

# Effects of Adaptive Conversational User Interfaces on Engagement while assessing Wellbeing

Charlotte Eijkelkamp (c.e.eijkelkamp@student.tudelft.nl)

Supervisors: Willem van der Maden, Garrett Allen, Ujwal Gadiraju & Derek Lomas

## 1. Research Question

*To what extent does adaptability affect enjoyment and engagement while using Conversational User Interfaces for wellbeing assessment?*

## 2. Background Information

### Wellbeing Assessment

As the COVID-19 pandemic negatively affected wellbeing worldwide, universities started prioritizing student and staff wellbeing [1]. Proper wellbeing assessment can give a foundation for further actions tailored to the needs that come forward



**Conversational Interface (CUI)**  
CUIs are systems that are able to mimic human conversation, such as chatbots or virtual assistants like Amazons Alexa.

### CUIs for Wellbeing assessment

CUIs are shown to be suitable for wellbeing assessment. To increase engagement several adaptations are tested and reviewed.

## 3. Adaptations

Adapting a wellbeing assessment chatbot can be done by changing amongst others the conversational style or the visual design of the chatbot. [2]

### Conversational styles

Changes in terms of formality, empathy, agreeableness, output speed.

### Visual Design

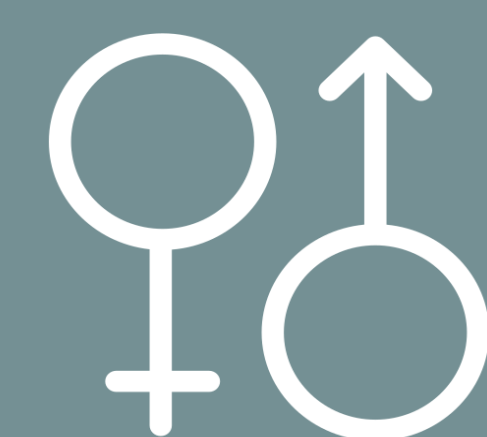
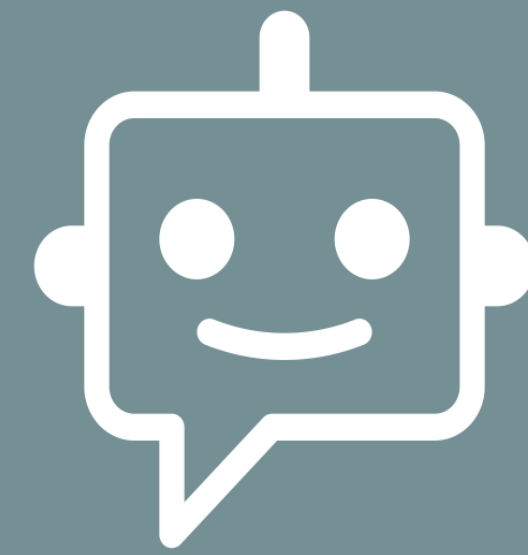
Changes in the gender, the name, the perceived age and the profile picture.

Combining different contexts and different aspects, the effects of **Empathic Conversational style**, **Avatar Presence** and **Chatbot-gender** seem to affect engagement or enjoyment

## 4. Methodology

### 4.1 Chatbot creation

A subset of the questions posed in the 'My Wellness Check' [5] are used in a baseline chatbot. See figure 1. This chatbot has no specific characteristics.

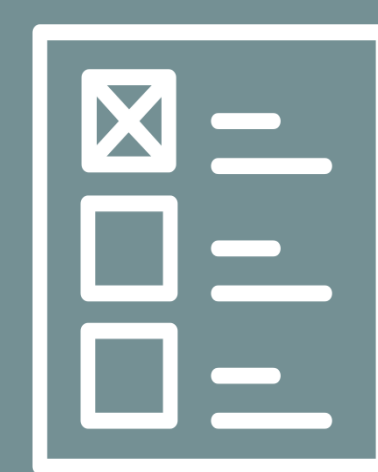


The name and profile picture of the chatbot are changed to mimic a female and a male version. The used profile pictures for the female (Jane) and male (Jacob) chatbot are found in figure 3 and 4 respectively.

The conversational styles are changed to make the chatbot show more empathy. This includes responses to the given questions, which are tailored to the input. See figure 2.



### 4.2 User Experience



Users are assigned a chatbot to talk with at random. After the conversation is over, the user will fill out a survey about their experiences. The survey tests effects on **Questionnaire Experience (QX)**, **Enjoyability** and **Empathy**

### 4.3 Analysis

The results gathered in the survey will be analyzed and checked for any **significant differences** between making use of empathic conversational styles, presence of an avatar or the gender of the chatbot. **30 participants** filled in the survey.

