# Understanding Disclosure and Support for Youth Mental Health in Social Music Communities

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Online music platforms that include social networking features sometimes become supportive social communities where young people can disclose their emotional distress and receive support. However, few studies have examined young people's disclosure in social music communities or the support they provide or receive. In this study, which focuses on a large online music platform as a research site, we used mixed methods to analyze young users' comments (N = 163) and the associated replies (N = 2,732) related to their psychological distress (e.g., depression, anxiety, stress, and loneliness). We found that the main types of comments involved experience sharing, and these comments often invoked peer support in the form of encouragement, caring, or self-disclosure. We also conducted an interview study with 13 young users of our research site to understand their perceptions of and motives for engaging in disclosure and support. The interviewees stated that music-induced and comment-induced emotional resonance was the main reason for their disclosure and support. Finally, we discussed the implications of our findings for designing a supportive social music community to benefit youth mental health.

CCS Concepts: • **Applied computing** → *Consumer health*; • **Human-centered computing** → **Social networks**.

Additional Key Words and Phrases: online social support, social music community, youth mental well-being, self-disclosure, netease cloud music, music recommendations

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## 1 INTRODUCTION

Youth, the time between childhood and full adulthood (15–29 years), is a transitional phase. During this period, young people are commonly under considerable pressure as they must deal with the

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complex demands of their studies, relationships, and jobs [21, 81]. These critical life events place heavy demands on young people's emotional resilience and lead to an increased risk of mental health issues, such as depression and anxiety [90]. When dealing with stressful life events, young people often seek peer and family support in the form of encouragement or guidance [76, 81, 82]. In the digital era, social media platforms (e.g., Facebook and Twitter [20, 39, 86]) and online entertainment communities focusing on gaming [66] and music [13] have emerged as ways youth can seek social support to cope with psychological distress (e.g., depression, anxiety, stress, and loneliness).

Online music platforms that include social features (e.g., NetEase Cloud Music [NCM], QQ Music, and YouTube Music) have become increasingly popular [12, 35, 122]. For instance, NCM enables users to leave comments under songs and listen to live streams with friends or strangers. Such social networking capabilities have transformed this platform into a supportive social community, where young people can post comments to *disclose* their personal experiences (e.g., breakups or academic stress) and the associated emotions (e.g., sadness, worry, or disgust) [12, 64, 131]. In response, young people give *support* through "likes" and replies [17, 119, 131]. The gray block below shows an example of a music comment and reply from NCM. Additionally, music itself can be therapeutic, as it has been shown to reduce stress and anxiety and alleviate negative emotions [15, 65, 109]. Thus, we argue that social music communities (SMCs) that fuse music listening and social networking could be an ideal venue for youth to deal with psychological distress.

**Comment**: *"I will attend the high school entrance examination tomorrow. I need your encouragement because I am really stressed out!"*
**Reply**: *"Good luck, stranger. Believe in yourself, you can do it!"*

Song title: 海底 (Seabed)

Unlike online social communities that specialize in health and well-being [34, 68, 88, 130], SMCs are not designed as sources of health advice or professional knowledge. Nevertheless, on SMCs, young people connected by music are often willing to disclose their emotional experiences in their comments [17, 43]. Previous studies of SMCs have investigated users' comments about topics and the emotions they express [12, 17, 64, 131], and have shown that these comments cultivate emotional resonance, thereby enhancing users' emotional connection and immersion and satisfying their social needs [12, 64].

However, few studies have investigated what types of comments young people post in SMCs when they experience psychological distress. Little is also known about how young people respond to these comments to offer social support. Motivated by a previous study that examined mental health self-disclosure and social support on social media [24], we perform an in-depth investigation into comments related to young people's psychological distress in SMCs through a lens of disclosure and social support. We further aim to identify how young people perceive SMCs and why they engage in them for disclosure and support. These findings provide insights into disclosure and social support in music communities, which could inform the design of online music platforms to support youth mental well-being.

We thus address the following research questions:

**RQ1**: *What type of comments do young people post in SMCs to disclose their psychological distress?*
**RQ2**: *What type of social support do young people provide in response to comments in SMCs?*
**RQ3**: *What are young people's perceptions of and motives for disclosure and support in SMCs?*

To answer these questions, we collected and, using a mix of qualitative and quantitative methods, analyzed young users' comments (N = 163) from our research site about common types of

psychological distress (i.e., depression, anxiety, stress, and loneliness), and the associated replies (N = 2,732). Then, we conducted a semi-structured interview study (N = 13) to better understand young people's subjective perceptions of and their motives for disclosure and support on the site.

Through our in-depth qualitative analysis of users' comments and the corresponding replies, we identify six types of comments related to psychological distress (e.g., life opinion, help-seeking, and experience sharing) and nine types of social support in the replies (e.g., encouragement, caring, and acceptance). We also show that "experience sharing" is the most common type of comment disclosing psychological distress. Regarding each type of psychological distress, we uncover prominent support patterns; for example, we identify the most common support types ("caring" and "encouragement") in response to comments involving the "experience sharing" of *loneliness*. Third, based on semi-structured interviews, we incorporate first-person narratives in our analysis to offer a richer view of young people's perceptions of and motives for viewing, posting, and responding to comments related to their psychological distress, and compare divergent opinions on SMCs as an outlet for young people to disclose their feelings of distress. Finally, based on our findings, we present several design implications for integrating explicit support into SMCs to promote youth mental health, and discuss how our findings may be generalized to other online music platforms.

## 2 BACKGROUND AND RELATED WORK

We introduce several closely related psychological concepts, namely mental health and psychological distress [83]. In this section, we clarify how we adopt these concepts to define, operationalize, and interpret our key concepts.

Mental health, according to the World Health Organization (WHO), refers to *"a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community"*, and is *"more than the absence of mental disorder (e.g., anxiety disorders, psychotic disorder, and eating disorder)"* [76]. The WHO's definition is in line with the positive psychology perspective [52], which measures mental health on a continuum between "flourishing" (e.g., positive mood and good psychological and social functioning) and "languishing" (e.g., negative mood and impaired psychological and social functioning) in daily life [51, 84]. In this study, we follow the WHO's definition and consider mental health on a continuum from flourishing to languishing. The mental health problems or psychological distress (e.g., depression and anxiety) discussed in this study are indicative of languishing mental health rather than mental disorder (or mental illness) [52].

Psychological distress typically refers to *"a state of emotional suffering associated with stressors and demands that are difficult to cope with in daily life"* [5]. It can also be seen as a range of non-specific symptoms, such as depression, anxiety, and stress [115]; these may be reported by a user without necessarily being observed or diagnosed by a mental health professional. For example, if a user makes a music comment that contains the word "depression," this does not mean that they must have clinical depression; they have simply expressed a depressive mood. Loneliness is another type of distressing feeling about individual social needs and relationships [37]. Therefore, in this study, we treat psychological distress as the emotional suffering associated with depression, anxiety, stress, or loneliness.

### 2.1 Youth Mental Health

There is growing worldwide concern about the mental health and well-being of young people aged 15–29 years [50, 76, 81]. Most young people, who are known as "emerging adults" in developmental psychology [4], are under increased pressure as they experience life events such as taking college entrance exams, leaving home, adapting to university life, developing new relationships,

and looking for a desirable job [21]. Young people increasingly experience psychological distress (e.g., depression, anxiety, stress, and loneliness) [77] and struggle with the associated mental health issues [32, 59, 81]. During the COVID-19 pandemic, rates of youth mental illness rose steeply [113].

In their struggles, young people usually seek and receive support from peers and family, which can offer them a sense of belonging and yield useful advice [6, 81]. Young people also increasingly discuss their struggles and experiences on social media platforms, such as Facebook, Twitter, Instagram, and Weibo (the Chinese version of Twitter) [14, 20, 44], and in online entertainment communities, such as gaming communities [66] and music communities [13]. Previous studies have shown that these online communities can offer young people social support to cope with their psychological distress [31, 118]; for example, young people can receive guidance and suggestions on social media platforms to address the problems they face [31] and gain a sense of companionship from others who like or comment on their posts [118].

In addition to seeking in-person and online social support, various strategies, such as listening to music, doing exercise, and sleeping, are commonly used by young people to reduce tension and maintain good mental health [61, 114]. It is well known that listening to music has positive effects on mental well-being: it helps with relaxation, elevates mood and motivations [36], and reduces depression [15], anxiety [109], stress [65], and loneliness [99]. As previous research has shown [65, 79, 92, 99], music is a common and effective tool with which young people can regulate their emotions and reduce their psychological distress.

### 2.2 Social Support in Online Communities

Among the various types of online social support identified by previous studies [16, 24, 73, 74, 124], *emotional support* and *informational support* have attracted the most theoretical and empirical attention. Emotional support (e.g., caring, acceptance, intimacy, and empathy) can give individuals a sense of being respected, which strengthens community ties and engagement [125, 130]. In contrast, informational support refers to providing suggestions or sharing knowledge to help individuals cope with problems; this meets temporary information needs but has limited influence on individuals' engagement [125]. In this study, our investigation of social support types relies on the concepts of emotional and informational support, as defined in an influential conceptual model of social support [57].

Researchers have studied online social support in a variety of online communities, including those catering to unemployed people [30], pregnant and postpartum women [23, 34], overweight adults [111], sexual abuse victims [2], and cancer patients [130]. Most online community studies focus on social support for serious health issues, such as pregnancy, obesity, and cancer. These community members actively seek or provide support for specific purposes, such as acquiring medical knowledge [130] and asking for directions and advice [34]. Members who have received social support from an online community are more likely to reach their health goals (e.g., weight loss [111]) and improve their health [34, 41, 63, 74, 91, 130].

Additionally, several studies have investigated social support in online communities dedicated to youth mental well-being. Horgan and Sweeney [39] found that 68% of young students surveyed were willing to use the Internet to obtain mental health support, primarily to deal with depression. Prescott et al. [88] studied young people's use of an online mental well-being community (kooth.com) and found that they felt more connected with others when asking questions or sharing advice with peers. Youth also claimed that online friendship and mentorship were essential to their perceptions of social support [86]. For young people with weak social connections, online social support may also complement in-person support [20]. Nevertheless, several studies have also shown that young people feel uncomfortable seeking social support from their online social network [25], probably due to privacy and boundary regulation in the community [118].

### 2.3 Social Music Communities

In recent years, online music platforms such as NCM, QQ Music, and YouTube Music have embedded social features (e.g., sharing music with friends [116], posting comments under songs, and watching live concerts [12, 64]), thus enabling users to use music as a means of connecting with both friends and strangers. By integrating music and social features, online music platforms create a community where young people can identify people who share similar musical tastes and interact with them through comments and likes. Previous studies of SMCs [12, 64, 131] have shown that young people frequently share negative feelings (e.g., depression and anxiety), disclose unpleasant experiences (e.g., breakups and isolation), and discuss their campus activities (e.g., examinations). They have also demonstrated that this form of social communication facilitates young people's emotional connection and interaction and gives them a feeling of connectedness [12], which are essential to youth mental well-being [76]. Another study analyzed comments on music based on the theory of use and gratification. It revealed that SMCs satisfy the needs of young people, including their needs for information, entertainment, and social contact, and thus confer psychological benefits [64]. These findings suggest that SMCs that combine music listening and social communication may serve as a venue for young people to reduce their psychological distress and restore their mental health.

Unlike many online communities dedicated to mental well-being, SMCs were initially created to enhance communication between musicians and listeners [12] instead of communicating negative feelings and experiences. Although young people are willing to share their struggles and negative feelings in these communities, few studies have investigated the content they disclose when experiencing psychological distress and the support they may provide in such communities. Thus, we aim to fill this gap by exploring the design space of supportive SMCs that benefit youth mental well-being.

## 3 METHODOLOGY

### 3.1 Research Site

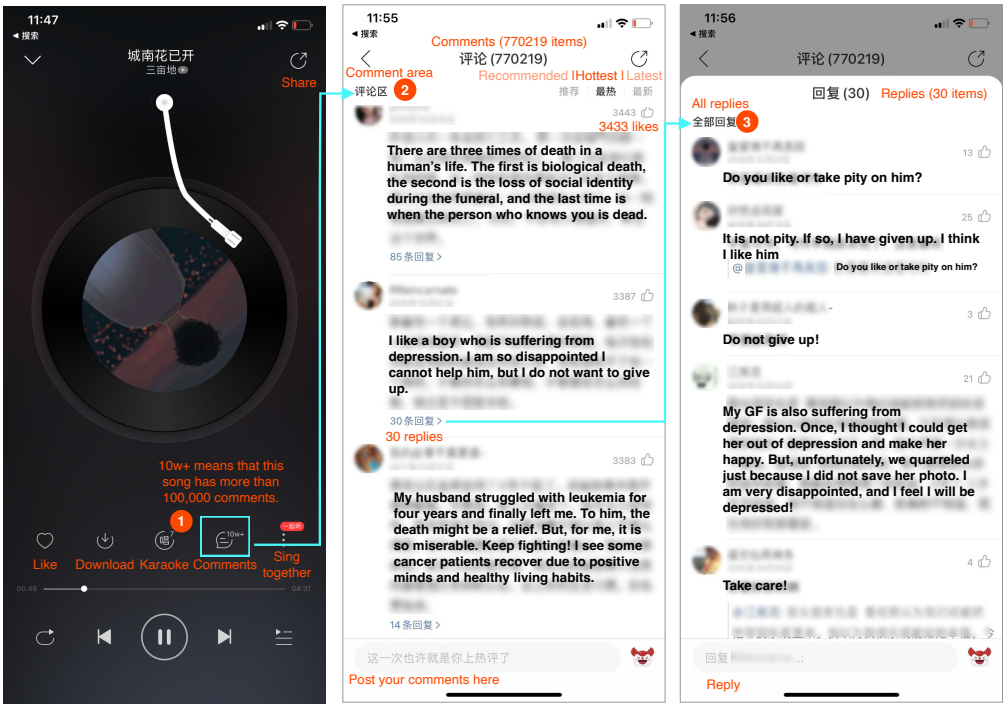
Launched in 2013, NCM[1] is one of the most popular online music platforms, with 181 million monthly active users, 90% of whom are under 29 years old, and 60% of whom are from the post-00s generation (born after 2000).[2] In 2020, NCM generated USD761 million in revenue.[3] We chose NCM as our research site for two reasons. *First*, it has become the most popular SMC among young people aged 15–29 years in China, a place where they express themselves to relieve their study and work pressures. *Second*, it is becoming a supportive community where young people can support each other with likes and replies, demonstrating empathy and encouragement.

