Protocol for the Study: Enhancing Empathy in Text-Based Therapy

1. Research Goals

The core goal of this research is to evaluate the impact of the EPITOME framework on the development of empathy in text-based therapy for patients with depression and anxiety. Text therapy is a very widely used psychological intervention, primarily for patients who are unwilling or unable to engage in traditional face-to-face therapy themselves. However, there are still some clear limitations of current text-based therapy in effectively conveying empathy. Effective empathetic communication is key to improving treatment outcomes, and a lack of emotional connection over the years of treatment may lead to patients feeling neglected or misunderstood, which can hinder their recovery to some extent. Developing and conveying empathy through text-only communication is therefore a key issue that needs to be addressed.

Instead, our study focuses on how the EPITOME framework can overcome this limitation by enhancing empathic interoperability between therapist and patient. The EPITOME framework combines Natural Language Processing (NLP) with multi-task learning models (e.g., RoBERTa) to identify empathic patterns in textual dialogues and to extract arguments supporting empathic communication. By applying this framework to text-based therapy, we expect to improve the recognition of emotions in dialogue, enabling therapists to better respond to the emotional needs of their patients, thereby improving the overall therapeutic experience.

The ultimate goal of this study is to provide a viable solution to the mechanism of empathy in text therapy. This not only helps to improve mental health support for patients, but also provides valuable theoretical and practical guidance for the future development of digital therapies. We expect the results of this study to drive the development of digital platforms with greater empathy and emotion recognition to provide more effective support for mental health patients globally.

2. Research Questions

(a) Which features of the EPITOME framework can be adapted to text-based therapy for depression and anxiety?

(b) How effective is the EPITOME framework in enhancing empathy in text-based therapy?

(c) Can EPITOME-based text therapy significantly improve the experience of depression and anxiety patients?

3. Measurements and Observations

Regarding data collection, we will focus on the following:

- Counts of actions or errors

- Time spent

We were first licensed the EMO-KNOW dataset, a dataset that captures detailed sentiment and its causes from 9.8 million tweets over 15 years. Since our main research direction targets "ANXIOUS" and "DEPRESSED" emotions, we extracted a total of 24,858 pieces of data in the EMO-KNOW dataset with these emotion labels. Due to the large number of data and time constraints, we ultimately extracted 50 pieces of data for each emotion for final processing.

We plan to observe whether OLLAMA, the chatbot, demonstrates empathy in its responses to our selected tweets with "ANXIOUS" and "DEPRESSED" emotion labels. During the data labeling process, each of our group members labeled an average of 40 pieces of data, and each piece of data was labeled by 2-3 people to reduce the bias rate of subjective judgment.

Additionally, we will use the EPITOME architecture to compute and evaluate the empathy level of chatbot responses. The EPITOME framework, through the use of Natural Language Processing (NLP) techniques in conjunction with the multi-task-learning RoBERTa model, is able to efficiently identify empathetic communication mechanisms in textual conversations and extract arguments in support of these exchanges The NLP technology, combined with the multi-task learning RoBERTa model, can effectively identify the mechanisms of empathetic communication in textual dialog and extract arguments in support of these communications. After processing the data, we will manually annotate each response into three categories: (1) no empathy: 0; (2) average empathy: 1; (3) high empathy: 2.

4. Script and Data Collection Procedure

(a) Greeting:

When communicating with the dataset authors, our greeting is as follows:
“Hello! I am a graduate student in Computer Science and Technology at the University of Auckland. We are currently conducting a study on empathy. I read your paper on the EMO-KNOW dataset and found the GitHub repository from it. I would like to use this dataset to complete our research, so I am here requesting access! Thank you so much for your help!”

This greeting not only respects the source of the data but also emphasizes the purpose of the research. Since our research data comes from an external dataset, explaining this directly to the authors helps demonstrate the legitimacy of the data use, ensures transparency of the research, and enables the authors to clearly understand where we are heading and how we are using the data.

To better demonstrate our research background and ensure the legitimate use of the data, we also attached the following personal and academic information: name, university information, supervisor information, and contact details (phone number and email address). This information shows that we are clear about our responsibilities, contributes to credibility, and facilitates smooth communication.

(b) Informed Consent:

In our group's experiment, the data used were all from the EMO-KNOW dataset. We have been in contact with the authors of the dataset via email and have received their express authorization to use the dataset for experimental research. As a result, the use of the data is already licensed and informed consent.

For the best participants in the experiment, we will ensure that their informed consent is obtained. Participants will receive a detailed informed consent form prior to the start of the experiment, including the purpose of the experiment, how data will be collected and used, participants' privacy measures, and their rights. Participants were given enough time to read and understand the informed consent form and could ask questions at any time. After confirming full understanding, the participant may indicate consent by means of an electronic signature or online confirmation. Participation in the experiment was voluntary, participants could withdraw at any time, and there were no adverse effects.

(c) Task Prompts:

Participants are shown scenarios related to negative emotions or anxiety, such as being misunderstood by others, overwhelming behaviour in certain scenarios, and so on. These scenarios are modelling real-life emotional states and these participants are encouraged to interact with the chatbot, similar to talking to a therapist or a friend. Examples of scenarios include: “I feel like no one understands me,” or “I’ve been feeling anxious about everything lately.”

After understanding each scenario, participants will respond in some way using a chatbot with the EPITMOE framework or a text-based standard interface. Also encouraged to express themselves freely and casually with extra prompts, like “Can you tell me more about what has been troubling you?” will be used to facilitate deeper conversations and capture meaningful interactions.

Once all scenarios have been completed, participants will be asked to evaluate their experience through a short survey that focuses on the chatbot's level of empathy and

support. This feedback will help assess the effectiveness of the EPITOME framework in enhancing empathetic communication.