxing exercises based on progressive relaxation -superior and inferior limbs- and depth breathing.

Extract of narrative –example- (2 phase of 2 session)

It's night...The stars in the sky give more intensity to the calm that is all around you
You're seating on the ocean river...

Hear...

Only sounds of nature are heard..

The wind blows between the palms...

The waves break up on the sand...

And suddenly come back to the sea..

Synchronize your breathing with these movements

When the wave come back to the sea, inspire deeply from the nostrils

...and when the wave returns to the beach...expire from the mouth..

Continue to breath...

Inspire...

Expire...

All your body is relaxed..

Now fix the attention on your inferior limbs.....etc...

I video beach 1"- day scenario

II cloud video -night scenario

III waterfall video" -day scenario

IV beach II video"- night scenario



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PROCEDURE

Experiment consists of 2 sessions, carried out in two different following days. Each session is composed by 2 times . The procedure is the same for the experimental condition VRnar and DVD.

Participants in CTRL condition received no treatment and were only assessed in two following days. They were asked to complete the questionnaires to assess their level of anxiety, emotional state, anxiety trait and self-efficacy.

First step is the presentation of the study to the participant that was conducted as following

FIRST DAY

- T1 : assessment before session 1 (Pre-treatment)
- Pre treatment, as assessment before treatment. Participants were asked to complete questionnaires to assess their emotional state ,anxiety trait and self efficacy (STAI state, PANAS VAS,STAI-trait, GSES)
- *Listening to the instructions*
- *Viewing the first video during the morning trip –from home to university- (according to the experimental condition assigned)*
- *Viewing the second video during the evening trip –from university to home-*
- T2: assessment after session 1
- In Post treatment subjects were asked to complete the following questionnaires to assess their emotional state and to investigate the sense of presence (STAI state, PANAS VAS, ITC-Sopi, UCL)

SECOND DAY

- T3 : assessment before session 2 (Pre-treatment)
- Pre treatment, as assessment before treatment. Participants were asked to complete questionnaires to assess their emotional state (STAI state, VAS, PANAS,)
- *Viewing the third video during the morning trip –from home to university- (according to the experimental condition assigned)*
- *Viewing the fourth video during the evening trip –from university to home-*
- T4: assessment after session 2
- In Post treatment subjects were asked to complete the following questionnaires to assess their emotional state, anxiety trait, self efficacy and to investigate the sense of presence (STAI state, PANAS, VAS,, STAI-trait, GSES, iTC-Sopi UCL,)

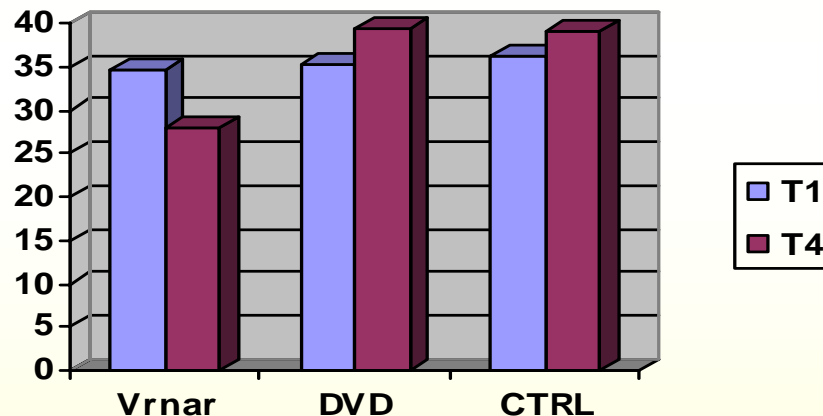


PRELIMINARY RESULTS

Question 1. we investigated whether our data showed significant differences in anxiety reduction and emotional state in time, separately for VRnar, DVD and control groups

within groups analysis: Wilcoxon tests -paired samples-

VRnar ($Z=-2,943$; $p< .001$) **showed a significant reduction in anxiety scale** (as measured by STAI state questionnaire) from the beginning of the treatment (T1) to the end of the treatment (T4), **while no significant reduction was found for DVD** ($Z=-1,409$; $p=.098$) **and Control Group** ($Z=-, 592$; $p=,291$)



