

Novel Video Game Paradigm is Useful for Emotion Research

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Abstract

In many psychology labs, there are various methods that are used in order to induce affect. Some methods include showing pictures that can stimulate specific emotions or using sounds or film clips to induce affect. These independent stimuli don't elicit the full range of context, agency, and continuity that we experience in real life. In our experiment, we propose a better way to induce and mimic a range of real life emotion through a videogame. The videogame goes through a storyline of scenarios that allows the player to have agency, through first person control, context, through the storyline and continuity, through a constant plot. The sample size was kept within the Northeastern University community (N=20, 10F/10M, ages 18-27, 20.65). In the videogame, each participant experienced four emotional scenarios and five neutral hubs which served as a control. Each scenario induced a state of pleasant or unpleasant valence as well as a state of activated or inactivated arousal. We hypothesize that two of the four scenarios, the cave and the casino, will induce a higher arousal and valence, and that the other two scenarios, the hotel and the valley, will induce a lower arousal and valence state. From the participant's behavioral subjective responses and physiological responses, it is concluded that the design of the videogame is successful in the way that the cave and the casino did induce a higher arousal and valence than the hotel and valley.

Background

- In psychology labs, conventional methods have been used to induce affect.
 - Pictures (IAPS; Lang, Bradley & Cuthbert, 1999; Tottenham et al., 2009)
 - Sounds (IADS; Bradley & Lang, 2007)
 - Film clips (Gross & Levenson, 1995; Schaefer et al., 2010)
- These methods do not elicit the full range of rich affective experiences we have in daily life and deprive participants of:
 - contextual information, continuous plot development, autonomy to alter stimuli
- In the current study, we propose to use videogame as a more effective medium in order to overcome above issues.