Figure 1 shows three screenshots of the NCM mobile app. The music play interface (Figure 1a) shows an icon for viewing the comments for the song currently playing, where the number beside the icon indicates the number of comments. By clicking on the Comments icon, users can view all comments (Figure 1b) and the corresponding replies (Figure 1c).

### 3.2 Research Methods

We used a mix of qualitative and quantitative methods to analyze the 163 users' comments and the 2,732 associated replies on NCM (see Section 3.2.1) and identify prominent comment types and topics and social support types. Additionally, we conducted semi-structured interviews (N=13) to understand young people's perceptions of and motives for viewing, posting, and responding to

[1] https://music.163.com/
[2] https://www.codetd.com/en/article/12626854
[3] https://www.protocol.com/china/netease-cloud-music-ipo




(a) Music play interface (b) Music comments (c) Replies of music comments

Fig. 1. User interface of NetEase Cloud Music (NCM): (a) music play interface, ①: users can view the comments on the song; (b) music comments, ②: the page shows all of the comments, which can be sorted by recommendation score, popularity, and post time; (c) replies to comments: ③: the page lists all replies to the selected comments.

comments related to psychological distress. The samples used for both comment analysis and user interviews represent the mainstream of NCM. The authors' university's research ethics committee (REC) approved this study. To prevent the comments from being re-identified during data analysis, following Bruckman's [10] medium level of disguise, we did not disclose the usernames or user IDs in this research. In addition, in this paper, we paraphrase quotes from users to protect their privacy.

*3.2.1 Comment Analysis.* The emotions conveyed in music can induce corresponding emotions in listeners [49, 54]. Thus, we selected songs based on the emotion tags provided by NCM. Among the available tags, we think some (e.g., "sentimental," "lonely," and "healing") are likely to evoke users' disclosure of "languishing" mental health. For example, the "sentimental" tag represents "exaggerated and self-indulgent feelings of tenderness, sadness, or nostalgia" [96]. We collected and filtered users' comments and replies by following the procedure depicted in Figure 2. The number of comments reflects how much social interaction a song stimulates among listeners. Targeting songs with a larger volume of comments can help us identify social support patterns based on rich social interaction data. Therefore, we first identified the top five songs (Table 1), in terms of the number of *hot comments* (those receiving the most likes and replies), from the 9,514 songs on the top-recommended playlists with the emotion tags of interest. These top-recommended playlists were determined based on play counts. For the five songs, we scraped 2,560,328 records (comments

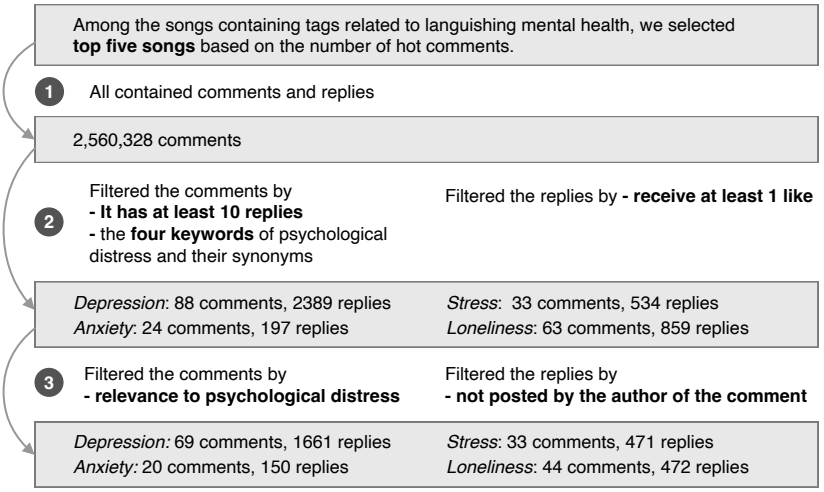



Fig. 2. The procedure of data collection for comment analysis.

Table 1. Statistics of Comments and Replies in the Top Five Songs

| Title | #Hot comments | #Comments | #Replies to all comments | #Replied comments | #Replies in a comment (max) |
|---|---|---|---|---|---|
| 撒野 (Run Wild) | 965 | 316,996 | 289,411 | 41,823 | 2,448 |
| 水星记 (Mercury Records) | 668 | 493,940 | 199,634 | 36,804 | 3,428 |
| 海底 (Seabed) | 574 | 147,562 | 239,020 | 29,234 | 3,450 |
| The truth that you leave | 492 | 490,135 | 110,241 | 15,881 | 7,761 |
| 城南花已开 (Flowers in the south of the city are in bloom) | 491 | 143,755 | 159,283 | 29,744 | 820 |

and replies) posted up to May 27, 2021. Referring to prior work that analyzed a large volume of social media data [3, 28, 30] by sampling or selecting the top posts sorted by the number of likes [28] or comments [30], we searched for comments from the scraped items using the keywords "depression," "anxiety," "stress," and "loneliness," and their synonyms. We chose these four keywords based on the common forms of psychological distress experienced by young people [1, 71, 113]. Moreover, we excluded comments that had fewer than ten replies and replies that did not get any likes. After filtering, we kept 208 comments and 3,979 replies. Although some comments were matched by the keywords and their synonyms, as identified based on the Chinese Term Embedding Corpus,[4] they could be jokes that are not relevant to mental health—for example, *"The word 'loneliness' is so lonely because it has no antonym, haha!"* In addition, some replies were questions asked by the comment authors—for example, *"What was the book you mentioned?"*. Such comments are irrelevant to supportive replies. After manual filtering, the final result contained 163 comments and 2,732 replies.[5] The average number of replies for each comment was 16.90 (SD = 49.30).

Our comment analysis attempted to identify the types and topics of comments and the support types exhibited in the associated replies. We followed the open coding process [40] to identify the

[4] https://ai.tencent.com/ailab/nlp/en/download.html

[5] The sum of the number of comments and replies for each psychological distress type was 166 and 2,754 because some comments contained multiple psychological distress keywords.

topics and types of comments. We used the deductive coding approach [29] to develop a codebook for social support types, which was mainly based on the conceptual model of social support [57] and the online social support scale [73] developed by Langford et al. We also incorporated additional codes based on the specific social support types investigated by other studies, such as humor [70] and empathy [112].

Before we analyzed the data, it was skimmed by two coders to get a sense of what kind of comments and replies the NCM users posted concerning psychological distress. After that, two coders randomly selected 60 replies for each of the four types of psychological distress and 95 comments associated with all of these types. They independently coded them to identify six comment types and 13 support types. Based on the initial coding schema, we discussed discrepancies in coding and addressed all disagreements. Moreover, another two coders independently coded the same number of randomly picked replies and the associated comments and did not find any newly emergent comment or support type. Furthermore, the two coders who conducted the second round of coding finished coding the rest of the comments and replies. Eventually, we achieved a substantial inter-rater reliability[6] as measured by unweighted Cohen's Kappa scores (0.74 for the comment types and 0.78 for the social support types in replies).

Because we found a large number of social support types and some shared a very similar concept, we then discussed, refined, and consolidated the support type codes. Consequently, we combined "mutual encouragement," "self-encouragement," and "encouragement" because they can be seen as different forms of encouragement. We also consolidated "comforting," "blessing," and "caring." The Merriam-Webster dictionary defines "caring" as "displaying kindness and concern for others." In a sense, "comforting" is more like showing kindness, and "blessing" is associated with expressing concern for someone. We show the final results of our comment analysis in the next section 4.

*3.2.2 Interviews.* Our analysis of users' comments identified the comment types and topics, and different social support types. However, it only captured a narrow view of youths' disclosure and support behavior in SMCs, and did not reveal the reasons behind the behavior (e.g., posting comments concerning their psychological distress). To provide a richer view of young people's subjective perceptions and their motives in using NCM for disclosure and support, we conducted semi-structured interviews with 13 NCM users to collect first-hand data. We used offline and online strategies to recruit participants at the university. We posted a description of our interview project and a pre-interview questionnaire on various WeChat (a Chinese social media platform) student groups, in classes, and through in-person word-of-mouth to collect information on potential interviewees. In our pre-interview questionnaire, we asked the participants about their demographic information, study major, and previous experience with using NCM (i.e.,"*How long have you used NCM?*" and "*How often do you use NCM?*") and its comment function (i.e., "*Have you left comments on NCM?*"). Based on their responses, we selected 25 students who had been using NCM for more than three years and had experience with posting comments on the platform. Finally, we sent interview invitation e-mails to these potential participants, of whom 13 responded and were interviewed (see Table 2 for the demographics of our interviewees).

We conducted individual interviews face-to-face in Chinese to facilitate communication; the interviews were typically about one hour long. During the interviews, the interviewees were asked to describe their experiences of viewing, posting, and responding to comments when listening to music on NCM (e.g., "*Could you please tell me under what circumstances you would go to the comments section to view comments under the song?*" and "*Could you please tell me under what circumstances you would post comments?*"). They were also asked to reflect on their motives for posting comments on NCM (e.g., "*Could you please tell me why you posted comments?*") and their

[6]Slight: 0.0–0.2; Fair: 0.21–0.4; Moderate: 0.41–0.6; Substantial: 0.61–0.8; Almost Perfect: 0.81–1 [56]

Table 2. Demographics of Interviewees in Our Study

| No. | Age | Gender | Major of Study | Study Degree | Experience of Using NCM | Frequency of Using NCM |
|---|---|---|---|---|---|---|
| P1 | 23-26 | Male | Data Analytics and AI | Master student | 3 - 5 years | Everyday use |
| P2 | 23-26 | Male | IT Mgmt | Master student | 3 - 5 years | 3 - 5 times per week |
| P3 | 18-22 | Female | Business Mgmt | Master student | > 5 years | Everyday use |
| P4 | 18-22 | Female | Business Mgmt | Master student | 3 - 5 years | Everyday use |
| P5 | 23-26 | Female | Communication | Master student | 3 - 5 years | Everyday use |
| P6 | 23-26 | Female | Applied Economics | Master student | > 5 years | Everyday use |
| P7 | 18-22 | Male | IT Mgmt | Master student | > 5 years | 3 - 5 times per week |
| P8 | 23-26 | Male | Personal Health Mgmt | Master student | > 5 years | Everyday use |
| P9 | 23-26 | Female | Personal Health Mgmt | Master student | 3 - 5 years | Everyday use |
| P10 | 18-22 | Female | Analytical Chemistry | Master student | > 5 years | Everyday use |
| P11 | 23-26 | Male | Arts | Master student | > 5 years | Everyday use |
| P12 | 18-22 | Male | IT Mgmt | Master student | 3 - 5 years | Everyday use |
| P13 | 23-26 | Male | Computer Science | Research Assistant | > 5 years | Once per week |

reasons for posting responses (e.g., "*What kind of comments did you usually respond to?*" and "*How did you usually respond to those comments expressing negative feelings? And why?*"). Finally, they were asked about the impacts of comments concerning negative feelings on their own emotions (e.g., "*How do you think NCM comments would affect your emotions?*"). During the interview, they were allowed to view their posts and comments on NCM, which helped the interviewees recall past events. We also prepared some sample comments and replies extracted from NCM to facilitate the discussion when the interviewees had less experience viewing and posting comments; these were only used in two interviews. After completing each interview, we compensated each interviewee with a supermarket coupon worth HKD200 (about USD25.48).

All of the interviews were audio-recorded and transcribed. We analyzed the transcripts with MAXQDA,[7] a tool for qualitative data analysis, using an interactive inductive process based on grounded theory [11, 22]. Two researchers first independently coded a subset (N = 4) of the 13 transcripts using an open coding technique (i.e., in-vivo coding in our analysis [98]), and together discussed the coded transcripts to develop a shared understanding of the coding schemes, with the support of MAXQDA's Creative Coding feature (which can be used to organize codes to show their structure). One researcher then coded all of the remaining interview transcripts. After the initial coding, we collaboratively conducted axial coding to merge and group the individual codes into categories, to gain insights into the central phenomenon, causal conditions, contexts, strategies, and consequences [117]. Based on these results, we then performed theoretical coding to develop themes related to our research questions. We performed the qualitative analysis in Chinese. Finally, we translated quotations from the interviews and reported our results in English (see Section 5).

