# A-MAZE-ING ARGUMENTS IN VIRTUAL REALITY

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1. RESEARCH QUESTION

Does shared situational awareness between group members have an effect on their level of social modes of co-construction inside Virtual Reality?

Independent
Visualizations of activities

Mediator
Shared Situational Awareness

Dependent
Social Modes of Co-Construction
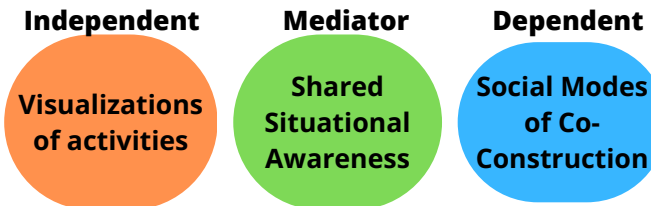
2. BACKGROUND

- Shared Situational Awareness (SSA) is a way to measure how much a group knows of a current situation [1]
- Social Modes of Co-Construction (SMOCC) are levels that show how effective a discussion is [2]
- Because Virtual Reality (VR) can give people more freedom of expression, the paper analyses if in VR being more aware as a group leads to better discussions faster

3. METHOD

VR Maze
- Hints to gates and codes on the ground in 4 colors
- Gates require code
- Code written in 3 colors
- 2 mazes: 1 controlled, 1 experimental

Participants
- Groups of 3
- Can see their own color
- Can use vision cone and laser pointer in experimental test

Data
- 2 groups do both mazes
- Video and Audio recordings
- Surveys
- Scored awareness for SSA with SART [3] and SALIENT [4] and on communication for SMOCC

4. LIMITATIONS

- Participant requirements
- Repeated test so limited groups and data
- Scheduling the experiment
- Differences in awareness methods
- Data outliers
- Missing data
- Realiable data encoding

5. RESULTS

- Gaining Visualizations seems to maintain SSA or slightly positively influence it
- Losing Visualizations seems to have a stronger negative effect
- When SSA stays, SMOCC seems to do the same, slightly rising or falling depeding on reading of data
- When SSA drops, SMOCC seems to drop along with it

6. CONCLUSIONS

From the results, it can be observed that there is a (slight) positive correlation between group SSA and SMOCC when participants interact in VR. It is suggested that the experiment is recreated on a larger scale to strengthen these observations.

7. REFERENCES

- [1] Mica R Endsley. Toward a theory of situation awareness in dynamic systems. Human factors, 37(1):32–64, 1995.
- [2] Armin Weinberger and Frank Fischer. A framework to analyze argumentative knowledge construction in computer-supported collaborative learning. Computers & education, 46(1):71–95, 2006.
- [3] Stephen J Selcon and RM Taylor. Evaluation of the situational awareness rating technique(sart) as a tool for aircrew systems design. AGARD, Situational Awareness in Aerospace Operations 8 p(SEE N 90-28972 23-53), 1990.
- [4] E Muniz, R Stout, C Bowers, and E Salas. A methodology for measuring team situational awareness: situational awareness linked indicators adapted to novel tasks (salient). NATO human factors and medicine panel on collaborative crew performance in complex systems, Edinburgh, North Atlantic Treaties Organisation, Neuilly-sur-Seine, pages 20–24, 1998.

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