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. The purpose of the field study was to develop scales based on Danish travellers' own words and observational data. The scale test had the purpose of using and testing the scales developed from the field study. The idea behind the scales is that the scales will help robot designers to design their robot for different use cases and target groups.

Methods and Proposals In both tests the travellers were recruited by a remote controlled robot from Double Robotics, Inc., which had an iPad with an interface 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 behaviour of the subjects was observed throughout the interaction with the robot and the interview. In the second test the physical parameters height, distance to subject, and angle of approach were altered throughout the study in order to be able to test the scales. When subjects started following the robot they were stopped and asked to evaluate the robot and the interaction with it on the 24 scales develop 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 roughly revolved around appearance, trust, behaviour, approach, problems with touch screen, avoidance of interaction, personal interest, positivity towards the robot, usefulness, and tech-experience. Variables were formulated as scale questions with labels for each category. A Visual Analogue Scale (VAS) with closed endpoints was used for the scale presentation. In total 24 scales 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 In total 43 subjects participated and answered the scales. The variance for each scale was very different, because of the varied use of midpoints and labels. The scale responses were analysed with 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 the scale responses. Perhaps the label "fine" is to broad and does not represent a fitting mid-point.

References

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