Subjective Experience of Interacting with a Social Robot at a Danish Airport

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Introduction An ecological field study and a scaling test were conducted to assess the experience of social robots at Aalborg Airport (AAL). The purpose was to develop scales based on Danish travellers' own words and observations. Hopefully the scales will help robot designers to design robots for different use cases and target groups.

Methods In both tests the travellers were recruited by a remote controlled Double robot, asking if it may help the travellers with wayfinding at AAL. When the subjects had chosen the desired location they were kindly asked to follow the robot. In the first test, the robot led them to a semi-structured interview about their experience with the robot. The subjects were observed throughout the Human-Robot Interaction (HRI) and the interview. In the second test the physical parameters height, distance to subject, and angle of approach were varied in order to be able to test the scales. In stead of a semi-structured interview the subjects were asked to rate their HRI on 24 scales developed from the previous study.

Results - Elicitation of Parameters The observations and the 30 subjects' statements were interpreted and coded using an affinity diagram. 567 affinity notes were sorted by a bottom-up procedure into ten categories which revolved around appearance, trust, behaviour, approach, problems with touch screen, avoidance of interaction, personal interest, positivity towards the robot, usefulness, and tech-experience. Variables from each category were formulated as scale questions with labels. In total 24 Visual Analogue Scales (VAS) with closed endpoints were developed, 11 scales were unipolar and 13 were bipolar. All of the bipolar scales had a midpoint and on two of them the label "Fine" was added.

Results - Scale Testing 43 subjects gave scale responses. The variance for each scale was very different, perhaps due to the varied use of midpoints and labels. The responses were analysed using Principal Component Analysis (PCA) with groupings relating to the robot's height, distance from subject, and direction of approach. Within the group *robot height* four pairs of positive correlation and five negative correlations were found. For the group *distance* there were four positive and six negative correlations, and for the group *direction* three positive and five negative correlations were found.

Discussion The results presented in this study probably needs further validation given that they were collected on a small sample size. Even though correlation is found it might be useful to test the reliability of the scale items. Overall the subjects who participated were very fond of technology which might have biased their scale responses. Further, the mid label "Fine" should be reconsidered due to the small variation in these scale responses. Perhaps the label "Fine" is to broad and does not represent a fitting midpoint.

References

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