## 4 FINDINGS FROM COMMENT ANALYSIS

As an approach to answering our research questions, this section presents the results of our investigation into 1) the general topics and types of comments youths post to disclose psychological distress (RQ1) and 2) the types of social support youths receive from their peers (RQ2). The average age of the users who posted the comments and replies in our sample was 18.52 (SD = 4.62), which means the following findings concern young people (aged between 15 and 29 years).

[7] https://www.maxqda.com/

### 4.1 Types of Comments Disclosing Psychological Distress

In our analysis, we use "comment type" to refer to the way an individual discloses their mental health. For example, "experience sharing" refers to comments that explicitly describe personal experiences and the associated emotions. In total, we identified six comment types ("opinion about life" (15.34%), "help-seeking" (12.88%), "anecdote" (3.68%), "experience sharing" (77.91%), "story behind the music" (2.45%), and "wishes" (5.52%)). The number in parentheses after each comment type is the percentage of the comment type for all comments regardless of the type of psychological distress.[8] Table 3 provides an explanation and example for each comment type.

Table 3. Types of Music Comments Related to Psychological Distress

| Comment Type | Explanation and Example |
|---|---|
| **Opinion about life** | Express the general feelings and thoughts about human life.<br><br>*"After reading many comments, to be honest, I really feel that many people are so negative. Everyone is born to die. Maybe you think what I said is easy. If you are always worrying about whether you will die tomorrow. You will spend your short life in worry, fear, and **anxiety**. Is it really worth it? Is this the life that a person should have?"* |
| **Help-seeking** | Seek help to address the problems the poster encounters in their lives.<br><br>*"Seeing so many injured children here, what should I do? I am so panicky. After I learned that my son was diagnosed with severe **depression**, I regretted that I knew it so late and put unknown pressure on him! Please help me make a remedy to make my child better Now when I see the children walking around the school, I really hope that my child can be like them, but I don't know how to help him."* |
| **Anecdote** | Tell a short story about a person or thing, which is not necessarily related to the poster.<br><br>*Doctor: "He has too much **stress**!" Parents: "He is just a teenager. How can he have stress?" Doctor: "Your child may suffer from **depression**." Parents: "No way, he has such a good life and does not suffer!"* |
| **Experience sharing** | Describe the poster's personal experiences and the associated emotions.<br><br>*"March is coming. It has been two years since I was diagnosed as severely **depressed**. I was treated in the hospital where I took medicine and injections alone every day. When I was free, I smoked in a garden and then went back to the ward. It was a very tough period. After that, I decided to leave the hospital and went back home. But recently, I feel I cannot control myself. I cry every night, shrinking in bed, my whole body is trembling and tired. I want to end it all."* |
| **Story behind music** | Show a story about songwriting, and discuss lyrics, films, or literature related to the music.<br><br>*"Actually, I didn't finish reading the book Run wild, which makes me feel very **depressed**. I couldn't breathe. This kind of pressure and hope are not what I have at my age. I admire that. they support each other. They still have each other's company and hope no matter how tired and difficult they are. Just follow the light!"* (The theme song for the novel: *Run wild.*) |
| **Wish** | Make a wish or pray for some good things.<br><br>*"I hope someone can understand your sorrow and the cautiousness behind your anxiety. I hope someone will hold you in his hand, eager to comfort you and dispel your **loneliness**. Don't be disappointed in yourself, Let's keep waiting."* |

[8] As each comment may contain one or several comment types, we calculated the percentage of comment type by dividing the number of comments containing a particular type by the number of all comments with respect to each psychological distress type. Hence, for each distress type, the sum of the percentages of all comment types may exceed 100%.

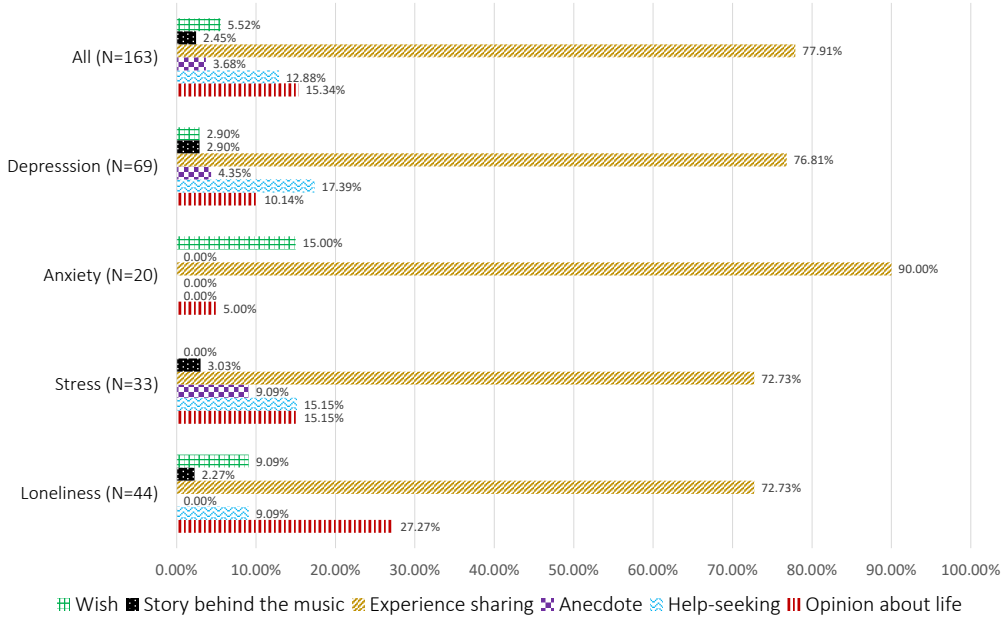



Fig. 3. The percentages of comment types for each psychological distress.

Figure 3 presents the percentage of comment types for each type of psychological distress. Overall, "experience sharing" accounted for the largest proportion (between 72.73% and 90.00%) of comments among the four psychological distress types. For instance, the example of "experience sharing" in Table 3 describes one person sharing their personal experience of struggling with depression. A recent study also pointed out the phenomenon of the increased sharing of negative experiences through users' comments on SMCs [17]. The explanation of this phenomenon may be that people suffering from psychological distress are more likely to perceive online platforms as a safe place to disclose negative emotions and relieve their stress [67]. The comments on "depression," "stress," and "loneliness" featured a similar distribution of comment types. For example, "help-seeking" and "opinion about life" were the two major types after "experience sharing." However, there was no "opinion about life" comments in the "anxiety" category. Thus, although the percentages of comment types differed slightly among the four psychological distress types, users were more willing to share their personal experiences and emotions related to corresponding psychological distress in their comments.

### 4.2 Types of Social Support Exhibited in Replies

Users' disclosure of their psychological distress in their comments elicited support from their peers. The replies fell into two categories of social support [73, 103]: *emotional support* (e.g., encouragement, empathy, and caring) and *informational support* (e.g., suggestions). The replies that contained discursive content (e.g., jokes, poems, and sarcasm) were categorized as "Other" (N = 830), accounting for 30.38% of all analyzed replies. We excluded replies categorized as "Other" when coding the support types of replies. We did not observe any offensive reactions (e.g., bullying and abuse) toward the comments or others' replies.

Table 4. Types of Social Support in Replies to Users' Comments

| Social Support Type | Definition and Example | #Likes Mean (SD) |
|---|---|---|
| **Emotional Support (ES)** | | |
| **Encouragement [25]** | Encourage someone to gain confidence and hope in life.<br><br>*"Don't be mourned. People always say that life is not worth living, but after experiencing setbacks and looking back, you will find that there are always some little things that make you feel that life is worth living! Cheer up, brother, there will always be someone who supports you!"* | 5.20 (19.47) |
| **Reassurance [112]** | Confirm the point of view expressed in the comments and make the poster feel less worried.<br><br>*"Take it easy, the college entrance examination are simpler than the usual examinations... Don't worry about it too much. I always think that you are the only person that can determine your destiny."* | 6.08 (23.36) |
| **Caring [73]** | Express concerns on the poster's situation, or comfort the poster.<br><br>*"Have you been recovered? Cheer up! Chongqing hot pot is very delicious. It will be my treat if you come to visit Chongqing..."* | 4.19 (15.37) |
| **Acceptance [73]** | Accept or acknowledge the comment.<br><br>*"You must be a nice, sensible, and considerate person. It will definitely be tiring to bear all things by yourself, so let's carry it together..."* | 5.32 (17.85) |
| **Self-disclosure [126]** | Reveal personal or private experiences and sufferings to other people.<br><br>*"...Two years ago, I was very timid and didn't dare to ask the question. I was afraid that my parents would be disappointed..."* | 5.99 (15.97) |
| **Companion [73]** | Express the willingness to be a companion.<br><br>*"We will stay with you!"* | 2.33 (3.52) |
| **Empathy [112]** | Understand and share someone's feelings or experiences.<br><br>*"Dear, I want to give you a hug. I know how difficult you are, but promise me, do not give it up, okay? ..."* | 3.81 (5.22) |
| **Humor** [70] | Tell something that can make people amused.<br><br>*"Don't feel sad about that nobody ever texts you. Maybe just because your cellular data has been used up!"* | 12.69 (51.41) |
| **Informational Support [IS]** | | |
| **Suggestion [16]** | Provide information that might be helpful to the poster.<br><br>*"It is important to make him feel that he is not alone, the world has not treated him badly, someone loves him, and he is also very important to his family and friends. This is my personal experience of fighting depression during the past two years. He will get out when he overcomes his mental block and feels love and warmth."* | 8.67 (65.83) |

Table 4 presents definitions for each social support type, examples, and the number of likes. We identified eight emotional support types, namely encouragement (34.49%), reassurance (6.05%), caring (20.82%), acceptance (8.46%), self-disclosure (23.97%), companionship (2.05%), empathy (4.47%),

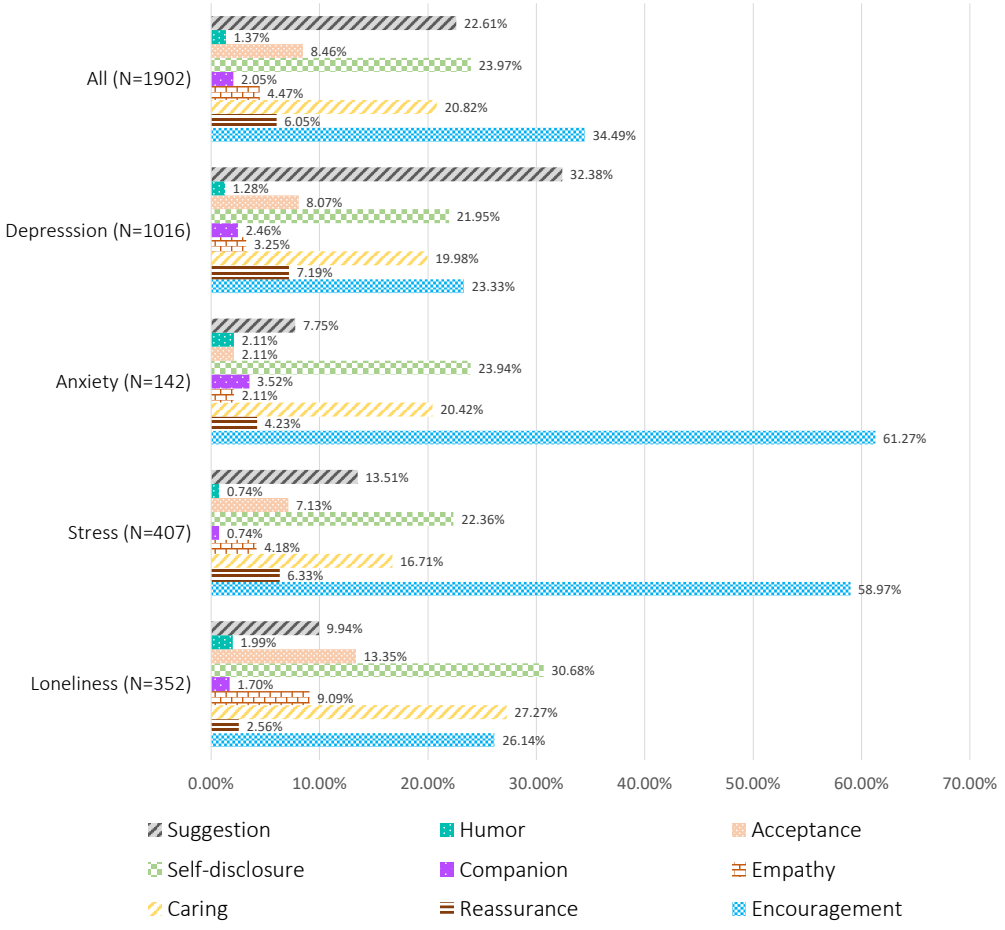



Fig. 4. The distribution of social support types in replies for each psychological distress type.

and humor (1.37%), and one informational support type, namely suggestion (22.61%), among the supportive replies. The number in parentheses after each support type is the percentage for all replies regardless of psychological distress type. The results indicate that the three primary types of social support in users' replies were "encouragement," "self-disclosure," and "suggestion," suggesting young people's supportiveness on NCM. In such SMCs, young people were willing to offer support by giving peers encouragement to achieve their goals (e.g., better academic performance), disclosing their personal experiences to get more emotionally intimate with others, and providing suggestions to help with specific problems. Moreover, some young people also provided support by showing "caring," "acceptance," "reassurance," and "empathy," which are also commonly used to comfort people in psychological distress [58, 73]. Additionally, despite representing only a small percentage of replies (1.37%), "humor" received the most likes (Mean = 12.69, SD = 51.41), which probably reflects its positive effects on youth mental well-being [70].

