

Facilitating Co-existence - with humans and robots

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Background

Increasing the acceptance of technology is key in light of the demographic change. It is plausible that in near future service robots will be deployed in elderly care and other settings. However, people often react with fear and prejudice against new technologies (Nomura & Kanda, 2003), hindering them from interacting with and accepting service robots (Bartneck et al., 2005). To explore the underlying psychological mechanisms, experimental studies are needed.

Thus, even though our work starts in the lab, our results reach beyond: Our goal is to study humanization from two angles – taking into account both humans and technical systems. That is, we investigate factors that facilitate co-existence in human-human and human-robot context. To do so, we test psychological determinants of humanization empirically to identify factors that reduce robot anxiety and negative attitudes towards robots.

Theoretical background and experiments

Anthropomorphism describes the attribution of humanity (e.g., personality traits, emotions, and intentions) to *non-human entities*, whereas dehumanization implies the denial of humanity to *fellow humans* (Waytz et al., 2010). Recently, Waytz and colleagues (2010) argued that dehumanization is the inverse process of anthropomorphism (Epley et al., 2007). However, little empirical research on the interplay of both processes has yet been conducted. To close this research gap, we examine the cognitive and motivational processes underlying the humanization of both human and nonhuman entities. Our results show that the motivation to master ones' environment (referred to as effectance motivation) influences anthropomorphic inferences about a robot, but also the humanization of social out-groups.

Obviously, reducing dehumanization is an important issue, as dehumanization is seen necessary for genocide to occur (Savage, 2013), but what is the gain of increasing anthropomorphism?

We assume that anthropomorphism of and attitudes towards robots are linked, supposing that increasing anthropomorphism also increases positive attitudes, the willingness to interact and reduces prejudice and anxiety.

To examine that further, we take the results we gained about humanization and dehumanization and apply them to develop an intervention to reduce prejudice and anxiety towards robots and to prepare people for interaction with them. It has been shown that a paradigm from social psychology, namely imagined contact (the mental simulation of a social interaction (Crisp & Turner, 2009) is effective reducing prejudice and negative attitudes (Brambilla et al., 2002), intergroup anxiety (Turner et al., 2007) and increasing contact intentions (Crisp & Husnu, 2011). We adapted this paradigm to robots as target group. Several experiments are planned, examining the intervention from the theoretical aspects to the practice and to long-term effects.

Conclusion

Our research provides insights into the psychological underpinnings of anthropomorphism and dehumanization and is thus highly relevant for basic and applied research in Social Robotics and Social Psychology.

Findings contribute to the improvement of HRI and to the development of interventions to reduce dehumanization of humans and support humanization of nonhumans. Furthermore, findings on the reduction of prejudice towards robots are important as we will need robots to face the challenge of the demographic changes in our society.

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