Happiness through virtual lens : The influence of immersion, social and nonsocial contents on positive emotion induction

Katarina Pavic, Dorine Vergilino-Perez, Thierry Gricourt, Laurence Chaby

Happiness through virtual lens : The influence of immersion, social and nonsocial contents on positive emotion induction

Katarina Pavic [1,2,3,4], Dorine Vergilino-Perez [1,2], Thierry Gricourt [4] & Laurence Chaby [1,3]

[1] Institut de Psychologie, Université de Paris; [2] Vision Action Cognition, Université de Paris;
[3] Institut des systèmes intelligents et de robotique, Sorbonne Université; [4] SocialDream

- katarina.pavic@u-paris.fr -

INTRODUCTION

- **Positive emotions** have **health benefits** *(1)* and are tightly linked to **well-being** *(2)*
- Critical issue : How to foster well-being and positive experiences among users?
- **Positive technology** framework suggests technologies may improve users' subjective, psychological and social well-being *(3)*
  - **Virtual Reality (VR)** appears as a suitable technology for inducing positive emotions and promoting well-being
  - But VR's efficacity has mostly been assessed with **"subjective" measures (questionnaires),** more rarely with **"objective" ones (*e.g.,* physiological measures)**
- Widespread use of **natural (*i.e.,* nonsocial) video contents** for inducing positive emotions in VR studies, yet social contents can have an influence on induced emotions and arousal *(4)*

AIM OF THE STUDY

- Investigate VR's (*i.e.,* immersion) effects on positive emotion induction compared to a screen presentation
- Comparing social and nonsocial (landscape) contents influence on elicited emotions
- Confronting "subjective" and "objective" measures for assessing participants' emotional states

METHOD

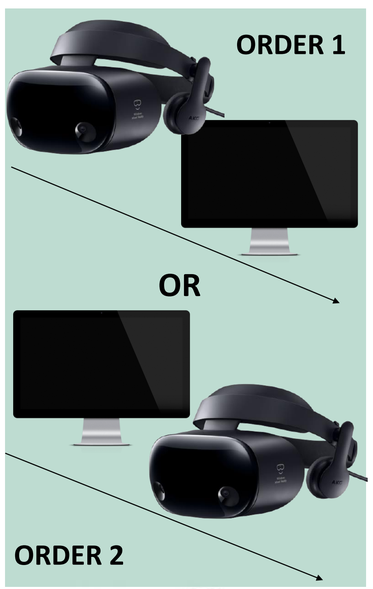
Participants : 28 healthy undergraduate students
16 women, 12 men, 23 years ± 2.6
Non-inclusion of participants having major psychiatric and/or neurological disorders (epilepsy).

Material : 25" screen (resolution of 1920 x 1080 pixels)
HMD Samsung Odyssey+ (110° Fov, resolution of 1440 x 1600 pixels)
Empatica E4 wristband

Stimuli : Eight 360° videos shot with a GoPro 360° camera and a tutorial video

Procedure

Consent
Demographic data
Visual Analogical Scale (VAS)
HADS

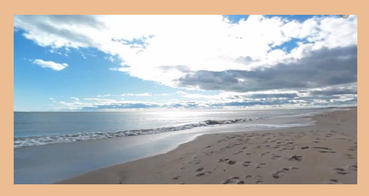


Tutorial video
1 x per media

Habituation
2 min baseline

SAM
VAS
Presence

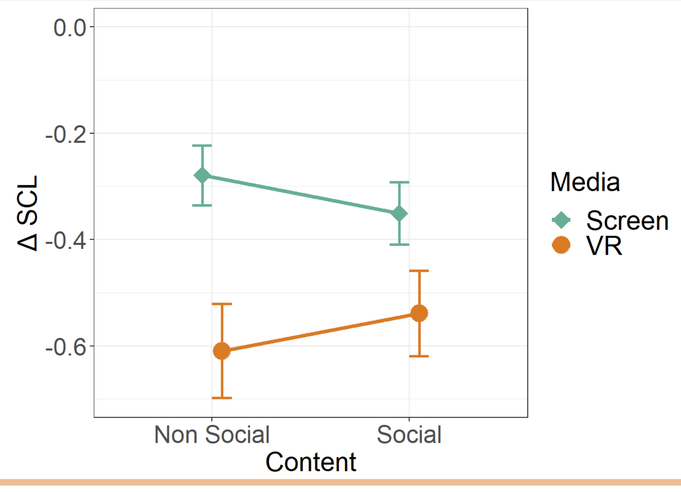
Pseudo-randomized order of clip watching
4 videos watched per technology