Considering the distinctions among the four psychological distress types [78], we further analyzed the pattern of social support by looking at the distribution of social support types in response

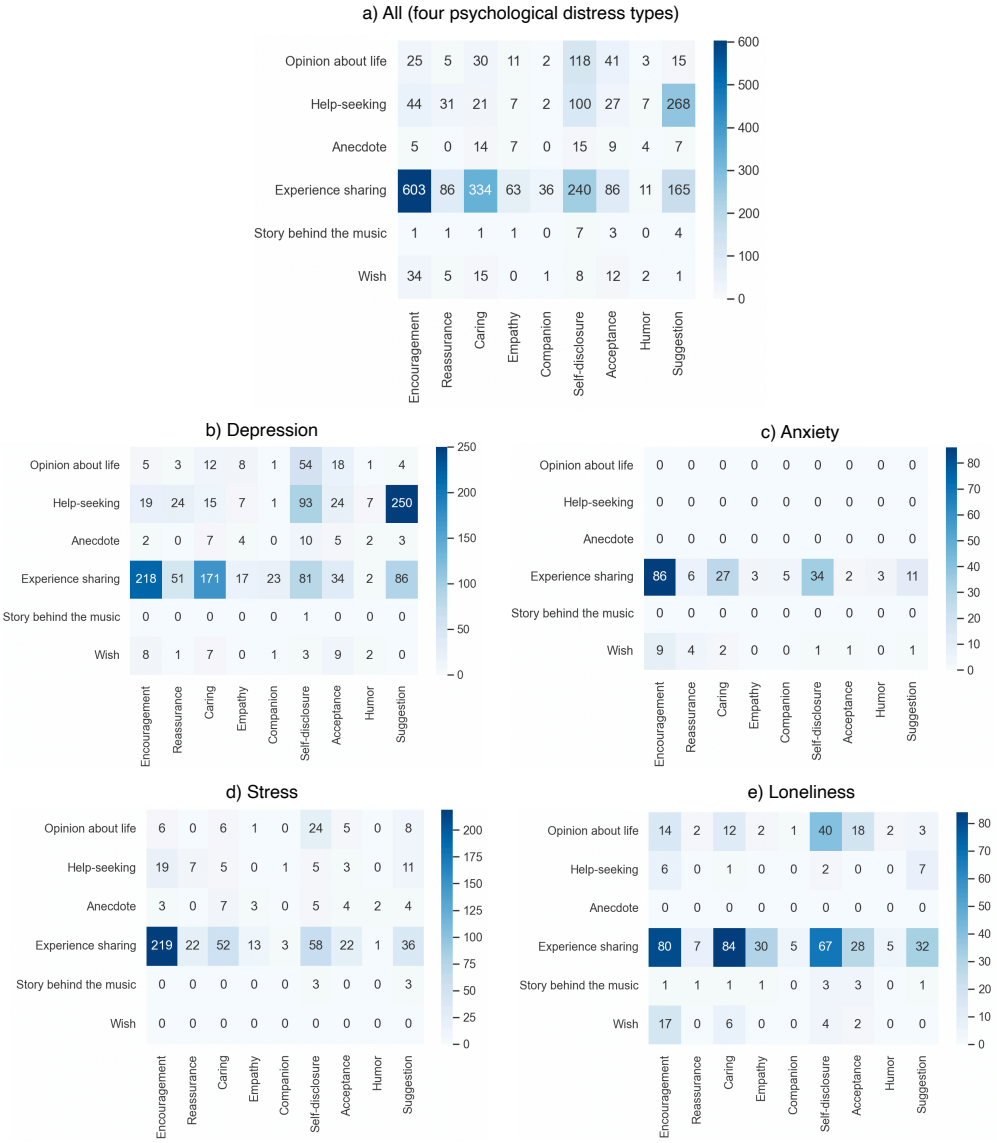



Fig. 5. Relationships between comment types and social support types. The color saturation indicates the frequency with which the relationship appears among all pairs of comments and replies.

to each psychological distress type (see Figure 4).[9] "Encouragement" was the dominant support type for *anxiety* and *stress*, whereas "suggestion" and "self-disclosure" made up the largest proportion of social support types for *depression* and *loneliness*, respectively. The high proportion of "suggestion" in depression replies echoes the findings of prior work that "suggestion" is a commonly

[9]Similar to comment type, each reply may involve one or more support types. We calculated the percentage of each support type by dividing the number of replies that contained a particular type by the total number of replies with respect to each psychological distress type. Hence, for each distress type, the sum of the percentages of all support types may exceed 100%.

adopted informational support for depression [129]. In response to comments that expressed loneliness, the support type "self-disclosure" occurred most frequently, probably because the respondents attempted to increase their emotional intimacy with the commenters to reduce their feelings of loneliness [87].

Moreover, we found that 26.13% of the replies (N = 497) showed multiple social support types; for instance, the example for "suggestion" in Table 4 expressed two social support types, "suggestion" and "self-disclosure." From our additional analysis of the co-occurrence of the eight social support types, we found that for "encouragement"—the most common social support type in all replies regardless of psychological distress type (34.49%, N = 656)—42.68% of these replies (N = 280) indicated "encouragement" and another support type simultaneously. "Encouragement & caring" (32.50%, N = 91) and "encouragement & suggestion" (19.29%, N = 54) were the pairs that most frequently occurred, suggesting that many young people expressed kindness and disclosed their experiences to enhance their connections in addition to simply giving encouragement.

Furthermore, we analyzed the relationship between comment types and social support types for each psychological distress type (Figure 5); that is, we explored which type of social support was most frequently provided to each specific comment type. The majority of replies were made to "experience sharing" comments regardless of the psychological distress type, which may imply that "experience sharing" tends to motivate users to provide social support to others [60]. The most common social support types for "experience sharing" were "encouragement," "caring," and "self-disclosure," which echoes the effect of self-disclosure in increasing closeness among young people [80, 104]. The comments containing "opinion about life" often received replies belonging to "self-disclosure," and the comments containing "anecdote" tended to invoke "caring" and "self-disclosure." Additionally, most "help-seeking" comments received replies from posters who provided suggestions for dealing with mental health problems (e.g., anxiety and depression). As shown in Figure 5b, the combination of "help-seeking" and "suggestion" was a prominent pattern. We found that a considerable number of users sought advice for their depressive mood or diagnosed depression, and more than half of the replies (56.82%, N = 250) belonged to "suggestion." As a type of informational support, the suggestion is particularly useful for those who suffer from mental health issues [129]. NCM users seldom replied to comments about "story behind the music" and "wishes," probably because these comments showed a low level of psychological distress and thus invoked less support. Overall, the combination of "encouragement" and "experience sharing" was a dominant support pattern, although we also found some unique patterns associated with specific psychological distress types: for example, "suggestion" and "help-seeking" for depression (Figure 5b) and "self-disclosure" and "opinion about life" for loneliness (Figure 5e).

## 5 FINDINGS FROM INTERVIEWS

Our analyses of user comments on NCM revealed the types of comments young people post to disclose their psychological distress and the types of support they provide in SMCs. We further conducted *in-depth interviews* to place user experience at the center and analyzed their first-person narratives, aiming to offer a richer view of young people's perceptions of and motives for disclosure and support in SMCs (e.g., why people post comments about their psychological distress in the song comment section) (RQ3). In this section, we describe the major themes (as illustrated in Figure 6) that emerged from our qualitative analysis of our interviews with 13 university students (see Section 3.2.2).

### 5.1 The Role of Social Music Communities

*NCM is regarded as a supportive platform for emotional release; it is a venue used to relieve psychological distress.* As mentioned earlier, increasingly many young people disclose their psychological

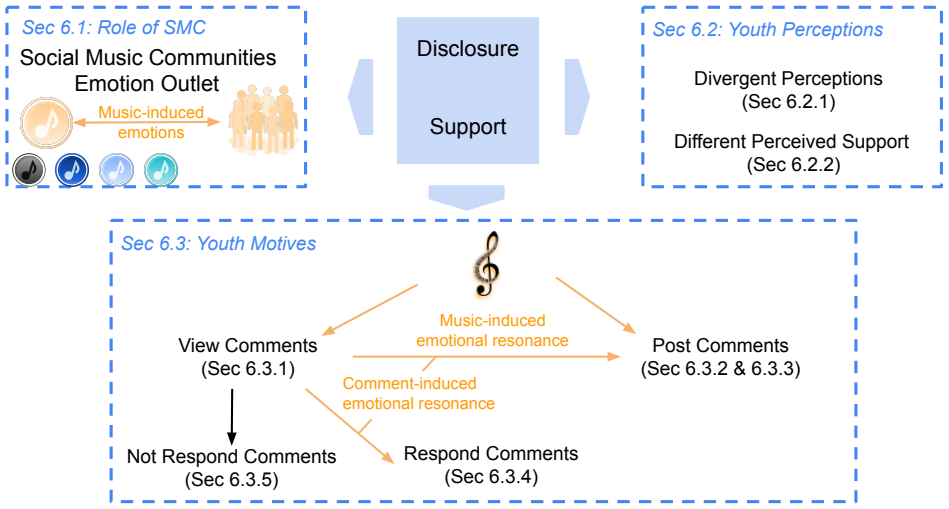



Fig. 6. A summary of major findings from our interview data.

distress on NCM, and the comments section has become flooded with their feelings of distress and emotional experiences. The majority of our interviewees (10/13) indicated that this platform is an excellent venue for young people to express their negative emotions and daily struggles, because they can both listen to music to obtain relief and have social interactions with others to obtain support. For example, P5 noted that this platform creates a supportive space for young people to share their emotions and socialize with others:

> "*We all need an outlet for releasing negative emotions. We can't always keep those emotions in our hearts. There seems to be no more suitable social platform to express negative feelings than the NCM platform because it enables both music listening and social interaction. It adds many social functions such as recording cover songs and watching live streaming, which are widely accepted by young people as online forms of social communication. In fact, I feel that NCM provides a great platform for many young people who need an emotional outlet to express their feelings.*" (P5)

Another interviewee, P8, held a similar view to P5, and additionally shared his insights into the characteristics of NCM:

> "*This community, on the one hand, could be a 'tree hole' for many people. They may have nowhere to release their stress, but really want to express some emotions. It can be a good place where they can share their emotions and may also receive some support [...] On the other hand, unlike other tree holes that mix together various kinds of emotions, this community has a very interesting music-related characteristic: each song can represent one kind of emotion or feeling; people who like one particular song get together and share their thoughts in the same tree hole; the tree hole may accumulate similar experiences, which can generate emotional resonance among people who listen to the same song. That is to say, a song may establish connections among a group of similar people due to shared emotions.*" (P8)

As with most online communities, the pseudo-anonymity of the platform encourages young people to post comments to share their innermost thoughts. As P8 pointed out, they often thought of this platform as a tree hole (where people can freely tell their secrets) and felt they could safely

express their emotions. However, unlike other online communities, NCM has a unique characteristic: **people are connected by music-induced emotions**. That is to say, the emotion expressed by the song may connect a group of strangers who have had similar experiences or share similar emotions, and these people are more likely to understand how others feel. This may create an empathetic and supportive atmosphere that increases people's willingness to express their innermost feelings and thoughts.

### 5.2 Youth Perceptions of Disclosure and Support in SMCs

*5.2.1 Young people had divergent perceptions of comments related to psychological distress and the associated replies.* On the NCM platform, emotion-laden comments, such as personal experiences of psychological distress, are pervasive. Our interviewees showed both positive and negative attitudes toward this type of comment. Most held positive attitudes and mentioned that they sometimes benefited from these comments and the replies to them. For instance, P8 and P13 stated the following:

> "*Some people would share their sad stories in the comments. If I was also feeling sad, reading about these comments seemed to give me some comfort.*" (P8)

> "*It's nice to see others' kindness [on the platform]. When something bad happens to a person, there are a bunch of people who try to give comfort and provide support by responding to the comment. This will actually have a positive impact on me. I quite like to see this kind of thing.*" (P13)

These perceptions provide an interesting insight into the subjective sense of being supported. Both interviewees recognized the benefits of getting emotional support from such comments or replies on NCM, but they experienced the benefit for different reasons. For example, P8 felt comforted knowing that others had similar experiences, whereas P13 gained support from seeing people trying to provide support to others through replies. This evidence suggests that the same individuals perceive different types of benefits in different contexts, and the type of benefits received may depend on individual characteristics (e.g., personality) [110].

Whereas most of the interviewees had positive perceptions of emotion-related comments and replies, seven interviewees expressed concerns about the truthfulness of posted comments, and some stated that such comments did not influence them. For example, P12 stated:

> "*First, I don't know whether the comment content is true or not. Even though the comment resonated with me, I would probably give a like at most instead of making a reply, because I do not understand their real situation. Second, I think that even stories that really happened would not influence my feelings, because those are other people's experiences.*" (P12)

P12's perceptions differed from those of P8 and P13. P12 did not pay much attention to comments due to doubts about their authenticity or an inability to understand the whole situation. He also distinguished others' experiences and feelings from his own, and felt that others' comments would not influence his feelings. The above evidence also suggests that the impact of comments on individuals might be associated with their emotional self-awareness [53] (i.e., the ability to understand their own thoughts and feelings and distinguish them from those of others).

