

Rawal: A Reflection Assistant with Active Listening for Peer Support Chats

RYAN LOUIE, Northwestern University, USA

TAEWOOK KIM, Northwestern University, USA

ZHENHUI PENG, Sun Yat-sen University, China

People often chat with peers to discuss their challenging situations and receive support from them. These peer-support chats commonly happen online via text messaging. Reflection is key for a successful peer-support chat. Support seekers should reflect upon their concerns and goals, while providers should introspect on whether their dialog behaviors are appropriate during the chats. In this paper, we consider promoting the reflection of both groups in peer-support chats with just-in-time adaptive assistance for providers. After summarizing the design goals from the literature, we present Rawal, a technical prototype that extends the Slack messaging interface for assisting providers to 1) encourage seekers' reflections and 2) self-examine their enactment of active listening skills during the peer support conversation. We call for future work on how individual and social factors could impact the design and usage of reflection assistants like Rawal in peer-support chats.

Additional Key Words and Phrases: emotional support, peer support, self-reflection, real-time suggestion

1 INTRODUCTION

People commonly turn to their peers, such as friends and colleagues, to discuss their concerns regarding various subjects like research, family, and relationships. This is done in an effort to receive social support that includes emotional support or advice aimed at enhancing their overall well-being [4, 19]. In this study, we focus on the text-based peer-chat sessions that serve as a source of social support on messaging platforms.

For successful social support from peers in peer-chat sessions, both support seekers and providers need careful reflection during the peer-chat session. For one thing, seekers should reflect upon their problems, feelings, concerns, goals, etc. [16]. For another, providers should consider their choice of words to provide effective support [17]. In doing so, support providers can better shape their responses to facilitate seekers' reflection and promote positive cognitive change [3]. Support providers may refer to several therapeutical approaches (*e.g.*, active listening [20], problem solving [8]) for better shaping their responses during the peer-chat session. However, even when support providers receive prior training, such as guides on using active listening skills, they can struggle to effectively apply these skills during real chats [3].

Hence, we explore designing a just-in-time adaptive assistant for support providers to encourage seekers to reflect and self-examine their dialog behaviors during the peer-chat session in real-time. Our work is inspired by the effectiveness of adaptive writing support tools in online communities (*e.g.*, *MepsBot* for improving manifested social support in a depression forum [17]) and text messaging platforms (*e.g.*, *Lily* for promoting affective communication between couples in Slack [10]). However, previous adaptive writing support tools in the mental health context usually neither focus

Authors' addresses: Ryan Louie, Northwestern University, Evanston, IL, USA, ryanlouie2021@u.northwestern.edu; Taewook Kim, Northwestern University, Evanston, IL, USA, taewook@u.northwestern.edu; Zhenhui Peng, Sun Yat-sen University, Guangzhou, China, pengzh29@mail.sysu.edu.cn.

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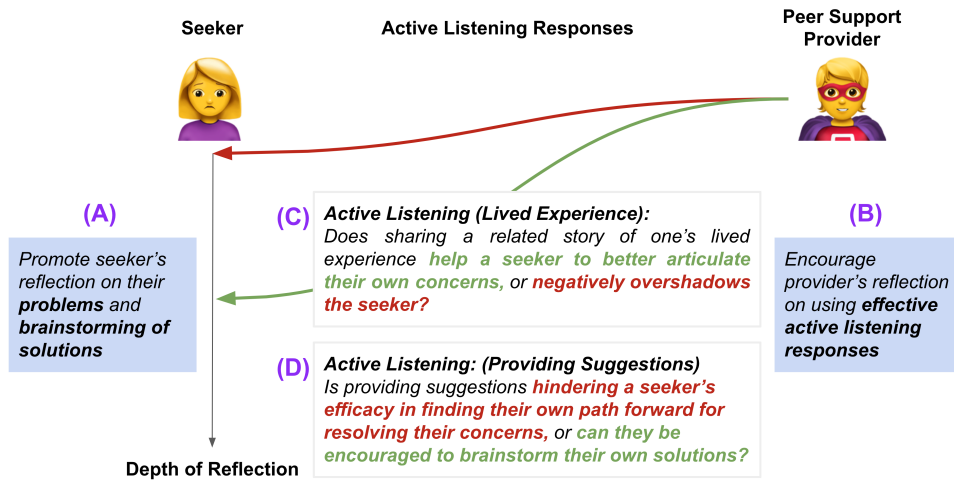


