CounselAR: Exploring How AR Filters Facilitate Online Psychotherapy In the Wild With South Korean Young Adults

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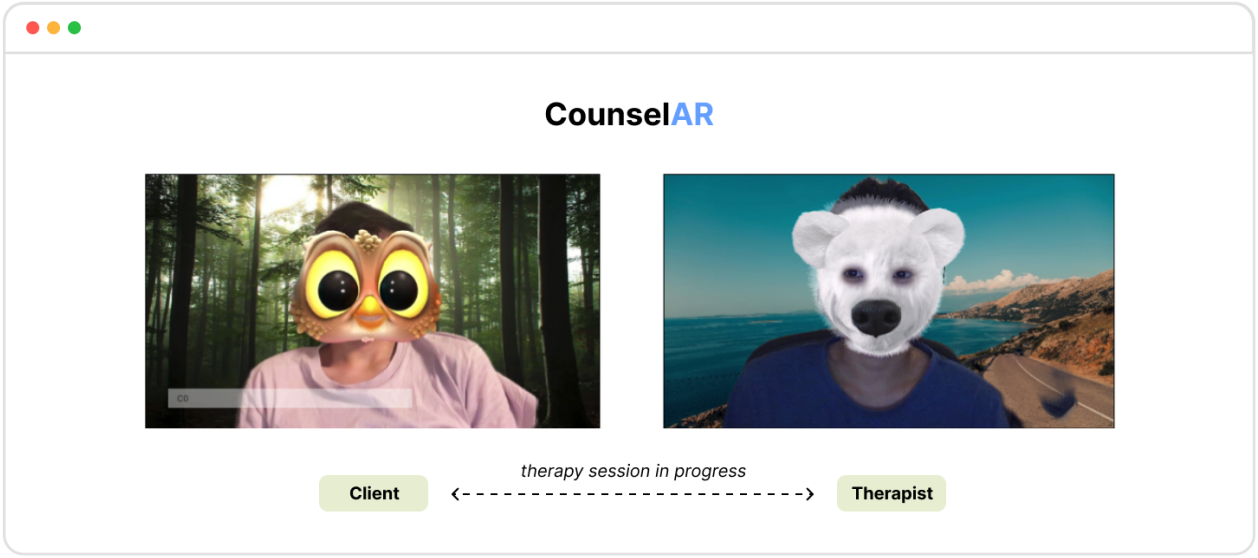

Figure 1: Example therapy session between a therapist and client.

Abstract

In a society where mental health issues are prevalent, engagement with psychotherapy remains low due to stigma and accessibility barriers. Telepsychotherapy offers a potential solution but holds challenges, including difficulties in encouraging open self-disclosure and ease of access. In this paper, we introduce CounselAR, an augmented reality (AR)-mediated therapy service designed to facilitate

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one-on-one therapy sessions by allowing both client and therapist to use AR filters to maintain varying degrees of anonymity. Through a six-week field deployment involving nine clients and four therapists, we explored how AR-mediated therapy might support psychotherapy from both the clients' and therapists' perspectives. The results illustrate the potential role of AR filters in enhancing self-disclosure, building rapport, and lowering entry barriers to psychotherapy. Drawing on these findings, we discuss the nuanced role of AR filters and the implications of leveraging AR in psychotherapy.

CCS Concepts

• **Human-centered computing → Empirical studies in HCI**; **Field studies**.

Keywords

AR, HCI, Psychotherapy, Field Deployment Study, Young Adults, Mental Health

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1 Introduction

The global burden of mental health challenges is undeniable, affecting nearly 970 million people worldwide [128]. The crisis is particularly severe in South Korea, where 9 out of 10 people report experiencing stress [62]. Among young adults in their 20s and 30s, the situation is especially acute, with suicide being the leading cause of death—a stark indicator of the profound societal and emotional challenges faced by this age group [57].

Effective interventions like pharmacology and psychotherapy are available [21, 56, 80, 120, 125], yet global treatment uptake remains low due to perceived, anticipated and actual barriers such as limited accessibility and widespread stigma [28, 50, 103]. In South Korea, the challenges of mental health care are exacerbated by structural discrimination and societal narratives that associate shame and stigma with seeking help [105]. These factors significantly deter young adults from accessing mental health services, with only about ten percent receiving any form of care [113].

Telepsychotherapy has become a viable alternative, eliminating time and geographical barriers and offering anonymity. Although doctor-patient confidentiality is foundational to a successful therapeutic alliance, confidentiality alone is not sufficient to facilitate client self-disclosure. Not only do factors such as perceived safety, comfort, and trust within the therapeutic setting determine its quality and depth; but client self-disclosure is also fluid, requiring attention across the treatment timeline [27, 39, 114, 127]. This is especially because the act of disclosing in earlier sessions can provoke feelings of anxiety and shame [37], highlighting the need for a safe and accepting therapy environment.

Studies on online therapy have shown that anonymity is a key factor that could encourage clients to share personal and sensitive information by reducing stigma-related barriers [46, 70]. However, client anonymity brings its own challenges in the therapeutic space, such as potential difficulty in building therapeutic relationships and limitations in the ability of both client and therapist to interpret non-verbal cues, considered a vital part of effective therapy [51, 78]. These issues are especially pronounced in text or audio-based therapy, where anonymity is maximized, but visual cues are completely lost [30, 79]. Recognizing these limitations, mental health researchers have called for further exploration to address these challenges, particularly through qualitative studies that examine the nuanced experiences and effects of such therapy modality [60, 79].

Moreover, the field of Human-Computer Interaction (HCI) has been actively exploring technological interventions aimed at addressing access barriers and how to best meet the unique needs of individuals living with various psychological conditions [4, 7, 24, 85, 97]. These efforts have led to the development of various technological interventions and have provided valuable insight into how technology can bridge gaps in accessibility, anonymity, and self-disclosure in mental health contexts [4, 7, 33, 93, 108].

Studies highlight the need for technology-mediated anonymity and confidentiality in mental health care [2, 7, 33], particularly when clients need to overcome initial anxiety about self-disclosure due to fear of judgment or stigma [2]. While research in technology-mediated psychotherapy remains sparse, with only a few studies focusing on counseling or psychotherapy, initial findings suggest potential benefits. Virtual reality (VR), for instance, has demonstrated its ability to provide anonymity and facilitate self-disclosure [8, 19]. However, VR equipment is not readily accessible to everyone, which limits its utility in making mental health support widely available [3]. In contrast, augmented reality (AR) technology, which employs real-time information such as text, graphics, audio, and virtual enhancements integrated with real-world objects, shows potential as a more accessible alternative [83]. Despite the scarcity of research on technology-mediated psychotherapy, existing studies suggest that AR filters can potentially increase self-disclosure and comfort levels in online counseling, offering a viable alternative to traditional video counseling [83].

In this study, we present CounselAR, an AR-mediated psychotherapy service depicted in Figure 1, designed to facilitate one-to-one psychotherapy between therapists and young adult clients dealing with a range of psychological difficulties, including anxiety and depression. CounselAR's AR filters provide optional anonymity for clients and therapists while allowing for the detection of some non-verbal cues, addressing limitations of audio or chat-based telepsychotherapy. We iteratively designed this service in collaboration with clients and therapists through co-design workshops. We conducted a six-week field deployment study with nine clients and four licensed psychotherapists (hereafter, 'therapists'), who held weekly one-hour sessions in an AR-mediated therapy setting using CounselAR. We gathered standardized measures data through questionnaires (before, mid, and after) and qualitative data through in-depth semi-structured interviews (before and after) to understand clients' and therapists' experiences and perceptions of AR-mediated psychotherapy. This study is guided by a primary research question, supplemented by two sub-questions:

- What are the perceived benefits and challenges of using AR filters in telepsychotherapy?
  - How do clients and therapists view and use AR filters?
  - How do AR filters influence the therapeutic dynamics, specifically clients' self-disclosure and rapport-building?