*5.2.2 Different types of support in responses, such as encouragement and self-disclosure, resulted in different perceived support among young people.* Social support in responses can come in different forms, and our analysis showed that emotional support is the primary type of social support in users' replies on NCM. Among various kinds of emotional support, "encouragement" and

"self-disclosure" were the two most frequently occurring types (see Figure 4). Our interviewees acknowledged the importance of the emotional support provided through replies, particularly when they felt lonely or stressed. For instance, P3 and P11 said:

> "*Some people who post replies may have had similar experiences to ours. Those people may empathize with us, so they may know the best way to provide comfort, and their words may have a more soothing effect than simple words of encouragement. This is because we may feel we are not the only ones going through this kind of thing. Everyone is the same, which may make our experience seem less difficult.*" (P3)

> "*If someone replied that they had a similar experience, I would be relieved and feel less stressed. It would feel like everybody might have such an experience. You know, I was very nervous when there was a conflict between my parents; I was afraid that they would fight with each other … After seeing the responses, I would know it is common to see conflicts between parents, and we all have a cross to bear.*" (P11)

Both P3 and P11 mentioned that they got emotional support from others' sharing of similar experiences because this let them know they were not alone. P3 pointed out that people who had a similar negative experience in the past were more likely to understand her emotional state and provide more effective support. She also perceived higher intimacy in replies with a higher level of self-disclosure than in those that merely offered encouraging words (e.g., "Chin up!"). P11 also stated that sharing similar experiences with others can help relieve feelings of stress. This evidence indicates the benefits of self-disclosure in SMCs. Self-disclosure is particularly important in initial interactions because it can bring people closer and increase their desire to build a relationship [105].

Additionally, some interviewees reported different perceptions of support resulting from two other forms of response, namely getting likes on their comments and receiving a virtual "hug" (a new function on NCM, as mentioned by one of our interviewees). As P5 noted:

> "*When I am in a bad mood and really need some comfort, I think a hug may offer me greater emotional comfort than a simple thumbs-up.*" (P5)

In addition to getting support from others' textual responses, P5 found that hugging virtually could soothe her when she felt sad, and its effect was better than receiving likes. The reason may be that a virtual hug can be seen as conveying social support [19], thus providing emotional support to the recipient.

### 5.3 Youth Motives for Disclosure and Support in SMCs

*5.3.1 Most young people wished to share emotional experiences that resonated with them when the song they listened to evoked particular feelings.* Listening to music often relates to people's emotions and reflects their current state of mind [48]. When our interviewees talked about their music listening experience, almost all of them mentioned that songs could reveal or influence their current emotional state, and certain songs could evoke particular feelings and thoughts, suggesting that **music can induce emotional resonance**. The majority of the interviewees (10/13) stated that when they listened to a song that evoked their memories and feelings, such as sadness, guilt, or grief, they desired to view others' comments on the song to see whether others shared the same feelings. For instance, P5 told us:

> "*I was listening to a song, and the lyrics of the song were talking about a sad love story: One person regretted not cherishing the other person when they were in a relationship, and now things had changed, and there was no way to be with that person anymore. In such a mood, I would read users' comments under the song, including their personal monologue and their*

*description of their emotions at that moment, and could feel something in common with them. (Follow-up questions: 'Why did you feel a sense of commonality?') Perhaps because I had similar experiences before, I would feel the same emotions when reading about others' experiences. To elaborate, I felt that I was in a group where all of us shared the same feeling, which gave me a sense of belonging.*" (P5)

P5 stated that music-induced emotional resonance might impel her to view others' comments, especially comments containing emotional experiences that were likely to generate resonance with her. We call this kind of resonance **comment-induced emotional resonance**. By viewing such comments, she felt more socially connected with others and had a sense of belonging. This suggests that viewing comments is a way of seeking social support.

In addition to viewing comments about others' emotional experiences due to resonating with the listened music, about half of the interviewees reported that they were interested in gaining more music-related information from comments, such as the story behind their favorite songs. For example, P8 mentioned that a deeper understanding of the song could help him better experience the emotion it expressed:

"*Every song might have a story behind it ... In the comment area, someone may tell the story behind the song, which conveys the deep hidden meaning of the song. We might not necessarily hear about the story and understand the meaning of many songs when listening to them alone. However, from the music-related comments posted by other listeners, we can get inspiration and gain a deeper understanding of the song. If we know the hidden emotion expressed by the song, we are more willing to listen to it.*" (P8)

*5.3.2 Young people felt like sharing their personal stories and expressing their emotions when the songs or the comments resonated with them.* With regard to the motives for sharing personal stories and emotional states in SMCs, our interviews showed that emotional resonance, including **music-induced and comment-induced emotional resonance**, was the main driving force behind their disclosure. As suggested by previous studies [93, 121, 127], music is the language of emotion; it often affects people emotionally and resonates with those with similar emotions. In our study, seven interviewees stated songs could resonate powerfully with them and could evoke their deepest feelings and motivate them to express themselves, as noted by P12:

"*When I listen to a song that arouses my innermost feelings, I feel like posting a comment, which is actually a way of expressing my feelings.*" (P12)

Moreover, three interviewees mentioned that others' comments that shared emotional experiences could also resonate with them (comment-induced emotional resonance). The shared emotional experiences would evoke memories of their own experiences and their negative emotions, which in turn motivated them to discuss their emotional experiences; for example, P3 said:

"*When listening to music, I was often reading others' comments under the song. If some comments made me think of my own experiences, especially those that touched my heart and made me 'emo,'*[10] *I would also write down something about myself, such as some of my problems with my ex-boyfriend.*" (P3)

When asked about the content of posted comments, five interviewees mentioned that they would post comments to communicate their emotional experiences with others to seek help or support when facing difficult situations (e.g., family issues or academic stress). P11 stated that he sometimes posted comments to seek advice about domestic problems while listening to music:

[10]The word "emo" is Chinese internet slang that can be used to express sadness, depression, or being emotional.

> "*... There was some conflict between my dad and my mom during that time. I remember that I was listening to a song by Xu Fei (a Chinese singer), 'Prose Poems Written by Father.' I wrote down a comment, 'What should I do when my parents quarrel? I don't know how to help them as their child.*" (P11)

In addition to sharing emotional experiences, our interviewees said they were more likely to talk in their comments about the emotional influence of the music or the story behind it; for example, P12 told us about his experience of being moved by the music they were listening to:

> "*I remember what I wrote in that comment was, 'I have already known [... emotional scene of the movie related to the mentioned song]. However, when I listened to this song, tears still blurred my eyes.' Sometimes I would post this type of comment. I think posting comments is a way to give vent to my emotion.*" (P12)

However, three interviewees stated that they rarely posted comments about their personal experiences and their emotions on social platforms, which may be related to individual differences (e.g., extroverts are more comfortable expressing their feelings to others [102]). Some of them did not discuss their experiences online because they believed other people were not able to empathize with them, as P13 remarked:

> "*I rarely post comments to share my emotions and my experiences, because I think it's just like the famous saying goes: 'No one in this world shares the same happiness and sorrow.' I quite understand this saying. It is unrealistic to expect others to understand you completely, so it is better not to post [a comment].*" (P13)

*5.3.3 After posting comments, receiving a response can bring young people happiness and make them feel supported.* In agreement with previous studies of social media platforms [3, 18], we found that young people expected responses to their posted comments in SMCs. Seven interviewees stated that they wanted to have follow-up interactions with others after posting comments. Some of them expected to obtain comfort or emotional support from others; for example, P3 said:

> "*I think it is fun if there is some interaction [among people on the platform]. I would feel like I'm not alone in listening to the song. Also, it's very heartwarming to receive someone's reply. For example, they would say something about themselves or comfort me, which can make me feel happy and not so sad, and then I know that there is someone who feels the same as me.*" (P3)

In addition to direct replies, likes were also considered a common form of support by our interviewees. As revealed in a previous study [100], such lightweight feedback conveys signals of social acceptance and support. P12 expressed a similar view:

> "*I have experience in posting comments and getting likes from others. When others liked my posted comments, I actually felt that there were still some people in the world who could understand me, and I felt I was supported.*" (P12)

However, some of the other interviewees treated the platform as a tree hole. Their purpose in posting comments was to release their emotions, so they had no expectations for further communication, as noted by P8:

> "*Due to my personal experiences, listening to some music that resonates emotionally with me can arouse deep feelings. At that moment, I just wanted to voice my feelings. I didn't care if anyone replied to me or liked me.*" (P8)

*5.3.4 Young people usually responded to comments containing emotional expressions due to the induced emotional resonance.* Our interviewees indicated a variety of reasons for responding to comments. About half mentioned **comment-induced emotional resonance** as a major reason

for giving responses. Most of the comments that generated emotional resonance were about experiences of struggle, such as breakups and academic stress. Given their own similar experiences, our interviewees could relate to those people's concerns and provide support. For example, P9 shared her experience of offering support to someone who was under academic pressure:

> "*In general, I would respond when some girls were crossed in love or when a student struggled with family relationships, poor academic performance, a high level of stress, or peer pressure. I would reply to their comments by saying something like, 'The world is huge. Those who look as strong as mountains may be ordinary in front of others. Don't put so much pressure on yourself!'*" (P9)

Our interviewees also mentioned their attention to people who had extremely negative thoughts involving self-harm or suicide. Some of them wanted to share positive thoughts with such commenters, as described by P2:

> "*If someone talked about suicide or depression, I would give them some encouragement and suggestions. For example, a person who was depressed because he had lost his loved one (their grandmother) expressed thoughts showing suicidal tendencies. I replied to him by writing something like, 'There are still many good things in the world. Also, if your grandmother were alive, she wouldn't want to see you kill yourself. Living people should obey the will of the deceased to live better.'*" (P2)

In addition to responding through written replies, some of the interviewees provided support by clicking the "Like" button either when they had the same feeling described in the comment or when the comment described a negative experience, as stated by P10:

> "*If they left some comments about their sufferings, such as having an illness or experiencing the loss of a loved one, I would definitely give them support through likes.*" (P10)

The interviewees mentioned empathy as another reason for posting responses. They would feel and absorb the emotions expressed by the comments. For example, when the comment described the author's sadness, they were caught up in their own sadness. Therefore, they wanted to show empathy and acknowledgment through responses, such as clicking "Like" or sending a virtual hug.

> "*If I felt this person was really sad, I would give them a [virtual] hug. Personally speaking, most of the time, the reason we respond to comments, whether through likes, hugs, or written responses, is our emotional resonance. In fact, we have similar emotions and want to voice our emotions in this way.*" (P5)

*5.3.5 Young people who perceived online responses as giving limited support tended not to respond to comments describing negative experiences.* Some interviewees had the opposite attitude concerning responding to comments with negative self-disclosure. They chose not to respond because they thought simple responses that were uninformed about the full situation would not be supportive. For example, P13 stated:

> "*I have never made any response to those comments because I think that the responses, such as encouragement on social network sites, should be from someone who has stood in their shoes. After all, we don't know the real situation of those who posted comments, so it is hard to change their minds with our responses.*" (P13)

The interviewees also expressed concerns about the possible effect of their responses on people who disclosed mental health problems, especially those experiencing mental illness, such as clinical depression. As P10 noted:

> "*For some comments regarding depression, I don't know whether doing this (making a response) would positively or negatively affect them. I may respond to the comment out of the*

*goodness of my heart, but my response might harm them on a deeper level. It is possible to do bad things with good intentions. So in such situations, I cannot do anything.*" (P10)

People who are not mental health professionals may not know how to support people with mental illness. To avoid unintentional harm, some interviewees, like P10, thought it would be better not to say anything. Given the above evidence, it can be seen that there is perception bias regarding support through online responses, which can influence young people's attitudes toward responding to others. In addition, people respond differently to comments that reveal others' psychological distress or serious mental health problems; for example, some may share positive thoughts to encourage those people, whereas some may remain silent.

## 6 DISCUSSION

In this study, we make the following findings:

(1) We provided a detailed content analysis of comments posted by young people to disclose psychological distress. We identified six comment types (e.g., "experience sharing," "help-seeking," and "story behind the music"). In particular, we identified the most common type, "experience sharing," associated with all four psychological distress types, indicating that young people are likely to share their experiences and emotions in SMCs.
(2) Accordingly, we identified nine social support types, which we categorized as either emotional support or informational support. Among these, "encouragement" was the most prevalent support type, followed by "caring" and "self-disclosure." Young people also tended to provide suggestions when peers disclosed *depression* in their comments.
(3) Our interview analysis revealed that young people who actively use the social features of NCM consider this community an emotional outlet, where people bond based on music-induced emotion when they listen to the same music and feel safe expressing negative emotions. In such a space, both music and others' comments may induce emotional resonance among young people, which significantly motivates them to share their emotional experiences and provide support to others. Concerning the phenomenon of frequent exposure to others' psychological distress in SMCs, young people hold divergent opinions and have different perceptions.

The following sections discuss these findings in depth to address our research questions and provide exploratory design implications for building a supportive SMC that benefits youth mental health.

### 6.1 Emotional Disclosure

Previous work has shown that young people increasingly use social media platforms to disclose their struggles and psychological distress, and seek help from others [24]. Similarly, we find that in SMCs such as NCM, young people frequently (77.91% of our analyzed comments) share emotional experiences related to psychological distress (i.e., depression, anxiety, stress, and loneliness) and emotions. From their comments, we notice that they discuss various experiences (e.g., academic stress and interpersonal relationships) that commonly occur during the period of emergent adulthood [20, 39, 81, 88]. However, distinct from social media platforms [31, 72] and online communities dedicated to health [34, 130] where people often seek advice or health-related information from peers in similar circumstances, SMCs are mainly regarded as an emotional outlet to disclose emotional experiences and feelings of distress; only a small number of users (12.88%) post comments to ask for advice. This may be because people prefer to seek health-related information and support in online health communities [130], whereas in SMCs, people may initially participate for social and entertainment reasons while listening to music.

