The EmojiGrid as an Immersive Self-Report Tool for the Affective Assessment of 360 VR Videos

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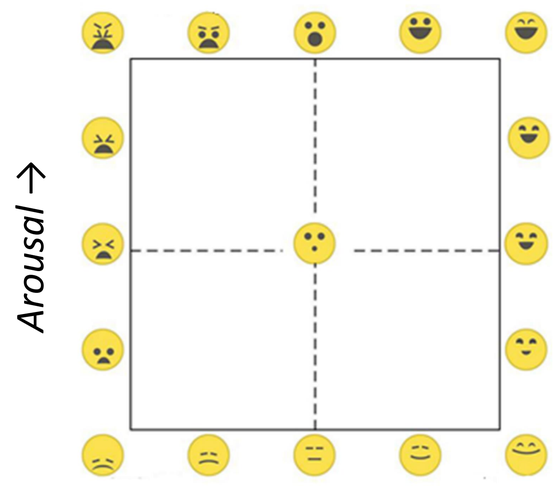
Introduction

- Immersive VR systems effectively induce different emotional responses.
- The assessment of these responses should not disrupt the VR experience.
- An affective self-report tool should therefore require minimal cognitive effort (be intuitive) and be applied in the VR itself.
- The EmojiGrid is a language-independent emotional self-report tool:

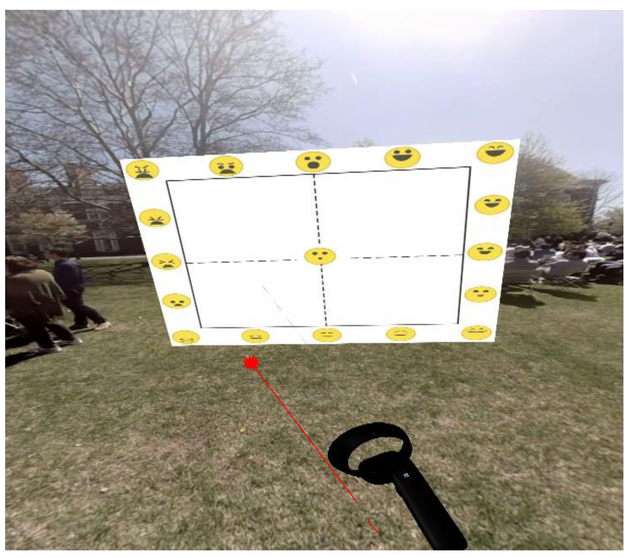


- The emoji-labels express different degrees of valence (horizontal axis) and arousal (vertical axis).
- Users rate their subjectively experienced valence and arousal by clicking the corresponding location on the grid.
- The EmojiGrid can be depicted in VR (-videos).
- This study was performed to evaluate the EmojiGrid as a self-report tool for the assessment of emotions evoked by immersive 360° VR videos.

Methods & Procedure

- **Stimuli**: 62 immersive 360° VR videos from a validated public database (Li et al., 2017), divided in 16 clusters with an average duration of 12 min each.
- **Participants**: N=40, 18 males (mean age=22.2±2.7 years) watched 3 randomly selected clusters.
- **Display** : A Samsung Odyssey Windows Mixed Reality headset was used to present the VR videos. The EmojiGrid was embedded in the VR at the end of each video.
- **Response**: Participants reported their affective state by pointing a virtual laser beam at the EmojiGrid in the VR.

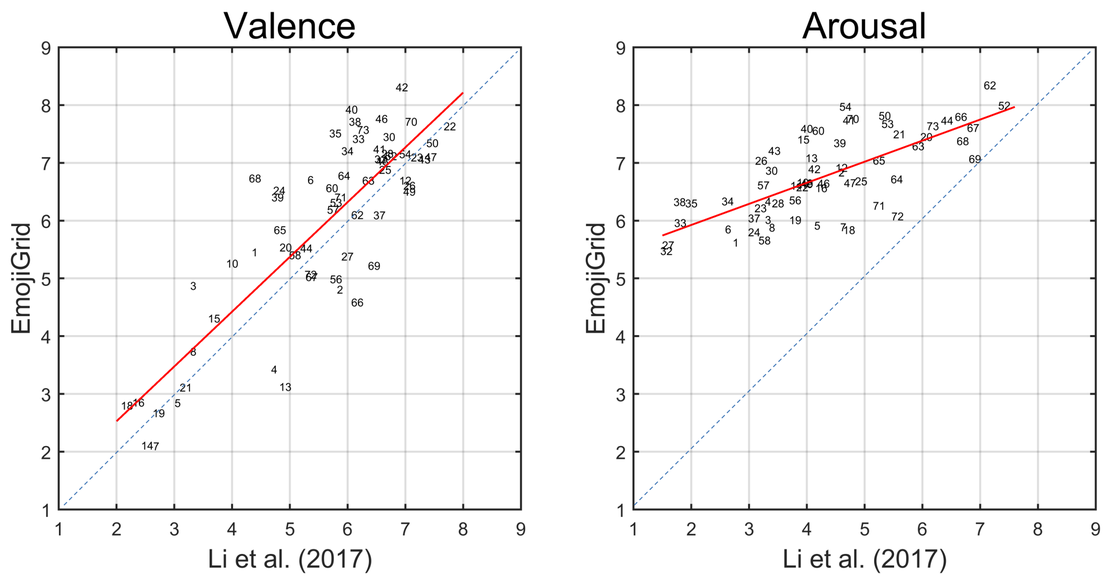
Participant wearing the HMD and holding the remote control.



A response is given by pointing the virtual laser beam at the EmojiGrid in the VR space.

Results

- The immersive 360° VR videos successfully elicited a wide range of different emotions.
- Valence and arousal ratings were as expected:
  - videos showing beaches (#22) and puppies (#50) were rated highest on valence, while videos showing a prison cell (#16) and war-refugees (#18) received the lowest valence ratings.
  - videos showing hang gliding (#52) and roller coaster (#62) experiences were rated highest on arousal, while videos showing birds (#27) and a sunrise beach (#32:) were rated lowest on arousal.
- Mean valence and arousal ratings closely agree with those reported by Li et al (2017; obtained with Self-Assessment Mannikin), with intraclass correlations for
  - Valence: 0.91 [0.85-0.95]
  - Arousal: 0.73 [0.55-0.84]



Relation between the valence and arousal ratings from Li et al. and those obtained with the EmojiGrid in the current study. The numbers correspond to the original video identifiers in the database from Li et al.

Conclusions & Discussion

The EmojiGrid :

- is a valid and immersive affective self-report tool for the assessment of VR-evoked emotions.
- is intuitive: participants can use the EmojiGrid with minimal instructions.
- affords real-time affective annotation of multimedia or real-time affective feedback in gaming and entertainment applications.

References

Li e.a. (2017). A public database of immersive VR videos with corresponding ratings of arousal, valence, and correlations between head movements and self report measures", Frontiers in Psychology, 8, # 2116.

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