The key contributions of this work include (1) the design and development of CounselAR, an AR-mediated psychotherapy system tailored for one-to-one synchronous online therapy, developed in collaboration with stakeholders; (2) empirical findings grounded in rich qualitative data, confirming the feasibility and acceptability of AR-mediated telepsychotherapy delivered in a real-world setting; (3) foundational work demonstrating the validity of AR-mediated therapy as a talking therapy, which may act as an important vehicle for the reduction of stigma and removal of accessibility barriers.

2 Related works

2.1 Mental health disorders amongst young

Mental health disorders are widespread health challenges that significantly impact adults globally. According to the Global Burden of Disease Study 2015, major depressive disorder (MDD) ranks as the second most prevalent condition, while anxiety disorders are ninth due to their high prevalence and the substantial disability they cause at an individual level. Young adults in their 20s and 30s are particularly vulnerable to mental health issues [59, 104]. This period, characterized by substantial changes in educational pursuits, relationship statuses, professional lives, and often geographic and living situations, is recognized as a significant developmental phase [55]. Unsurprisingly, mental health issues during this stage are linked to problems in work, interpersonal relationships, and educational achievements, potentially affecting later life stages, including parenting behaviors and the risk of developing chronic mental health conditions [52, 59, 94].

In South Korea, the situation appears more dire, with approximately 40% of the population experiencing clinically significant low mood at any given time [64]. Over the past four years, the incidence of depression among young Koreans in their 20s and 30s has surged by over 50% [61, 86]. Additionally, since 2003 (with the exception of 2016 and 2017), South Korea has consistently had the highest suicide rate among OECD countries [57, 86], with suicide being the leading cause of death among people in their 20s and 30s [63]. Recent studies indicate that nearly half of young adults in South Korea considered suicide last year [57]. This underscores a critical need for early intervention in mental health to prevent a range of later life challenges, including suicide.

The heightened rates of depression among young adults are often attributed to intense pressures related to employment, educational expectations, and societal norms [63, 64, 88]. Despite the high prevalence, proactive treatment seeking remains remarkably low, majorly due to structural discrimination, such as disadvantages in employment, and deep-seated cultural stigmas surrounding mental health [64, 86]. Only about 10 percent of affected young adults seek professional help, a rate much lower than in Western countries like Canada and the US [87]. In response, the South Korean government has introduced biannual mental health screenings for high-risk individuals. However, experts caution that this policy might exacerbate the issue, as fears of being labeled with a mental health condition, along with the potential social repercussions, such as in employment, might deter seeking help. Thus, experts emphasize that more specific approaches prioritizing privacy and anonymity are needed for this demographic's mental health care [69].

2.2 Telepsychotherapy and Computer-Mediated Communication

Psychotherapy has become the key treatment for anxiety and depression, utilizing a range of therapeutic practices and approaches. To enhance the accessibility of these therapies, computer-mediated psychotherapy (CMP or Telepsychotherapy) has gained popularity. Telepsychotherapy involves delivering mental health services through digital platforms such as video calls, messaging apps, and emerging technologies such as AI and VR, enhancing accessibility, cost-effectiveness, and convenience [9, 15, 25, 98, 121]. However, it is important to note that telepsychotherapy may not be best suited for all; in particular for individuals with severe mental health problems or those needing immediate crisis intervention [81, 119]. Anonymity on digital platforms can enhance self-disclosure [26, 35, 45, 49, 96] and may reduce stigma associated with cultural norms, encouraging more people to seek help for sensitive topics [2]. However, client's anonymity (i.e. turning the video off) in these settings is often debated, with research indicating that it hinders building an authentic therapeutic alliance and communication due to the inability to detect nonverbal cues, essential for effective therapy [31, 51, 78]. These limitations are more pronounced in phone or text-based modalities, highlighting greater potential for video-based psychotherapy which allows for the detection of more nonverbal cues [30, 79]. The effectiveness of telepsychotherapy has been actively debated. Some research supports that telepsychotherapy is not inferior to in-person therapy in treating mental health issues [1, 18, 89, 95], while other research demonstrates that in-person therapy may build stronger rapport and yield better results [73, 84]. These mixed results highlight the need for continued exploration into online therapy, particularly through qualitative studies that can provide deeper insights into its nuances [60, 79].

2.3 VR and AR in Mental Health and HCI Community

The field of HCI has been actively exploring and designing technology-enabled solutions to address global mental health challenges. Extensive efforts within the HCI community have aimed to enhance the accessibility of mental health treatments through a variety of approaches, including emotional regulation techniques, digital community support, chat-bot-based assistance, cognitive behavior therapy interventions, and in-situ technologies [78, 79, 80, 81, 82, 83, 85]. Moreover, a growing body of research underscores the importance of anonymity in mental health contexts to foster help-seeking behaviors and mitigate stigma-related barriers [2, 6]. Despite psychotherapy's proven effectiveness and potential for anonymity-preserving methods online, technology-mediated psychotherapy is still under-explored in HCI. Preliminary studies indicate that AR filters in counseling can boost self-disclosure among open individuals due to the visual anonymity provided [83]. These findings, however, are limited to controlled environments, highlighting the need for

more natural, longitudinal research to understand the enduring effects of AR filters. Despite these preliminary promising insights, a comprehensive understanding of how these tools function in real-world settings, their impact on therapy from both therapists' and clients' perspectives, and their influence on therapy outcomes require further exploration.

Conversely, VR (fully computer-generated environments) and AR (overlaying computer graphics on the real world) have been integrated into clinical treatment of mental health settings, primarily for treating PTSD and phobias [123, 132]. VR technology, in particular, has garnered more attention than AR, with research exploring its use in treating conditions such as acrophobia [22, 41, 41, 118], agoraphobia related to panic attacks [72], psychosis [38], social phobia [124], and obsessive-compulsive disorder (OCD) [68]. These comparative studies have demonstrated that VR and AR exposure therapies can be effective alternatives to traditional in-vivo treatments, offering similar outcomes to cognitive behavioral therapy (CBT) which focuses on reducing cognitive biases without direct exposure to fear- or anxiety-inducing scenarios [117].

In parallel, social virtual reality platforms are being embraced by users seeking deeper connections, recognized as effective tools in supporting subjective well-being. For example, Deighan et al. described how social VR is used as a mental health support tool, with participants attributing well-being benefits specifically to the anonymity provided by avatars [33]. However, the heterogeneity and quality of current research into the application of VR and AR in the therapeutic environment have been criticized, calling for patient-centered, higher-quality studies [9]. Despite the growing interest in AR, VR, and immersive worlds for treating mental health disorders [75, 109, 111, 130]; there is a significant research gap in their use specifically within psychotherapy [101, 122]. Building on initial findings that AR enhances client self-disclosure [83], further investigation is essential to determine how AR filters can be effectively implemented in psychotherapy. More research is needed to meet the rising demand for mental health methods that prioritize anonymity and privacy, potentially lowering barriers to mental health care.

3 Designing and Developing CounselAR

Below, we outline the design and development process of CounselAR prior to its field deployment.

3.1 Preliminary Exploration of Design Functions and Features

To identify the essential design functions and requirements that meet user needs, we conducted a preliminary participatory workshop with three clients and three therapists. This workshop was a pragmatic step in our development process, aimed at gathering key design functions to consider when developing CounselAR.

We conducted three 2.5-hour participatory design workshops, each pairing one client with one therapist. Clients were recruited through flyers distributed within university buildings, while therapists were recruited via online advertisements within the university's internal psychologists network. The recruitment criteria required clients to be in their 20s and 30s with experience in both in-person and online therapy. Therapists needed to be licensed and have at least one year of experience in conducting therapy in both formats. To ensure that participants did not know each other beforehand, recruitment was carried out at two different campuses in separate cities. Consequently, we recruited three clients in their 20s, all of whom are university students, and three licensed therapists in their 30s and 40s. While therapists were recruited through the university's internal network of psychologists, all therapists were private practitioners with varying affiliations to the university (e.g., as researchers); none were employed as university counselors or therapists.

