RAVE-08 Abstract

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Bodily Responses towards a Virtual Woman

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Abstract

In this abstract we report on an experiment where shy or confident males interact with a forward virtual woman in an immersive (Cave) system. People tend to respond realistically to virtually generated data, both emotionally and physically. While interacting with a virtual character, their responses should be similar to how they would respond to a real person. Here we concentrate on their body movements as the virtual character speaks to and approaches them.

Current research measures people's responses in a Virtual Environment through questionnaires, physiological responses, and post-experiment interviews. However, questionnaires and interview results need to be supplemented with behavioural data. Physiological data, such as heart rate, heart rate variability and electrodermal activity provide evidence of a person's autonomic system responses rather than higher level behavioural responses. Bodily movement is a gross overall indicator of a person's state, and is relatively easily observable. It therefore could offer us an additional method to measure the degree of presence, especially when the participant interacts with a virtual character.

Here we show that participants, all males, who interacted with a female virtual character exhibited appropriate bodily responses during their social interaction. In the scenario, after the participant entered the virtual bar, the virtual woman made her way towards him and then started a conversation which became increasingly personal and intimate. Towards the end of the conversation, she moved closer to the participant to a distance which breaks the norms of social distance. The participants were recorded with a camera from behind during the experiment and annotated afterwards by a body movement expert who otherwise had no involvement in the experiment. The annotation featured 3 main measures: first, whether the participant stepped backward when the woman approached the participant to an intimate distance; secondly, some participants asked the avatar to repeat what she had said, and when doing so, if the participant leaned forward to the woman; thirdly, when the avatar mentioned the participant's clothes (shirts and trousers), whether he looked down at his shirts/trousers.

There were 36 participants included in our study, half of whom are socially confident and the rest are shy. The results are shown in Table 1. It can be seen that the majority of participants leaned forward when asking the avatar to repeat a question. Also there were significant differences between the two groups (shy and confident) with respect to whether they stepped backwards when the avatar moved towards them, or looked down when the avatar referred to their clothing. The leaning forward made no sense from an objective point of view since the sound was not spatialised and therefore was not actually coming from the location of the virtual woman. These results suggest that the participants' bodily responses towards the female were similar to how they would respond to a real person.

	1. Stepped Backwards*	2. Leaned Forward	3. Looked Down*
Shy participants	4/18	8/11	7/18
Confident participants	0/18	11/13	11/16

Table 1: Bodily movement analysis of the shy and confident participants. The number of participants who 1. stepped backwards when the virtual female approaches the participants to an intimate distance; 2. leaned forward when asking the avatar to repeat; 3. looked down when asked about their clothes/ All participants observed. * significant at < 0.001.

In our pervious work (Pan and Slater 2007) we have evaluated the reactions of participants and the results showed that the participants tended to respond to the situation at the subjective and physiological level as if it were real. In the previous study we have also evaluated their verbal responses to assess their behaviour; however, one can argue that verbal responses can be playfully delivered by the participants without being serious. This new evaluation of bodily responses further supports the findings of our previous study. In further research, the analysis of facial expressions, voice and other automatic human responds is being considered. These results also point the way towards the application of this technology to the treatment of social phobic males.

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References:

Pan and Slater 2007: Pan, X. and M. Slater (2007). *A Preliminary Study of Shy Males Interacting with a Virtual Female.* PRESENCE 2007: The 10th Annual International Workshop on Presence, Barcelona, Spain.