Fig. 1. The success of peer support chats depends on reflection from the seeker's and provider's perspectives. Seekers should use the chat to reflect deeper on their problems and potential solutions (A). While providers can promote this by using effective active listening responses, doing so is difficult. Thus, peer support providers need to reflect on how they improve their active listening responses (B) when they are *sharing their lived experience* (C) and *providing suggestions* (D).

on synchronous conversations with short messages nor offer adaptive guidance on applying therapeutical methods. O'Leary *et al.* designed guided peer support chats with fixed prompts on problem-solving skills and found it more effective for reducing seekers' anxiety compared to the unguided chats [16]. Nevertheless, they drive the chat sessions in a structured way, and the prompts could not adapt to the conversational context, which may not be applicable to the natural peer support chats where the members have flexibility in deciding how the chats should flow. Besides, they do not focus on promoting the reflections of the seekers and providers.

To this end, we propose *Rawal* (Reflection assistant with active listening), a prototype to navigate support providers' conversational behaviors during online peer-chat for social support. To promote support seekers' reflections, we choose a set of active listening skills (*e.g.*, sharing one's lived experience, providing suggestions) which when used correctly, promote a seeker's own reflection on their problems and brainstorming of solutions [20]. We first derive the design goals of *Rawal* from the literature on human-computer interaction and psychology. Then, we develop *Rawal* as a browser extension to the Slack messaging app interface. *Rawal* facilitates peer support providers to promote seekers' reflection on their problems and brainstorming of solutions, by improving their use of active listening skills (Fig.1). To assist providers' self-reflection on their dialog acts, we build text classifiers so providers recognize and reflect upon their effective use of active listening skills when drafting a response. In the end, we discuss how individual and social factors like culture and peer relationships could affect the usage of *Rawal* and call for future work to improve it.

2 DESIGN GOALS OF RAWAL

We outline four design goals of an adaptive writing assistant like *Rawal* for providers during peer support chats.

- **Promote Help Seeker's Reflection on their own Problems and Solutions (Fig. 1 A).** Peer support conversation should encourage seeker's own reflection on their problems and brainstorming of solutions. This

105 goal is based on psychotherapeutic frameworks like active listening [20], cognitive behavioral therapy [7], and
106 motivational interviewing [21], which advise the help-seeker or patient to better understand the root causes of
107 their concerns, and to find an optimistic path forward. Thus, our tool is designed to support providers responding
108 in conversation to encourage a seeker’s reflection on their own concerns and solutions, and discourages providers
109 from giving advice.
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- 111 • **Encourage Provider’s Reflection on Effective Active Listening Responses (Fig. 1 B).** Providers can
112 struggle to use active listening skills in their chat responses, which is important for the seeker’s deeper
113 reflection. Chen *et al.* found that providers are often unaware when they are dominating the conversation when
114 sharing their lived experience, or providing advice when it’s not appropriate [3]. To solve this, our goal is to
115 assist a provider’s reflection on how they are adopting effective active listening skills during the conversation,
116 specifically when sharing their lived experience (Fig 1C) and providing suggestions (Fig 1D).
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- 118 • **Assistance during the conversation (Fig 2).** Since our work seeks to assist peer support providers in their
119 reflection on active listening skills, we considered whether to provide this assistance pre-conversation, during-
120 conversation, or post-conversation. While assistance can be provided pre-conversation or post-conversation,
121 these types of assistance can have their limitations. Pre-conversation instructions like online psychotherapeutic
122 techniques training [9, 12, 15] (*e.g.*, cognitive reappraisal) usually require additional time and effort and could
123 suffer from a high attrition rate [1, 9]. Post-conversation interventions like flagging a bad dialog act by the
124 moderators or algorithms is a kind of delayed feedback that may impair providers’ confidence, interest, and
125 reputation [11, 14, 22]. Accounting for these limitations, our work instead focuses on assisting support providers
126 during the peer-support chat, with just-in-time reflections of their responses while they are writing them.
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- 128 • **Natural conversations, but with encouragement, awareness, and reflection.** Unlike other guided chat
129 tools which instruct pairs to follow a series of prompts [16], our tool should allow users to have flexibility
130 in deciding how the conversation should flow, while still providing just-in-time awareness and reflection on
131 how they are using specific psychotherapy skills. We anticipate this can help a wider variety of peer-support
132 text-based conversations that occur in a natural way.
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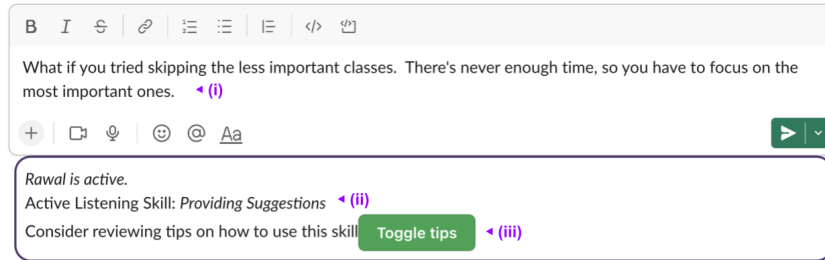
138 3 RAWAL SYSTEM DESIGN

