Questions About Videos: Examining the Effects of Virtual Reality on Deception Detection

Colin Lamb, Ian Robinson, Megan Frillici, and Nick Patritti

Advisor: Susan T. Davis, Ph. D.

UNIVERSITY *of* DAYTON

Memory
Aesthetics
Attention
Perception
Research Lab
UNIVERSITY OF DAYTON

Background

In this study we focused on whether Virtual Reality has an impact on deception detection when using direct or indirect questions. Our goal was to identify if someone who feels like they are with a person in a virtual reality world can better perceive body language cues that when paired with indirect questions will enhance deception detection. Research has shown that participants are more aware of their surroundings and recognize slight changes more readily in virtual reality.

This study used a virtual reality headset that projected two dimensional images on screens as three-dimensional spaces such that viewers feel as if they are actually in a setting with another individual. Thus, the person in the headset can be in a simulation-style environment and have a better chance of observing someone else's body language for deception (Manstead, 1984; Sebbanz & Shifrar, 2009; Waller, 2007).

The type of questions asked of the participants in this study were indirect and direct questions. Indirect questions ask more about a person by focusing on their jobs, character, and what actions they would take in a given scenario (ten Brinke, 2014; Manstead 1984; Hippel, 2015). In contrast, direct question about a person are targeted specifically and pointedly to the honesty of the individual. These questions explicitly ask if a target person is honest (ten Brinke, 2014). Previous research has shown that indirect questions are better at detecting deception than direct questions.
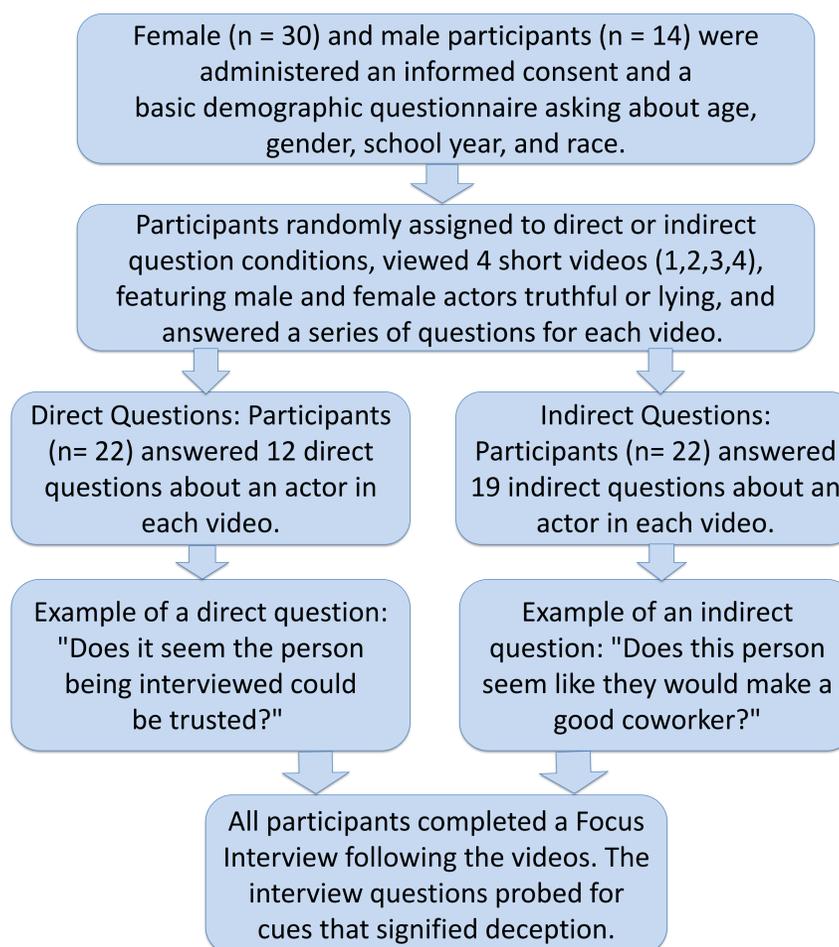
Hypotheses

Hypothesis 1: Indirect questions will produce more accurate detection of deception. Additionally, questions about dishonesty such as those that focus on behaviors and activities that have been identified as related to dishonesty (e.g., an individual's possible occupation) would lead to more accurate determinations of lying (Brenan, 2017).

Hypothesis 2: The use of virtual reality technology will enhance detection of nonverbal facial-emotional and body language characteristics In individuals.

