Looking Good? Appearance Preferences and Robot Personality Inferences at Zero Acquaintance

Extended Abstract

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A. 1. Introduction

1) 1.1 Statement of Intent

This study uses video narratives to investigate the relationship between participant personality and preferences towards robot appearance of differing degrees of anthropomorphism. It also compares participant personality attributions of robots on such basis to psychological studies on human-human personality attributions at zero acquaintance[1].

2) 2. Appearance does Matter

Great care is usually taken with the appearance of artifacts marketed to the public. Both the intrinsic reward of using the product as well as decisions as to what product to use are strongly dependent on the aesthetic qualities of the products in question [1-3]. It is only natural, that appearance should be a focus of current HRI research [4-9]. While these studies focus primarily on aesthetic preferences, the results of Goetz et al. [6] also suggest that appearances should conform to the task context.

3) 3. Personality Matters

Participant personality has an impact on an HRI situation. We have previously considered participant personality and its effect on participant behavior in an experimental setting [10], as well as in post-experimental evaluation of robot behavior [11] and the assessment of robot personality [12]. Other researchers have found differences in participant evaluation of proxemics [13]. Tapus and Matarić [14] found an effect in which robot behavior matching participant personality led to increased task performance.

Manuscript received October 6th, 2006. The work described in this paper was conducted within the EU Integrated Project COGNIRON("The Cognitive Robot Companion") and was funded by the European Commission Division FP6-IST Future and Emerging Technologies under Contract FP6-002020

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[1] Zero Acquaintance is defined by Albright et al. [1] as a 'context in which perceivers are given no opportunity to interact with targets who are strangers to them'. Strangers are defined as 'individuals of whom one has no prior knowledge'

In Human-Human interactions, subtle differences in appearance leads to marked differences in personality attributions [15, 16]. Also, taking the combined results from Tapus and Matarić [14] and Goetz et al. [6] into consideration, it is reasonable to assume that differences in robot appearance will lead to differences in perceived robot personality. The study of the details of these differences and their impact on HRI situations will be important in order to create robots, whose appearance and behavior not only match the tasks they perform, but also take account of individual differences between potential users.

The particular personality model used in this study is the Big Five model measured using items from the IPIP [17] and was chosen for two reasons: Firstly, it is a personality model that is used extensively in psychological research and will enable us to compare our results with pre-existing results in this field. Secondly, it is a descriptive model of personality based on Allport's Lexical Hypothesis [18], and does not explicitly assume a human-specific biological basis for personality, as Eysenck's 3-factor model [19] does. This allows for a less problematic application of this model to perceived robot personality.

Figure 1 Mechanistic Robot Appearance

B. 2. Method

Eighty participants were shown a narrative presented as a video, in which a robot approached a person in a home environment in order draw his attention. The video scenario designed for these particular trials took place in a 'real'

home (The University of Hertfordshire Robot House) to increase the believability and ecological validity of the trials. The participants were shown three versions of the video clip in which the robot's appearance varied in the degree of anthropomorphism.

Figure 2 Basic Robot Appearance

Note that we have previously compared the results of live and video HRI trials [20, 21], and found that the results of video trials are comparable to those of live trials. This, combined with the existing literature on Human-Human personality attribution and judgments at zero acquaintance made us consider this method appropriate for our particular research questions. Participants were invited to indicate their overall preferences regarding robot appearance as well rate the different robot appearances on the five traits in the Big Five Model. These results were analyzed along with participant personality scores and demographics.

C. 3. Results

In accordance with previous studies on human – human personality attribution, the most salient variance between the robot appearances was found for perceived Extraversion, where the three appearance types differed significantly from each other $F(1,79)=51.62, p<.001$). This relationship followed the degree of anthropomorphism, with the most anthropomorphic appearance scoring the highest and the least anthropomorphic scoring the lowest. For overall participant preferences, the most preferred appearance overall, was the most anthropomorphic appearance. This result was significant ((χ^2 (2) = 36.189, $p<.001$). An analysis of the relationship between participant personality and appearance preferences found that introversion was significantly correlated with preference scores for the least anthropomorphic appearance ($r=.263, p=.011$). As this appearance was rated as the most introvert of the three, this does suggest that the effect reported by Tapus and Matarić [14] may be apparent for robot appearance as well as robot behavior and interaction style.

The full paper will contain a more detailed analysis of perceived robot personality, as well as an in-depth discussion of its relation to perceived anthropomorphism. It also will also discuss implications, both practical and theoretical.

Figure 3 Humanoid Robot Appearance

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