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Can an AI Counselor Relieve Loneliness? A Qualitative Study in a Metaverse Environment

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***Abstract*:**

In response to growing concerns about adolescent loneliness and suicide, particularly during late-night hours when human support is often unavailable, this study explores the perceived usefulness of an AI counselor—Hironya AI—as a conversational partner for university students. Drawing on a qualitative research design, the study collected open-ended responses from 10 participants who interacted with the AI counselor. Data were analyzed using thematic coding and frequency analysis in MAXQDA, supplemented by emotional polarity assessment and code co-occurrence modeling.

Findings revealed that many participants expressed favorable impressions of Hironya AI, appreciating its accessibility, emotionally neutral stance, and capacity to encourage self-expression. Several users described it as a temporary conversational companion that could provide a sense of ease during moments of emotional vulnerability, especially when human interaction was less available. However, participants also noted its limitations, such as shallow conversational depth, lack of memory continuity, and limited emotional resonance. Concerns regarding privacy and the absence of a sustained sense of relational trust were also highlighted.

Overall, Hironya AI was viewed as a potentially helpful, yet inherently limited tool for alleviating loneliness. While it may offer immediate, low-barrier emotional engagement, it lacks the interpersonal depth and continuity necessary for long-term psychological support. The study suggests that AI counselors could serve a complementary function in mental health ecosystems, provided that future systems address current shortcomings by enhancing relational coherence, multimodal interaction, and privacy safeguards.

***Keywords*: AI, AI Counselor, Metaverse, Loneliness.**

1. Introduction

In recent years, social isolation and loneliness have emerged as critical mental health concerns among adolescents and young adults, particularly in countries such as Japan, where youth suicide rates have reached historically high levels. According to the Ministry of Education, Culture, Sports, Science and Technology (MEXT, 2025), the number of suicides among school-aged children in Japan reached a record high of 527 in the 2024 academic year, surpassing the previous year's confirmed total of 513. Many of these incidents occur late at night or in the early morning—times when family members and school counselors are typically unavailable. This temporal mismatch between the onset of emotional crises and the availability of human support underscores the urgent need for alternative, around-the-clock emotional support systems.

One potential response to this challenge is the use of AI-driven conversational agents, or AI counselors, which can provide real-time, anonymous, and judgment-free communication. Conversational AI technologies have already been employed in mental health contexts to support self-disclosure, emotional regulation, and stress management (Fitzpatrick et al., 2017; Morris et al., 2018). Some studies suggest that users may find it easier to express emotions to non-human entities, especially when privacy and fear of social evaluation are concerns (Ho et al., 2018).

However, despite growing optimism about the promise of AI in mental health care, questions remain regarding its effectiveness as a source of genuine emotional connection and support—particularly in addressing the deeply personal and existential feelings associated with loneliness.

This study investigates the perceived potential and limitations of an AI counselor, Hironya AI, as a conversational partner for university students experiencing loneliness. Given the increasing accessibility of generative AI and its integration into virtual environments, it is important to explore whether such systems can offer emotional relief during periods of isolation. The research adopts a qualitative approach, focusing on how participants evaluate the role of Hironya AI in alleviating loneliness, and what conditions might enhance or inhibit its effectiveness as a psychological support tool.

2. AI Counselor in the Metaverse

2.1 Selection of the Metaverse Platform

The term "Metaverse" is defined as a three-dimensional virtual environment within a digital space, where users can interact with one another and participate in various activities via avatars and user interfaces. The concept is a portmanteau of "meta (meaning "beyond")" and "universe," providing a space that surpasses physical constraints. The Metaverse has a wide range of applications, including entertainment, education, business, and social interactions (Durt, C., 2022). Around 20 years ago, Linden Lab's Second Life was the leading platform; however, since then, numerous metaverse environments have proliferated. Examples of such platforms include Fortnite, VRChat, Cluster, Minecraft, V-expo, Favorite Space, Roblox, Microsoft Mesh, Growtopia, ZEPETO, Spatial, and AEON Metaverse Hall.

In recent years, the Metaverse has evolved beyond merely a virtual world, becoming a technological foundation to facilitate integration with physical reality (Guo, Y., et al., 2022; Perkins, J., 2022). For example, it contributes to remote education, virtual corporate meetings, and the development of new business models in sectors such as tourism and exhibitions. Considering the characteristics of the Metaverse, it can be categorized into approximately three types. The features, strengths, and areas of application of each category are summarized below.

