AI-Bots as Influencers in Social Behavior - A Speculative Concept

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Abstract

During the last decade, artificial intelligence (AI) shows a huge impact on our society through learning from human behavior and assisting them [9]. In the future, they may influence humans making decisions based on their honest emotional needs [7]. Since some humans are more reserved in their social concept and others make commitments more often than preferred, a speculative concept and prototypical bots have been created. To fit human behavioral patterns and personal needs, we designed six interactive objects with different look, character and behavior. Through a two-stage evaluation process, we conducted semi-structured qualitative interviews with eight psychologists to identify whether these prototypes suit the decision-making process. Our findings may lead to a new approach to enhance human behavior and cause higher self-satisfaction for users. Through this type of interaction, AI-bots not only interact based on human behavior but can also contribute to personal reflection on one's own behavior.

CCS Concepts

• Human-centered computing~Scenario-based design

1.Introduction and Related Work

Despite networking is easier than ever we feel lonelier because of less real contact [8]. For Generation-Z, one problem obtains the difficulty in making decisions which lies in the correct evaluation, e.g. whether joining an invitation will be worth or not. Many prefer not to waste their emotional

energy and time. Others stand under the social pressure to accept invitations. Across Europe 'about 34 million people are socially isolated' [4]. Becoming lonely is a bigger problem for people in the ages between 18 and 34, then those over 55 [5]. Finding a balance between accepting or refusing invitations can be very difficult. Different methods are used in the psychology- and marketing-field to support people in their decision-making: Cognitive behavioral therapy (CBT) changes patterns of thinking or behavior which leads to change their feelings. Like in the 'five step process' [3], the treatment is short term and aims to solve reality-oriented problems, like depression or drug abuse [6]. Different than our concept, these methods are based on general information and goals of the client but do not support him to react independently in his everyday life. We assume that support for making decisions from someone who knows their personality and interacts at the right moment might help them. This leads us to the following research question:

1. Which approaches do AI have to support people with their decision making?
2. Could the designed interaction patterns of these bots be helpful in order to make decisions? What opportunities and problems arise?

The main contributions of the paper are a speculative design of six different AI-based bots which aim to support people in making decisions on invitations, and the bots' first evaluation with critical reflection. This work extends the use of AI in such a way that it supports the user in his personal development and strengthens self-esteem.

2. Pre-Studies
To frame the problem, we conducted two preliminary studies. First an online survey (10 questions) with the scenario of being invited to a BBQ, was conducted. 44 participants (17 women, 25 men, 2 divers[1]; age range: 20 to 35 years) responded to the questionnaire. We found a connection in decision making related to loneliness and social pressure and identified two groups with different behavior: some confirmed and some refused invitations too often (personal perception without a data value). Most participants do not want to disappoint the inviting party. 89% want to change their decision-making behavior. In the second step one-hour qualitative guideline interviews (participants: 3 female, 2 male; age range 24 to 35) were conducted to determine the reasons for their behavior. The results were visualized and evaluated in a user journey map. All participants made their decisions before or during the invitation question. The participants who rejected the invitation admitted to asking for more information to find an excuse. The participants who accepted the invitation were busy persuading themselves to make the right decision, even though they honestly didn't want to join. Age, spiritual maturity and culture have a great influence on decision making.

3. Design Concept
To create approaches that support people in the decision-making process (RQ 1) and improve their behavior pattern, we developed three everyday usable AI-bots (Fig 1.) for each of the two mentioned groups. Thanks to their physical existence they have the power to intervene during conversations and help as a reliable friend to accept or refuse invitations more often. To find the most suitable helper for individual users, speculative bots have been created, whereby their character transforms their appearance and behavior.

3.1 Form language, character and behavior of AI-bots
Based on our pre-study results some intrinsic reasons for rejecting invitations too often are caused by previous bad

[1]divers: is a general term for third gender e.g. intersex or non-binary person

PushAI

WhisperAI

BlurAI

TroublAI

LiarAI

DragAI

Figure 1: For each Target Group (Yep and Nope) three different AI-bots were created

experiences or the desire not to waste their time and emotional energy. The PushAI acts as a third participant during conversations and uses arguments to arouse the interest of the user. To stop it the user can use his hand to cover its mouth. Being rational and calm, the WhisperAI spends his time on the shoulders of the user and whispers advice during conversations in the user's ear. Its head can be put back to the original position to be stopped. The special glasses, BlurAI, start to get blurry if the user starts to reject invitations. This symbolizes the increase of distance and alienation from the other. To undo the blurriness the user can blow some air on the surface of the glasses.

Those who accept invitations too often use to be very shy, hesitant and need to learn to take care of themselves. The intention of TroublAI is to distract other interlocutors during a conversation. Through waving its arms and losing its hands the user gets more time to think and obtains the opportunity to express his opinion. He can be stopped by pushing both of his arms down. In urgent moments the LiarAI intervenes in the conversation directly and gives excuses about his schedule. The validity of the information can be asked afterwards. In order to stop LiarAI, the user can turn its head. The DragAI is located on the upper arm. Through electroshocks it's possible to pull the arm of the user backwards. This represents the movement of a little kid which tries to hold someone back. This object can be stopped by using the arm to make a rough movement back to himself. This portrays the same gesture as self-liberation.

