

# 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 elicitated 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 vari- abels 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 sub- jects 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 ecologi- cal and undisturbed interaction between robot and subject. The robot ap- proached potential subjects after the security check and asked to help trav- ellers 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 di- agram is pivotal in eliciting the variables that affect HRI, and thereafter in cre- ating 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 variables

From the first tests 23 variables were elicitated, which led to 17 scale questions answered on 23 VAS scales (see tabel 1 and figure 2). Scale questions (SQ) are as stated below and is answered on appurtenant scales (S):

- SQ1: How do think the screen on the robot reacted? (S1)
- SQ2: How did you experience the robot? (S2)
- SQ3: How was it to use the robot? (S3)
- SQ4: How did you experience the robot's movements? (S4)
- SQ5: I think that the robot stopped... (S5)
- SQ6: I think that the robot's speed is... (S6)
- SQ7: I think that the robot's height is... (S7)
- SQ8: I feel that the robot can help me (S8-S13)
- SQ9: I think that the robot was obstructing me (S8-S13)
- SQ10: I feel safe around the robot (S8-S13)
- SQ11: The robot startled me (S8-S13)
- SQ12: I like to be served by the robot (S8-S13)
- SQ13: I counted on the robot to lead me to the location I chose (S8-S13)
- SQ14: How personal did you experience the robot's help? (S14)
- SQ15: How surprised were you by the robot's approach? (S15)
- SQ16: What do you think about the robot? (S16-S19)
- SQ17: What else do you think about the robot? (S20-S23)

S	Left label	Mid point	Right label
1	Extremely bad	No label	Extremely well
2	Extremely unwelcoming	No label	Extremely welcoming
3	Extremely difficult	No label	Extremely easy
4	Extremely wild	No label	Extremely calm
5	Way too close	No label	Way too far
6	Way too slow	Fine	Way too fast
7	Way too low	Fine	Way too high
8-13	Completely disagree	No label	Completely agree
14	Not at all personal	-	Extremely personal
15	Not at all surprised	-	Extremely surprised
16	Not at all annoying	-	Extremely annoying
17	Not at all elegant	-	Extremely elegant
18	Not at all exciting	-	Extremely exciting
19	Not at all cute	-	Extremely cute
20	Not at all cool	-	Extremely cool
21	Not at all intrusive	-	Extremely intrusive
22	Not at all funny	-	Extremely funny
23	Not at all human	-	Extremely human

Tabel 1. Scale labels for every scale.

Three different types of VAS are used with the desribed labels (see figure 2). Scales 1-5 and 8-13 have a middle point in the middle but no label, scales 6 and 7 have a middle point with a label and scales 14-23 have no middle point.

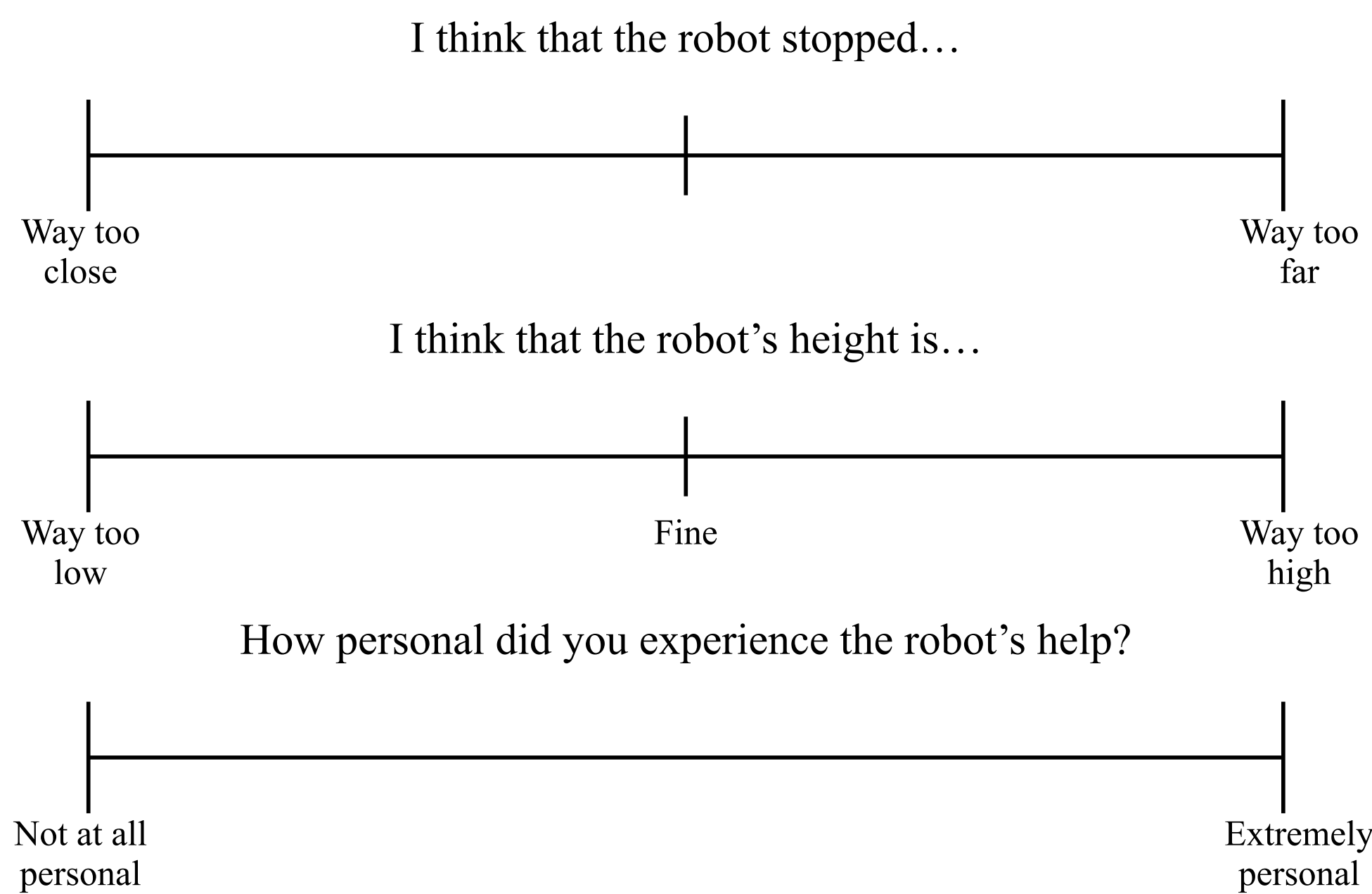


Figure 2. The three types of VAS developed from the elicited variables.

## Results - Scale Testing

## Conclusion

## Acknowledgements

## References