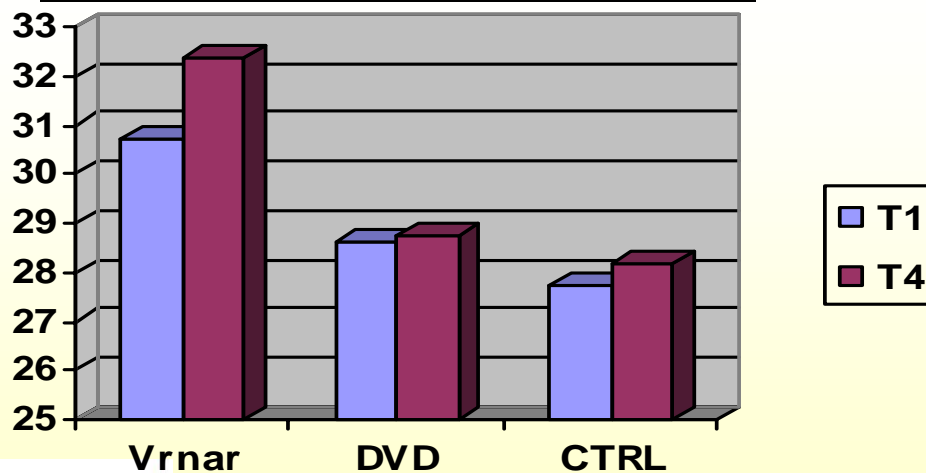
Changes in emotional state, as measured by VAS questionnaire, showed coherent result with STAI Questionnaire. Data show a significant **decrease in anxiety scale** ($Z=-2,598$; $p< .005$) and a significant **increase of relax scale** ($Z=-2,842$; $p< .001$) for **VRnar. Ctrl group** shows a significant **decrease in relax scale** from T1 to T4 ($Z=-2,070$; $p< .05$).



Data show a significant reduction in **anxiety trait** (Stai trait questionnaire) from T1 to T4 for **VRnar** ($Z=-2,943$; $p< .001$) and an increasing of anxiety trait for DVD ($Z=-1,794$; $p<05$)

The same result is relieved on the analysis performed on General **Self Efficacy** Questionnaire. Wilcoxon test (paired samples) performed on data related to T1 and T4 moments in treatment, shows a significant increase in **VRnar** ($Z=-2,406$; $p< .01$).

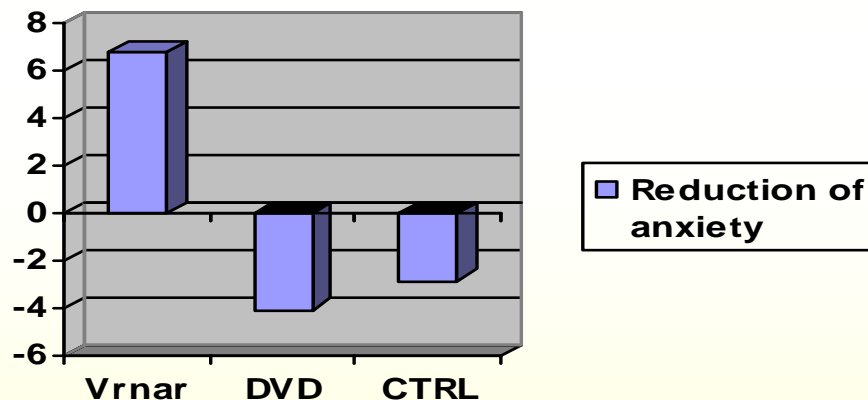
Difference in T1 and T4 measurements for self efficacy (General Self efficacy Scale) in experimental conditions:



Question 2. We carried out a Kruskal-Wallis (3 independent samples) test, in order to assess if there was a significant difference in reduction of anxiety and modification in emotional state from the beginning to the end of WHOLE TREATMENT among the 3 groups (VRnar, DVD and Control)

Between groups analysis: Kruskal-Wallis -3 independent samples-

Data show significant differences in **anxiety reduction** (Stai state questionnaire) **among the three groups** (Chi-square=20,749; $p<001$). Post hoc analyses show a significant difference between VRnar and both DVD ($U=66,500$; $p<.001$) and Ctrl group ($U=69,00$; $p<.001$) while DVD and Ctrl group didn't shown significant difference between them ($U=58,500$; $p=,328$).

