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A cross-cultural study on attitudes towards robots

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Abstract

This study presents the result of a cross-cultural study of negative attitude towards robots. A questionnaire was presented to Dutch, Chinese and Japanese participants based on the Negative Attitude towards Robots Scale (NARS). Against our expectation, the Japanese participants did not have a particularly positive attitude towards robots.

1 Introduction

The United Nations (UN), in a recent robotics survey, identified personal service robots as having the highest expected growth rate (UN, 2002). These robots help the elderly (Hirsch et al., 2000), support humans in the house (NEC, 2001), improve communication between distant partners (Gemperle, DiSalvo, Forlizzi, & Yonkers, 2003) and are research vehicles for the study on human-robot communication (Breazeal, 2003; Okada, 2001). A survey of relevant characters is available (Bartneck, 2002; Fong, Nourbakhsh, & Dautenhahn, 2003).

It appears that different cultures have a different exposure to robots through media or through personal experience. The number of humanoids robots, toy robots, games and TV shows give Japan the leading role in robotic development and culture. However, the typical “robots will take over the world” scenario that is so often used in western culture (Cameron, 1984; Wachowski & Wachowski, 2003) is less present in Japan. Yamamoto (1983) hypothesized that Confucianism might have had an influence on the positive development of robot culture in Japan. In the popular Japanese Manga movies good fights evil just like in the western world, but the role of the good and the evil is not mapped directly to humans as being the good against robots being the evil. In these movies the good and the evil are distributed. You might have a good robot that fights an evil human villain or a good robot fighting bad robots.

If we are to employ more and more robots in daily life it appears necessary to study what attitude the users have towards robots, which of course depend on culture. Computer anxiety prevents users from using computers and educational psychologists have studied its effects in great detail (Raub, 1981). However, the effects of robot anxiety are still largely unknown. With an increasing number of robots, robot anxiety might become as important as computer anxiety is today.

2 Method

We conducted a cross-cultural study that investigated the attitude towards robots. We presented 24 Dutch, 19 Chinese (living in the Netherlands) and 53 Japanese participants a questionnaire based on the Negative Attitude towards Robots Scale (NARS). Most of the participants were university students. The validity of the questionnaire has been previously assessed (Nomura, Kanda, & Suzuki, 2004). The questionnaire consisted of 14 items (5-point-scales) in three constructs:

1. attitude towards the interaction with robots *(interact)*
   (e.g. I would feel relaxed talking with robots)
1. attitude towards social influence of robots *(social)*
   (e.g. I am concerned that robots would have a bad influence on children)
2. attitude towards emotions in interaction with robots *(emotional)*
   (e.g. I would feel uneasy if robots really had emotions)

In the following text we will use the italic style to highlight the dependent variables.

2.1 Results

A 3 (nationality) x 2 (gender) analyses of variance (ANOVA) was conducted. Only nationality had a significant influence on the social dimension ($F(2,90)=4.713$, $p=.011$). The Dutch and Chinese participants rated social significantly lower than the Japanese ($t(75)=2.892$, $p=.005$). Gender had no significant influence on the measurements. Figure 1 presents the means of all conditions.

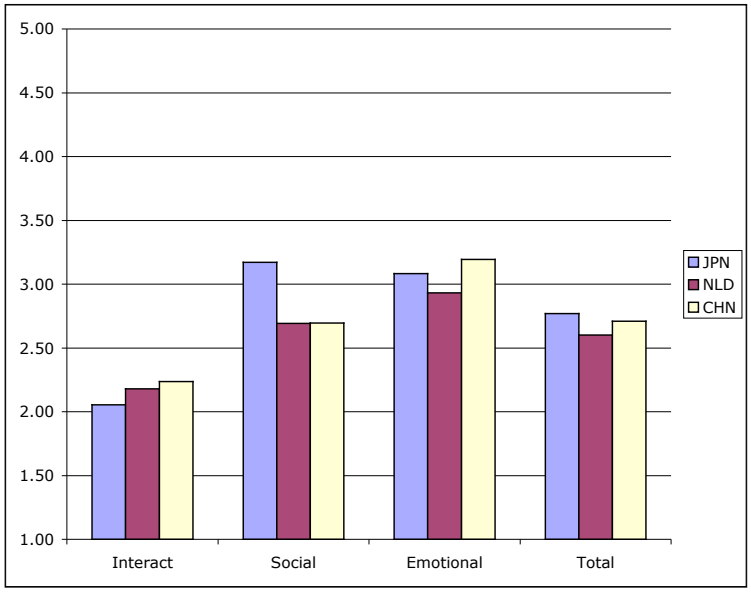

Figure 1: Means and Standard Deviations for all nationalities.

3 Conclusions

In contradiction to the popular believe that Japanese love robots our results show that the Japanese are significantly more concerned with the impact that robots might have on society. A possible explanation could be that through the high exposure to robots, the Japanese are more aware of robots abilities and also their lack of abilities.

The prior experience that the participants had with robots, such as a personal interaction with a robot, was not assessed by the NARS questionnaire. This experience might have an influence on the results and we are currently preparing to administer the questionnaire to owners of the Sony's robotic dog Aibo. In addition, we are planning to conduct the experiment in other eastern and western countries.

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