The workshops were divided into two parts: pre-activity and main activity.

- **Pre-activity:** The workshop started with a client and therapist conducting an intake therapy session over FaceTime using AR filters (Memoji and Animoji) in separate rooms, using iPhones provided by the researchers to ensure no personal information was exchanged. This was to help them understand the technological concept of using AR filters in the therapy to provide them with more hands-on experience for the subsequent design discussions.
- **Main activity:** Participants then joined together in one room to debrief their experiences. Guided by two facilitators, they discussed the advantages and disadvantages of their experience, collaboratively identified crucial design features, and created paper prototypes based on these functions.

Through collaborative workshops with clients and therapists, we derived essential design features and functions for an AR-mediated therapy service, as outlined in Table 1. These features were designed to address the needs of clients, therapists, and their shared goals within an AR-mediated therapy context.

Since participants' experiences were based on FaceTime, many proposed design features aimed to address its limitations.

Clients wanted flexible video controls to resize their faces to keep AR filters aligned, maintain anonymity by avoiding personal contact sharing, and preview AR filters before sessions. They also sought therapist selection criteria (e.g., gender, age, experience) and an option to indicate whether therapists should use AR filters.

Therapists also emphasized the ability to use AR filters themselves and suggested logging client filter usage for gaining deeper insights. Other key features included emergency contact access, standardized test integration, and secure session transcriptions, aligning with in-person therapy practices.

Both clients and therapists highlighted the need for pre-session filter exploration, a calendar function, privacy safeguards to block faces during filter malfunctions, changeable backgrounds, and secure data storage. They also noted AR filters often failed when users touched their faces, briefly exposing them.

Some design features, like automatic face-blocking during technical glitches and a dedicated space for AR filter exploration prior to therapy session, align with proposed design implications for AR-aided counseling platforms in previous studies [83]. Based on these key functions, participants collaboratively designed paper prototypes of a mobile phone UI as the final workshop activity (see Figure 2). These insights provided a foundation for understanding key features and priorities, serving as an essential starting point for the development of CounselAR.

Figure 2: Example Images from Design Workshops

Table 1: Key Design Features Identified

Category	Key Feature
Clients	View both faces on one screen, with resizing options*
	Maintain complete anonymity (no personal information shared)*
	Set preferences for therapist's AR filter
	Easily select and change therapists
	Choose AR filters before the session*
Therapists	Secure and automatic transcription of sessions*
	Administer and store psychological tests within the service
	Access a log of client's AR filter usage*
	Access to client's emergency contact
	Option to use AR filters*
Shared Needs	Automatic blocking of user's face when AR filter malfunctions or is being changed*
	Dedicated function for AR filter exploration and practice*
	A calendar for booking sessions
	Changeable backgrounds*
	Secure data storage*

*Features that were implemented as direct functionalities in CounselAR.

3.2 Development of CounselAR

Guided by insights from the design workshops, we integrated core functionalities and developed CounselAR as a web-based service to ensure accessibility across various user devices. Recognizing the exploratory nature of this study, we concentrated on features specifically supporting AR-mediated therapy, rather than constructing a comprehensive therapy application. For example, design features such as choosing and changing therapists or storing psychological tests within the service, which align more closely with a comprehensive therapy platform, were not implemented in CounselAR for this research. These features fell outside the scope of our study, given the controlled number of therapists involved and the short-term nature of our in-the-wild field study which did not aim to evaluate the long-term efficacy of AR-mediated therapy. Instead, we prioritized implementing core features identified as key in the preliminary design workshops, including maintaining strict anonymity, secure data storage, flexible video controls, a preventative blackout when detection fails, and the ability to apply and explore AR filters before sessions, in line with established recommendations for AR-aided counseling platforms [83]. For other identified design features, such as setting preferences for the therapist's AR filters and a calendar for booking sessions, alternative methods were used to address these needs. For example, we implemented anonymous communication channels to facilitate communication outside of sessions, allowing scheduling without requiring the exchange of personal information such as email addresses or phone numbers (see Section 4: Field Deployment).

Consequently, the CounselAR system incorporates the following features: (1) Pre-session AR filter selection allows users to choose AR filters before the session begins (2) Automatic face concealment ensures the user's face is automatically obscured if no AR filter is detected (3) In-session AR filter adjustments enable users to change filters during the session to maintain privacy (4) AR filter usage log records the use of AR filters throughout the session (5) Strict data anonymization guarantees all user data, such as session transcriptions, are anonymized immediately upon collection (6) Levels of Anonymity in AR Filters provide varying degrees of privacy, including full, partial, no coverage (7) Resizable screens and 8) Background Customization allows users to adjust their video displays and personalize their backgrounds. For the user workflow, refer to Figure 3.

3.3 Technical Implementations:

CounselAR is a web-based service built with React and TypeScript, enabling seamless access across phones, laptops, computers, and tablets. The service utilizes Azure Communication Service for real-time communication between clients and for gathering captions for conversations (i.e. therapy transcriptions). After evaluating multiple options, we selected DeepAR's AR filters for CounselAR due to their wide range of anonymity levels and ability to capture facial expressions even when obscured. We provided 24 AR filters divided into three categories: 10 for full anonymity, 12 for partial anonymity, and 14 as accessories, selected based on their coverage and appearance (See Figure 4). We offered default background options similar to typical video conference environments (e.g., nature landscapes, office settings, blurred effects) to create a familiar environment for users.

3.4 Pilot test

Before launching, we conducted a series of internal pilot tests, with the researchers serving as participants, to refine usability rather than therapy outcomes. We used a role-switching approach, alternating between client and therapist roles to thoroughly assess user flow from both perspectives. We documented these walkthroughs to identify and correct subtle errors. Additionally, we tested the service on various devices, including mobile phones and Windows and iOS platforms, across different WiFi environments to evaluate performance under varying connectivity conditions. We observed

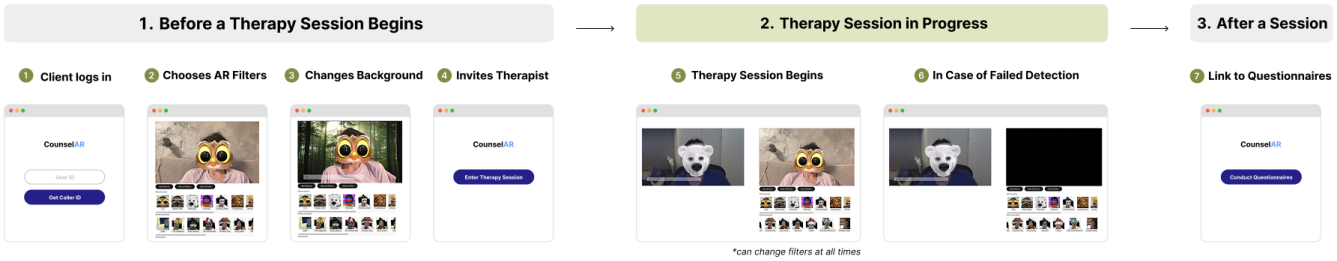

Figure 3: CounselAR: User Workflow

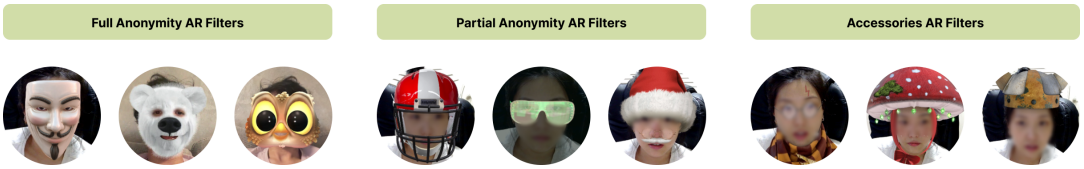

Figure 4: CounselAR: Examples of AR filters

that unstable WiFi can delay AR filter face recognition, which we shared with our participants during introductory sessions.