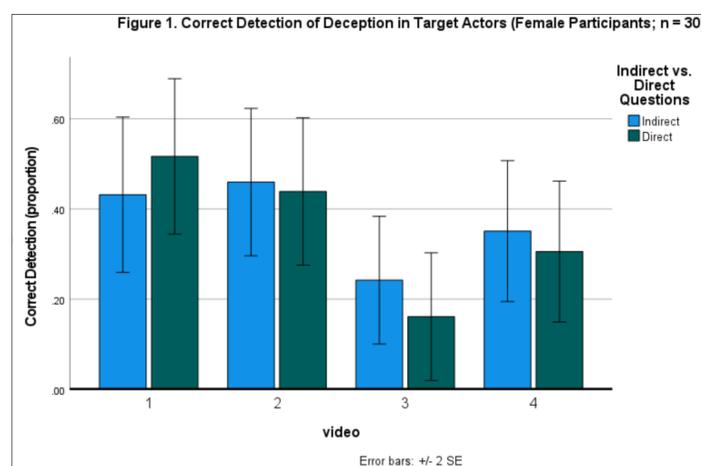### References

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Methods

Female (n = 30) and male participants (n = 14) were administered an informed consent and a basic demographic questionnaire asking about age, gender, school year, and race.

Participants randomly assigned to direct or indirect question conditions, viewed 4 short videos (1,2,3,4), featuring male and female actors truthful or lying, and answered a series of questions for each video.

Direct Questions: Participants (n= 22) answered 12 direct questions about an actor in each video.

Indirect Questions: Participants (n = 22) answered 19 indirect questions about an actor in each video.

Example of a direct question: "Does it seem the person being interviewed could be trusted?"

Example of an indirect question: "Does this person seem like they would make a good coworker?"

All participants completed a Focus Interview following the videos. The interview questions probed for cues that signified deception.

Results and Discussion

Figure 1. Correct Detection of Deception in Target Actors (Female Participants; n = 30)

Note. Videos in this order: (1) Male actor, truthful (2) male actor lying; (3) female actor, truthful; (4) female actor lying

Results and Conclusion

As can be seen in comparing Figures 1 and 2, male participants appear to respond more uniformly to the videos. The only reliable statistical effect reported in the ANOVA was a main effect of video, $p < .05$; overall, there were lower correct responses to Video 3 (the truthful female actor). There was no reliable effect of questionnaire nor gender.

Figure 2. Correct Detection of Decepton in Target Actors (Male Participants; n = 14)
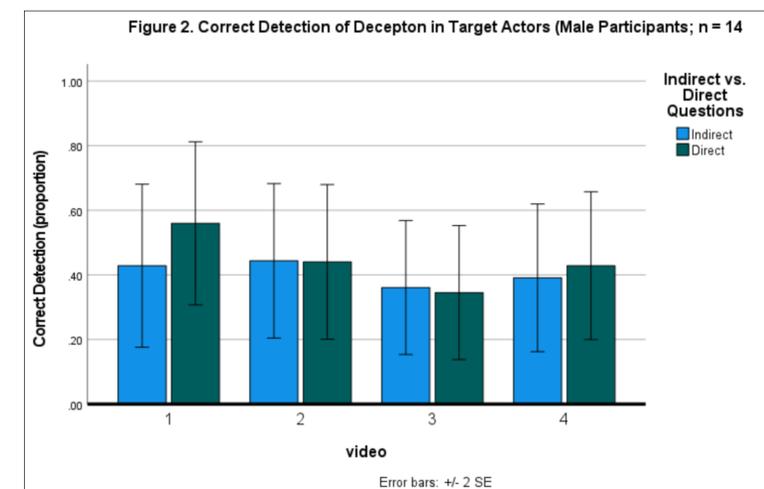
Focus Interview Question: Likewise, as can be seen in Figure 3, although there appears to be a noticeable enhancement effect of virtual reality on body language cues (e.g., facial emotions, fidgeting, posture) as compared with language cues, the results of a chi square test were not statistically significant, $p > .05$.

Figure 3. (Female participants only)

Actual vs. Expected Frequencies of Cues for Deception Detection
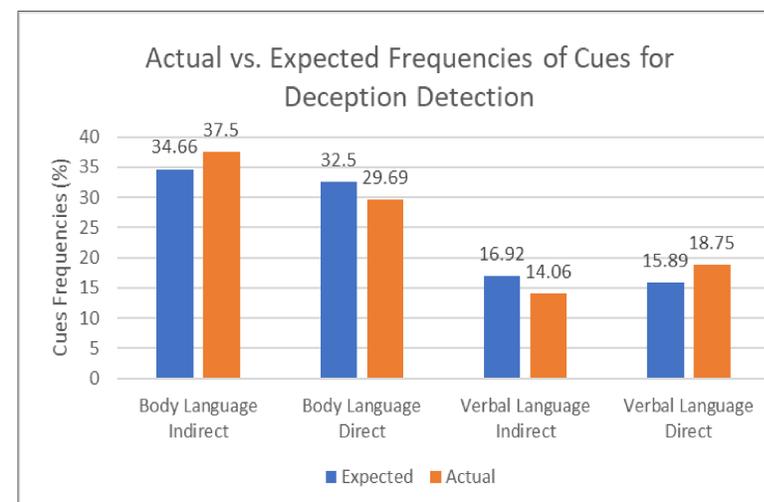
Despite the effects of the pandemic in abbreviating our data collection, consequently reducing the size of our sample, we are encouraged by what we see in our data and the potential for using virtual reality to enhance perception of subtle cues.