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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 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 questions 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.

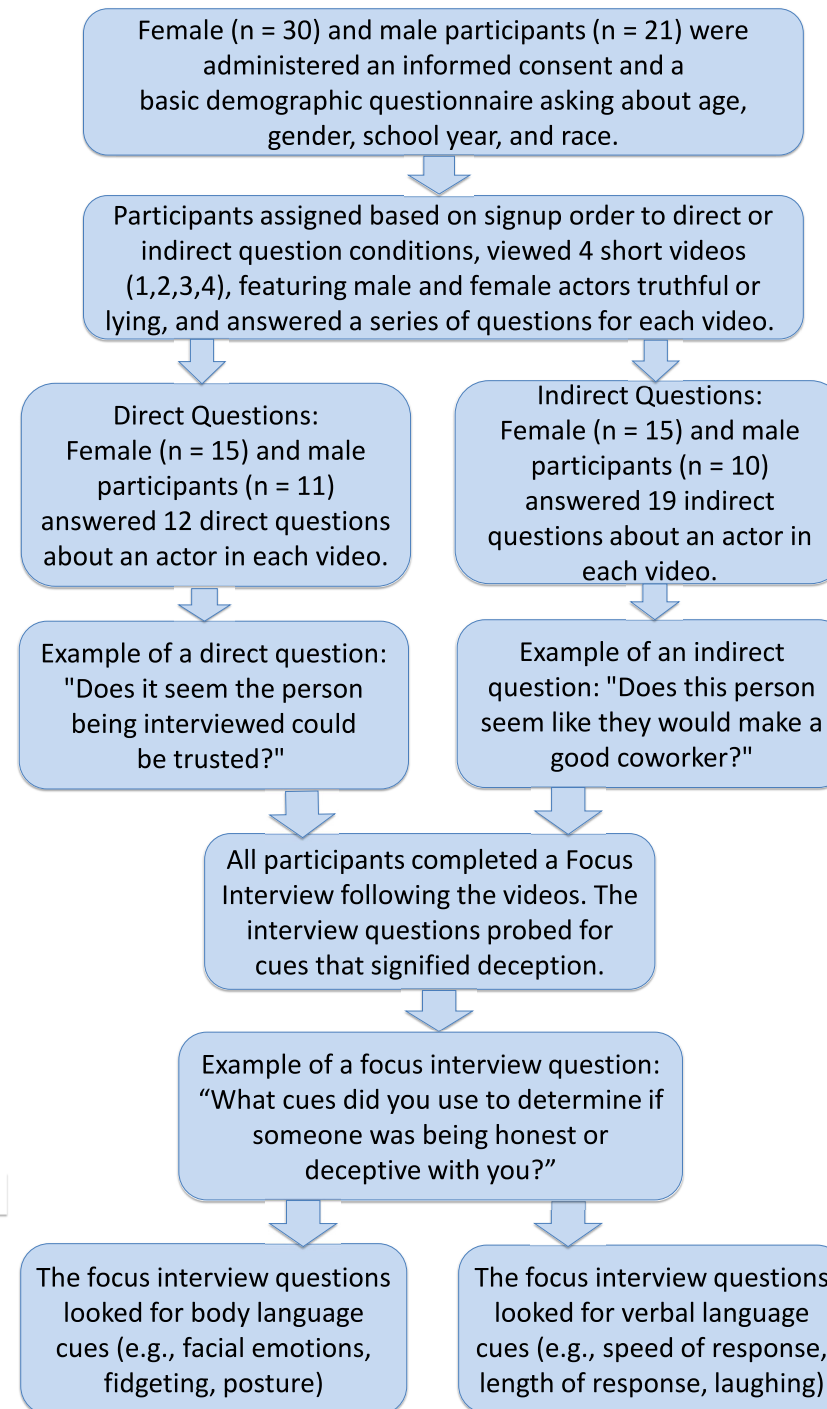
Hypotheses

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) will 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.



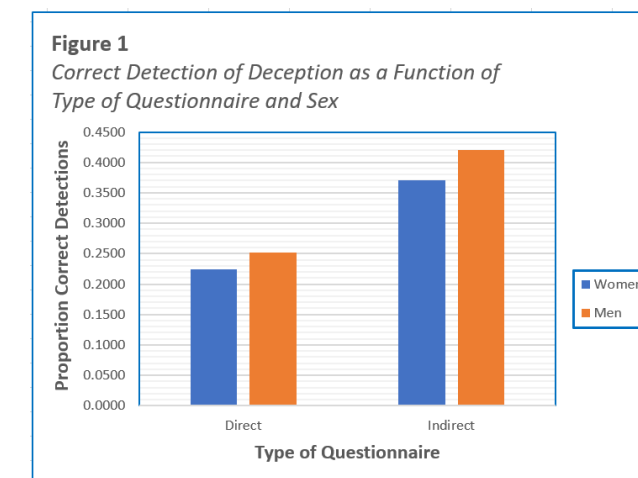
Methods



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

Results and Conclusion

Figure 1 shows that correct detection of deception was greater when both male and female participants responded to indirect rather than direct questions. A 2 (Questionnaire) x 2 (Participant's Sex) ANOVA found no main effect of sex, and no interaction between sex and type of questionnaire. However, there was a strong and statistically significant main effect of Type of Questionnaire, $p < .05$, $\eta^2 = .362$, supporting Hypothesis 1.



Focus Interview Question: As can be seen in Tables 1 and 2, although there appears to be a slight enhancement effect of virtual reality on body language cues (e.g., facial emotions, fidgeting, posture) as compared with language cues for women responding to direct tests, the results of a chi square test was not statistically significant, $p > .05$, the criterion used in these analyses. In contrast, there was a similar effect for men responding to indirect tests. As with the data for women, these results for men were not statistically significant, either. Plans are to continue data collection to boost sample sizes for male and female participants.

Table 1.

Percent of Cue Types Reported in Focus Interview: Female Participants

Type of Test	Percent	Body	Facial	Language
Direct	within Test Type	37.00	40.70	22.20
	within Cue Type	55.60	47.80	37.50
Indirect	within Test Type	26.70	40.00	33.30
	within Cue Type	44.40	52.20	62.50

Table 2.

Percent of Cue Types Reported in Focus Interview: Male Participants

Type of Test	Percent	Body	Facial	Language
Direct	within Test Type	38.20	29.40	32.40
	within Cue Type	41.90	43.50	47.80
Indirect	within Test Type	41.90	30.20	27.90
	within Cue Type	58.10	56.50	52.20