3.2 Voice Recognition Strategy
To achieve emotional interpretation, a conceptual strategy, AI voice recognition, was created. To intervene, the bots must cover several aspects: it needs to be understood who the user is talking to and what kind of relationship they share; what they are talking about; whether the given

information reflect the true emotions. During a conversation basic information about the event like time and location will get checked. At the same time the speech will be analyzed from two aspects, word- and voice recognition. Through recognized word and sentence structure it's possible to detect the content of the conversation [1][10]. Otherwise the voice of the user can be interpreted in three levels through its waveform and spectrogram [1][10]: Linguistic Level (e.g. accentuation), Para-linguistic Level (e.g. speed) and Extra-linguistic Level (e.g. gender) [2]. In this way the language model of the user will be learned. Combining the two aspects through deep learning algorithm it's possible to detect if the recognized words match to the voice and the emotion. All the collected data will be saved in the portable brain and be used to command bots' behavior when the brain has been positioned in the body of the bots (Fig.2).
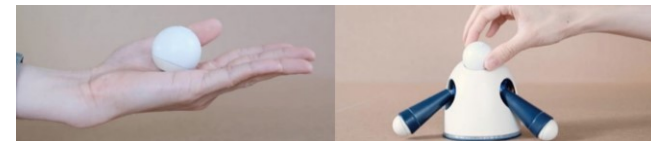

Figure 2: Brain of the bots

4. Expert Review: Two-stage Evaluation with Method and Results
The goals (RQ 2) were to get feedback from psychologists (see table 1) whether the designed bots could be helpful to make decisions or not and estimate advantages and possible problems of the bots and the use of AI. First, we conducted an individual interview with a psychologist (P0) with experience in Environmental Psychology, Digital Media Research and Artificial Intelligence (Duration: 60 Minutes). Second, we conducted a semi-structured qualitative colloquium (Duration: 90 Minutes) with seven psychologists from the field personality and social psychology (P1-P7). All participants were introduced to the topic, the process, the

ID	Titel	knowledge in... ①Personality and social psychology ②Human technology interaction ③Decision making	ET
P0[1] (m)	Prof.Dr.	②③	9
P1[2] (m)	Prof. Dr.	①②③	25
P2[3] (f)	Ph.D.	②③	5
P3[4] (f)	Ph.D	①②	5
P4[5] (f)	Ph.D	②	8
P5[6] (m)	M.Sc.	①②③	4
P6[7] (f)	M.Sc.	①②	4
P7[8] (f)	M.Sc.	①②	5

Table 1: Summary of participant background (ET: experience time)
1.Environmental Psychology, Digital Media Research and Artificial Intelligence;
2.Personality and Social Psychology;
3.Group process, political psychology;
4-7.:Environmental psychology;
8.Business administration, environmental psychology

objects and the voice recognition. Afterwards we asked open questions. P0 rated the general concept very positively. Since the bot is only owned by the user, a personal relation to the bots could be established. As a result, a lot could be entrusted to it and the advice of the bots could be perceived as those of good friends. In this way the probability is high to not only believe the statements but also to change one's actions. Through voice recognition it's possible to collect clearer, unadulterated information about the user than if the person himself passes on descriptions of himself to the therapist. P1 stated that the Yes/No-decision-issue, known as a neurotic disorder, can be exhibited through personality diagnostics. Mostly, the reasons rely on the patient himself, not on the event or the conversation partner (P4). To find out the actual cause, a therapist tries to foremost break down the patient's inner processes, which cannot be completed by the designed bots independently (P1). A solution could be to update the needs of the user by adding further interactions between the bot and the user (e.g. a conversation to give instructions) (P2, P3). First two parameters from voice recognition could be measurable. However, the third parameter, the validity of the information and emotions, is very important and complicated and its reliability is debatable (P1). The ability to stop the bots was considered essential because it makes it clear to the person to make their own decisions. (P4, P5, P6, P7). Additionally, it gives meaningful feedback to the bot by supporting and optimizing the machine learning process.

5. Discussion
According to RQ1and RQ2, a concept with different AI-bots were created and their relevance and usability were evaluated by psychologists in a two-stage process. One question about the actual reliability of emotion- and word recognition through voice recognition and big data can only be determined by testing the bots. Another rising question is the validity of the gathered information through speech. Otherwise it's possible to tell a lie to a psychologist, and remain unrecognized, as well. Also important is whether the bots could be well trained to discover the inner process of the user through deep learning. In case it takes too long, the use of the bots may be considered as meaningless and cause negative effects on human behavior in the initial stage. These may lead to the abandonment of the bots. From a speculative perspective it's questionable whether the bots would be treated as smart products or humanlike companions. How trustworthy would AI-bots be considered from humans due to data protection. How much self-related information could be necessary to achieve a deeper comprehension of the user without endangering the feeling of safety. However, the AI-bots have high potential in a new way to influence people in reaching a higher self-satisfaction by changing their habits in everyday life. And the quality of the assistance for the user is based to a large extent on the quality of the AI and Deep Learning Algorithm.

6. Conclusion and Future Work
In this work, we investigated whether the conceived AI objects could help people through changing behavior patterns. The presented objects have in combination with AI a high potential for a supplementary approach and may lead to a new therapy form in the future. Important for this is a highly functional AI that has learned the needs of the user and his behavior. In the next step we need to determine whether the use of conceived AI should be only addressed to social components or should be extended to other areas. Should they be able to reform users' behavior patterns as psychologists or simply give small hints in order to change small habits of users in everyday life? Overall, the presented approach can create a new way of interaction with AI and support in social behavior and decision making.

7. References

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