

APPENDIX: SUPPLEMENTAL DATA ON THE NETWORKED MINDS SURVEY

This supplemental document contains additional data from our customized version of the longer, Networked Minds survey of social presence. The prompts used in the survey are listed in Table 1. A factor analysis was performed on the full set of questions. The appropriateness of the factor analysis was tested using Bartlett's test and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Based on low KMO scores, Q24 and Q25 were removed. To avoid collinearity, Q2 was removed because it correlates at 0.87 with Q1. This left us with 33 questions. We used Haitovsky's significance test to check our determinant, which is lower than the rule of thumb, but not significant based on Haitovsky, so should be acceptable. Both an analysis of the scree plot and Kaiser's criterion suggested a six factor structure. Oblique rotation appeared warranted and was performed. We named the six factors Clarity of Communication, Satisfaction with Results, Social Awareness, Conversation Management, Ease and Efficiency of Task Completion and Disconnection to Partner. Chronbach's alpha was calculated on each factor with respective alpha's of 0.92, 0.9, 0.86, 0.81, 0.37 and 0.76. We eliminated factor Ease and Efficiency of Task Completion due to unacceptable internal consistency. Q12 was dropped because it improves alpha. Repeated measure ANOVAs were run on the remaining factors. Factor 2, Satisfaction with Results, failed Mauchly's test for sphericity and correction by Greenhouse-Geiser and Huynh-Feldt, so was eliminated. The mean scores and significant differences on these factors are shown in Figure 1. The factor loadings are listed in Table 2. The effect sizes for all comparisons are detailed in Table 3.

#	Prompt
<i>Factor 1: Clarity of Communication</i>	
16.	My opinions were clear to the other.
17.	The opinions of the other were clear.
18.	My thoughts were clear to my partner.
19.	The other individual's thoughts were clear to me.
20.	The other understood what I meant.
21.	I understood what the other meant.
23.	I often understood what my partner was referring to.
<i>Factor 2: Satisfaction with Results</i>	
5.	My partner is happy with the result of the exercise.
6.	I am happy with the result of the exercise.
7.	My partner was satisfied with the final layout.
8.	I was satisfied with the final layout.
<i>Factor 3: Social Awareness</i>	
3.	The system was well suited to the task.
11.	My partner had appropriate body language.
28.	I perceive that I am in the presence of another person in the room with me.
29.	I feel that the person is watching me and is aware of my presence.
34.	My partner was paying a lot of attention to me.
35.	I could tell what my partner was paying attention to.
36.	I am confident I understood the emotions expressed by my partner.
<i>Factor 4: Conversation Management</i>	
10.	I knew when I could speak.
13.	I enjoyed working with my partner.
22.	My partner often spoke for longer than necessary.
30.	I was interrupted often by my partner.
31.	I interrupted my partner often.
32.	It was difficult to interrupt my partner.
33.	It was difficult to get my partner's attention.
<i>Factor 5: Ease and Efficiency of Task Completion</i>	
1.	I enjoyed interacting with this interface.
4.	It felt natural to interact through the system.
9.	My partner and I often compromised.
26.	My partner worked with me to complete the task.
27.	I worked with the other individual to complete the task.
<i>Factor 6: Disconnection to Partner</i>	
12.	There were awkward pauses.
14.	I think the other individual often felt alone.
15.	I often felt as if I was all alone.
<i>Removed Questions</i>	
2.	I enjoyed working with the system.
24.	The other individual was influenced by my moods.
25.	I was influenced by my partner's moods.

