Robin, an Empathic Virtual Buddy for Social Support (Demonstration)

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ABSTRACT

In order to understand how Embodied Conversational Agents (ECAs) can be endowed with the emotional skills to provide social support to users, we developed Robin, an empathic virtual buddy for victims of cyberbullying.

Categories and Subject Descriptors

I.2.1 [**Artificial Intelligence**]: Applications and Expert Systems

General Terms

Design, Experimentation

Keywords

Pedagogical, companion, and coaching agents, Verbal and non-verbal expression, Empirical studies

1. INTRODUCTION

To alleviate stress and deal with negative emotions, people frequently turn to others to talk about their problems. Early work in the field of affective computing demonstrated that virtual agents are able to reduce negative emotions in users [6]. More recent developments show that empathic agents are increasingly capable of complex social and emotional dialogues, but so far they are unable to provide social support.

The goal of our research is to explore how Embodied Conversational Agents (ECAs) can provide social support. We are particularly interested in endowing ECAs with the emotional skills required to comfort users. To this end, we are developing an empathic virtual buddy. In order to be able to provide social support, a context of emotional distress is required. The application domain of the virtual buddy is cyberbullying, that is, bullying through electronic communication devices. Research shows that cyberbullying has a high impact on victims [7], making it a suitable test environment for the virtual buddy. We would like to emphasize that our research is focused on designing supportive interactions between ECAs and users. The virtual buddy is not intended as a replacement for professional help or human

support. Also, the question of whether the virtual buddy can help to reduce cyberbullying is beyond the scope of our project.

This paper presents the prototype of the empathic virtual buddy that we have implemented to gain understanding of how ECAs can provide social support. The virtual buddy, called Robin, uses comforting strategies employed by human counselors in telephone and chat conversations, such as expressing sympathy, encouraging the user, giving compliments, and mirroring the user's emotional state. Additionally, Robin gives advice and, at the user's request, explains how to execute advice that requires technical know-how. The conversation structure is tailored to facilitate providing support.
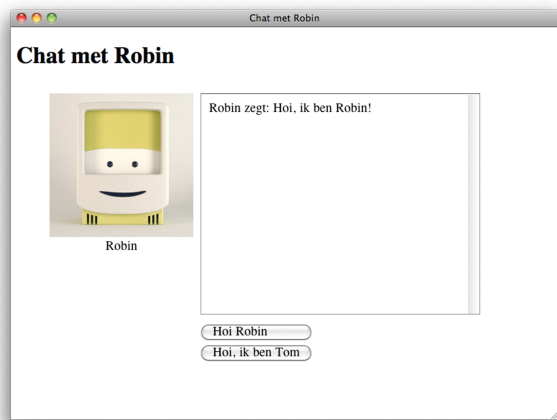
2. SOCIAL SUPPORT

Social support can be defined as communicative attempts to alleviate the emotional distress of another person [4]. Multiple types of social support exist, including emotional, esteem and information support [2]. Five subtypes of social support were selected to be implemented in the prototype, that is sympathy (emotional support), compliment (esteem support), encouragement (emotional support), advice (information support) and teaching (information support).

The conversation between the virtual buddy and the user is structured according to the 5-phase model. The 5-phase model was developed as a methodology to structure counseling conversations via telephone and chat [1]. The five phases of a conversation are:

1. Warm welcome: the counselor connects with the child and invites him to explain what he wants to talk about

2. Clarify the question: the counselor asks questions to try to establish the problem of the child

3. Determine the objective of the session: the counselor and the child determine the goal of the conversation (e.g., getting tips on how to deal with bullying)

4. Give advice: the counselor suggests action the child can try to deal with the problem

5. Round up: the counselor actively rounds off the conversation

3. THE PROTOTYPE

The prototype of the empathic virtual buddy was implemented in GOAL, a high level agent programming language [5]. Figure 1 shows a screen shot. A Powerpoint

Figure 1: Screen shot of Robin, the empathic virtual buddy.

presentation demonstrating the prototype can be found at http://ict1.tbm.tudelft.nl/~janneke/aamas2013/Robin.pptx. Robin's embodiment was designed after an old computer to make it look like an expert on digital matters such as cyberbullying. It is capable of expressing different emotional expressions, including happy, sad, angry, afraid, and surprised at either high or low intensity.

The user communicates with the agent by selecting predefined response options. The user's emotional state is transmitted through the AffectButton [3]. The AffectButton is a tool for explicit emotion input that shows a rudimentary and gender-neutral face that changes its expression based on the position of the mouse cursor. By clicking the button when it shows the emotional expression the user wants to communicate, the emotion is send to the virtual buddy.

In order to understand, comfort and suggest actions to the user, the virtual buddy combines the structure of the 5-phase model with an emotional model. This model determines whether Robin expresses sympathy, encouragement, or compliments the user. It is based on the OCC model [8]. In OCC, emotions are conceptualized as responses to events, agents, and objects. The OCC model specifies eliciting conditions for different emotion types. In the prototype, the user's response options are interpreted as actions and events, which are appraised by the system. The emotions triggered by these appraisals are expressed both verbally and nonverbally.

For example, during the conversation the buddy asks the user how he responds to being bullied. The users answer specifies an action. In OCC actions of agents are appraised with regard to the praiseworthiness of the action. In the domain of cyberbullying 'talking to someone about being bullied' is a praiseworthy action. So, if the user selects this answer in response to the buddy's question, admiration is triggered. The virtual buddy expresses admiration by changing its facial expression to happy and uttering a compliment, e.g., *'Good of you to talk to some one!'*.

Not all response options trigger emotions. If the user selects a response option that does not trigger an emotion, the buddy's emotional state (and facial expression) gradually decays to neutral.

The buddy's verbal utterances are based on counselor's utterances from actual chat conversations about bullying. Sympathy, compliment and encouragement are always expressed in response to user input. Advice and teaching are offered proactively. When the user clicks the AffectButton, the agent mirrors the emotional expression and utters a sympathetic response.

4. EVALUATION

The prototype of the empathic virtual buddy was evaluated in a focus group with six pedagogical experts. The results indicate that the buddy is able to communicate social support. The experts substantiated their claims about feeling supported by referring to specific behavior, including the verbal expression of emotions and the facial expressions. In particular, the combination of verbal and nonverbal expressions was commended by the experts. On the whole, the emotional model selects appropriate emotions to express, although the experts agreed that the number of verbal empathic responses should be increased.

The results indicate that the prototype works and that social support is communicated. The next step is to involve children in the evaluation of the prototype.

5. ACKNOWLEDGEMENTS

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