4 Field Deployment

We conducted a field deployment study with four therapists and nine clients through a six-week therapy session using CounselAR from June to July 2024. The purpose of the study was not to evaluate the system's medical effectiveness but to explore how therapists and clients interact with CounselAR. The study received approval from the ethical review board at our institution.

4.1 Recruitment & Participants

Participants, including both clients and professional therapists, were recruited through a combination of existing networks, online advertisements, and referrals. For client recruitment, we posted advertisements in several online university student communities to reach individuals who met the study's eligibility criteria. Some participants were also referred by others who saw these advertisements. For therapist recruitment, researchers utilized their existing networks by contacting licensed psychotherapists, who then shared the recruitment posts within their internal therapist online communities. Notably, the client and therapist participants in this study were different from those who participated in the earlier co-design sessions. This distinction ensured that all participants started with an equal level of familiarity—specifically, no prior experience—with AR-mediated therapy settings.

Clients were screened based on the following eligibility criteria: (1) South Korean individuals in their 20s to 30s; (2) seeking mental health support to improve their situations or moods; and (3) not currently receiving therapy elsewhere.

Participants at high risk were excluded, as our therapy sessions were designed for a 6-week duration, a standard short-term period for treating general mild to moderate anxiety and depression [12, 82]. Consequently, 9 clients (2 males and 7 females) were selected, with ages ranging from their early 20s to early 30s.

As an initial screening protocol, we gathered GAD-7 for anxiety and PHQ-9 for depression. Regarding the anxiety levels, where two participants (C5-6) exhibited moderate anxiety, three (C1, C4, C8) demonstrated mild anxiety, and four (C2-3, C7, C9) reported minimal anxiety. For depression, two participants (C1, C6) experienced moderate depression, three (C4-5, C7) displayed mild depression, and four (C2-3, C8-9) showed none to minimal depression.

For therapists, the eligibility criteria included: (1) a licensed psychotherapist with more than one year of clinical experience and (2) prior experience in conducting therapy sessions both in-person and online. During the field study, therapists were asked to deliver the therapeutic approach they typically employed in routine practice. We included therapists who utilized therapeutic approaches rooted in principles of psychotherapy to ensure consistency for clients. Consequently, four therapists (2 males and 2 females) were recruited and received compensation of 500,000 KRW (approximately 372 USD) upon completion of the study. Table 2 presents the demographic details of the study participants.

Clients and therapists were paired before the deployment based on availability and the client's preferences for the gender of the therapist. None of the clients or therapists knew each other before the study, ensuring unbiased interactions. To ensure clients' privacy, clients and therapists were connected through an anonymous online messaging platform for scheduling appointments and necessary external communication. We discuss the ethical safety protocols in detail below in Section 4.3 Ethical and Safety Considerations.

4.2 Data Collection & Procedure

The field deployment consisted of three parts: (1) a 1-hour introductory session; (2) a 6-week deployment; (3) three questionnaires; and (4) a 70-minute exit interview. Figure 5 illustrates the phases of the study.

Introductory session. We invited each participant to a one-hour remote introductory session. During this session, the researcher

Table 2: Participant demographics for both therapists and clients

Client #	Age	Gender	Therapy Experience	Therapist #	Age	Gender	Therapy Experience
C1	Early 20s	Male	2-3 years	T1	Mid 30s	Male	9 years
C5	Early 30s	Female	no experience				
C8	Early 30s	Female	2-3 years				
C7	Early 20s	Female	no experience	T2	Mid 20s	Female	4 years
C9	Early 30s	Female	2-3 years				
C2	Mid 20s	Male	1 year	T3	Early 40s	Female	5 years
C3	Early 20s	Female	no experience				
C4	Mid 20s	Female	2-3 months	T4	Late 20s	Male	1 year
C6	Early 20s	Female	1-2 months				

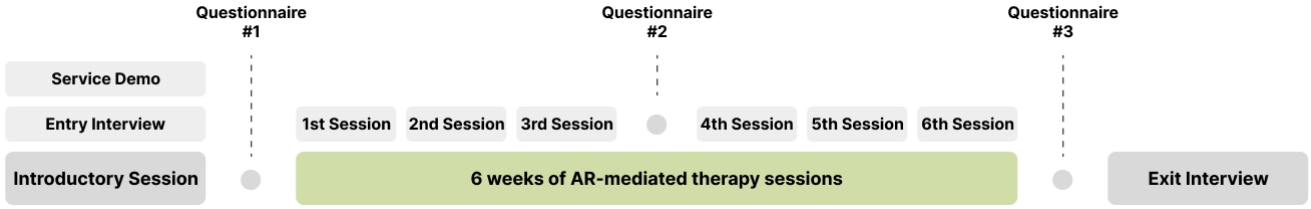

Figure 5: Overall Study Procedure

reviewed the research goals and information sheets, obtained consent forms, and outlined the overall study plan. The researcher then provided a brief demonstration of CounselAR, showing participants how to access the system and apply AR filters during therapy sessions. We also had a short trial run with the participants to ensure they could use the filters easily during therapy. Then, we conducted a 30-minute entry interview to discuss participants' plans and expectations for the six-week deployment. For therapists, we mainly inquired about the expected outcomes of AR-mediated therapy and asked them to compare the method with traditional psychotherapy. For clients, questions included "Which AR filters do you plan to use?", "What are your expectations of the AR-mediated therapy?", and "Would you want your therapist to use the filter?" among others. Two clients (C5, C8) requested their therapists to wear AR filters during all sessions, while others showed no particular preference, leaving the decision up to the therapist. Additionally, we suggested they log into the system five minutes before the session to explore different filters but provided no further instructions to wear AR filters during the sessions, leaving decisions entirely up to the participants. Given our field study is conducted in the wild, we believed providing full flexibility to our participants on their use of AR filters would be most suitable to gain valuable insights into their experiences of AR-mediated therapy.

Field Deployment. Following the introductory session, participants engaged in six therapy sessions using CounselAR, each lasting approximately 50 minutes. Both clients and therapists had the freedom to use the system at their discretion within therapy sessions. However, some therapists were asked to employ AR filters for certain clients based on preferences indicated before the initial session. Additionally, we asked participants to keep a diary of notable moments, such as unexpected outcomes from using (or not using) AR filters for exit interviews.

All therapy sessions were audio-recorded with both parties' consent to be used as references during exit interviews for the therapists. The audio recordings were transcribed using an encrypted, university-managed transcription service. Importantly, while the researchers managed the data in an encrypted folder, the session transcripts were accessed solely for logistical purposes (i.e., providing them to therapists). To protect confidentiality, the research team did not review any of the transcriptions' content. Additionally, the logs of the AR filters used by clients and therapists on CounselAR were collected. These logs did not include any information from the sessions; they included only the type of AR filters each user used and the duration of usage.

Questionnaires. We asked participants to complete three online questionnaires: before the first session, after the third session, and after the final session. We collected the standardized measurements, GAD-7 for anxiety [112] and PHQ-9 for depression [67] before and after the 6-week deployment and compared pre- and post-therapy scores to assess any improvements. Both clients and therapists were asked to complete WAI-SR for the therapeutic alliance [48] after the third and the sixth sessions, which is a well-established measurement tool for assessing the collaborative relationship between clients and therapists. A strong working alliance would imply effective therapy. Therapists were additionally asked to complete the Therapist Self-Efficacy Scale (T-SES) [43]. T-SES assesses therapists' self-efficacy during therapy sessions in a tele-therapy environment. Whether therapists can demonstrate high self-efficacy in the unique context of AR-based therapy would provide insight into AR filters' potential in online therapy.