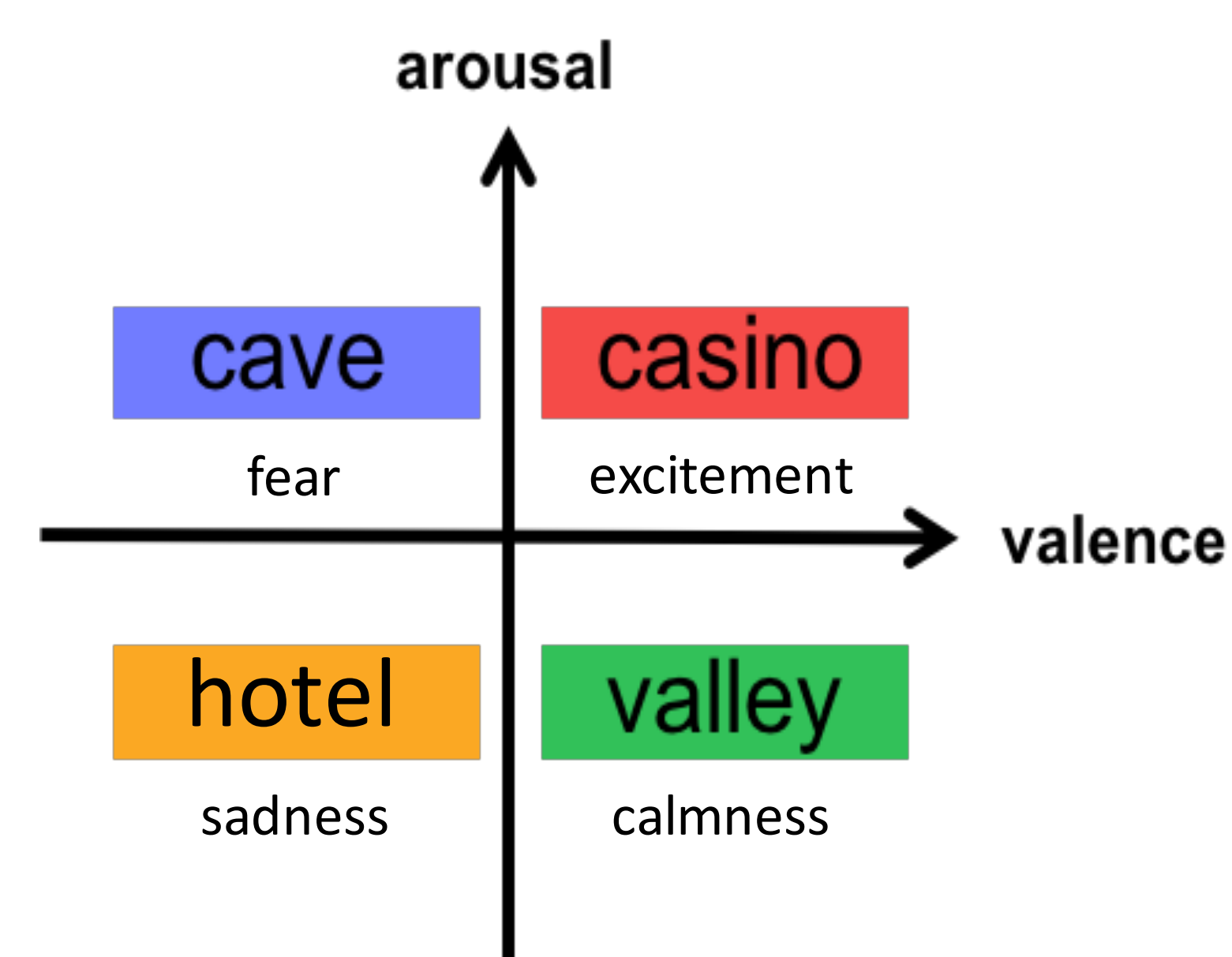


Figure 1:
Affective circumplex regarding scenarios

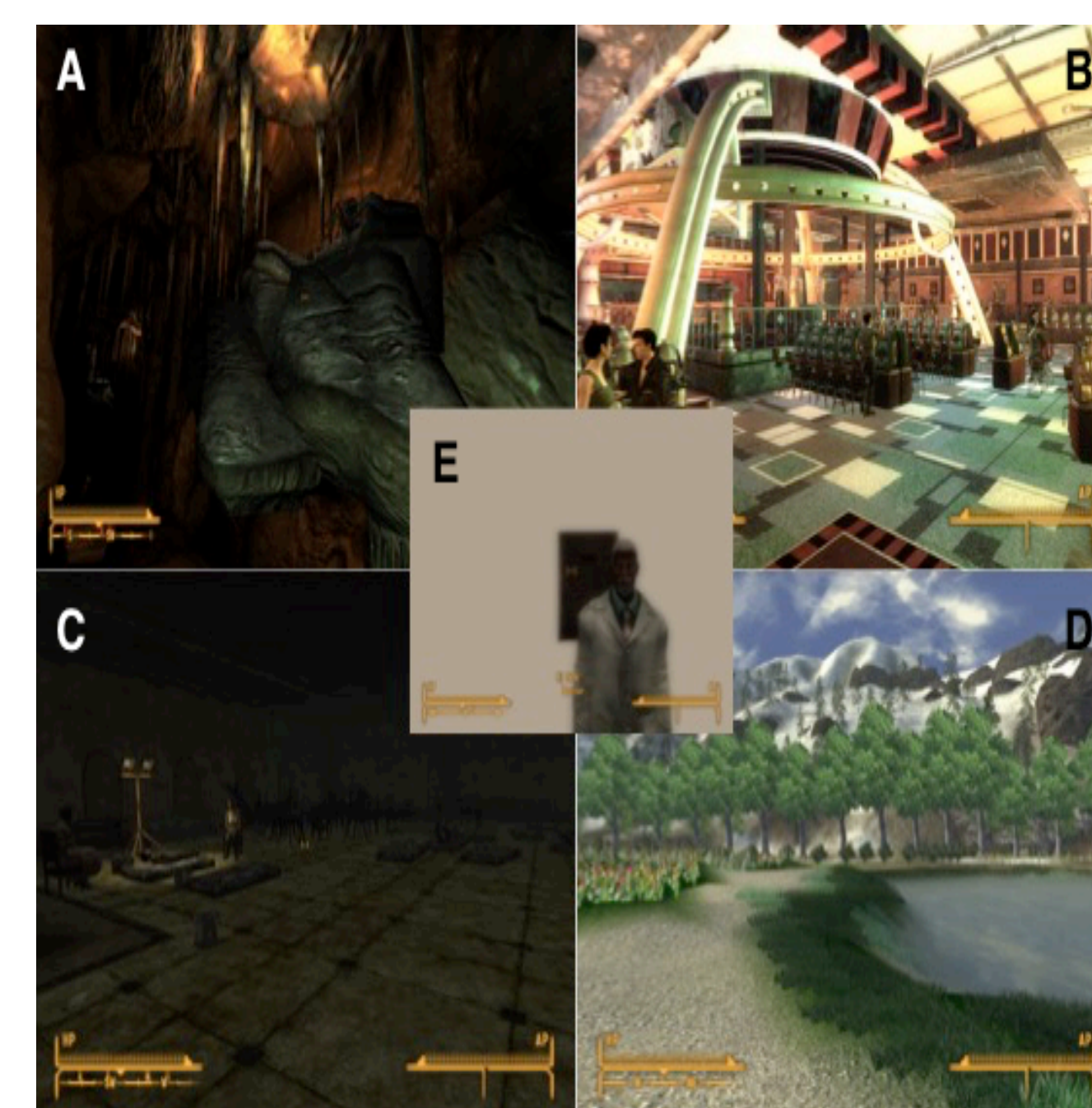
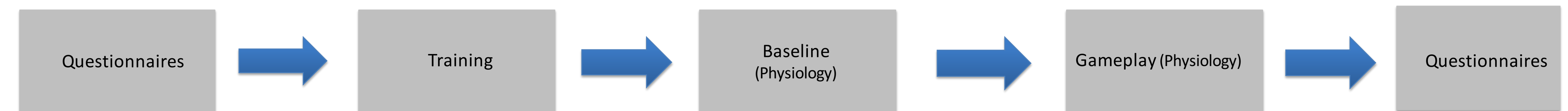