<Metaverse Emphasizing Entertainment and Gameplay>

1. Fortnite

Characteristics: A metaverse space that provides advanced gameplay and competitive elements, primarily serving as an entertainment platform. In addition to gaming, it also hosts concerts.

Strengths: Highly popular among younger users, with a strong ability to attract users through gaming.

Applicable Fields: Game events, entertainment-related marketing, and community engagement.

2. Minecraft

Characteristics: A highly open-ended, block-based construction game that is widely applied in education.

Strengths: Fosters creativity and imaginative thinking.

Applicable Fields: Creative learning and self-directed project-based learning.

3. Roblox

Characteristics: A platform where users can design and share games, widely utilized in programming education and creative activities.

Strengths: Widely recognized as an engaging learning environment for children, with a strong advantage in educational game development.

Applicable Fields: Programming education and experiential learning through game development.

<Socially Interactive Metaverse. >

4. VRChat

Characteristics: Enhances real-time interaction through avatars, centered around user-to-user communication.

Strengths: Ideal for social engagement, allowing for immersive and realistic VR-based conversations.

Applicable Fields: Social events and real-time social interactions.

5. Favorite Space

Characteristics: Facilitates communication in private virtual spaces and offers a personalized environment.

Strengths: Well-suited for personalized experiences, making it applicable to private consultations and small-scale events.

Applicable Fields: Small-scale educational activities and the organization of private events.

6. Cluster

Characteristics: Extensively utilized in Japan, featuring a large number of user-created worlds. The platform is designed to support educational events, lectures, and various applications.

Strengths: Offers Japanese-language support, has a large user base, and has established a strong presence in the education sector. Additionally, with over 40,000 user-created worlds, Cluster allows users not only to engage passively in the Metaverse but also to take an active role in creating their own virtual worlds.

Applicable Fields: Domestic educational events, interactive lessons, workshops, and user-to-user interactive experiences.

<Corporate Public Relations-Focused Metaverse>

7. AEON Metaverse Museum

Characteristics: Specializes in providing content related to the history of temples, shrines, and corporations, as well as company-related quizzes and exhibition materials, focusing primarily on educational content delivery.

Strengths: Is highly effective in exhibition-based education, offering a visual representation of educational content.

Applicable Fields: Museum-style educational content and knowledge dissemination.

8. Microsoft Mesh.

Characteristics: Primarily utilized as an enterprise-oriented remote collaboration tool.

Strengths: Provides high-level business collaboration features, making it a strong plat-form for enterprise-oriented Metaverse applications.

Applicable Fields: Corporate training, remote meetings, and collaboration activities.

9. V-expo.

Characteristics: A platform designed for exhibitions and business networking, de-signed to support industrial showcases.

Strengths: Specializes in virtual exhibitions and industry-focused presentations.

Applicable Fields: Virtual events for business expos and industrial exhibitions.

<Selection of the Metaverse Platform>

In this study, particular emphasis was placed on dialogue and interaction in education, leading to the selection of Cluster. The platform was chosen for its key feature of allowing users to actively create their own Metaverse worlds, as well as its well-established Japanese-language support and capacity to accommodate a large number of users.

2.2 Development of the AI Counselor "Hironya AI"

AI characters in the Metaverse function as guides and sources of information by interacting with users. For example, in the education sector, students who do not at-tend school can gather in virtual classrooms within the Metaverse (Kanoh, 2023), where they can attend lessons, go on virtual picnics with friends, or enjoy watching the sunset together. In the future, AI teachers could conduct lessons in virtual class-rooms and respond to individual student inquiries.

So far, the author has handled consultations with non-attending student's multiple times. In these interactions, the author has frequently heard students express concerns about their fear of talking to people. It appears that some students can talk comfortably to stuffed animals in their rooms but become nervous and unable to relax when facing an "actual person." To address this, the AI counselor was designed with an animal-like appearance and named Hironya AI. Hironya AI uses the 3D model from Unity Asset Store's "Little Friends - Cartoon Animals". The conversation interface is shown in Figure 1, where Hironya AI is the character on the left, while the user (Hiroka) is represented by the avatar on the right.

Unity was used to develop the virtual world in Cluster. Figure 1 illustrates the appearance of the entrance to "Hironya AI Room 2024" in Cluster. When users click on Hironya AI, a text input box appears, displaying the messages: "Hello" and "Please feel free to share what you would like to discuss or consult about".

```
view_timer.setText("Hello");
view.setText("Please feel free to share what you would like to discuss or consult about");
```

The script was based on the ChatGPTApp (Public) repository on GitHub, created by Guillemine A (2023). The JSON files were modified in Visual Studio Code.