It is important to note that, due to the small sample size and the exploratory nature of our in-the-wild study, these measures were only collected to examine potential trends and to determine whether AR filters might pose challenges to therapy rather than to provide definitive results for the efficacy of AR-mediated therapy. Since AR-mediated therapy serves as the environment in which therapy is conducted, our goal was to understand whether this new therapeutic setting might influence the delivery of interventions, providing context for exploring the feasibility of using AR filters. Additionally, these measures also served as helpful reference points during our interviews, which are the primary data analyzed and reported in this study. For example, when a therapist's self-efficacy score increased after six weeks, we used this insight to start a conversation to further explore how their experiences of facilitating and delivering therapy in this AR-mediated environment had changed over time.

Exit interview. After participants submitted the final questionnaire, we conducted semi-structured interviews to explore their experiences from the past six weeks of conducting therapy in AR settings. To understand nuanced therapeutic experiences, therapists were interviewed before clients. We provided the AR filter logs along with transcribed sessions to therapists before the interviews as references to revisit when needed. All interviews were conducted online and lasted approximately 70 minutes.

In the interview, we explored AR-mediated therapy over six weeks, focusing on participants' experiences with AR filters and their impact on therapy. We asked clients and therapists questions such as: "What are the perceived benefits and challenges of AR-mediated therapy?" and "How have AR filters affected your or your client's willingness to self-disclose and comfort level?" Therapists were also asked about the influence of AR filters on their therapy delivery, and clients were queried about the co-use of AR filters and the implication of AR filters on rapport building with therapists, among other topics. To examine specific examples, we referenced the AR filter logs to understand more detailed reasons and experiences related to using or discontinuing AR filters. Questions included: "What led you to start using full filters in the second session?" and "How did taking off the filters affect you and the therapy session?"

During interviews, therapists referred to text transcriptions of their therapy logs to accurately recall specific session details when needed. For instance, if a therapist couldn't remember the exact moment a client removed their filters or the conversations that followed. This was designed to help ensure accurate reflections on the therapy process, particularly given that therapists managed a minimum of 12 sessions in six weeks. However, we note that to protect the confidentiality of the sessions, researchers did not look at the contents.

4.3 Ethical and Safety Considerations

Given the sensitive nature of this study, we took several safety and ethical precautions. First, we adopted a risk assessment protocol consistent with those used in real-life therapeutic settings. During the first session, therapists conducted a focused risk assessment including questions about suicidal ideation and other potential risk factors; an individualized safety protocol was established by client and therapist which was revisited during subsequent sessions, as is common in the therapeutic context. Moreover, before starting therapy, clients completed standardized anxiety and depression measures that served both as a screening tool and to assess general capacity for therapy, which were evaluated by the therapists after the first session. After evaluating these standardized measures and conducting the first session, therapists determined that no clients were at immediate risk of suicide or in a severe mental health state requiring urgent intervention. This was important as we aimed to exclude high-risk clients.

Nevertheless, as a precaution and to ensure the safety of all participants, the lead researcher maintained emergency contact information in an encrypted folder to address any unexpected escalations in participants' conditions. Furthermore, one researcher was always on call during each therapy session to provide immediate assistance if necessary. Throughout the six weeks, no escalations were reported by any clients or therapists.

Recording therapy sessions is a common practice, particularly in the context of therapist training. This allows therapists to reflect on their work, review interactions, and enhance their skills while also serving as a reference log and supporting ethical oversight in our study. It is also not uncommon for clients to record the therapeutic session on their smartphones, for example, to aid reflection and support self-discovery. It is important to note that in our study context—conducted in South Korea and approved in the UK—these recordings were not considered medical information as they were not part of healthcare services, were excluded from clients' medical records, and had all identifiable information removed.

Nonetheless, we acknowledged that this is sensitive information and implemented strict security measures to treat these recordings as sensitive and personal data. Audio recordings were securely stored in encrypted folders with limited access until they were transcribed. After transcription, all recordings were immediately deleted. The transcriptions were immediately anonymized by removing all potentially sensitive information, including direct associations such as participants' names (replaced with participant numbers) and other distinguishing details (e.g., the name of the university they attended). The anonymized transcriptions were then stored in a separate encrypted folder, accessible only to authorized personnel. Both clients and therapists were fully informed about the recording process and gave explicit consent before participation.

Lastly, robust data management protocols were implemented to protect participants' privacy in the development of CounselAR. CounselAR anonymizes user names at login, and all data are encrypted and stored in a secure, university-managed folder, accessible only to authorized researchers.

Researcher Positionality: Our research team consists of individuals from varied backgrounds, including over half who are South Korean natives, providing deep insights into the local mental health context. Two researchers with experience working with highly vulnerable groups led data collection and analysis. The team also includes a (non-Korean) academic psychotherapist with over ten years of experience. A steering group of two external psychotherapists was engaged from the project's start who provided clinical insight throughout. Moreover, we held frequent whole-team discussions and periodic reviews with external advisors, in order to foreground reflexivity and curiosity in our analysis of the data.

Nonetheless, we acknowledge that our backgrounds may have introduced bias in our interpretation of the results.

4.4 Analysis

For the qualitative data, both entry and exit interviews were audio-recorded and transcribed. Since the interviews were conducted in Korean, two fluent Korean-speaking researchers first open-coded the data in Atlas.ti using an inductive thematic approach [20] to generate and revise codes from the bottom up. After individually coding two interviews, researchers engaged in bi-daily meetings to discuss emerging themes and patterns and initiate the development of the codebook. Following the initial coding, a psychotherapist researcher on the team reviewed the coded data to ensure the accuracy of interpretations from clinical perspectives. The codes were later transferred to a Miro board, where the same researchers conducted affinity diagramming to categorize codes into sub-themes and themes. In addition to the interviews, we separately reviewed the log data and standardized measurements gathered through questionnaires. The log data from CounselAR was analyzed to track AR filter usage for each participant and therapy session. This analysis identified patterns in usage and engagement with AR filters during six-week therapy sessions for each client and therapist, including which specific AR filters were used and the exact duration of usage per session. To identify trends for standardized measurements, we calculated average scores and changes in standardized measures: GAD-7 for anxiety, PHQ-9 for depression, WAI-SR for a therapeutic alliance, and T-SES for therapist self-efficacy. Due to the small sample size and the exploratory nature of this in-the-wild field study, statistical testing was not conducted.

We structured our findings around three key dimensions to best reflect our analysis: (1) Engagement and Use of AR Filters, which integrates usage patterns from log data, standardized measurements, and qualitative insights from interviews; (2) Creating Bespoke Therapeutic Environments Through AR Filters; and (3) Challenging Pre-Existing Assumptions of the Therapeutic Setting Through AR Filters, based on thematic analysis of the interviews.

5 Results

The main findings are divided into three areas: Section 5.1 discusses the engagement and use patterns of AR filters; Section 5.2 explores how AR filters enabled clients to create bespoke therapeutic environments; and Section 5.3 discusses how AR filters challenged pre-existing assumptions in the therapeutic environment.

It is important to note that AR filters were integrated into the therapeutic context rather than being evaluated as a standalone variable. Therefore, we focus on the perceptions and experiences associated with a therapeutic intervention in which AR filters were one component.

5.1 Engagement With and Use Patterns of AR filters

Over six weeks, every client-therapist pair consistently completed weekly therapy sessions using the CounselAR platform without any dropouts. In total, 3,137 minutes of therapy were conducted, averaging 348 minutes per client-therapist pair. Each session lasted 59.5 minutes on average.