Figure 2: Game scenarios
A, B, C, D, and E are screenshots of the cave, casino, hotel, valley and hub respectively

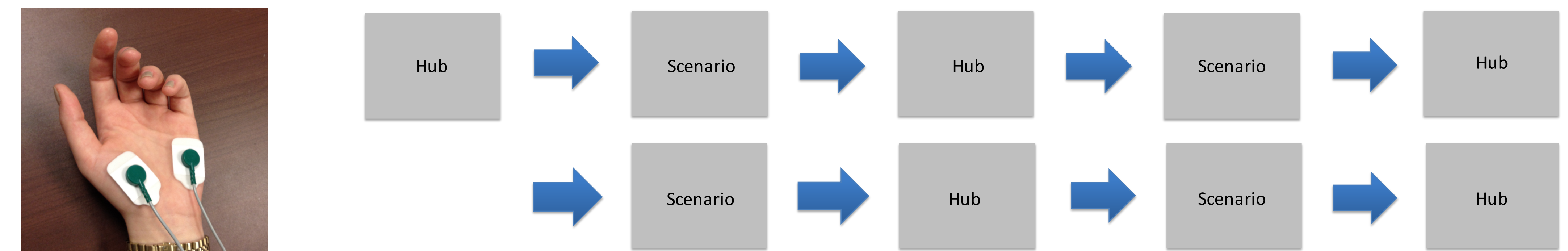
Goal

We hypothesize that subjects would subjectively report the targeted valence, pleasant or unpleasant, and arousal states, high or low. We also hypothesize that during high arousal targets, participants would show enhanced skin conductance.