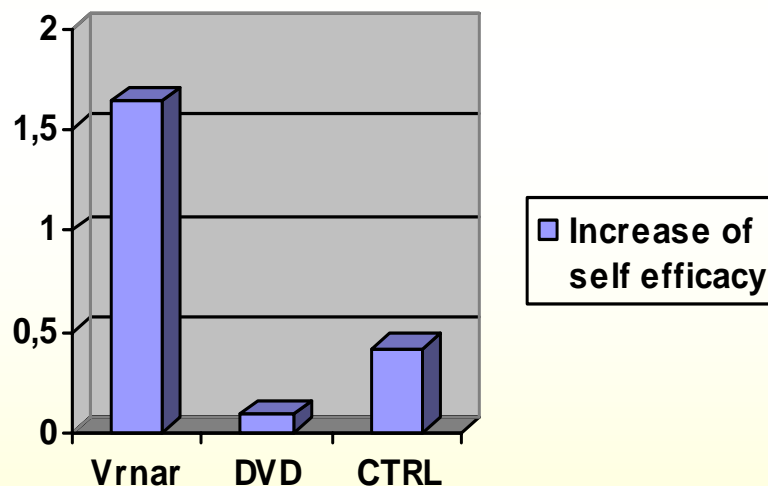
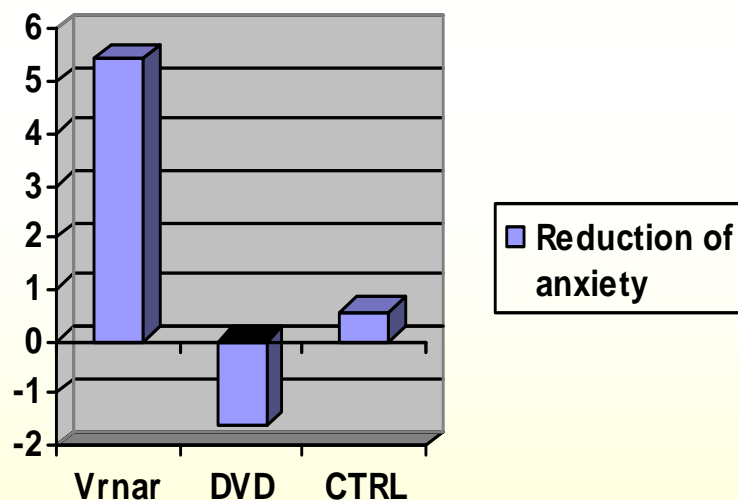


Significant difference among the three group is confirmed by **anxiety item** as concern VAS questionnaire (Chi-square=8,047; $p<01$). VRnar differs from DVD ($U=32,500$; $p<05$) and from Ctrl group ($U=27,000$; $p<05$) showing a reduction of anxiety. **Relax item** also shows this trend (Chi square=19,019; $p<.001$): the higher mean value is referred to VRnar.



Significant differences among three groups are tested also in anxiety trait (Stai trait questionnaire) (Chi square=17,085; $p<.001$) and in self efficacy (General Self Efficacy Scale). (Chi square=6,744; $p<.05$).