However, it has not yet been made publicly available. The reason for this is that the GPU usage upon public release remains unpredictable. Currently, Hironya AI runs on ChatGPT (GPT-4o model).

```
if (vision) {
        payload.model = 'gpt-4o';
```

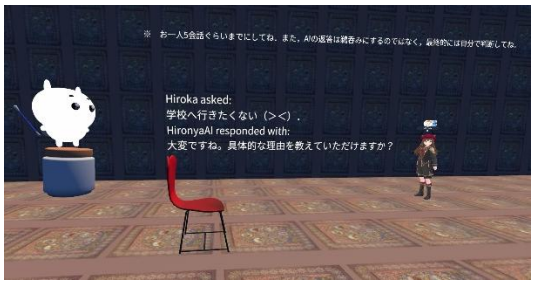

Figure 1: Consultation Scene with Hironya AI

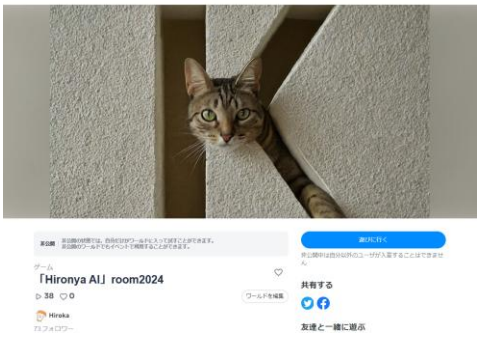

Figure 2: Entrance to Hironya AI Room 2024 within Cluster

Since this setup only involves text-based output, GPT-4 Turbo was expected to be sufficient, but it failed to generate the desired responses. For example, when users said phrases like "I don't want to go to school" or "I'm struggling with relationships," GPT-4 Turbo simply responded with "Please consult a counselor," which abruptly ended the conversation. By using the GPT-4o model, the AI was able to generate responses such as "Let's find a solution together," producing the expected counselor-like output that engages in joint problem-solving with the user (Figure 3).

Figure 3: Example of AI Output Engaging in Joint Thought with the User

Additionally, the program for exchanging JSON files within Unity was implemented using Google Apps Script. The instructions given to ChatGPT were set to make it behave as a counselor well-versed in Japanese law and medical knowledge. Furthermore, since excessively long responses may be truncated within the Cluster world, the response length was set to be limited to a maximum of 15 words.

```
const chat = ChatGPTApp.newChat();
chat.add Message ("You are a counselor. You are also knowledgeable about Japanese law and medical knowledge. Please explain the technical details in a polite and easy-to-understand manner. give a response no more than 15 words. answer in the language of the question.", true)
chat.add Message (request String);
```

Figure 4 illustrates the implementation sequence diagram. The response processing procedure follows the steps below:

