Release Adolescent Stress by Virtual Chatting

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Abstract. Many teenagers today live with stress. Due to their spiritual immaturity, teenagers cannot properly cope with stress, which probably brings such bad consequences as depression and even suicide. Hence, it is important to help teenagers timely resolve their stress. Many times, teenagers hesitate to express and reveal their negative emotion to the people nearby. In this paper, we present the design and implementation of a web-based virtual chatting tool, which can listen to, comfort, encourage the stressed teenagers and give useful solutions for their problems through chatting and thus releasing their stress. The tool also integrates social media micro-blog not only to support stress detection but also to provide useful resources for stress release.

Keywords: Adolescent · Virtual chatting · Stress · Release · Micro-blog

1 Introduction

Nowadays, people of various age groups are experiencing stress. Especially for the youth group, whose outlook on life and problem-solving ability are still immature, too much stress is easy to turn into severe consequences such as depression or even suicide. Parents, teachers and psychologists cannot offer help when teenagers refuse to express their stress to the people nearby, but rather turn to the virtual world for stress release. Hence, researchers try to help release teenagers' stress based on the virtual platform. Recently, the work in [3] proposed a chatting robot PAL, which could answer non-obstructive psychological domain-specific questions. It acts more like a Question&Answering (Q&A) system to match users' psychological questions from the numerous collected Q&A pairs and then selects suitable answers. However, only answering psychological questions offers limited help, for the stressed teenagers would pour forth their woes sentence by sentence instead of only asking questions and the comfort and encouragement for their experiences play a vital role in releasing their stress.

In this paper, we build a virtual chatting tool to communicate with teenagers like a virtual friend, comforting and encouraging teenagers to make them feel listened and understood, or a mentor, providing some useful solutions for their problems as well as guiding them to speak out what they can't say in real life

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for cathartic stress relief. The tool extends our previous work [2] by integrating micro-blog for comprehensively learning the user's stress. Statistics show that 53% of 600 million registered micro-blog users are teenagers born after 1990, and every day produce over 200 million micro-blogs, of which main usage are self-expression [4]. Hence, by integrating users' micro-blog, the tool can be supplied much sentiment information to make some guesses and tentative inquiries about users' stress when the chatting sentences only offer incomplete information.

2 System Framework

Fig. 1 shows the tool framework. Its server consists of three components:

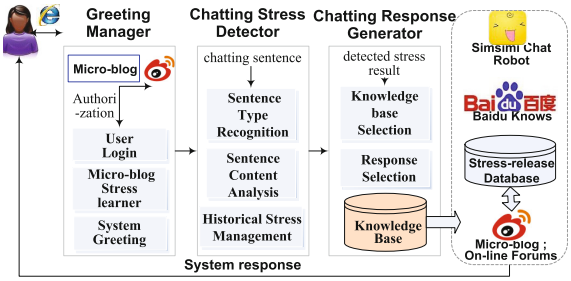

Fig. 1. Framework

- **Greeting Manager.**When a user logs into our tool, s/he can choose to use the micro-blog account to login or entry the chatting page directly. Fig. 2 shows the login interface of the tool. If the user authorizes us to access his/her micro-blog, *Micro-blog stress learner* module uses the method in [6] to learn his/her stress status based on the emoticons, punctuation marks, tweeting time, tweeting type as well as the text of recent tweets. Meanwhile, *System Greeting* module correspondingly adjusts the greeting sentence according to the detected result for better effect of stress release.
- **Chatting Stress Detector.** For a user's input sentence, *Sentence Type Recognition* module categorizes it into three different categories (interrogative question, rhetorical question or declarative sentence) for understanding user's expected answer. *Sentence Content Analysis* module detects user's stress status in the form of `(Stress, Category, SubCategory)` based on the established seven adolescent's stress-related lexicons. This module picks out the stress-related emotion and degree words to sense the user's stress level, namely denoting `Stress` ranged from 5 to 0. Then we use the LTP tool [1], a Chinese language processing tool for word segmentation and dependency analysis, to build a linguistic dependency tree of the sentence. The stress category/sub-category word, which has the the shortest path to the negative emotion word, is selected as the primary stress category/sub-category. Besides, the detected result is adjusted according to the historic detected results from the previous sentences or micro-blog, which is managed by the *Historical Stress Management* module.

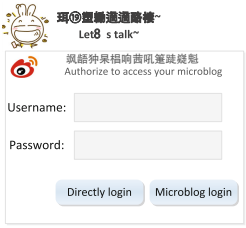

Fig. 2. Login Interface

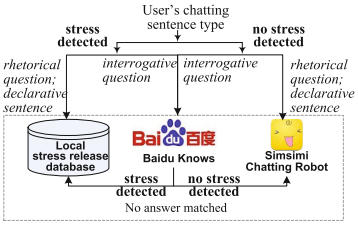

Fig. 3. Knowledge Base Selection Strategies

Fig. 4. A Chatting Example

– **Chatting Response Generator.** The knowledge base of the tool is comprised of three parts: local stress-release database, Chinese Q&A community Baidu Knows,which has six main topics about psychological questions and Simsimi [5],which provide public API for developers to establish their own chatting tool. According to different chatting sentence type and whether a user has stress, *Knowledge Base Selection* module chooses different knowledge base to get response. Fig. 3 shows the knowledge base selection strategies. According to the specific detected stress result, *Response Selection* module further chooses suitable responses from the corresponding knowledge base.

3 System Implementation

Fig. 4 shows a chatting example of our 10-participants user study. As it shows, the tool release teenagers' stress by acting the following roles:

A Listener: Anytime, the tool is willing and patient to listen to the teenagers' complaints, agony and inner struggle. Meanwhile, the tool can gradually guide teenagers to pour forth their woes.

A Friend: After teenager telling their stress, the tool says some words of comfort to express concern and encouragement to cheer up the depressed teenager like a friend, which makes teenagers feel understood and emboldened.

A Mentor: For teenagers' problems, the tool provides some specific solutions to help them get out of the trouble. Besides, the tool also recommends some helpful materials such as some related books and websites for their problems.

4 Conclusion

In this demo paper, we present a web-based virtual chatting tool for releasing adolescent stress. The tool integrates micro-blog for additionally detecting user's stress and seeking useful release resources to achieve better release effect. In our future work, we plan to investigate using the social relationship in users' micro-blog to seek personal stress release resources from the micro-blog.

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