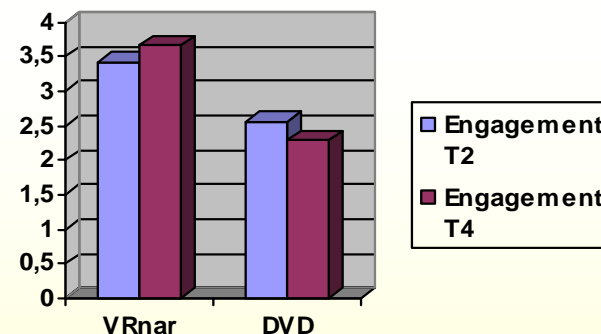
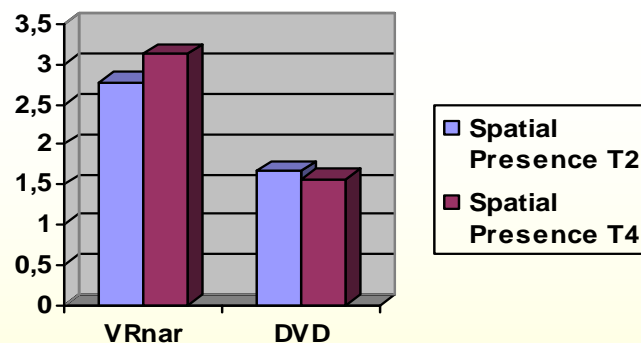
In either cases **VRnar shows significant difference from both DVD and CTRL conditions** as confirmed by Post Hoc Analyses



Question 3. As far as the Presence Questionnaires is concerned, we investigated whether degrees of change in sense of presence were different across the two groups (VRnar, DVD).

Between groups analysis: Mann-Whitney test -2 independent samples-

Data show a significant **difference in sense of presence** among the two groups (*Spatial presence in t2* $U=16,000$; $p<001$ in *t4* $U=2,000$; $p<.001$; *Engagement in t2* $U=10,500$; $p<001$, in *t4* $U=4,500$; $p<.001$; *Question 1 in t2* $U=16,000$, $p<.001$; in *t4* $U=1,500$ $p<.001$).



VR mean values are higher than DVD ones. This trend confirms the hypothesis that VRnar treatment increases the sense of presence



DISCUSSION

- VRnar induced a significant reduction in anxiety while DVD and CTRL group did not show any significant change. → ***this seems to suggest that VRnar is effective in reducing anxiety***
- VRnar induced a significant change in emotional state, increasing relax while DVD and CTRL group did not show any significant change → ***this seems to suggest that VRnar is effective in increasing relaxation***
- When comparing which condition induced a stronger changes in anxiety and relax, VRnar differs statistically from the other two groups, while no difference are found among DVD and Ctrl groups → ***this seems to suggest that VRnar is more effective in reducing anxiety and increasing relax respect to other experimental conditions***
- Strong result on Anxiety: ***VRnar seems to be significantly more effective in reducing anxiety***
This might be related to the structure of VRnar condition that differs from DVD for interactive role of users given by exploration, first-person experience evoked by narration and subjects' activation in doing relaxing exercises
- Strong result also on Self-Efficacy: ***VRnar seems to be significantly more effective in increasing self-efficacy***
- When comparing which condition induced a stronger sense of presence, VRnar shows a significant increase, not revealed for DVD condition. On the contrary DVD shows a significant decrease of the sense of presence in time → ***this seems to suggest that VRnar is more effective in increasing sense of presence***



CONCLUSION

Question 1. *Are there differences in anxiety reduction and emotional state in time, separately for VRnar, DVD and Ctrl group?*

The study showed the efficacy of VRnar in reducing anxiety and changing emotional state → to confirm I Hypothesis

Question 2. *Are there reduction in anxiety and emotional state in treatments, among the three groups?*

VRnar showed significant advantages over commercial tools (DVD) for relaxing → to confirm I Hypothesis

Question 3. *Are there a significant difference in the sense of presence comparing VRnar and DVD conditions?*

The study showed a significant difference in sense of presence among VRnar and DVD conditions, showing higher sense of presence for VRnar → To confirm II Hypothesis
Interactive contents, that promote an active role of users, and narration that define the field of meaning of the experience, may be key factors in inducing high sense of presence.

The preliminary results strongly support the use of high-presence Induction Procedure to improve the efficacy of positive emotional change: to be tested with more accuracy



TO BE TESTED

- The role of interactive contents and narration to promote higher sense of presence
- Relationship between presence and emotions
- Long term applications in everyday stressful situations
- Testing with clinical subjects



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THANK YOU FOR THE ATTENTION

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