



# Meaningful Voice Interactions

How to design smart speakers that foster well-being

MASTER THESIS Felipe da Motta Rezende Pierantoni

## Supervisory Team

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## Executive Summary

What is the impact of smart speakers on our well-being?

With an expected global installed base of 325 million units in 2020 (Advanced Television, 2020), smart speakers continue to become increasingly present in households worldwide, especially among young adult consumers (Kinsella, 2019). As their popularity grows, however, so does the discussions around the potential dangers of these devices that speak like humans and share the intimacy of our homes. From reports of children developing aggressive behaviours (Childwise, 2018) to studies on the perpetuation of sexist stereotypes (West, Kraut, Ei Chew, 2018), our interactions with smart speakers are accompanied by a series of risks. This project proposes a repertoire of meaningful voice interactions to mitigate those impacts and foster well-being instead.

To achieve this, a categorisation of seven dangers of voice interactions was created based on literature review: impoliteness, aggressiveness, gender stereotyping, exposure, shallow mindedness, emotional dependency and social detachment. Each danger was analysed in order to define which of three fundamental human needs they harm: autonomy, competence and relatedness. This approach is based on the Self Determination Theory, which proposes that people experience well-being when these three needs are satisfied (Ryan & Deci, 2000).



Figure 1. Illustrations representing the seven dangers of smart speaker interactions.

In addition to this analysis, a phase of exploratory research was also conducted, combining established research methods such as user interviews with emerging More-Than-Human Design approaches in the form of Thing Ethnography. The result was a series of findings on the perspectives of users and devices that would not be accessible from literature alone. These insights inspired the ideation phase, where more than 70 ideas were created to prevent the dangers of current voice interactions.

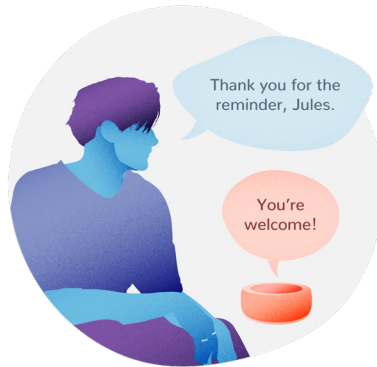


Figure 2. Photographs from the exploratory research with users and devices.

After clustering and filtering, these ideas were tested with people by showing them videos depicting each interaction concept. Participants were asked to evaluate how the needs for autonomy, competence and relatedness would be affected, together with ranking the ideas and expressing their overall perceptions. The resulting data revealed the interaction concepts perceived as the most meaningful. These served as the basis for the final deliverable of this project, a repertoire of meaningful voice interactions.



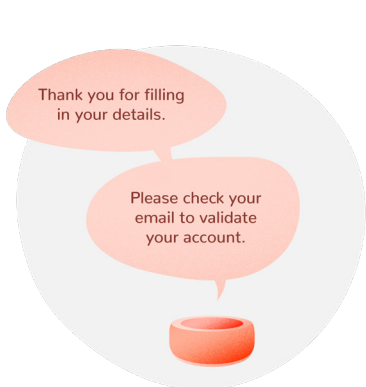
Ensure that grateful expressions are a valid way to confirm commands or conclude interactions.



Praise people who express politeness or gratitude, but make it quick and succinct.  
Consider allowing people to disable this feature, but let them know why it exists.



Respond to polite engagement in a warm tone of voice.



Speak respectfully to set an example.



Do not offer rewards as a benefit for being polite.



Do not force users to use polite words.

Figure 3. Sample from the content included in the Repertoire of Meaningful Voice Interactions.

The repertoire includes design guidelines, traps to avoid, in-depth analysis of the dangers of voice interactions and reflective questions to guide ideation. Its goal is to serve as a tool for designers and researchers involved in voice-related projects to foster well-being by designing more humane voice interactions. It was designed to be initially shared as an online platform and a booklet, but its content could take various forms beyond those.



Figure 4. Representation of the repertoire as an online platform and a booklet.

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