139 Informed by these design goals, we developed Rawal (**R**eflection assistant **w**ith active **L**istening), a browser-extension
140 to the Slack messaging app interface for identifying the use of active listening skill and providing relevant tips on how
141 to use the skills. Rawal monitors a provider’s real-time text input (Fig.2a-i); classifies the likely active listening skill a
142 provider attempts to use with a machine learning model (Fig.2a-ii); encourages them to review tips on how to use the
143 skill (Fig.2a-iii); and provides tips to self-examine how they are effectively using the active listening skill (Fig.2b-v&vi).
144 We explain the details of the classifier training process in Section 3.1.
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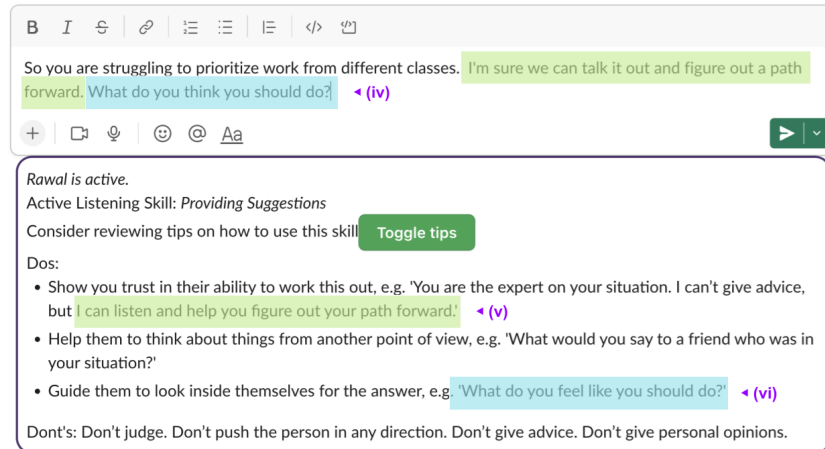
146 The tips Rawal uses come directly from the active listening training guide on the peer-support platform 7cups.com [5],
147 which every trained-listener reads through when starting on the site. Rawal exposes the tips only at the moment the
148 provider is drafting a response associated with the active listening skill. In this way, we argue that tips that would
149 have been hard to remember from a training guide, will be more easily accessible for providers through just-in-time
150 reflection.
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152 As an example scenario, imagine a seeker has shared their concern about struggling in the past week to prioritize all
153 the work they have in different classes. Fig.2a shows a provider responding to them by directly providing suggestions
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(a) As the support provider is drafting a response in their conversation (i), Rawal has identified they are using the "Providing Suggestions" skill (ii) and encourages the provider to review tips on how to effectively use the skill (iii).



(b) Upon pressing the button to toggle the tips view, the provider can reflect on how their dialogue behaviors follow the "dos" and "donts" for this skill. After reflecting, the provider has revised their response (iv) to encourage the seeker to self-introspect about a path forward on their own accord, rather than the provider directly giving advice. They improved their response via the tips about trusting in seekers' ability (v) and guiding seekers to look inside of themselves for the answer (vi).