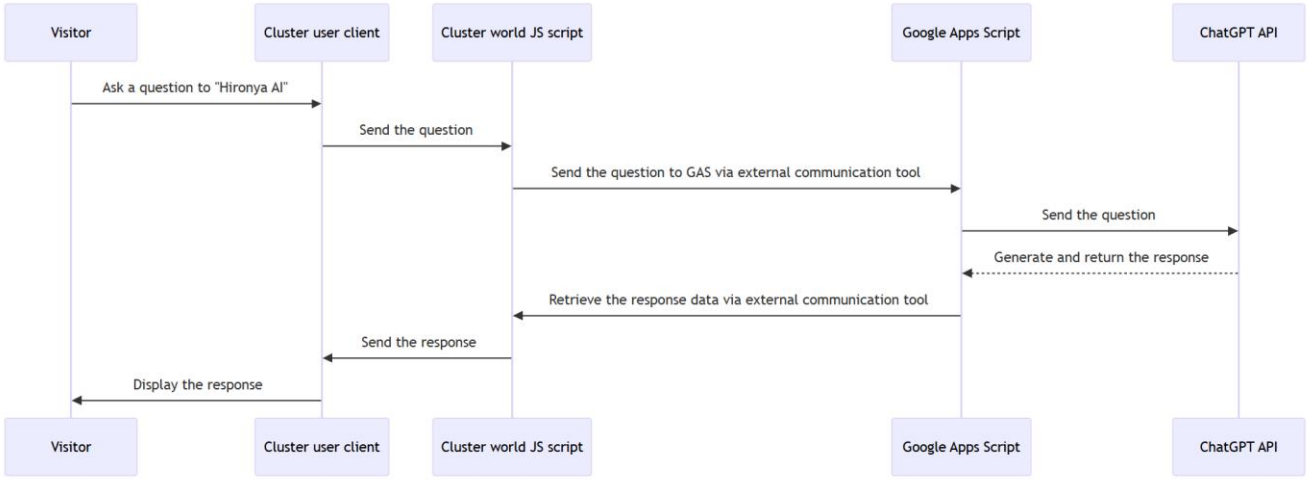

Figure 4: Implementation Sequence Diagram

A. Visitor Asks a Question: The Visitor (i.e., the user seeking consultation) asks a question to the Hironya AI character within Cluster.

B. Processing the Question: The question data received from the Visitor is first transmitted via the Cluster user client and then received and processed by a JavaScript (JS) script located within the Cluster world (a world created in Unity and uploaded to the server). The script formats the question into a JSON file for further processing.

C. Sending Data to Google Apps Script: The JSON file containing the question data is sent to Google Apps Script using the call External () function.

D. Generating a Response via ChatGPT API: Google Apps Script processes the question via the ChatGPT API and generates a response.

E. Returning the Response: The generated response from the ChatGPT API is sent back to Google Apps Script, which then transmits it via a JSON file to a world created in Unity.

F. Displaying the Response: The response is transmitted from a world created in Unity to Cluster, allowing the Visitor to view the response within the Cluster environment.

3. Methodology and Results

3.1 Methodology

In Japan, student suicide remains a serious and ongoing issue in the field of education. Many cases occur during the late-night or early-morning hours, when students are often unable to reach out to family members or school counselors, who are likely to be asleep. This temporal gap in human availability poses a critical challenge for timely psychological support. In response, this study explores the potential of an AI-based counselor, Hironya AI, as an always-available interlocutor for individuals experiencing loneliness.

As part of an ongoing research agenda, the author has conducted several experimental studies focusing on the educational use of metaverse environments and the implementation of AI counselors to support well-being(Kanoh,2024a; Kanoh,2024b; Kanoh,2025).

To investigate the question, "Could an AI Counselor like Hironya AI be helpful as a conversation partner for individuals experiencing loneliness?", a qualitative exploratory study was conducted. Ten university students participated voluntarily and responded to an open-ended questionnaire regarding their perceptions of Hironya AI as a supportive agent during times of emotional distress.

The collected textual data were analyzed using MAXQDA 2022, a qualitative data analysis software. After importing the responses into the software, a coding process was conducted to extract recurring themes, expressions

of emotional need, and evaluations of AI interaction. Categories were developed inductively through iterative reading and refinement of codes. The coded segments were then reviewed and visualized using MAXQDA's Code Matrix Browser and summary tables to identify patterns in students' views.

Furthermore, participants explicitly provided consent for the text data—used for morphological analysis and other text mining procedures—to be utilized for academic purposes and potentially published in an anonymized format.

3.2 Results

3.2.1 Frequency of Codes Applied to Participant Responses

The qualitative analysis using MAXQDA revealed several key codes that frequently appeared in participants' responses regarding their impressions of the AI counselor Hironya AI. The six most frequently applied codes and their respective frequencies and percentages are shown in Figure 5.