SMCs, unlike other online communities, have a unique characteristic—**people are connected by music-induced emotions**. Music can be seen as a vehicle for establishing social connections among young people who share similar music-induced emotions [12, 122, 131], which may bring them into the same emotional space where they can understand each other's feelings [106]. Moreover, music always conveys emotions to listeners [48], and it can thus evoke young people's memories and emotions [45, 101]. In addition to music-induced emotional resonance, comments posted by others can generate emotional resonance with young people. This indicates that music itself can be a tool that allows people to process their feelings, and the comments can be a place for deeper exploration of one's thoughts; both reasons impel them to disclose their feelings in SMCs. In addition, as with other online communities [3, 20, 33], pseudo-anonymity is another reason for young people's high level of self-disclosure in SMCs. Previous studies have shown that young people are more willing to use anonymous, semi-anonymous, or ephemeral platforms (e.g., Reddit and Tumblr) to seek help for mental health-related problems [88, 118]. On NCM, there is no requirement to use one's real name, which may give young people a sense of semi-anonymity, which can reduce their fear of stigma (e.g., a fear of losing their positive image) and induce more candid self-disclosure of their psychological distress [3, 81]. Through social connection by means of music-induced emotions and a sense of pseudo-anonymity, SMCs create a supportive and empathetic atmosphere that may encourage young people's honest self-disclosure of their emotional experiences and feelings of distress, and thus offer a space serving mental health needs. In light of the positive effects of emotional self-disclosure, such as releasing pressure, fostering connectedness, and satisfying social needs, which can benefit young people's mental health [67, 80, 85, 107], SMCs can be an ideal platform for young people to reduce psychological distress and maintain their mental health.

**Design implications:** Our findings provide evidence that young people adopt SMCs such as NCM, which are non-mental health communities, as mental health forums where they can disclose psychological distress, such as depression and anxiety. Given the prevalence of emotional self-disclosure and its benefits for young people's mental health, we encourage SMC developers to enhance self-disclosure through an improved interface design for posting comments, such as by encouraging expressive writing (given that written self-disclosure about critical life events can improve both physical and mental health [62]). For instance, the system could incorporate instructions for expressive writing to help young people write their thoughts, feelings, and reflections on unpleasant experiences. Considering that anonymity is an important factor that encourages self-disclosure, we suggest that NCM allow young people to control the disclosure of their psychological distress, such as by allowing them to post comments anonymously or to selected people they are close to, which might reduce their emotional burden and help them obtain appropriate support.

### 6.2 Online Social Support

A sense of belonging is one of the most basic human needs [75]. With the advent of the Internet, the search for a sense of belonging has moved from offline to online [128]. Online social communities (e.g., Reddit and Twitter) have become important venues for seeking and receiving social support [30, 94], ranging from emotional support (e.g., giving a like [100] and sending encouraging words [25]) and informational support (e.g., giving advice [30] and sharing knowledge [34]) to instrumental support (e.g., providing tangible assistance [30]). Similarly, we identify forms of emotional support and information support in the comment replies in SMCs. However, unlike other online communities (e.g., online health communities, Reddit, and Facebook) [33, 72], SMCs (e.g., NCM) foster emotional support but include only limited informational support on specific issues. This discrepancy can be attributed to a unique characteristic of SMCs: people are connected by

music-induced emotions. These connected people typically do not set out to obtain information or provide support, but most respond to comments due to music-induced or comment-induced emotional resonance, thereby giving emotional responses to support others who feel bad.

The common emotional support types identified on NCM include "encouragement," "caring," and "self-disclosure." "Encouragement" was the most common type and was often expressed in relatively simple and short phrases such as "Chin up," "Be strong," and "Keep fighting." Although some interviewees reported that they felt "encouragement" offered only limited support and preferred not to offer such simple encouragement feedback to others, we would argue that lightweight feedback is also critical to maintaining interpersonal relationships in online communities [100]. Most of the interviewees recognized the benefits of emotional support on NCM and believed that encouraging words and empathetic feedback increased the community's warmth. Some interviewees pointed out that a high level of self-disclosure about personal experiences was more appreciated than simple encouraging words. Prior work has indicated the role of self-disclosure in increasing closeness between people [104], which in turn enhances social connectedness and the perception of social support [69]. Thus, the higher perception of support from others' self-disclosure may reflect young people's quest for a kind of social support that can develop intimate interpersonal relationships [125] in SMCs.

**Design implications:** Through our interviews, we identified two reasons people might not offer support in SMCs: reluctance to offer similar support (e.g., simple encouragement) and underestimation of the benefit of simple encouraging words. As the Chinese saying goes, *"Don't miss doing any good thing, no matter how insignificant it looks."* To encourage supportive actions, we suggest offering richer support choices, such as supportive animations and supportive words recommended by the system. For example, NCM has enabled users to send a vivid hug animation with a two-finger pinch on the comment; however, using icons could make this animation more visible. Furthermore, providing encouraging information is a strategy for motivating lurkers' participation in the online community [108], which implies that the system could encourage users who receive peer support to acknowledge benefits when they perceive them.

### 6.3 Personalization and Customization

Although NCM is perceived as a supportive platform where young people can disclose their psychological distress and satisfy their social needs (i.e., seek social support), some users indeed expect to exchange music-related information (e.g., the story behind the music) through comments and engage in the community for entertainment purposes [64, 122]. Concerning the phenomenon of negative emotional-laden comments becoming prevalent in SMCs [64], young people expressed different opinions in the interviews. Some felt these emotional comments and the associated supportive replies conveyed warmth and friendliness, but some complained that these comments interrupted them from enjoying the music. This implies that diverse users' needs should be considered when building SMCs. Although some previous studies have suggested that it is not advisable to share negative emotions on social network sites [3, 64], it has been shown that young people can benefit from music-based supportive communities and receive positive social support from replies. Given users' diverse needs in SMCs, future research could investigate how to foster such communities using personalization and customization technologies [132].

**Design implications:** In light of users' diverse needs, we suggest that developers of SMCs consider personalizing the comments shown to different users. For example, based on users' active responses to different types of comments, the system could show more comments about their interests. In this way, for users who do not want to be exposed to negativity, the comments shown to them could be more positive. However, given that personalization may have a disadvantage (i.e., presentation bias) [9], we suggest accommodating customization by allowing a higher level of user

control, as suggested in user-control-oriented user interfaces for music recommenders [46, 47]. Specifically, the system could allow users to control the type of comments or the valence of the comments shown. For example, users could freely select whether they see more music-related comments or emotion-related comments.

### 6.4 Social Music Community for Youth Mental Health

Prior studies have discussed youth's emotional motives for listening to music, such as alleviating loneliness [7] and releasing stress [114]. Additionally, numerous studies have shown that young people turn to online platforms like social media to support their mental health [26, 33, 86, 118]. Previous social music research has mainly focused on sharing songs and playlists or discussing music on social networks (e.g., Facebook) [35, 120]. We investigate youth's disclosure and support in SMCs and demonstrate that such communities, which integrate music listening and social communication, create a supportive mental health space where young people can disclose their psychological distress and express their emotions. Engaging in such an SMC, young people also become better at perceiving and expressing emotions through music, which is closely associated with adolescent development of social communication and well-being [95]. The warmth perceived in replies offering "encouragement," "caring," and "self-disclosure" in SMCs implies that non-mental health communities have the potential to maintain youth mental health. However, we still note some challenges to the provision of social support in non-mental health communities: 1) a lack of intervention for youths who express extreme thoughts and 2) neglect of comments expressing psychological distress.

**Design implications:** To address these challenges, we suggest that the platform use AI technologies (e.g., NLP) to automatically detect comments containing extreme thoughts (e.g., *"No one can understand me, life is meaningless!"*) and offer resources accordingly (e.g., information about mental health care services). Moreover, following the philosophy that "prevention is better than a cure," the community operator may develop a virtual agent that can generate diverse and adaptive responses to unnoticed comments that demonstrate negative feelings [97], similar to a social support chatbot in an online health community [123].

### 6.5 Generalization to Other Online Music Platforms

As a social music platform, NCM provides rich social features, such as the abilities to listen to music with other listeners, follow and message others, and view others' playlists [12]. However, the interview results indicate that disclosure and support for mental health do not rely on salient social activities or intimate social relationships but on the emotional resonance induced by music or comments. Therefore, other music platforms, including non-social music platforms (e.g., Apple Music and Spotify), could incorporate ephemeral social interactions (e.g., posting and liking music comments), which may support listeners when they need an emotional outlet to relieve psychological distress. In addition, culture seems to influence the design orientation of online music platforms; for example, unlike popular Chinese online music platforms (e.g., NCM and QQ music), Apple Music and Spotify provide minimal social features. Although YouTube Music allows users to comment on music videos, most still use YouTube mainly for music searching and listening and instead communicate with other listeners using social media platforms (e.g., Facebook) [55]. Therefore, we suggest that music platform developers should consider the cultural context when adopting the findings of our work.

## 7 LIMITATIONS

Our comment analysis and user interview results provide a holistic view of disclosure and social support in SMCs. However, there are several limitations to our study. *First*, the comment analysis

focused on four psychological distress types (i.e., depression, anxiety, stress, and loneliness). However, other feelings, such as fear, anger, and disgust, are also commonly seen in young people (e.g., those who suffer from cyberbullying [8]). Therefore, future work might incorporate an analysis of these feelings. *Second*, we used the keyword-matching method to search for comments regarding the four psychological distress types. However, although the comments mentioned certain keywords such as anxiety, this might not indicate that the original user was actually experiencing anxiety. Although we manually filtered comments irrelevant to mental health, biases in our data might still exist because it is challenging to identify real emotional states from the textual content. *Third*, although all of the young people interviewed had experience with posting and replying to comments, only a few posted comments related to psychological distress. Therefore, we could not investigate young people's perceptions of social support in depth from the receiver's perspective. *Fourth*, our interviewed students did not include youth aged between 15 and 18 years. Thus, our findings may not reflect how their thoughts differ from those of young adults. However, it has been challenging to contact adolescents with a parent's or guardian's consent for a face-to-face interview during the COVID-19 pandemic. *Lastly*, considering the effects of cultural differences on youth mental well-being [27, 38, 133] and their behavior in online social communities [42, 89, 133], further studies should investigate whether our findings can be generalized to youth in other countries.

## 8 CONCLUSION

We investigated young people's use of SMCs to disclose their psychological distress and offer social support to others. Combining our comment analysis and interview results, we found that young people often disclosed their emotional experiences and vented their negative feelings through comments. Emotional support such as "encouragement," "self-disclosure," and "caring" were the primary types of social support offered in the responses to emotion-laden comments. The young people in such SMCs were motivated to disclose their psychological distress due to the emotional resonance of the music and/or the posted comments. SMCs use music to connect young people who share similar music tastes, and this becomes an emotional outlet that allows young people to self-disclose and seek social support. Our findings contribute to the literature on youth mental health and SMCs by identifying young people's needs for social support through online music platforms and discussing the design implications for creating a supportive SMC to benefit youth mental health.

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## REFERENCES

[1] Ahmet Akin and Murat Iskender. 2011. Internet addiction and depression, anxiety and stress. *International online journal of educational sciences* 3, 1 (2011), 138–148.

[2] Nazanin Andalibi, Oliver L Haimson, Munmun De Choudhury, and Andrea Forte. 2016. Understanding social media disclosures of sexual abuse through the lenses of support seeking and anonymity. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 3906–3918.

[3] Nazanin Andalibi, Pinar Ozturk, and Andrea Forte. 2017. Sensitive Self-disclosures, Responses, and Social Support on Instagram: the case of# depression. In *Proceedings of the 2017 ACM conference on computer supported cooperative work and social computing*. 1485–1500.

[4] Jeffrey Jensen Arnett. 2000. Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist* 55, 5 (2000), 469.

[5] Tina Arvidsdotter, Bertil Marklund, Sven Kylén, Charles Taft, and Inger Ekman. 2016. Understanding persons with psychological distress in primary health care. *Scandinavian journal of caring sciences* 30, 4 (2016), 687–694.

[6] American College Health Association et al. 2015. American college health association-national college health assessment II: Reference group executive summary spring 2015. *Hanover, MD: American College Health Association* 132 (2015).

[7] Janet Batsleer, James Duggan, Sarah McNicol, Simeone Spray, and Kurtis Angell. 2017. *Loneliness Connects Us.* 42nd Street.

[8] Sara Mota Borges Bottino, Cássio Bottino, Caroline Gomez Regina, Aline Villa Lobo Correia, and Wagner Silva Ribeiro. 2015. Cyberbullying and adolescent mental health: systematic review. *Cadernos de saude publica* 31 (2015), 463–475.

[9] Engin Bozdag. 2013. Bias in algorithmic filtering and personalization. *Ethics and information technology* 15, 3 (2013), 209–227.

[10] Amy Bruckman. 2002. Studying the amateur artist: A perspective on disguising data collected in human subjects research on the Internet. *Ethics and Information Technology* 4, 3 (2002), 217–231.