Methods



Gameplay Scenario Sequence



Skin conductance (SC)

Results

Fig 3: Repeated measures ANOVA on subjective arousal rating

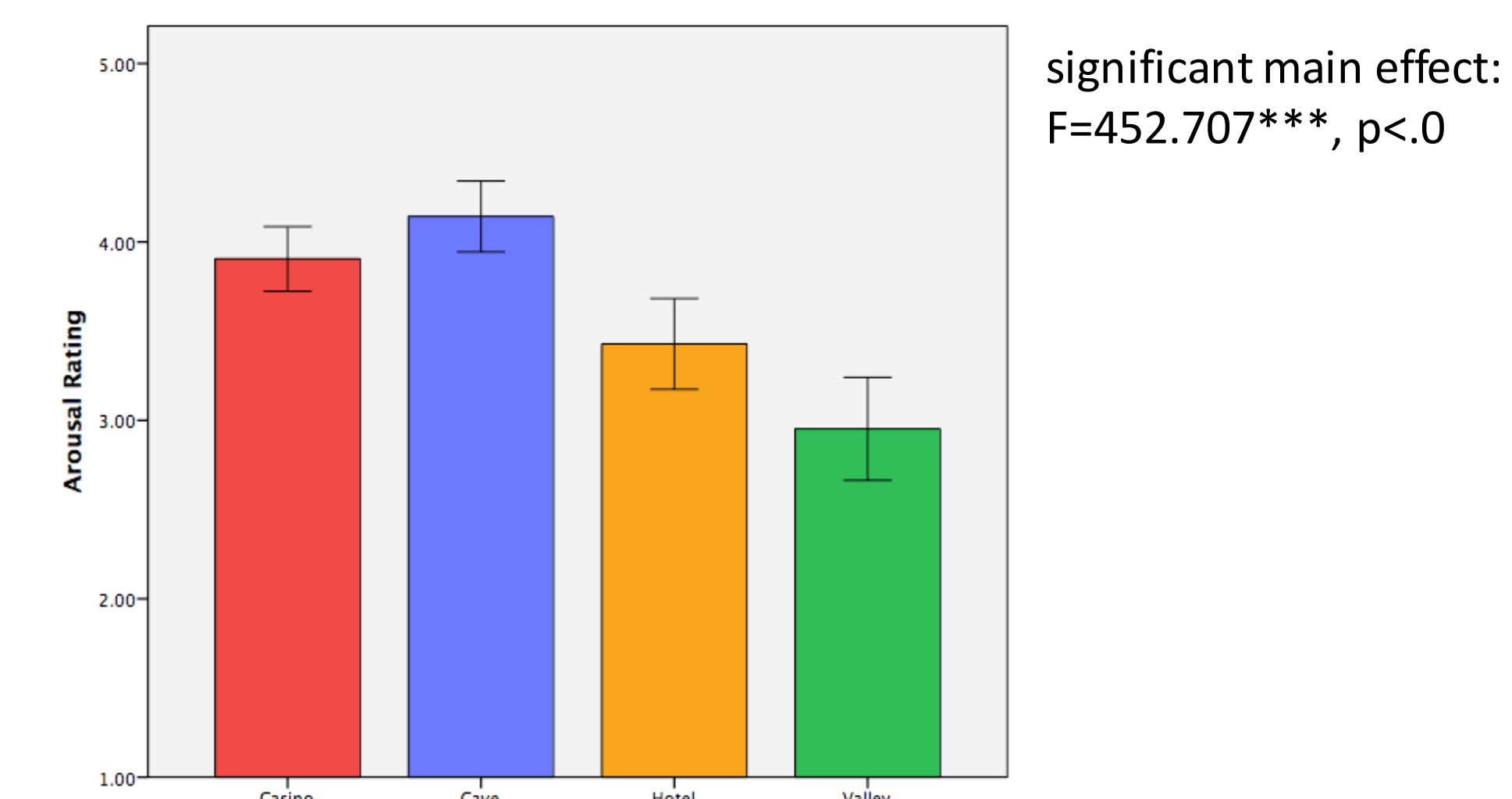


Fig 5: Repeated measures ANOVA on mean SC amplitude

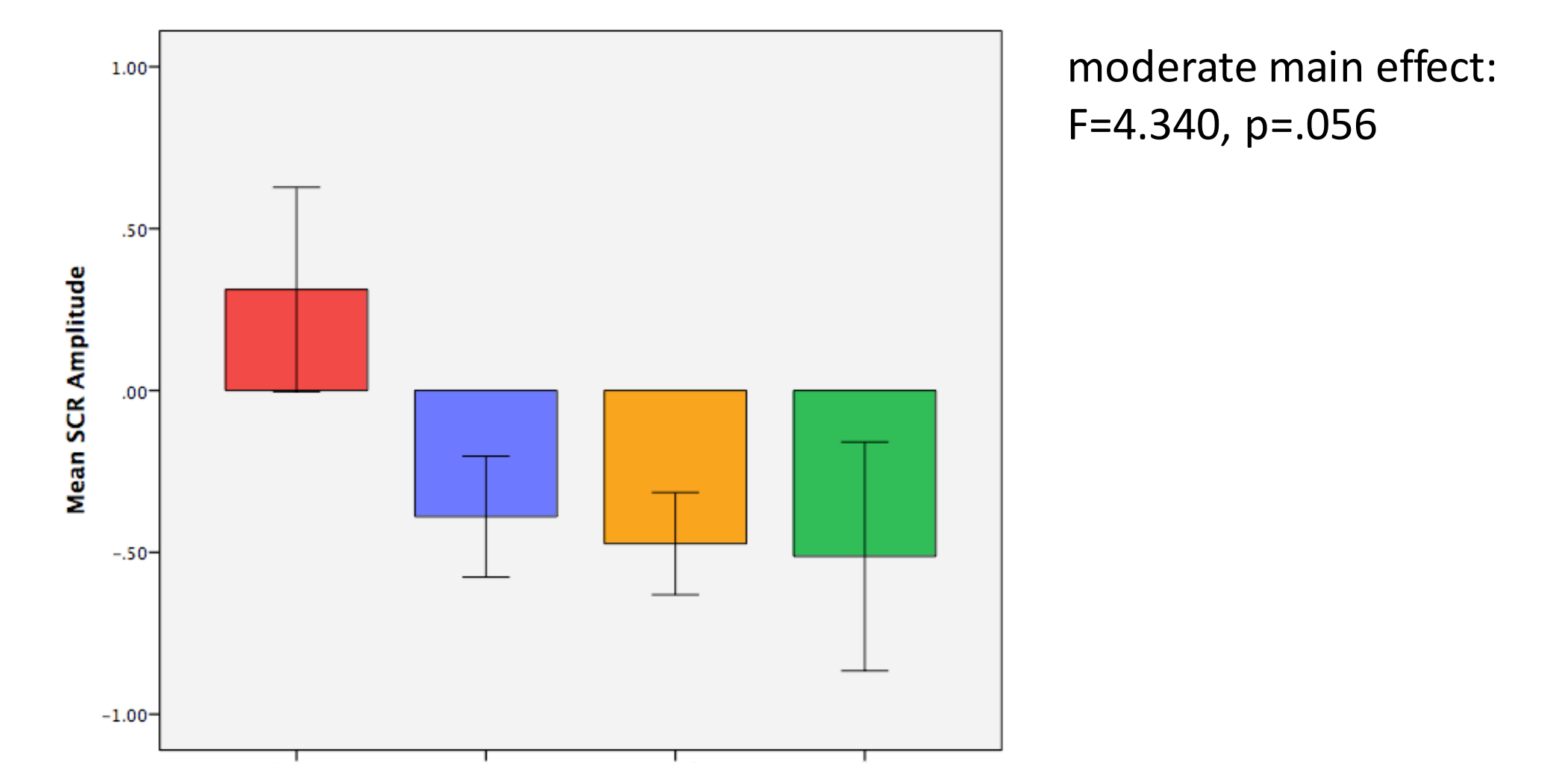


Fig 4: Repeated measures ANOVA on subjective valence rating

