Using Robots to Study the Perception of Feedback Cross-culturally

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ABSTRACT

While feedback currently generates much interest among many scholars, how feedback is perceived in cross-cultural contexts has not been extensively studied yet, due to considerable methodological obstacles. In this study, we investigate how different ways of providing feedback are perceived by inhabitants of neighboring countries such as Denmark, Germany and Poland. Based on initial analyses of different feedback strategies in these countries, we used a robot to deliver both positive and negative feedback. Using a robot has the advantage that the feedback is provided by an embodied interactant, yet whose behavior can be completely controlled. We carried out a questionnaire study in which the EZ-bot presented feedback using strategies identified as common in either Denmark, Poland or Germany; participants were then asked to rate the robot. The results show highly significant differences in the perception of different feedback strategies even in countries in geographical proximity. Using robots for studying cross-cultural communication differences thus constitutes a promising methodology.

CCS CONCEPTS

Human-centered computing → human-computer interaction, interaction design

KEYWORDS

Feedback perception; cross-cultural differences; human-robot interaction; positive & negative feedback

1 Studying Feedback

Providing and receiving feedback is not only a crucial part of many situations in daily life, such as school, the workplace or in interpersonal encounters, it is also a highly sensitive issue and can

affect people's feelings, relationships and self-esteem (Chydenius and Gaisch 2014). Such problems are amplified in intercultural contexts; for instance, Meyer (2014) suggests that feedback differs between Western cultures, like Germany, Israel, The Netherlands etc. on the one hand and Asian cultures, like the Philippines, Korea, Japan and Indonesia on the other.

However, the study of intercultural differences in general, and of differences between practices in countries of close geographical proximity in particular, is not trivial at all. For instance, analyses of dimensions of variation, like the well-known work by Hofstede (1984), for example, has been heavily criticized for relying on and enforcing stereotypes while at the same time being difficult to translate into concrete behaviors (e.g. McSweeney 2002). Concrete, empirical studies are furthermore difficult because of issues of representativity, i.e. identifying a representative sample of participants for the comparisons, and controllability, i.e. exposing participants to comparable situations. We suggest here to use robots as interaction partners, because robots can be manipulated and controlled in ways in which humans cannot, which allows the controlled investigation of the perception of different feedback strategies. In a pre-study, we gathered information about feedback giving strategies. These strategies were analyzed and exploited for the creation of stimuli for the subsequent questionnaire study, in which we had people rate a robot that gave them feedback using a strategy from one of the three cultures under consideration. We expect that the experiments making use of a robot will allow us to identify how different ways of providing positive and negative feedback are received in different cultures.

2 Eliciting Feedback Strategies in Different Cultures

In the first, qualitative study, participants were recruited by word-of-mouth and asked to provide feedback on two business ideas. In the experiment, three confederates per language elicited feedback from two participants each. The business ideas were designed deliberately in a way to trigger positive and negative feedback (i.e. one good and one stupid idea). Participants, 12 females and 6 males, were between 20 and 56 years old; 11 were students, but 7 were also professionals. 6 participants stem from Denmark, 6 from northern Germany and 6 from Poland. The confederates initially asked for feedback on the good business idea, and then elicited feedback on the bad idea. Participants' feedback was video recorded and analyzed based on dimensions previously discussed in the literature (especially Lewis 2018; Meyer 2014; Brown & Levinson 1987): language; content & listening patterns; politeness; body language; hesitation markers. The strategies identified were

used to create three different, culture-specific versions of positive and negative feedback to be used as stimuli in the subsequent questionnaire study.

3. Questionnaire Study Using Robots

In the questionnaire study, participants had to solve two tasks, for which they received feedback afterwards. To elicit information about how people perceive feedback designed according to practices common in their own and in other cultures, participants had to be confronted with positive and with negative feedback, irrespective of their performance. We therefore chose two tasks from leadership studies that do not have obvious solutions. Thus, two tasks were designed, as well as three versions of positive and three versions of negative feedback, based on our previous findings on the typical patterns in each language. In order to subject all participants to comparable stimuli, we presented all feedback in English. We created two general feedback texts in English, one positive and one negative, and modified them according to the strategies found. This ensures that all participants from all three cultural backgrounds were exposed to the same feedback strategies in order to compare the feedback delivered by EZ-bot cross-culturally. Then, we used a free text-to-speech synthesizer (fromtexttospeech.com) to create the robot utterances. For instance, the feedback inspired by German feedback strategies is:

