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AWESTRUCK

Natural Interaction with Virtual Reality on Eliciting Awe



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Motivation

Can awe be elicited through VR?

- Virtual reality (VR) has a major role in the future of communication;
- There is little known on the effectiveness of interactive VR in provoking profound emotions, and encourage lasting, positive change
- 'Awe' is of particular interest as a transformative emotion [1], and can be experienced physiologically in the form of chills and goose bumps [2-4]
- The role of interaction in VR on eliciting awe is unknown; VR has the potential as both a medium for awe-inspiring experiences and a data collection tool [5]

Hypothesis 1

Head-mounted, interactive Virtual Reality can induce subjective and physiological events of awe, that correlate with goose bump events and high awe ratings

Hypothesis 2

An 'flight' lounge interface may be more effective in eliciting awe than a "standing", vertical posture



A bird's eye view,
Mount Everest in Google Earth VR

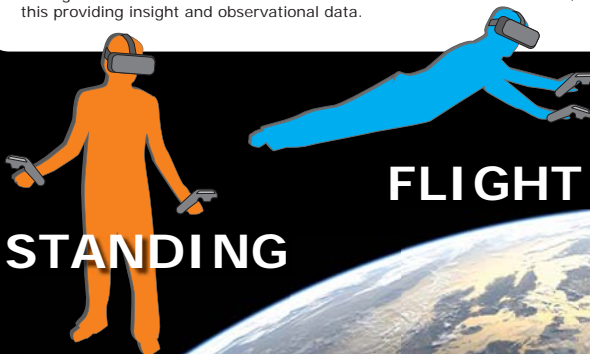


Goose bumps
visible on arm

Methods and Materials

Two conditions: "flight" lounge and "standing" (natural interaction); physiological, survey, and interview datasets

- 16 participants (10 men, 6 women) spent a total of 10 minutes per condition; content was Google Earth VR [6] with HTV Vive
- A video camera recorded goose bumps, participants completed surveys on their feelings of awe after each condition. We conducted a short interview after, with this providing insight and observational data.



Quantitative Results

Participants rated awe **79.7** (out of 100); **43.8%** of participants experienced goose bumps

- Participants who had goose bumps showed significantly higher ratings of awe than those who did not, confirming **Hypothesis 1**
- Awe was rated similarly between "flight" and "standing" interfaces, so **Hypothesis 2** could not be supported; there was a trend for somewhat more frequent goose bump events for "flight" vs "standing" (see **Figure 1**), but this trend was not significant.

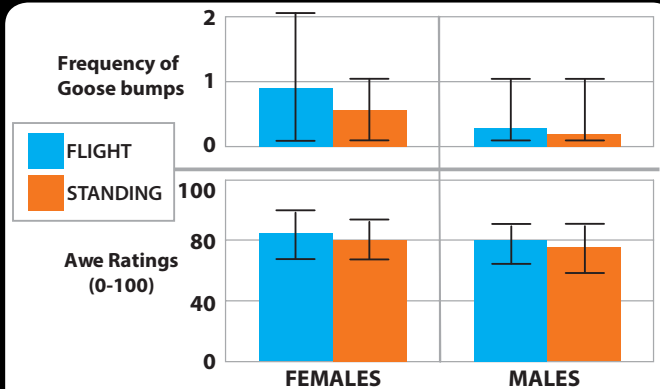


Figure 1 | Goose bump events and awe ratings (means and 95% confidence intervals) within interaction mode (flight vs standing) by gender.

Qualitative Results

Body posture and hand controllers counterintuitive; full 360 degrees of VR not utilized

- 15 of 16 participants elected to rest in the "flight" condition in an upright position similar to the "standing" condition, which may explain some of the lack of significant differences.
- 10 of 16 struggled with the controllers; despite a 360 degrees environment, looking around was not intuitive and many relied on controllers to manipulate the environment (a possible artefact of face-forward, seated gaming expertise).
- Verbal indications of awe and wonder were made by all participants.

Conclusions

Through non-intrusive and introspective data collection, these findings demonstrate VR can be awe-inspiring.

To our knowledge, this is the first study to explore whether interactive, head-mounted VR with natural interfaces can elicit awe. Despite the limitations with interaction, findings revealed events of awe and provides insight to future work.

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Presented at 3DU I Symposium 2017