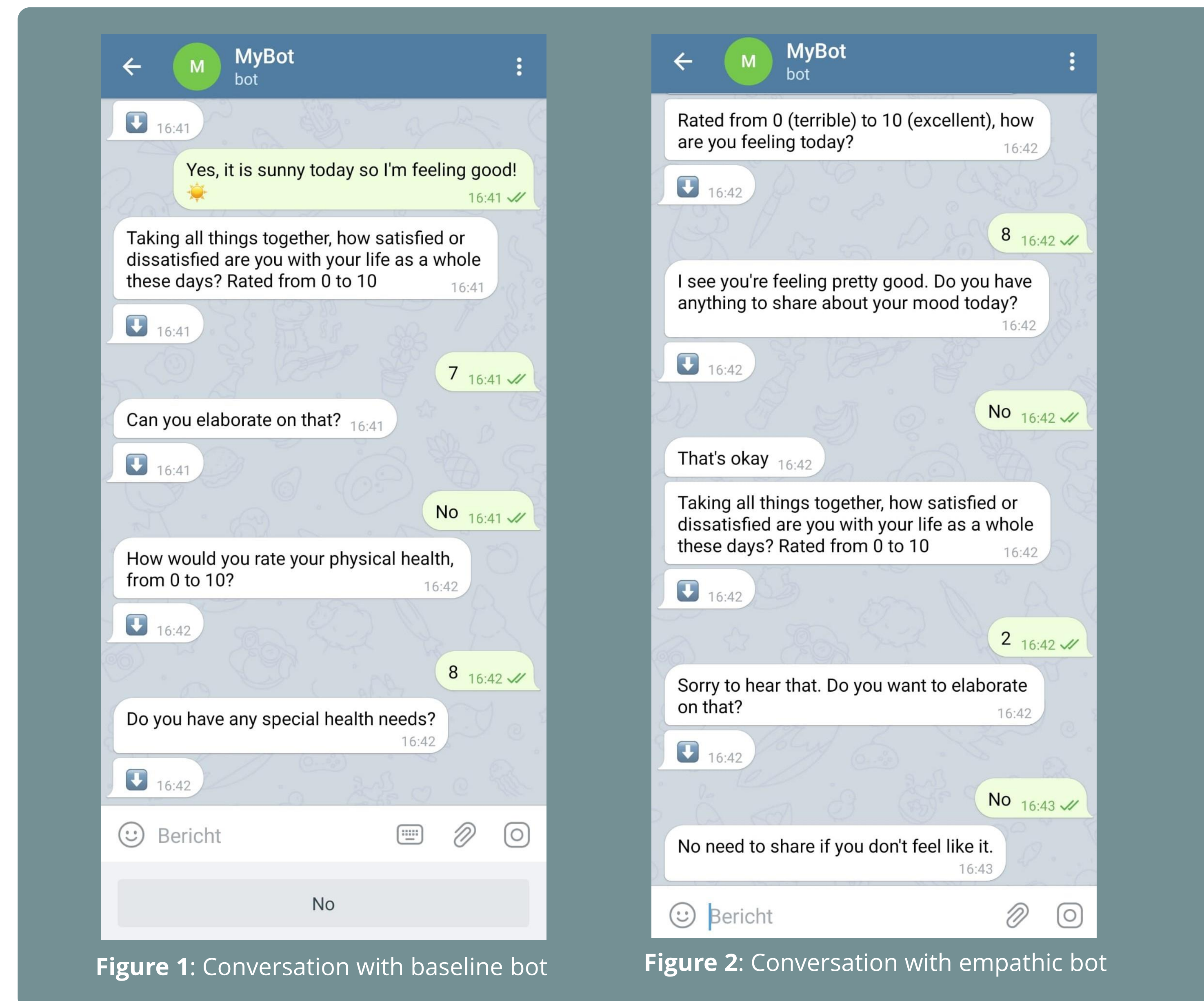


Figure 1: Conversation with baseline bot

Figure 2: Conversation with empathic bot



Figure 3: Female profile picture (Jane).

Scan the QR-code and have a chat with Jane

Scan the QR-code and have a chat with Jacob

Figure 4: Male profile picture (Jacob).

## 5. Results

Condition*	Questionnaire Experience (QX)		Enjoyability		Empathy	
	M	SD	M	SD	M	SD
NG-NE	4,16	0,34	3,27	0,65	3,4	0,68
NG-E	4,07	0,41	<b>2,89</b>	0,97	3,61	0,52
F-NE	<b>3,84</b>	0,34	3,33	0,47	<b>3,6</b>	0,39
F-E	<b>3,96</b>	0,53	3,33	0,7	3,73	0,77
M-NE	<b>4,65</b>	0,26	3,25	0,36	<b>2,58</b>	0,6
M-E	<b>4,64</b>	0,45	3,87	0,54	3,67	0,7

\*Gender: No gender (NG), Female (F) and Male (M). Conversational Style: Non-empathic (NE) and Empathic (E).

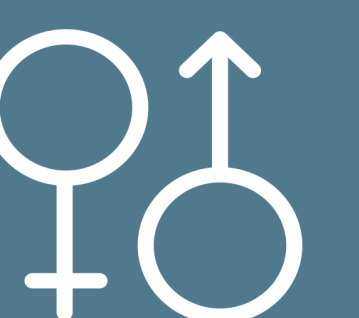
Table 1: Means and Standard deviations for all dependent variables and conditions. Marked orange are remarkable differences, printed italic are negative outliers.

## 6. Conclusion

- The presence of an **Avatar** has no significant effect on **QX**.
- An **empathic conversational style** is not statistically preferred over a non-empathic conversational style.
- There are no significant effects of **gender** on **enjoyment** and **empathy**.
- There is a significant preference for male chatbots over female chatbots on **QX** chatbots.

## 7. Future work

- Consider adapting to **user-attributes**, like gender, age or culture.
- Look into **non-binary** names and avatars.
- Look further into the effect of **gender** on **QX**.



## 7. References

[1] W. van der Maden, D. Lomas, S. Fonda, and P. Hekkert, "Designing a feedbackloop for community wellbeing," 2022

[2] R. G. Curtis, B. Bartel, T. Ferguson, H. T. Blake, C. Northcott, R. Virgara, and C.A. Maher, "Improving user experience of virtual health assistants: Scoping review," Journal of Medical Internet Research, vol. 23, no. 12, 2021

[3] <https://www.mywellnesscheck.org/>

Icons from [www.thenounproject.com](http://www.thenounproject.com)