[11] Philip Burnard. 1991. A method of analysing interview transcripts in qualitative research. *Nurse education today* 11, 6 (1991), 461–466.

[12] Jie Cai, Ruiqi Shen, and Starr Roxanne Hiltz. 2021. Choice of Social Music Systems in China: A Study of NetEase Cloud Music. In *Adjunct Publication of the 23rd International Conference on Mobile Human-Computer Interaction*. 1–6.

[13] Christine Carucci. 2012. An investigation of social support in adult recreational music ensembles. *International Journal of Community Music* 5, 3 (2012), 237–252.

[14] Joaquin Castillo de Mesa, Luis Gómez-Jacinto, Antonio López Peláez, and Amaya Erro-Garcés. 2020. Social networking sites and youth transition: The use of Facebook and personal well-being of social work young graduates. *Frontiers in psychology* 11 (2020), 230.

[15] Moon Fai Chan, Zi Yang Wong, and NV Thayala. 2011. The effectiveness of music listening in reducing depressive symptoms in adults: a systematic review. *Complementary Therapies in Medicine* 19, 6 (2011), 332–348.

[16] X Chen, LH Yang, J Toso-Salman, Schear R Chang, and D McGoldrick. 2016. Social Support within Online Communities: Internet Reach and Content Analysis of a Cancer Anti-Stigma Facebook Page in Mexico. *Global Media Journal. S* 1 (2016), 1.

[17] Chunhui Cheng. 2021. Self-expression of user comments in music social scenes: taking NetEase Cloud Music as an example (in Chinese). *NEW MEDIA RESEARCH* (2021).

[18] Cindy Chiu, Chris Ip, and Ari Silverman. 2012. Understanding social media in China. *McKinsey Quarterly* 2, 2012 (2012), 78–81.

[19] Sheldon Cohen, Denise Janicki-Deverts, Ronald B Turner, and William J Doyle. 2015. Does hugging provide stress-buffering social support? A study of susceptibility to upper respiratory infection and illness. *Psychological science* 26, 2 (2015), 135–147.

[20] David A Cole, Elizabeth A Nick, Rachel L Zelkowitz, Kathryn M Roeder, and Tawny Spinelli. 2017. Online social support for young people: does it recapitulate in-person social support; can it help? *Computers in human behavior* 68 (2017), 456–464.

[21] Bruce E Compas, Barry M Wagner, Lesley A Slavin, and Kathryn Vannatta. 1986. A prospective study of life events, social support, and psychological symptomatology during the transition from high school to college. *American journal of community psychology* 14, 3 (1986), 241–257.

[22] Juliet Corbin and Anselm Strauss. 2014. *Basics of qualitative research: Techniques and procedures for developing grounded theory.* Sage publications.

[23] Munmun De Choudhury, Scott Counts, Eric J Horvitz, and Aaron Hoff. 2014. Characterizing and predicting postpartum depression from shared facebook data. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing*. 626–638.

[24] Munmun De Choudhury and Sushovan De. 2014. Mental health discourse on reddit: Self-disclosure, social support, and anonymity. In *Eighth international AAAI conference on weblogs and social media*.

[25] Robert Deloatch, Brian P Bailey, Alex Kirlik, and Craig Zilles. 2017. I need your encouragement! Requesting supportive comments on social media reduces test anxiety. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 736–747.

[26] Michelle Drouin, Lauren Reining, Mindy Flanagan, Maria Carpenter, and Tammy Toscos. 2018. College students in distress: can social media be a source of social support? *College Student Journal* 52, 4 (2018), 494–504.

[27] Marwan Dwairy, Mustafa Achoui, Anna Filus, Maria Martina Casullo, Neharika Vohra, et al. 2010. Parenting, mental health and culture: A fifth cross-cultural research on parenting and psychological adjustment of children. *Journal of Child and Family Studies* 19, 1 (2010), 36–41.

[28] Jordan Eschler, Zakariya Dehlawi, and Wanda Pratt. 2015. Self-characterized illness phase and information needs of participants in an online cancer forum. In *Proceedings of the International AAAI Conference on Web and Social Media*, Vol. 9.
[29] Jennifer Fereday and Eimear Muir-Cochrane. 2006. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International journal of qualitative methods* 5, 1 (2006), 80–92.
[30] Radhika Garg, Yash Kapadia, and Subhasree Sengupta. 2021. Using the Lenses of Emotion and Support to Understand Unemployment Discourse on Reddit. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–24.
[31] John Gilmour, Tanya Machin, Charlotte Brownlow, and Carla Jeffries. 2020. Facebook-based social support and health: A systematic review. *Psychology of Popular Media* 9, 3 (2020), 328.
[32] Fabienne Glowacz and Emilie Schmits. 2020. Psychological distress during the COVID-19 lockdown: The young adults most at risk. *Psychiatry research* 293 (2020), 113486.
[33] Deborah Goodall, Sasha Ban, Eileen Birks, and Andrew Clifton. 2013. New perspectives on the contribution of digital technology and social media use to improve the mental wellbeing of children and young people: a state-of-the-art review. *Neonatal, Paediatric & Child Health Nursing* 16, 1 (2013), 19–26.
[34] Xinning Gui, Yu Chen, Yubo Kou, Katie Pine, and Yunan Chen. 2017. Investigating support seeking from peers for pregnancy in online health communities. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–19.
[35] Anja N Hagen and Marika Lüders. 2017. Social streaming? Navigating music as personal and social. *Convergence* 23, 6 (2017), 643–659.
[36] David J Hargreaves and Adrian C North. 1999. The functions of music in everyday life: Redefining the social in music psychology. *Psychology of music* 27, 1 (1999), 71–83.
[37] Louise C Hawkley and John T Cacioppo. 2010. Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of behavioral medicine* 40, 2 (2010), 218–227.
[38] Patrick CL Heaven and Mandy Goldstein. 2001. Parental influences and mental health among some Australian youth: Crosscultural analysis. *Australian Journal of Psychology* 53, 3 (2001), 170–175.
[39] Aine Horgan and John Sweeney. 2010. Young students' use of the Internet for mental health information and support. *Journal of psychiatric and mental health nursing* 17, 2 (2010), 117–123.
[40] Hsiu-Fang Hsieh and Sarah E Shannon. 2005. Three approaches to qualitative content analysis. *Qualitative health research* 15, 9 (2005), 1277–1288.
[41] Michaelle Indian and Rachel Grieve. 2014. When Facebook is easier than face-to-face: Social support derived from Facebook in socially anxious individuals. *Personality and individual differences* 59 (2014), 102–106.
[42] Linda A Jackson and Jin-Liang Wang. 2013. Cultural differences in social networking site use: A comparative study of China and the United States. *Computers in human behavior* 29, 3 (2013), 910–921.
[43] Pamela Braboy Jackson and Montenique Finney. 2002. Negative life events and psychological distress among young adults. *Social Psychology Quarterly* (2002), 186–201.
[44] Carrie James, Katie Davis, Linda Charmaraman, Sara Konrath, Petr Slovak, Emily Weinstein, and Lana Yarosh. 2017. Digital life and youth well-being, social connectedness, empathy, and narcissism. *Pediatrics* 140, Supplement_2 (2017), S71–S75.
[45] Qihao Ji, Sophie H Janicke-Bowles, Rebecca NH De Leeuw, and Mary Beth Oliver. 2021. The melody to inspiration: The effects of awe-eliciting music on approach motivation and positive well-being. *Media Psychology* 24, 3 (2021), 305–331.
[46] Yucheng Jin, Nyi Nyi Htun, Nava Tintarev, and Katrien Verbert. 2019. Contextplay: Evaluating user control for context-aware music recommendation. In *Proceedings of the 27th ACM Conference on User Modeling, Adaptation and Personalization*. 294–302.
[47] Yucheng Jin, Nava Tintarev, Nyi Nyi Htun, and Katrien Verbert. 2020. Effects of personal characteristics in control-oriented user interfaces for music recommender systems. *User Modeling and User-Adapted Interaction* 30, 2 (2020), 199–249.
[48] Patrik N Juslin. 2013. What does music express? Basic emotions and beyond. *Frontiers in psychology* 4 (2013), 596.
[49] Patrik N Juslin and Petri Laukka. 2004. Expression, perception, and induction of musical emotions: A review and a questionnaire study of everyday listening. *Journal of new music research* 33, 3 (2004), 217–238.
[50] Ronald C Kessler, G Paul Amminger, Sergio Aguilar-Gaxiola, Jordi Alonso, Sing Lee, and T Bedirhan Ustun. 2007. Age of onset of mental disorders: a review of recent literature. *Current opinion in psychiatry* 20, 4 (2007), 359.
[51] Corey LM Keyes. 2002. The mental health continuum: From languishing to flourishing in life. *Journal of health and social behavior* (2002), 207–222.
[52] Corey LM Keyes. 2005. Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of consulting and clinical psychology* 73, 3 (2005), 539.

[53] Kyle D Killian. 2012. Development and validation of the emotional self-awareness questionnaire: A measure of emotional intelligence. *Journal of Marital and Family Therapy* 38, 3 (2012), 502–514.
[54] Vladimir J Konečni, Amber Brown, and Rebekah A Wanic. 2008. Comparative effects of music and recalled life-events on emotional state. *Psychology of Music* 36, 3 (2008), 289–308.
[55] Amanda E Krause, Adrian C North, and Brody Heritage. 2014. The uses and gratifications of using Facebook music listening applications. *Computers in Human Behavior* 39 (2014), 71–77.
[56] J Richard Landis and Gary G Koch. 1977. The measurement of observer agreement for categorical data. *biometrics* (1977), 159–174.
[57] Catherine Penny Hinson Langford, Juanita Bowsher, Joseph P Maloney, and Patricia P Lillis. 1997. Social support: a conceptual analysis. *Journal of advanced nursing* 25, 1 (1997), 95–100.
[58] Louise J Lawrence. 2021. Compassion and Kindness: Refiguring Discourses of Student Mental Health and Wellbeing. In *Refiguring Universities in an Age of Neoliberalism*. Springer, 131–162.
[59] Christine M Lee, Jennifer M Cadigan, and Isaac C Rhew. 2020. Increases in loneliness among young adults during the COVID-19 pandemic and association with increases in mental health problems. *Journal of Adolescent Health* 67, 5 (2020), 714–717.
[60] Kyung-Tag Lee, Mi-Jin Noh, and Dong-Mo Koo. 2013. Lonely people are no longer lonely on social networking sites: The mediating role of self-disclosure and social support. *Cyberpsychology, Behavior, and Social Networking* 16, 6 (2013), 413–418.
[61] Regina LT Lee and Alice JT Yuen Loke. 2005. Health-promoting behaviors and psychosocial well-being of university students in Hong Kong. *Public health nursing* 22, 3 (2005), 209–220.
[62] Stephen J Lepore and Joshua M Smyth. 2002. *The writing cure: How expressive writing promotes health and emotional well-being*. American Psychological Association.
[63] Zachary Levonian, Marco Dow, Drew Erikson, Sourojit Ghosh, Hannah Miller Hillberg, Saumik Narayanan, Loren Terveen, and Svetlana Yarosh. 2021. Patterns of Patient and Caregiver Mutual Support Connections in an Online Health Community. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW3 (2021), 1–46.
[64] Xue Li and Junlong Dong. 2021. User Demand Awareness and Analysis of Online Music——Take NetEase Cloud Music Platform as an Example. In *2021 5th International Conference on E-Education, E-Business and E-Technology*. 82–88.
[65] Alexandra Linnemann, Beate Ditzen, Jana Strahler, Johanna M Doerr, and Urs M Nater. 2015. Music listening as a means of stress reduction in daily life. *Psychoneuroendocrinology* 60 (2015), 82–90.
[66] Huon Longman, Erin O'Connor, and Patricia Obst. 2009. The effect of social support derived from World of Warcraft on negative psychological symptoms. *CyberPsychology & Behavior* 12, 5 (2009), 563–566.
[67] Mufan Luo and Jeffrey T Hancock. 2020. Self-disclosure and social media: motivations, mechanisms and psychological well-being. *Current Opinion in Psychology* 31 (2020), 110–115.
[68] Haiwei Ma, C Estelle Smith, Lu He, Saumik Narayanan, Robert A Giaquinto, Roni Evans, Linda Hanson, and Svetlana Yarosh. 2017. Write for life: Persisting in online health communities through expressive writing and social support. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–24.
[69] Yining Z Malloch and Jingwen Zhang. 2019. Seeing others receive support online: Effects of self-disclosure and similarity on perceived similarity and health behavior intention. *Journal of health communication* 24, 3 (2019), 217–225.
[70] Rod A Martin, Patricia Puhlik-Doris, Gwen Larsen, Jeanette Gray, and Kelly Weir. 2003. Individual differences in uses of humor and their relation to psychological well-being: Development of the Humor Styles Questionnaire. *Journal of research in personality* 37, 1 (2003), 48–75.
[71] Robert W Moeller and Martin Seehuus. 2019. Loneliness as a mediator for college students' social skills and experiences of depression and anxiety. *Journal of adolescence* 73 (2019), 1–13.
[72] Robin L Nabi, Abby Prestin, and Jiyeon So. 2013. Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, behavior, and social networking* 16, 10 (2013), 721–727.
[73] Elizabeth A Nick, David A Cole, Sun-Joo Cho, Darcy K Smith, T Grace Carter, and Rachel L Zelkowitz. 2018. The Online Social Support Scale: Measure development and validation. *Psychological assessment* 30, 9 (2018), 1127.
[74] Hyun Jung Oh, Elif Ozkaya, and Robert LaRose. 2014. How does online social networking enhance life satisfaction? The relationships among online supportive interaction, affect, perceived social support, sense of community, and life satisfaction. *Computers in Human Behavior* 30 (2014), 69–78.
[75] Patrick O'Keeffe. 2013. A sense of belonging: Improving student retention. *College Student Journal* 47, 4 (2013), 605–613.
[76] World Health Organization et al. 2004. *Promoting mental health: Concepts, emerging evidence, practice: Summary report*. World Health Organization.