The adoption of AR filters during the sessions varied among participants. Among the clients, C5, C6, C7, and C8 consistently used full AR filters throughout of their sessions. C2 used full filters for 84% of their sessions, while C3 used them for 51.5% and C4 for 17%. C1 used AR filters in 97.2% of their sessions, with 66.3% involving full filters, 16.2% partial filters, and 14.7% accessories. Similarly, C9 used AR filters for 100% of their sessions, but only 53.4% were full filters, with 29.6% involving partial filters and 17% accessories. Therapists' usage of AR filters was also varied. T1 used full filters for 76.5% of their sessions, and T3 used them for 43.5%. T2 used AR filters in 16.9% of sessions, with 9.3% of that usage involving partial filters. T4, however, did not use AR filters at all during the study. This variation in AR filter adoption demonstrates differing levels of engagement with the platform's features among both clients and therapists.

5.1.1 Impact on Therapy. According to client self-report using standardized measures, the use of AR filters did not impede the therapeutic process. All clients completed baseline and exit standardized measures of anxiety (GAD-7) and depression (PHQ-9) and all clients reported a reduction in scores over a six-week period. Additionally, there was a notable increase in therapists' self-reported self-efficacy (T-SES) in conducting sessions within an AR-mediated environment and an improvement in the therapeutic alliance (WAI) between therapists and clients. It should be noted, however, that these measurements were not intended to establish efficacy in a small cohort; rather, they were collected to assess eligibility, track trends over time and assess the impact of AR filters on the therapeutic alliance and context. Furthermore, most clients attributed the positive experience of therapy specifically to the use of AR filters (above and beyond the act of simply engaging in a therapeutic intervention).

5.1.2 Choice of Filter. For clients, among the 24 AR filters provided (10 full, 12 partial, and 14 accessories), a total of 11 filters were used during the six-week period: 6 full filters, 2 partial filters, and 3 accessory filters. We found that the choice of AR filters depended on many factors, ranging from personal preference regarding filters' appearances to filters' ability to communicate or completely obscure facial expressions. The polar bear and owl filters were most commonly used because clients liked their appearances (C1-2, C5-7) and found them the least distracting (e.g. some clients found some filters too comical, such as snail filter and hipster sloth filters) (C1-2, C4), and appreciated their capacity for non-verbal communication through eyes or mouth (C2, C4, C7). However, certain clients (C1, C8) opted for a snail filter due to its affordance of providing the highest coverage, while some clients (C5, C8-9) preferred hipster sloths, which not only fully covered their faces but also appealed to their personal tastes, finding them cute rather than comical.

Clients sometimes changed AR filters between and during sessions to adjust their level of anonymity or disclosure. For example, C6 switched from the polar bear to the owl filter for more coverage, feeling more comfortable sharing vulnerable stories. C8 moved from the polar bear to the hipster sloth filter because she liked how it *"squashed her face,"* offering more anonymity. Conversely, C7 started with the vendetta mask filter for full face coverage but later chose the polar bear, which revealed her eye and mouth movements,

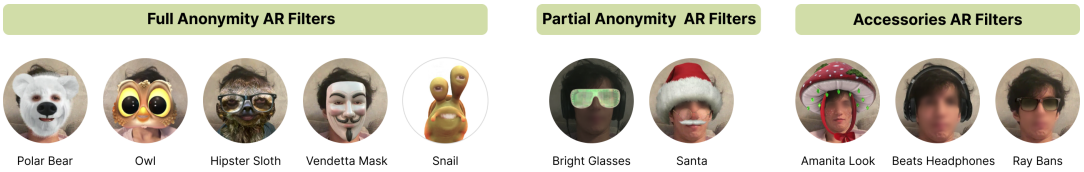

Figure 6: CounselAR: AR filters Used by Clients and Therapists

	1st session	2nd session	3rd session	4th session	5th session	6th session
C1	Polar Bear	Polar Bear	Snail	Bright Glasses	Snail	Beats Headphones
T1	-	-	-	-	Polar Bear	Polar Bear
C2	Polar Bear	Polar Bear	Polar Bear	-	Polar Bear	Polar Bear
T3	Polar Bear	Polar Bear	Polar Bear	-	Polar Bear	Polar Bear
C3	Vendetta Mask	Vendetta Mask	Vendetta Mask	-	-	-
T3	-	-	-	-	-	-
C4	Owl	Owl (5min)	-	-	-	-
T4	-	-	-	-	-	-
C5	Hipster Sloth	Hipster Sloth	Hipster Sloth	Hipster Sloth	Hipster Sloth (49min), Owl (10min)	Owl
T1	Polar Bear	Polar Bear	Polar Bear	Polar Bear	Polar Bear	Polar Bear
C6	Owl	Polar Bear	Owl	Owl	Owl	Owl
T4	-	-	-	-	-	-
C7	Vendetta Mask	Polar Bear	Polar Bear	Polar Bear	Polar Bear	Polar Bear
T2	-	-	Polar Bear	-	-	-
C8	Bright Glasses (20min), Polar Bear (2min), Hipster Sloth (48min)	Owl	Snail	Owl	Snail	Hipster Sloth
T1	Polar Bear	Polar Bear	Polar Bear	Polar Bear	Polar Bear	Polar Bear
C9	Amanita Look (18min), Johnny Bravo (3min), Amanita Look (39min)	Santa	Amanita Look	Owl (23min), Hipster Sloth (37min)	Owl	Owl
T2	-	Ray Bans	-	-	-	-

Color codes: full anonymity AR filters, partial anonymity AR filters, accessories AR filters
**No minutes mentioned indicate filters were applied throughout*

Table 3: Use of AR Filters by Clients and Therapists

to enhance communication. Similarly, C1 transitioned to using accessories like Beats headphones and partial filters like bright glasses in later sessions, stating it *"felt okay to reveal [his] face"* after establishing rapport with the therapist.

For therapists, one full filter, polar bear, and one accessory filter, Ray Bans, were used. While some clients were concerned that their therapists might be distracted by the AR filters during initial interviews, all therapists reported that the filters did not compromise the seriousness of the therapy sessions. They indicated that the need to focus intently on the clients' words made them largely oblivious to the effects of the filters, even those of a comical nature. Their motivations for using AR filters centered on supporting their clients in various ways. T1, for instance, wore AR filters with C5 and C8 upon request, consistently choosing the polar bear for every session because *"it showed eyes and mouth and conveyed most non-verbal communication."* T3 specifically used the polar bear filter with C2 to conceal her facial expressions during sessions where C2 discussed sensitive personal stories. By hiding her flustered expressions, T3 felt she and her client (C2) could remain more focused on the conversation. Similarly, T2 used the polar bear filter with C7 and the Ray Bans filter with C9, initially out of curiosity and to build rapport, using the AR filter as a conversation starter. However, T2 eventually stopped using the AR filters, concerned that obscured facial expressions might make her appear uncomfortable or unreliable to clients. Meanwhile, T4 was the only therapist who opted not to use AR filters, preferring to deliver therapy without digital alterations to convey sincerity and foster genuine connections with his clients (C4, C6).

5.2 Creating Bespoke Therapeutic Environments With AR Filters

Overall, both clients and therapists found that AR filters provided versatile, adjustable, and flexible degrees of anonymity in therapy through selective visibility of expression and appearance. This capability helped clients to establish a bespoke environment that encouraged sharing of their vulnerability, such as traumatic experiences (Section 5.2.1), and empowered clients with a sense of control over their self-presentation (Section 5.2.2). However, we discovered

that the dependency of AR filters on technical reliability sometimes interrupted these perceived benefits (Section 5.2.3).

5.2.1 AR Filters in Reducing Fear of Shame and Judgment: Facilitating Disclosure of Vulnerability. Many clients (C1-2, C5-6, C7-8) reported that AR-mediated therapy created a safe environment that facilitated earlier disclosure of vulnerabilities than expected. They felt the tailored AR environment allowed them to share deeply personal stories without fear of judgment or shame. Therapists (T1-3) also observed that clients were more willing to express personal stories in earlier sessions when using AR filters, attributing this to a *"rapid self-disclosure."*

C8, who had a history of enduring physical abuse as an adult from her father, shared that using an AR filter, along with the therapist's full filter, enabled her to disclose this trauma in her first session. She explained:

"I shared a very sensitive and traumatic story about getting beaten up by my dad. I didn't feel self-conscious with full filters on. I wouldn't have been able to share this without filters, especially in the first session."