Table 1. Detailed survey questions

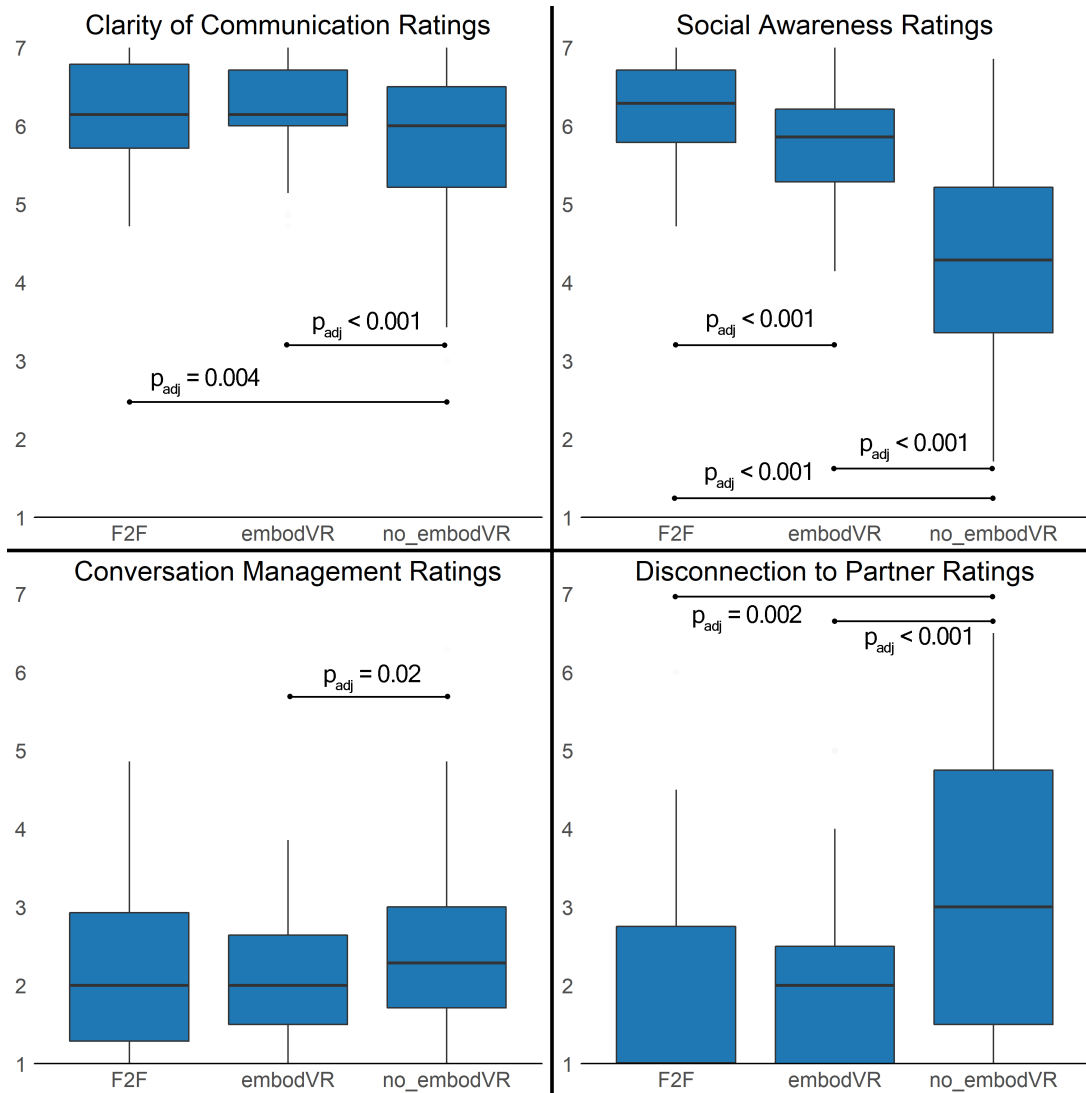


Figure 1. Ratings for four factors found in the networked minds survey. For Clarity of Communication and Social Awareness, higher scores are preferable. For Conversation Management, higher scores indicate more effort in managing the conversation, so lower scores are preferred. For Disconnection to Partner, higher ratings indicate more disconnection, so lower scores are preferred.

item	TC1	TC3	TC2	TC4	TC5	TC6
Q17	0.88					
Q19	0.85					
Q18	0.80					
Q21	0.79					
Q20	0.78					
Q16	0.75					
Q23	0.54				0.36	
Q29		0.85				
Q28		0.84				
Q35		0.71				
Q36		0.70				
Q11		0.66				
Q34		0.41				
Q3		0.40			-0.39	
Q7			0.86			
Q6			0.86			
Q5			0.85			
Q8			0.82			
Q22				0.83		
Q30				0.76		
Q31				0.70		
Q33				0.62		
Q32				0.54		
Q13				-0.47		0.35
Q10				-0.38		
Q27			0.32		0.60	
Q26				-0.38	0.56	
Q9					0.54	
Q4		0.45	0.34		-0.47	
Q1		0.38	0.34		-0.42	
Q15		-0.30				0.64
Q14						0.63
Q12						0.49

Table 2. Factor loadings

Factor	F2F vs. embodVR	F2F vs. no_embodVR	embodVR vs. no_embodVR
Clarity of Communication	-.15 (negligible)	0.43 (small)	0.54 (medium)
Social Awareness	0.51 (medium)	1.3 (large)	1.1 (large)
Conversation Management	0.13 (negligible)	-0.26 (small)	-0.37 (small)
Disconnection to Partner	0.014 (negligible)	-0.56 (medium)	-0.69 (medium)

Table 3. Cohen's d effect sizes for comparisons of each pair of conditions for the four factors.