[77] Shahla Ostovar, Negah Allahyar, Hassan Aminpoor, Fatemeh Moafian, Mariani Binti Md Nor, and Mark D Griffiths. 2016. Internet addiction and its psychosocial risks (depression, anxiety, stress and loneliness) among Iranian adolescents and young adults: A structural equation model in a cross-sectional study. *International Journal of Mental Health and Addiction* 14, 3 (2016), 257–267.

[78] Jayashree Panicker and Ritika Sachdev. 2014. Relations among loneliness, depression, anxiety, stress and problematic internet use. *International Journal of Research in Applied, Natural and Social Sciences* 2, 9 (2014), 1–10.

[79] Zoe E Papinczak, Genevieve A Dingle, Stoyan R Stoyanov, Leanne Hides, and Oksana Zelenko. 2015. Young people's uses of music for well-being. *Journal of Youth Studies* 18, 9 (2015), 1119–1134.

[80] Namkee Park, Borae Jin, and Seung-A Annie Jin. 2011. Effects of self-disclosure on relational intimacy in Facebook. *Computers in Human Behavior* 27, 5 (2011), 1974–1983.

[81] Sun Young Park, Nazanin Andalibi, Yikai Zou, Siddhant Ambulkar, and Jina Huh-Yoo. 2020. Understanding students' mental well-being challenges on a university campus: interview study. *JMIR formative research* 4, 3 (2020), e15962.

[82] Vikram Patel, Alan J Flisher, Sarah Hetrick, and Patrick McGorry. 2007. Mental health of young people: a global public-health challenge. *The Lancet* 369, 9569 (2007), 1302–1313.

[83] Andrew R Payton. 2009. Mental health, mental illness, and psychological distress: same continuum or distinct phenomena? *Journal of health and Social Behavior* 50, 2 (2009), 213–227.

[84] Sachin R Pendse, Naveena Karusala, Divya Siddarth, Pattie Gonsalves, Seema Mehrotra, John A Naslund, Mamta Sood, Neha Kumar, and Amit Sharma. 2019. Mental health in the global south: challenges and opportunities in HCI for development. In *Proceedings of the 2nd ACM SIGCAS Conference on Computing and Sustainable Societies*. 22–36.

[85] James W Pennebaker and Cindy K Chung. 2007. Expressive writing, emotional upheavals, and health. (2007).

[86] Jennifer Pierre. 2019. Chats Over Spats: Exploring Social Media Use for Mentorship in Youth Development Programs. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–16.

[87] Matthew Pittman. 2018. Happiness, loneliness, and social media: perceived intimacy mediates the emotional benefits of platform use. *The Journal of Social Media in Society* 7, 2 (2018), 164–176.

[88] Julie Prescott, Terry Hanley, and Katalin Ujhelyi Gomez. 2019. Why do young people use online forums for mental health and emotional support? Benefits and challenges. *British Journal of Guidance & Counselling* 47, 3 (2019), 317–327.

[89] Yada Pruksachatkun, Sachin R Pendse, and Amit Sharma. 2019. Moments of change: Analyzing peer-based cognitive support in online mental health forums. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–13.

[90] Meng Qi, Shuang-Jiang Zhou, Zhao-Chang Guo, Li-Gang Zhang, Hong-Jie Min, Xiao-Min Li, and Jing-Xu Chen. 2020. The effect of social support on mental health in Chinese adolescents during the outbreak of COVID-19. *Journal of Adolescent Health* 67, 4 (2020), 514–518.

[91] Maija Reblin and Bert N Uchino. 2008. Social and emotional support and its implication for health. *Current opinion in psychiatry* 21, 2 (2008), 201.

[92] Fabiana Silva Ribeiro, João Paulo Araújo Lessa, Guilherme Delmolin, and Flávia H Santos. 2021. Music listening in times of COVID-19 outbreak: a Brazilian study. *Frontiers in psychology* 12 (2021), 1471.

[93] Jenefer Robinson. 1994. The expression and arousal of emotion in music. *The Journal of Aesthetics and Art Criticism* 52, 1 (1994), 13–22.

[94] Jian Raymond Rui, Yixin Chen, and Amanda Damiano. 2013. Health organizations providing and seeking social support: a Twitter-based content analysis. *Cyberpsychology, Behavior, and Social Networking* 16, 9 (2013), 669–673.

[95] Suvi Saarikallio, Jonna Vuoskoski, and Geoff Luck. 2014. Adolescents' expression and perception of emotion in music reflects their broader abilities of emotional communication. *Psychology of Well-Being* 4, 1 (2014), 1–16.

[96] Ananna Saha, Ahmed Al Marouf, and Rafayet Hossain. 2021. Sentiment analysis from depression-related user-generated contents from social media. In *2021 8th International Conference on Computer and Communication Engineering (ICCCE)*. IEEE, 259–264.

[97] Koustuv Saha and Amit Sharma. 2020. Causal factors of effective psychosocial outcomes in online mental health communities. In *Proceedings of the International AAAI Conference on Web and Social Media*, Vol. 14. 590–601.

[98] Johnny Saldaña. 2014. Coding and analysis strategies. In *The Oxford handbook of qualitative research*.

[99] Katharina Schäfer, Suvi Saarikallio, and Tuomas Eerola. 2020. Music may reduce loneliness and act as social surrogate for a friend: evidence from an experimental listening study. *Music & Science* 3 (2020), 2059204320935709.

[100] Lauren Scissors, Moira Burke, and Steven Wengrovitz. 2016. What's in a Like? Attitudes and behaviors around receiving Likes on Facebook. In *Proceedings of the 19th acm conference on computer-supported cooperative work & social computing*. 1501–1510.

[101] Constantine Sedikides, Joost Leunissen, and Tim Wildschut. 2021. The psychological benefits of music-evoked nostalgia. *Psychology of Music* (2021), 03057356211064641.

[102] Gwendolyn Seidman. 2013. Self-presentation and belonging on Facebook: How personality influences social media use and motivations. *Personality and individual differences* 54, 3 (2013), 402–407.
[103] Eva Sharma and Munmun De Choudhury. 2018. Mental health support and its relationship to linguistic accommodation in online communities. In *Proceedings of the 2018 CHI conference on human factors in computing systems*. 1–13.
[104] Susan Sprecher, Stanislav Treger, and Joshua D Wondra. 2013. Effects of self-disclosure role on liking, closeness, and other impressions in get-acquainted interactions. *Journal of Social and Personal Relationships* 30, 4 (2013), 497–514.
[105] Susan Sprecher, Stanislav Treger, Joshua D Wondra, Nicole Hilaire, and Kevin Wallpe. 2013. Taking turns: Reciprocal self-disclosure promotes liking in initial interactions. *Journal of Experimental Social Psychology* 49, 5 (2013), 860–866.
[106] Anthony Storr. 2015. *Music and the Mind*. Simon and Schuster.
[107] John Suler. 2004. The online disinhibition effect. *Cyberpsychology & behavior* 7, 3 (2004), 321–326.
[108] Na Sun, Patrick Pei-Luen Rau, and Liang Ma. 2014. Understanding lurkers in online communities: A literature review. *Computers in Human Behavior* 38 (2014), 110–117.
[109] Huei-Chuan Sung, Anne M Chang, and Wen-Li Lee. 2010. A preferred music listening intervention to reduce anxiety in older adults with dementia in nursing homes. *Journal of clinical nursing* 19, 7-8 (2010), 1056–1064.
[110] Rhonda J Swickert, James B Hittner, and Aasha Foster. 2010. Big Five traits interact to predict perceived social support. *Personality and individual differences* 48, 6 (2010), 736–741.
[111] Gabrielle M Turner-McGrievy and Deborah F Tate. 2013. Weight loss social support in 140 characters or less: use of an online social network in a remotely delivered weight loss intervention. *Translational behavioral medicine* 3, 3 (2013), 287–294.
[112] Gary R VandenBos. 2007. *APA dictionary of psychology*. American Psychological Association.
[113] Prerna Varma, Moira Junge, Hailey Meaklim, and Melinda L Jackson. 2021. Younger people are more vulnerable to stress, anxiety and depression during COVID-19 pandemic: A global cross-sectional survey. *Progress in Neuro-Psychopharmacology and Biological Psychiatry* 109 (2021), 110236.
[114] Dianna Vidas, Joel L Larwood, Nicole L Nelson, and Genevieve A Dingle. 2021. Music listening as a strategy for managing COVID-19 stress in first-year university students. *Frontiers in psychology* 12 (2021).
[115] Satu Viertiö, Olli Kiviruusu, Maarit Piirtola, Jaakko Kaprio, Tellervo Korhonen, Mauri Marttunen, and Jaana Suvisaari. 2021. Factors contributing to psychological distress in the working population, with a special reference to gender difference. *BMC public health* 21, 1 (2021), 1–17.
[116] Amy Voida, Rebecca E Grinter, Nicolas Ducheneaut, W Keith Edwards, and Mark W Newman. 2005. Listening in: practices surrounding iTunes music sharing. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 191–200.
[117] Maike Vollstedt and Sebastian Rezat. 2019. An introduction to grounded theory with a special focus on axial coding and the coding paradigm. *Compendium for early career researchers in mathematics education* 13 (2019), 81–100.
[118] Piper Vornholt, Munmun De Choudhury, et al. 2021. Understanding the Role of Social Media–Based Mental Health Support Among College Students: Survey and Semistructured Interviews. *JMIR Mental Health* 8, 7 (2021), e24512.
[119] Greg Wadley, Amanda Krause, Jiahui Liang, Zihe Wang, and Tuck Wah Leong. 2019. Use of music streaming platforms for emotion regulation by international students. In *Proceedings of the 31st Australian Conference on Human-Computer-Interaction*. 337–341.
[120] Janice Waldron. 2018. Online music communities and social media. In *The Oxford Handbook of Community Music*. Oxford University Press Oxford, 109.
[121] Zachary Wallmark, Choi Deblieck, and Marco Iacoboni. 2018. Neurophysiological effects of trait empathy in music listening. *Frontiers in behavioral neuroscience* 12 (2018), 66.
[122] Han Wang and RongRong Fu. 2020. Exploring User Experience of Music Social Mode-Take NetEase Cloud Music as an Example. In *International Conference on Applied Human Factors and Ergonomics*. Springer, 993–999.
[123] Liuping Wang, Dakuo Wang, Feng Tian, Zhenhui Peng, Xiangmin Fan, Zhan Zhang, Mo Yu, Xiaojuan Ma, and Hongan Wang. 2021. Cass: Towards building a social-support chatbot for online health community. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–31.
[124] Xi Wang, Kang Zhao, and Nick Street. 2014. Social support and user engagement in online health communities. In *International Conference on Smart Health*. Springer, 97–110.
[125] Yi-Chia Wang, Robert Kraut, and John M Levine. 2012. To stay or leave? The relationship of emotional and informational support to commitment in online health support groups. In *Proceedings of the ACM 2012 conference on computer supported cooperative work*. 833–842.
[126] Yi-Chia Wang, Robert E Kraut, John M Levine, et al. 2015. Eliciting and receiving online support: using computer-aided content analysis to examine the dynamics of online social support. *Journal of medical Internet research* 17, 4 (2015), e3558.
[127] Roger J Watt and Roisin L Ash. 1998. A psychological investigation of meaning in music.

[128] Tim Wildschut, Constantine Sedikides, Clay Routledge, Jamie Arndt, and Filippo Cordaro. 2010. Nostalgia as a repository of social connectedness: the role of attachment-related avoidance. *Journal of personality and social psychology* 98, 4 (2010), 573.

[129] Wenwen Yang, Guiling Geng, Jianing Hua, Min Cui, and Zihan Geng. 2021. Informational support for depression and quality of life improvements in older patients with cancer: a systematic review and meta-analysis. *Supportive Care in Cancer* (2021), 1–13.

[130] Zheng Yao, Diyi Yang, John M Levine, Carissa A Low, Tenbroeck Smith, Haiyi Zhu, and Robert E Kraut. 2021. Join, Stay or Go? A Closer Look at Members' Life Cycles in Online Health Communities. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–22.

[131] Hong Zhang, Jiayi Nie, and Zenan Ruan. 2019. The Users Emotional Study of Netease Cloud Music Based on LDA Model. In *2019 4th International Conference on Cloud Computing and Internet of Things (CCIOT)*. IEEE, 20–23.

[132] Renwen Zhang, Kathryn E. Ringland, Melina Paan, David C. Mohr, and Madhu Reddy. 2021. Designing for Emotional Well-being: Integrating Persuasion and Customization into Mental Health Technologies. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–13.

[133] Renwen Zhang, Jordan Eschler, and Madhu Reddy. 2018. Online support groups for depression in China: Culturally shaped interactions and motivations. *Computer Supported Cooperative Work (CSCW)* 27, 3 (2018), 327–354.

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