C8's reluctance to share her story of abuse stemmed from the shame and fear of being visually *"pictured"* in the situation if her face was visible during disclosure. However, using a full filter gave her a sense of protection from this visualization. Additionally, she was concerned about eliciting pity and sorrow, which could reinforce victimhood and shame. The AR filter used by her therapist, however, allowed her to share her story without having to witness these unwanted *"immediate reactions."*

This situation highlighted an interesting dynamic between the client's need to avoid seeing visual reactions and the therapist's desire to provide visual cues of support. While the mutual use of full filters was key to enabling C8 to disclose, as they shielded her from her therapist's reactions, T1 noted a limitation in his ability to offer visual cues of support that are typically part of his therapy practice. He described:

"Typically, in these situations, I use my facial expressions to convey warmth and empathy. But with the full filter on, I could not convey that to her. I had to rely solely on my words to support her after her disclosure."

In another instance, C7 described how the act of obscuring her face using full filters allowed her to discuss vulnerabilities about her appearance. She described: *"It's not something I feel comfortable talking about with others, but surprisingly, I ended up opening up about my concerns regarding my appearance and body image from the beginning."*

This led to an unexpected exploration of her body image struggles—a topic she had not initially intended to address but ultimately became the central focus of her therapy. She noted that full filters created a visual separation that allowed her to detach from those anxieties and engage in a more open and honest dialogue with her therapist as she noted, *"If the therapist was able to see me, I would not have been able to open up about this because I'd think that the therapist will also form an opinion about me."*

C7's therapist, T2, also described the significant role full filters played in facilitating this unexpected disclosure. T2, who had extensive experience with clients facing body image challenges, described that this is *"unusual"* as it requires substantial efforts from the therapists to cultivate a safe environment that encourages such disclosure without fear of judgment. However, she pointed out that AR filters *"shared the responsibility of a therapist"* and created an immediate *"guaranteed safe space,"* which allowed for a deeper, more accelerated exploration of C7's body image struggles. T2 explained:

"We discussed a lot about C7's concerns regarding how people perceive her and how she sees herself. Typically, I need to be extra cautious about my expressions and body language to avoid making clients self-conscious, but with full filters on, I worried much less about how my behaviors might be perceived, and it was easier to navigate this topic as a therapist."

5.2.2 AR Filters as Tools to Support Self-Presentation: Reducing Conformity to Social Norms in Therapeutic Interactions. Having different AR filter options, as well as the decision to use them, provided clients with enhanced control over self-presentation, enabling them to engage in sessions more authentically while focusing on their therapeutic needs rather than conforming to social expectations.

Clients (C1, C3-7, C9) emphasized how the control over their self-presentation during sessions liberated them from the constraints of *"unspoken social norms"* (C7-8) and *"self-consciousness"* (C1, C3, C6-7). Specifically, C3, C6, and C7—all women in their 20s—valued the sense of freedom from having to apply makeup before therapy, which offered both physical and psychological comfort. C6 contrasted this granted comfort with her previous therapy experience, where she found herself overburdened dressing up for sessions after her ex-therapist complimented her on *"artistic"* attire. C1, a male in his 20s, also appreciated the option to avoid presenting a polished exterior. He frequently used full filters to conceal bad hair days or the fact he had just woken up—details he would prefer not to share in typical social interactions.

C9 used a range of AR filters—from full anonymity to accessories—across her sessions, adjusting to her psychological state and energy levels. On days when she felt particularly drained by long work hours or low mood, therapy sessions felt like *"an extension of [her] day's social demands,"* necessitating a *"socially acceptable"* facade. However, the option to use a full filter to obscure her face spared her efforts of managing facial expressions while still maintaining a visual presence through *"body language and gestures."* C9 found this significantly reduced her psychological burden, allowing her to concentrate on the therapy's content and interactions. She described:

"I felt like I could even communicate better with my therapist because I felt more relaxed and engaged, and my body language was still visible, so it kept the connection alive."

C9's therapist, T2, observed that this switch to full filters contributed to a noticeable increase in C9's comfort level and improved therapeutic communication. While acknowledging that *"therapy naturally deepens over time,"* she observed that their *"discussions flowed much better after [C9] began wearing the full filters."*

In the case of C5, who was undergoing a significant life event that she could not share with her friends and family, she expressed that this therapy session was *"the only hour in a week"* where she was able to express her true emotions and feelings. She credited this to the use of full filters, nothing that the *"constant sobbing"* would have been overwhelmingly uncomfortable to reveal. Yet, the ability

to conceal this very aspect while still conveying her emotional turmoil to her therapist by maintaining a visual presence created the ideal environment to express and process her emotions.

These affordances also extended to therapists, with T2 and T3 reporting that AR filters enhanced their comfort and sense of safety during sessions. T3 explained that wearing an AR filter enabled her to maintain professionalism while protecting her emotional well-being, reflecting on the emotional difficulty of fully supporting the client while simultaneously managing her own emotions. For example, while discussing topics outside her expertise, full filters allowed her to hide her immediate reactions, *"fostering a safe therapeutic space for the client to share his story."* She contrasted this experience with a previous situation where she had to begin a session immediately after learning of her grandmother's passing, mentioning that AR filters provided a layer of support in such moments.

5.2.3 AR Filters' Reliance on Technology: Interrupting Clients' Sense of Control. While AR filters enabled clients to customize their level of anonymity and thereby create a tailored therapeutic environment conducive to self-disclose and self-presentation, these perceived benefits were reliant on technical conditions. Despite the implementation of the feature within the CounselAR platform to "blackout" the screen when AR filters fail to detect a face, preventing unwanted disclosures, we found that unstable internet connectivity caused technical glitches. This issue caused the AR filters to instantly detach from the faces of two clients, disrupting their sense of comfort and control over their self-presentation.

For C4, a glitch during her first session revealed her face momentarily, leaving her feeling that her anonymity had been compromised. As a result, she chose to stop using AR filters altogether, explaining that *"continuing the usage felt awkward after the incident."* However, this decision came with its own challenges. Without the filters, C4 described the burden of needing to *"get ready every morning to take a shower and look presentable for a session,"* which she found draining. She also noted feeling increasingly self-conscious during sessions. For instance, she became hyper-aware of her facial expressions, worrying about how they might be perceived—such as not wanting to show confusion too bluntly. Additionally, she felt hesitant to share personal details that might inadvertently reveal aspects of her identity, such as her occupation. In contrast, she explicitly mentioned that before the glitch occurred, the filters made her feel comfortable sharing freely without such concerns. Although she longed to return to the ease and comfort of using full filters, C4 worried that reintroducing them might prompt questions from her therapist, which she felt uncomfortable answering. As she described, *"I wouldn't feel comfortable explaining 'it's because I look so bad today.'"*

C7 also experienced technical glitches that shortly disrupted her visual anonymity maintained by AR filters. However, her reaction differed from C4. Although initially startled, she felt her anonymity remained intact and continued to use the filters. Still, the incident heightened her awareness of potential future glitches, making her more cautious and concerned about the technical reliance. C7's therapist, T2, explained that when the glitch occurred, she immediately turned her face away from the screen, reassuring C7 that she had not seen her. She further reflected that C7's reaction to the glitch highlighted the necessity of AR filters for her, particularly given the sensitivity of their discussions around body image.