SAM ; VAS ; Presence

Preferences
VR/Screen Content

RESULTS

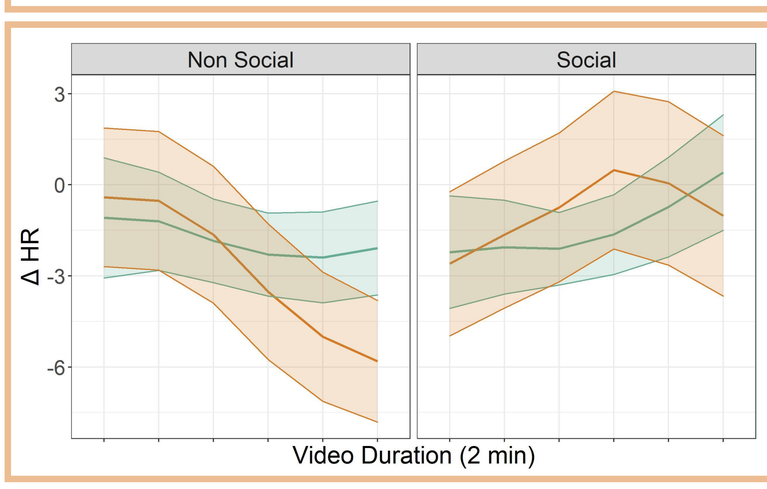


Effect of Media and Content on Skin Conductance Level Change (ΔSCL)

Significant **SCL decrease** when watching **nonsocial contents in VR** compared to a screen
⇨ **Natures' relaxing properties**

Same difference, in favor of VR, for social contents

VR tends to elicit higher levels of physiological arousal compared to a screen



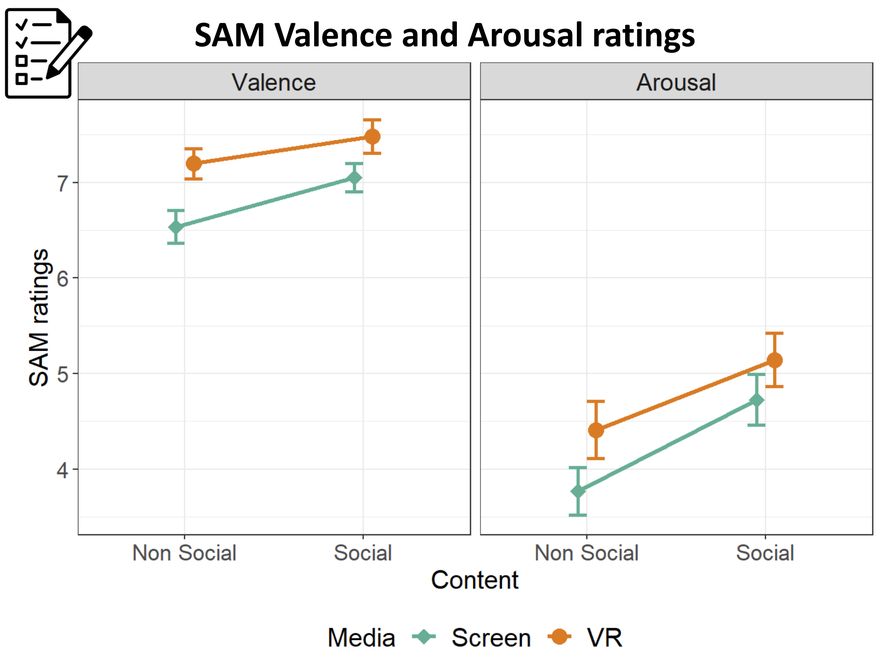
Temporal Heart Rate Change (ΔHR) in response to media and video contents

Important **HR deceleration** while watching **nonsocial contents** in **VR** compared to screen presentation

Less clear differences between VR and screen for social video contents

Perspective: **compute HR variability (HRv)**

SAM Valence and Arousal ratings



Main effect of immersion : VR induced **more positive emotions and arousal** compared to screen presentation

Main effect of content : Social videos are perceived as **more positive and arousing than nonsocial** video contents

No Media x Content interaction on valence or arousal ratings

CONCLUSION

- The **immersive nature of VR** leads to more positive emotions and arousal on both subjective and objective levels
- Nonsocial contents seem particularly efficient on a physiological level = **Natures' well-known benefits for relaxing and restoring resources** *(5)*
- **Social contents** seem to be more efficient on a **subjective level** for inducing positive emotions
- **Potential applications**: foster well-being through VR and positive emotions induction for more vulnerable and/or isolated users (*e.g.,* elderly users)

REFERENCES

(1) Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being, 3(1),* 1–43.

(2) Garland, E. L., Fredrickson, B., Kring, A. M., Johnson, D. P., Meyer, P. S., & Penn, D. L. (2010). Upward spirals of positive emotions counter downward spirals of negativity: Insights from the broaden-and-build theory and affective neuroscience on the treatment of emotion dysfunctions and deficits in psychopathology. *Clinical Psychology Review, 30(7),* 849–864.

(3) Riva, G., Banos, R. M., Botella, C., Wiederhold, B. K., & Gaggioli, A. (2012). Positive technology: using interactive technologies to promote positive functioning. *Cyberpsychology, Behavior, and Social Networking, 15(2),* 69–77.

(4) Britton, J. C., Taylor, S. F., Berridge, K. C., Mikels, J. A., & Liberzon, I. (2006). Differential subjective and psychophysiological responses to socially and nonsocially generated emotional stimuli. *Emotion, 6(1),* 150.

(5) Browning, M. H. E. M., Mimnaugh, K. J., van Riper, C. J., Laurent, H. K., & LaValle, S. M. (2020). Can simulated nature support mental health? Comparing short, single-doses of 360-degree nature videos in virtual reality with the outdoors. *Frontiers in Psychology*, 10, 2667.