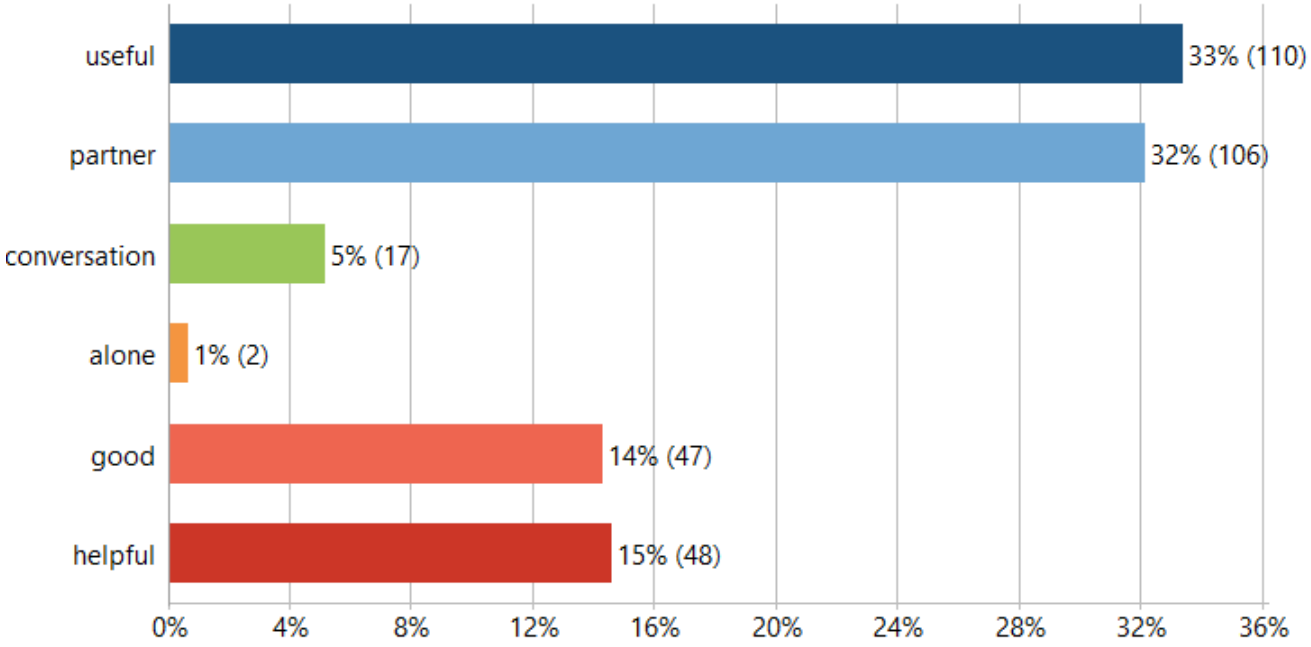

Figure 5: Frequency of Codes Applied to Participant Responses

The most prominent code was "useful", which was applied 110 times, accounting for 33% of all coded segments. This suggests that many participants perceived Hironya AI as a functionally beneficial tool in addressing emotional needs. The second most frequent code was "partner" (106 occurrences, 32%), indicating that students tended to see the AI as a potential conversational or emotional partner, not merely as a tool.

The codes "helpful" and "good" were applied 48 and 47 times, respectively (representing 15% and 14% of total coding), reinforcing a generally positive impression of the AI's potential. These codes suggest an appreciation for the AI's responsiveness and perceived empathy, even in the absence of true human understanding.

In contrast, the codes "conversation" (17 times, 5%) and "alone" (2 times, 1%) were less frequent. The low appearance of "alone" may imply that users did not often express feelings of isolation directly, or that they instead framed Hironya AI as mitigating such feelings rather than describing the experience itself. Meanwhile, the limited mention of "conversation" might reflect that participants emphasized utility and companionship over the mechanics of dialogue.

Overall, the results indicate a positive reception of Hironya AI as a supportive and accessible presence, especially during emotionally vulnerable times when human interlocutors are not available.

3.2.2 Word Cloud Analysis

To further explore the language participants used in describing the potential of Hironya AI, a word cloud was generated from all open-ended responses using MAXQDA's text mining function (Figure 6). The visualization highlights the most frequently occurring terms after lemmatization and stop-word exclusion.

The term "AI Counselor" appeared most prominently, reflecting the central focus of the responses. This indicates that participants engaged directly with the idea of AI as a counselor and used the term consistently throughout their reflections. Closely associated with this were the words "conversation," "talk," and "partner," suggesting that many participants conceptualized Hironya AI as a communication partner rather than a passive tool.

Words such as "lonely," "loneliness," "emotion," "feeling," and "worry" also featured prominently, indicating that emotional states and psychological needs were key themes in participant responses. The presence of these terms supports the idea that users were thinking about Hironya AI in the context of emotional support and mental well-being.

On the functional side, terms like "useful," "help," "immediately," "answer," and "response" were recurrent, suggesting an emphasis on the AI's immediacy, availability, and instrumental value in situations where human support may not be accessible.

Interestingly, terms such as "human," "person," and "relationship" also appeared, which may reflect participants' comparisons between AI and human counselors, or concerns about the lack of human warmth in AI-mediated interaction. Furthermore, the presence of modifiers such as "difficult," "concern," "depend," and "limit" may point to participants' reservations or perceived constraints of AI in sensitive emotional contexts.