> *DE (positive): So, the task has been done pretty well. Basically, it helped me understand what features are characteristic of a potentially great leader. Thank you for your effort.*
>
> *DE (negative): So, the answers are wrong. You did not perform well on the task I asked you to do. Due to your relatively law performance, I would need to take care of the second task myself.*

In contrast, the same feedback using Polish feedback strategies is:

> *PL (positive): I think you did great! God job! Now I know what I need to focus on to become a great leader. You were such of a great help! Thanks again! Both you and your family could be proud!*
>
> *PL (negative): I am really sorry to say that your performance was not entirely good. I noticed some mistakes and the overall outcome was not as good as I expected. Maybe it was not your day, maybe you were exhausted: so, it is sometimes. Well I will need to redo the task myself.*

The EZ-bot delivered the designed feedback to the participants in different variations; thus, participants saw feedback inspired by their own cultural background and feedback inspired by another culture. This results in three conditions:

Condition 1: Danish (DK) positive, German (DE) negative
Condition 2: German (DE) positive, Polish (PL) negative
Condition 3: Polish (PL) positive, Danish (DK) negative

The first question asked who a good leader is, followed by positive feedback; the second question was a complex task matching the leadership style with an accurate explanation generating the negative feedback delivery, which was followed by negative feedback presented by the robot. After each of the two tasks, participants were asked to rate the robot according to those features that had been identified as relevant for feedback (e.g. Meyer 2014), namely how motivating, friendly, polite, empathetic, dominant and entertaining the robot is perceived to be. In order to ensure comparability, all participants saw the same video of the robot; we thus traded the investigation of the effects of potentially culture-specific body movements against enhanced control for confounding factors. The independent variables tested in this study are thus only the different verbal realizations of feedback based on the three different cultural contexts. The dependent variables are participants' ratings of the robot's verbal positive and negative feedback behavior.
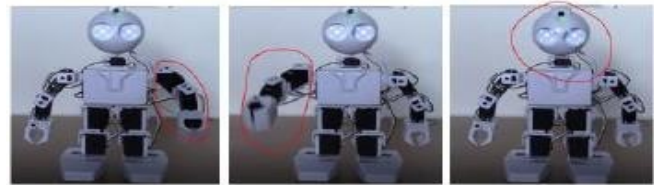

Figure 1: Different movements of the EZ-bot while providing feedback in the video

236 complete responses were gathered through social media; each version of the questionnaire was seen by 19-31 participants in each of the three countries: 61 Polish, 78 German and 85 Danish. Independent t-tests were applied in a pair-wise comparison for each of the features.

The feedback strategies inspired by the different cultures receive different ratings by native speakers with different cultural backgrounds. Interestingly, the feedback strategies do not always receive the best ratings from their own native speakers. For instance, Danish positive feedback is rated as significantly less motivating, empathetic and entertaining by Danish speakers than by German speakers, but also as less dominant. In contrast, Polish positive feedback receives the highest ratings from Polish speakers (Fig. 2).
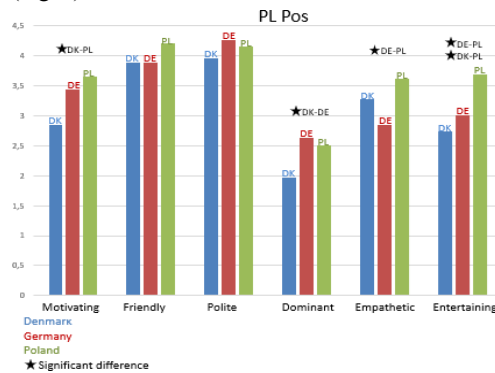

Figure 2: Perception of Polish positive feedback

4. Discussion

The study has revealed interesting intercultural differences concerning feedback giving strategies and their pragmatic effects even in countries of close spatial proximity. This suggests that robots that provide feedback to users may need to pay attention to the cultural background of the person receiving the feedback. Future research will have to show to what extent also the robot's non-verbal behavior, which was held constant in this study, contributes to these differences.

The results show moreover that using a robot in intercultural communication research allows the controlled investigation of otherwise elusive pragmatic information, such as intercultural differences in the perception of feedback.

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