

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

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Introduction

This study originates from a social robot research project at Aalborg University with the aim of developing and implementing robots in a variety of contexts. This raises questions on how social robots should behave and which variables in a social robot is important. When important variables are elicited scales can be developed from these variables which can be use to test a social robot. The study consists of two tests, one where variables are elicited and one where the scales are used to evaluate the robot, so possible correlation can be detected.

Methods

To investigate which variables are important when interacting with social robots and to check for correlation on scales designed based on these variables two tests are set up in Aalborg Airport (AAL). Both tests was conducted on Danish Travellers who interacted with a *Double* robot shown on figure 1. In the first test subjects was asked to participate in a semi-structured interview about their first impressions after the interaction and in the second test subjects were asked to rate their interactions on the developed scales. The *Double* robot was remotely controlled via a computer and a present controller. On the screen a developed wireframe to help with wayfinding in AAL was presented.



Figure 1. *Double's* front and profile.

The subjects were recruited by the robot, which provides a more ecological and undisturbed interaction between robot and subject. The robot approached potential subjects after the security check and asked to help travellers with wayfinding. If travellers wanted help, they were presented with four wayfinding options: Food, Shopping, Toilets or Gate information. After the interaction the robot led subjects to an interviewer.

Data Processing From the first test the interviews and observations were coded into affinity notes and an affinity diagram was made. This affinity diagram is pivotal in eliciting the variables that affect HRI, and thereafter in creating the scales to be used for further work. 567 affinity notes were sorted into 10 green categories with individual subcategories.

From the second test **Beskriv kort den databehandling**

Results - Elicitation of words

- SQ1: How do think the screen on the robot reacted?
- SQ2: How did you experience the robot?
- SQ3: How was it to use the robot?
- SQ4: How did you experience the robot's movements?
- SQ5: I think that the robot stopped...
- SQ6: I think that the robot's speed is...
- SQ7: I think that the robot's height is...
- SQ8: I feel that the robot can help me
- SQ9: I think that the robot was obstructing me
- SQ10: I feel safe around the robot
- SQ11: The robot startled me
- SQ12: I like to be served by the robot
- SQ13: I counted on the robot to lead me to the location I chose
- SQ14: How personal did you experience the robot's help?
- SQ15: How surprised were you by the robot's approach?
- SQ16: What do you think about the robot?
- SQ17: What else do you think about the robot?

S	Left label	Mid point	Right label
1	Extremely bad (Ekstremt dårligt)	No label	Extremely well (Ekstremt godt)
2	Extremely unwelcoming (Ekstremt afvisende)	No label	Extremely welcoming (Ekstremt imødekommende)
3	Extremely difficult (Ekstremt svært)	No label	Extremely easy (Ekstremt nemt)
4	Extremely wild (Ekstremt vilde)	No label	Extremely calm (Ekstremt rolige)

S	Left label	Mid point	Right label
5	Way too close (Alt for tæt på)	No label	Way too far (Alt for langt fra)
6	Way too slow (Alt for langsom)	Fine (Fin)	Way too fast (Alt for hurtig)
7	Way too low (Alt for lav)	Fine (Fin)	Way too high (Alt for høj)

S	Left label	Mid point	Right label
8-13	Completely disagree (Helt uenig)	No label	Completely agree (Helt enig)

S	Left label	Mid point	Right label
14	Not at all personal (Slet ikke personlig)	-	Extremely personal (Ekstremt personlig)
15	Not at all surprised (Slet ikke overrasket)	-	Extremely surprised (Ekstremt overrasket)
S	Left label	Mid point	Right label
16	Not at all annoying (Slet ikke irriterende)	-	Extremely annoying (Ekstremt irriterende)
17	Not at all elegant (Slet ikke elegant)	-	Extremely elegant (Ekstremt elegant)
18	Not at all exciting (Slet ikke spændende)	-	Extremely exciting (Ekstremt spændende)
19	Not at all cute (Slet ikke sød)	-	Extremely cute (Ekstremt sød)

S	Left label	Mid point	Right label
20	Not at all cool		Extremely cool

Results - Scale Testing

Conclusion

Acknowledgements

References