Overall, the word cloud reveals a nuanced perspective: participants generally viewed Hironya AI as a potentially helpful, immediate, and emotionally aware conversational partner, while also acknowledging limitations in terms of emotional depth and human connection.

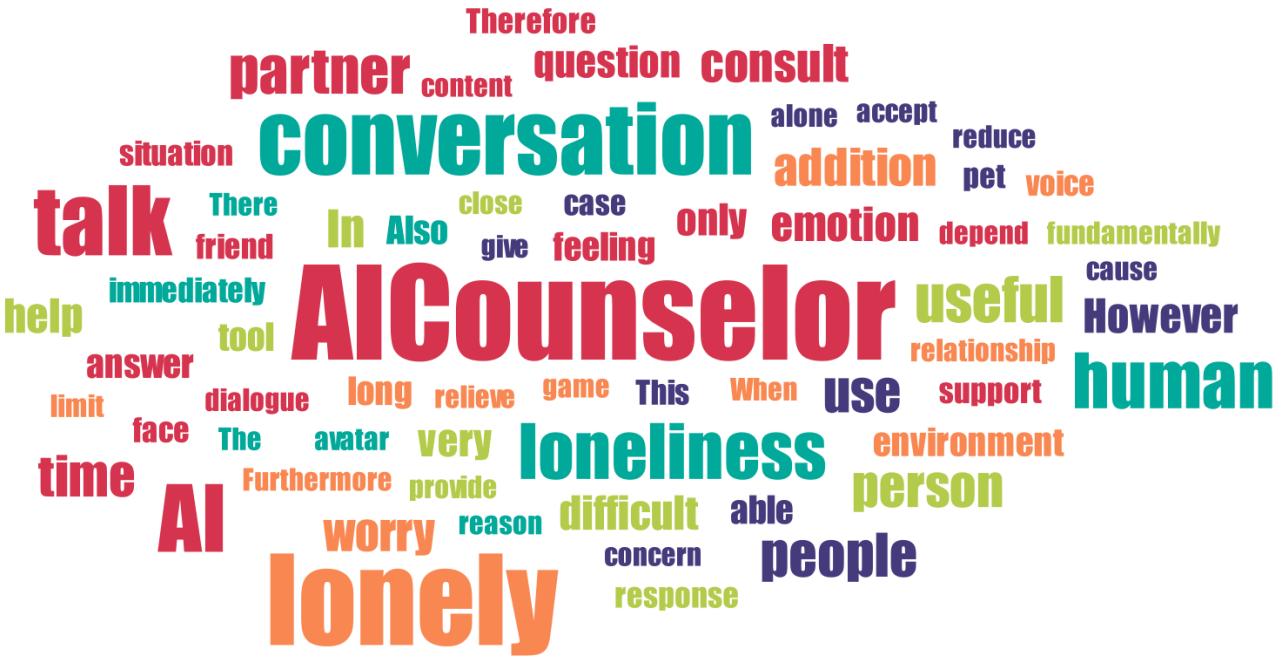

Figure 6: Word Cloud

3.2.3 Emotional Polarity Analysis

To better understand the evaluative stance of participants toward Hironya AI, responses were categorized into two thematic groups: Positive Emotion and Negative Emotion. The classification was based on previously coded data, grouping keywords such as useful, partner, and relieve under the positive category, and worry, difficult, and concern under the negative one.

As shown in Figure 7, the distribution of emotional valence revealed that 67% (n = 291) of the coded segments reflected positive emotional evaluations, while 33% (n = 145) indicated negative sentiments. This suggests that the majority of participants perceived Hironya AI as beneficial, supportive, or comforting, particularly in contexts of loneliness or emotional distress.

However, the presence of a considerable portion of negative sentiment also indicates ongoing concerns, especially related to emotional authenticity, depth of understanding, and comparisons with human counselors. These mixed sentiments point to a nuanced user perception, combining practical appreciation with reservations about relational depth.