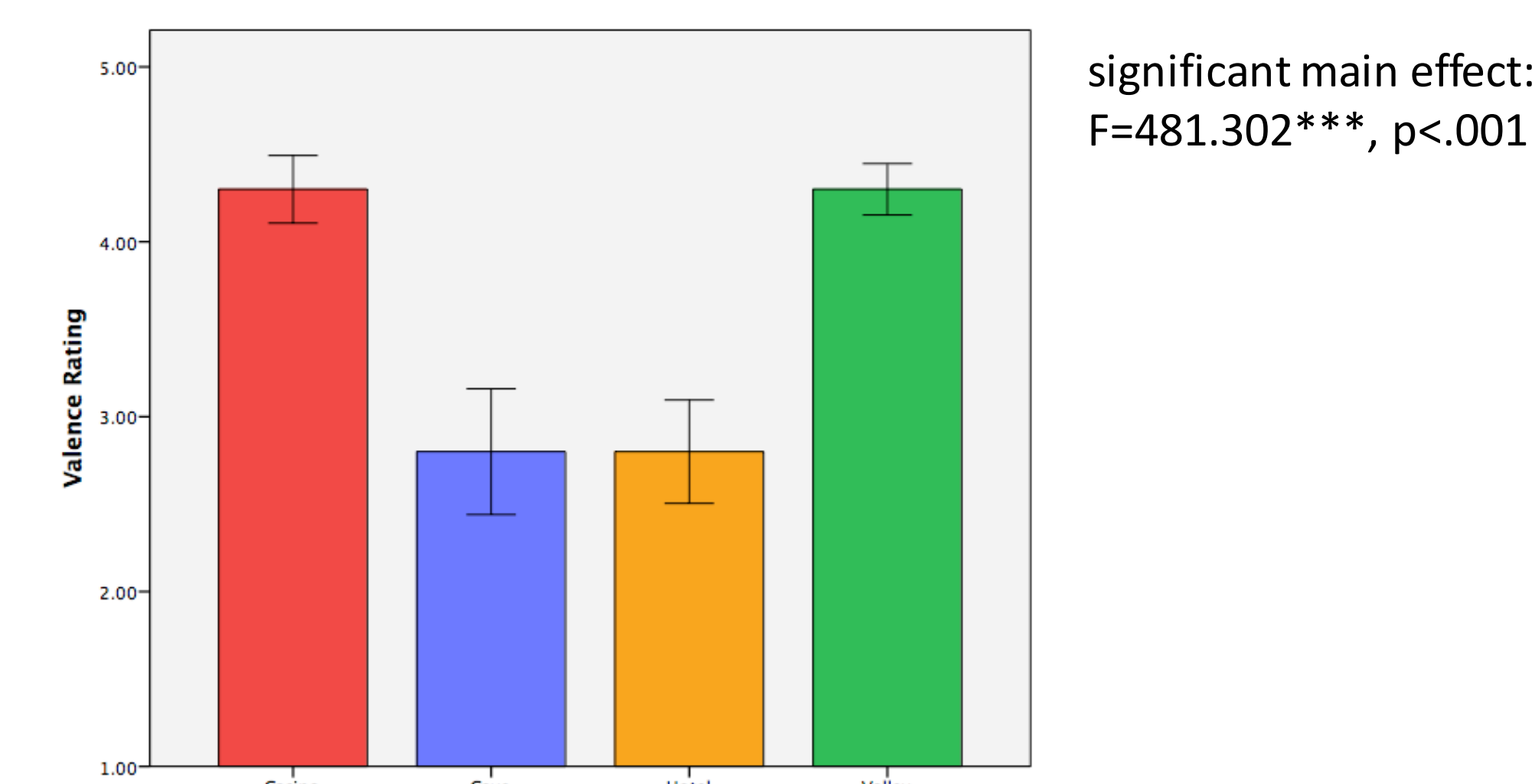
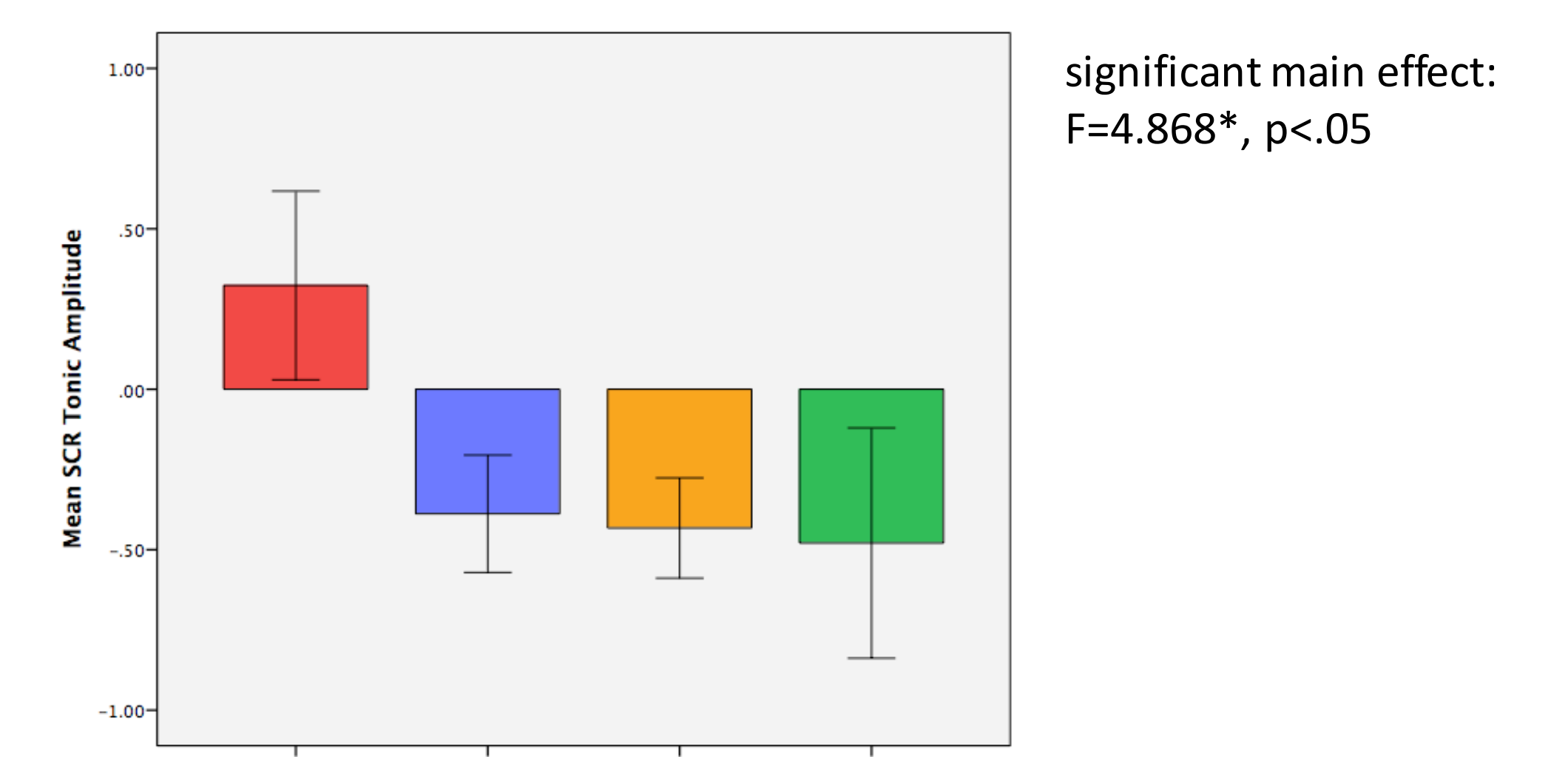


Fig 6: Repeated measures ANOVA on tonic SC level



Conclusion

- This paradigm was successful in inducing positive and high arousal states. The subjective reports validated the prediction that participants felt more pleasant for the positive targets and neutral for the negative targets as well as feeling more activated at high arousal targets and no change in activation for low arousal targets.
- Results of SCR data were not as conclusive across all scenarios. Mean amplitude and tonic activity for skin conductance were both lower than baseline for low arousal targets, but were not clear-cut for one high arousal target.
- Future directions of this model include altering game design elements in order to achieve a more negatively valenced and lower arousal states

References

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