Fig. 2. Rawal's augments Slack, an existing text-based message app, with AI capabilities for a provider to recognize and reflect upon their use of active listening skills when drafting a response in peer support conversations.

about what they could do about this problem. However, this type of dialogue response goes against the ethos of active listening where seekers should come to their own solutions. After using Rawal to reflect on their dialogue act, the provider revises their response to show they trust in the seeker's abilities to work problems out, and to guide them to brainstorm their own solution; see Fig.2b.

Rawal's system implementation works by processing what providers are typing, and sending the current draft response to a text classification microservice. If a classifier infers from their response that they are *Sharing their lived experience* or *Providing suggestions*, Rawal will display the predicted active listening skill and its associated tips.

3.1 Support Strategy Text Classifiers

Creating reflection assistants like Rawal requires AI-capabilities for inferring the support strategies being used by the support provider. To our knowledge, pretrained models for support strategies are not available through public research code repositories or APIs. Shah *et al.* did train models to classify 17 different support strategies, but their models are not publicly available [21]. Thus, we trained our own text classification models used by Rawal.

Our training data comes from a dataset collected by Liu *et al.* [13], consisting of 18376 dialogue acts across 1300 emotional support conversations. This dataset has labels for 7 different support skills. Two of them match the active listening skills we prompt users about, which include "Self-disclosure" (*e.g.*, sharing one's lived experience as it relates to what a help seeker shared) and "Providing Suggestions" (*e.g.*, giving advice based on the problems a person shared).

We trained a multi-label classifier for the 7 support strategies by fine-tuning a BERT model [6] to this dataset. For the "Self-disclosure" strategy, our classifier obtains a 0.55 precision score and 0.50 recall score on the training dataset; For the "Providing suggestions" strategy, our classifier obtains a 0.49 precision score and 0.66 recall score on the training dataset. While these numbers are far from the strong performance needed for a production system, our own testing of Rawal has given us confidence that the active listening skill identification is still usable for pilot testing of the system.

4 DISCUSSION AND CONCLUSION

To facilitate support providers to encourage seekers' reflections and self-examine their dialog acts during peer support chats, we propose an assistant prototype called Rawal, which augments the Slack messaging interface with AI-enabled identification and tips for active listening skills. In the future, we plan to first improve Rawal with feedback from domain experts and end-users via a formative study. Then, we are going to evaluate its user experience and effectiveness in enhancing support providers' self-reflection on their messages and seekers' reflections on their situations and goals. One key direction to improve Rawal would be taking into account the individual and social factors in its design. Below, we discuss the potential of how peers' culture and relationships would impact Rawal's design and usage.

Cultural background of the support seekers and providers could affect Rawal's classification performance and intervention design. Culture is the set of beliefs, values, practices, and norms that characterize a group or society. Pruksachatkun *et al.* investigated the cognitive change in online mental health forums and found that their text classification model trained on an Indian train set performs poorly on a non-Indian test set [18]. Chancellor *et al.* studied online weight loss communities and found that even two communities have similar linguistic patterns, their members have dramatically different behaviors around the seemingly common goal of weight loss [2]. These findings imply that to reach the full value of Rawal for peer support chats, we should develop its backend model using data that matches the peers' cultural background and tail its interaction design based on the peers' behavioral norms.

The relationship between the support seekers and providers could affect Rawal's user experience. People usually have varying conversation patterns when facing different chat partners. Yang *et al.* explored online cancer support groups and found that the peers' self-disclosure, reciprocity, and social support differ when they chat in public and private channels [23]. We suspect that whether and how well the peers know each other and whether they are in a romantic, school, or work relationship could influence how they perceived and use Rawal during the chats. For example, if the support provider knows the seeker well, he/she may converse in a more casual way with joys the seeker like. In this case, Rawal's prompts about using active listening skills could be a disturbance. In any case, the writing assistant should not force the providers to change their messages if they do not feel like doing so. Therefore, future work should evaluate how might peer relationships affect the usage of Rawal to better inform future peer support assistants.

In conclusion, we propose an adaptive writing assistant prototype for providers to promote both seekers' and providers' reflections during peer support chats. With this prototype, we sought to bring attention to better incorporating individual and social factors into the design of peer support assistants.

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