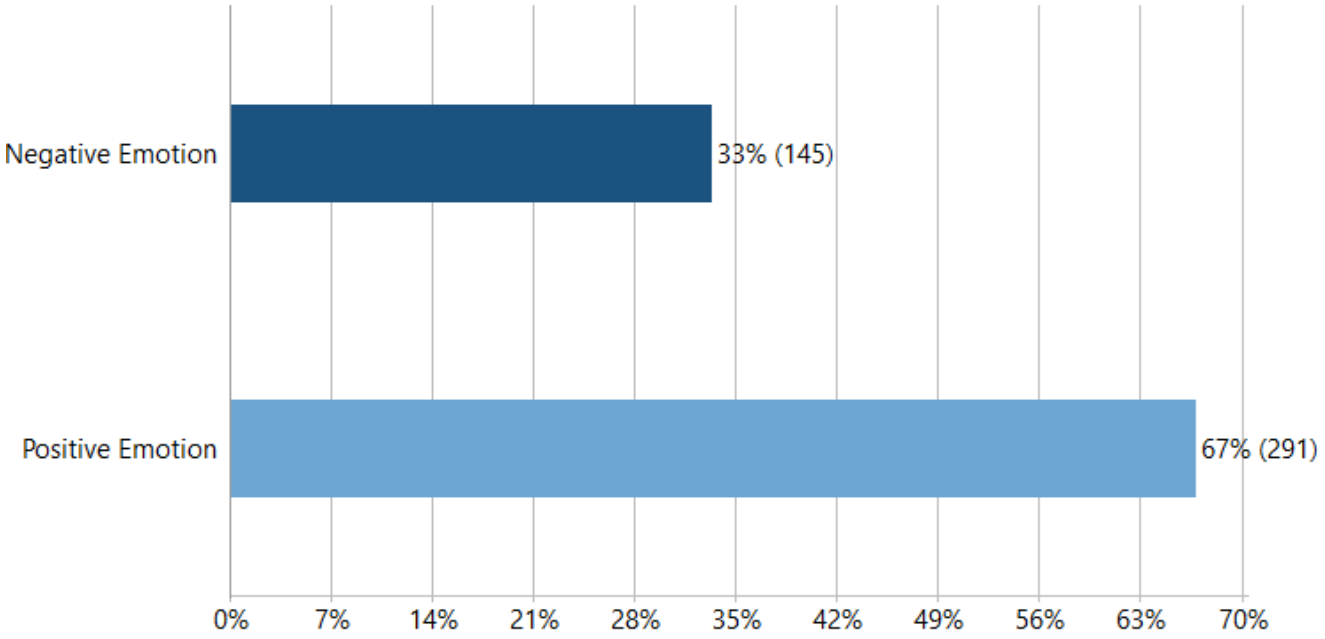

Figure 7: Positive vs Negative Emotion

3.2.4 Co-occurrence Analysis of Emotional Codes

To explore the coexistence of positive and negative perceptions in participants' responses, Table 1 presents the co-occurrence frequencies between positive emotion codes (e.g., useful, partner, conversation) and negative emotion codes (e.g., not human, difficult, concern, lonely). These frequencies represent the number of times two codes appeared within the same textual segment (e.g., sentence or paragraph).

Table 1: Co-occurrence frequencies between positive and negative emotion codes

Code System	Negative Emotion	not human	difficult	concern	alone	lonely
Positive Emotion > immediately	15	20	15	20	6	119
Positive Emotion > conversation	22	27	22	27	10	115
Positive Emotion > good	43	57	43	57	15	156
Positive Emotion > partner	88	116	88	116	30	215

Positive Emotion > helpful	2	2	2	2	0	32
Positive Emotion >helpful > help	43	57	43	57	15	156
Positive Emotion > useful	91	120	91	120	34	219

The highest co-occurrence was observed between useful and lonely (219), followed closely by partner and lonely (215). This indicates that Hironya AI was often viewed as a helpful and accessible partner in moments of loneliness. Similarly, conversation, good, and immediately also frequently co-occurred with lonely, suggesting that participants appreciated the AI's responsiveness and dialogue potential, particularly when feeling isolated.

Notably, several positive emotion codes frequently co-occurred with negative evaluations such as not human, difficult, and concern. For example, useful co-occurred with not human 120 times, and partner with concern 116 times. These findings suggest that while participants acknowledged the practical benefits of the AI counselor, they simultaneously expressed reservations about its emotional limitations or lack of human-like qualities.

Taken together, the results suggest a dual perception: while many participants found Hironya AI to be helpful and comforting, these positive views often coexisted with concerns about emotional authenticity and relational depth.

4. Discussion

The emotional polarity analysis showed that 67% of all coded segments were categorized as expressing positive sentiment, while 33% reflected negative or cautious attitudes. These results suggest that most participants perceived Hironya AI as a potentially valuable conversational partner during emotionally difficult moments. However, the substantial portion of negative responses and the nuanced expressions seen in the open-ended comments indicate that users' evaluations are not simply dichotomous but context-dependent and experience-driven.

Several participants expressed strong support for Hironya AI as a helpful resource in times of loneliness. One participant remarked:

"I think AI Counselor is very helpful when one feels lonely. Since loneliness arises from being in an environment where one feels alone, even having someone—or something—to talk to can significantly reduce that feeling."

Another user echoed this sentiment, noting the value of nonjudgmental expression:

"Because AI doesn't have emotions, I can express my feelings freely without fear of judgment. It helped me understand the cause of my loneliness and prompted self-reflection."

These comments align with prior research suggesting that conversational AI can promote emotional disclosure by lowering social evaluation concerns (Ho et al., 2018; Lucas et al., 2014). The 24/7 availability of the AI counselor was also frequently cited as an advantage, consistent with findings from Morris et al. (2018) that highlight the role of digital agents in mental health support, especially outside of regular service hours.

However, not all participants were satisfied with the depth or quality of interaction. One respondent critiqued the superficiality of responses:

"The content of the responses was shallow, and I did not feel that my inner thoughts were being truly understood. The AI forgets previous conversations, making it hard to build a trusting relationship."

Others commented on the lack of embodied interaction, such as vocal tone or gesture, which they felt diminished the sense of being "heard":

"The avatars felt less lonely because they used body language. AI Counselor didn't do that—it felt like no one was really listening."

The absence of multimodal cues (e.g., prosody, gaze, facial expression) appears to be a key limitation in the perceived emotional effectiveness of text-based AI systems (Bickmore & Cassell, 2005). Furthermore, concerns about privacy also emerged:

"Knowing that my input might be visible to others made me hesitant. It's hard to be honest when you're not sure your words are safe."

This reflects ongoing concerns in the literature regarding the ethical design of AI-mediated counseling systems (Fiske et al., 2019). In addition, some participants noted that while Hironya AI was convenient, it may not be suited for deeper or more complex emotional support, supporting the argument that AI should serve as a complementary rather than replacement solution (Zhou et al., 2021).

Overall, the discussion illustrates a dual perception: Hironya AI was appreciated as an immediately available and nonjudgmental listener, but participants also expressed clear awareness of its functional, emotional, and relational limitations. The findings support the notion that conversational AI tools can temporarily mitigate loneliness but are not yet sufficient to provide sustained emotional relief.

Future development should aim to address three key challenges raised by participants:

- Depth of conversation: enabling richer and more context-aware interactions;
- Continuity: maintaining memory across sessions to foster trust;
- Safe and private environments: ensuring secure, user-controlled communication settings.

5. Conclusion

This study investigated the perceived value of Hironya AI, a conversational AI counselor, in mitigating feelings of loneliness among university students. The emotional polarity analysis revealed that while the majority of participants expressed positive sentiments—emphasizing usability, immediacy, and emotional relief—approximately one-third also conveyed skepticism, particularly regarding the system's relational and affective limitations.

Thematic analysis of qualitative data from the ten participants revealed a nuanced landscape of user attitudes. Several students described Hironya AI as a helpful, nonjudgmental listener available on demand, underscoring its potential to provide momentary relief during emotionally vulnerable periods. Others, however, pointed to significant limitations—such as shallow conversational depth, lack of memory continuity, and absence of voice or embodied cues—that hindered its capacity to foster meaningful connection or sustained emotional support. Concerns about privacy and the unnaturalness of AI responses further complicated its acceptance as a trustworthy interlocutor.

These findings support the conclusion that while Hironya AI may serve as a situationally useful and psychologically accessible tool, it cannot yet replace the human capacity for emotionally rich and responsive interaction. Its role is best understood as complementary: an immediate and private outlet for low-stakes expression, but one that currently falls short of addressing deeper psychological needs.

To enhance the future utility of AI counselors in emotional support contexts, developers and researchers should prioritize improvements in:

- Conversational continuity, to facilitate trust-building;
- Emotional realism, via multimodal communication (e.g., voice, avatars, prosody);
- Privacy protection, ensuring a secure and confidential environment for users;
- Ethical design, especially regarding transparency and autonomy.

Ultimately, the promise of AI in loneliness interventions lies not in mimicking human empathy, but in thoughtfully augmenting human care systems with technology that is reliable, context-sensitive, and ethically grounded.

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