5.3 Challenging Pre-Existing Assumptions of the Therapeutic Setting With AR Filters

The integration of AR filters into therapy sessions has reshaped both clients' and therapists' perceptions of traditional therapeutic practices. For clients, AR filters helped reduce prejudice associated with a therapist such as their demographics (Section 5.3.1). For therapists, the use of AR filters challenged their expectations about AR filters' role in therapeutic rapport (Section 5.3.2) and the role of nonverbal cues in AR-mediated therapy relative to their therapeutic approaches (Section 5.3.3).

5.3.1 AR Filters Reducing Clients' Prejudices About Therapists . The use of AR filters in therapy sessions challenged clients' pre-existing assumptions about who can be their therapists. Traditionally, factors such as a therapist's gender, age, or physical appearance often influence clients' comfort and willingness to engage due to deep-seated associations or past experiences that could impede openness and rapport [58, 133]. However, our findings reveal that AR filters offer a way for clients to set aside these preconceptions, thereby facilitating the initiation of therapy and rapport-building.

C5 and C8, who have spent much of their lives in predominantly female environments, initially had concerns about opening up to a middle-aged South Korean male therapist and establishing a meaningful therapeutic relationship. Thus, after finding out about their therapist's demographic information, they both requested that he wear a full filter before the session began (Note: they opted for "no gender preference" in the beginning).

Although she shared initial reservations, C5 was surprised to find that the therapist's full filter minimized his identifiable demographic traits, as she explained: *"I was surprised that I was able to see him just a professional therapist, not the middle-aged South Korean man I initially thought of him as."*While she acknowledged that any therapeutic relationship could be awkward at first, she explained that without the full filter, it would have been particularly more challenging due to her unfamiliarity with the therapist's gender and age. C5 reflected,

"Seeing the therapist would have amplified the sense of unfamiliarity and made it harder for me to share. Like, I would start opening up and then suddenly think, 'Wait, why am I sharing this with someone I have nothing in common with?' But these thoughts did not occur and distract me from sharing."

Similarly, C8, a lesbian woman, was initially wary of judgment from her middle-aged South Korean male therapist due to past hurtful comments from this demographic, such as *"You look like a man,"* making her cautious about how her sexual identity might be perceived.

The use of full AR filters by both C8 and her therapist alleviated her initial concerns, creating a space where it felt *"as if these factors did not exist."* This enabled her to comfortably share her sexual identity in their first session, which was *"unexpectedly comfortable"* and *"liberating"* despite it being her first time coming out to this demographic. Surprised to *"feel unjudged,"* her experience contrasted with her initial assumptions, allowing her to view the therapist not

as someone akin to those she had negative past interactions with but as a therapist she could trust and open up to. She shared:

"I had never come out to a man of that age before. I always expected it to be unpleasant, so I was concerned. But surprisingly, I shared it so quickly, and it didn't feel difficult. I think it's because I didn't see him as a middle-aged man—he was just a therapist who's there to help, with a polar bear filter on."

She compared this to her previous experience with a female therapist, where it had taken a year to come out, attributing the use of AR filters to challenging her bias and showing that gender played a much smaller role in opening up than she had assumed.

T1, their therapist, fully supported wearing an AR filter at his clients' request, seeing it as a *"visual affirmation of [his] support"* for their comfort. Although using a filter made it harder for him to convey warmth and attentiveness through facial expressions, T1 noted that it is a *"trade-off"* to enhance client comfort and build rapport. He further elaborated that clients often engage in *"therapist shopping"*—a term used in South Korea to describe searching for a therapist *"who feels right to them,"* often based on physical appearances [90]. T1 described how AR filters can help mitigate this:

"A good therapeutic relationship requires more than people realize—it takes multiple factors. But most importantly, it requires opportunity. You need to give the time and space for it to develop. I think AR filters help create that opportunity by allowing people to look beyond their assumptions and see the potential in a therapist they might not have initially considered."

This highlights the potential of AR filters not just as a tool for maintaining anonymity but as a facilitator in the early stages of rapport-building.

Lastly, some clients found that AR filters challenged their initial assumptions that therapists are *"intimidating"* (C9) or *"authoritative and hierarchical"* (C8), creating a comfortable atmosphere compared to traditional clinical settings. Particularly, C9 described how AR filters fostered a *"sense of kinship,"* reminiscent of conversing with *"close friends rather than an intimidating mental health professional."* This change in dynamics contrasted with her previous experiences, where the formal setting with a psychiatrist made her *"feel like a patient"* and less inclined to open up. This sentiment was also shared by other clients (C1, C3-4, C7), who described that AR filters allowed them to approach their therapist more easily.

5.3.2 Reshaping Therapist's Expectations of Rapport in AR-mediated Therapy. All therapists initially assumed a direct correlation between increased trust and the abandonment of visual anonymity. They believed that as clients became more comfortable and rapport deepened, clients would gradually remove AR filters—a symbolic *"unveiling."* However, the relationship between AR filter use and rapport was far more complex and varied significantly depending on the client's needs and their perception of the filters.

For some clients (C5-8), AR filters provided a consistent sense of safety and comfort that facilitated both initial openness and ongoing therapeutic engagement. These clients, who commonly reported difficulties with self-disclosure even among their close circles, continue using AR filters even after developing strong trust and rapport with their therapists. Clients (C6-8) reported *"no need to suddenly reveal their faces"* even after feeling close to their therapists, expressing concerns that removing the filters might *"disrupt this sense of safety"* (C7) or *"hinder their ability to continue sharing openly"* (C8). As C5 articulated,

"It's not that I did not trust my therapist, it's just that this [using AR filters] is what allowed me to open up in the first place."

Interestingly, all therapists noted that AR filters seemed particularly beneficial for clients who were more *"guarded"* (T4), with T2 observing that "clients continued to maintain a sense of safety."

In contrast, other clients (C1-2, C9) eventually felt the AR filters were no longer necessary in their therapy sessions. They described that while filters were beneficial in *"easing into the therapy process"* (C2) and *"breaking down the initial awkwardness" (C1),* they found themselves voluntarily removing the filters as they felt *"closer with the therapist"* (C1). In particular, C3 noted that while the filters initially helped her feel less self-conscious and more at ease, they eventually became a barrier to deeper connection. Once she removed them, she experienced improved communication and felt a stronger connection with her therapist. C1 also shared a similar opinion: *"As I became more comfortable with the therapist concealing my face no longer felt necessary."*

These contrasting experiences reveal the nuanced role AR filters play in rapport-building for different clients over six weeks. This variability highlights that rapport-building is not inherently tied to whether or not clients physically *"unveil"* themselves. Instead, it depends on how clients perceive the filters and their function within the therapeutic relationship. While therapists may have initially viewed AR filters as a temporary aid, our findings suggest that their role is client-dependent, serving different purposes at different stages of therapy. Ultimately, the use of AR filters challenged the initial assumption of the therapists that rapport necessitates physical visibility and disclosure, instead demonstrating that trust and connection can be fostered in diverse and individualized ways.

5.3.3 AR Filters Challenging the Perception of Nonverbal Communication in Therapy: Adapting Therapeutic Approaches. Initially, all therapists considered nonverbal communication a vital aspect of understanding clients and facilitating therapy, believing that the reduced nonverbal cues inherent in AR-mediated sessions would pose challenges to effective therapy. However, our findings highlighted both obstacles and unexpected benefits, prompting therapists to reassess the role of nonverbal communication across different therapeutic approaches in an AR-mediated therapy environment.

T2 and T3, who had concerns about the reduction in nonverbal communication due to their reliance on reading such cues in their practice, surprisingly found that this limitation fostered a more focused and verbally engaged therapeutic environment. Both therapists noted that with their clients' facial expressions obscured by AR masks, they had to pay greater attention to verbal expressions. This shift facilitated a more *rational therapeutic approach* (T2), less influenced by external factors such as their *"own biases"* (T2) or *"preassumptions"* (T3). T2 explained,

"Nonverbal cues are not always directly related to the client's main issues, requiring constant critical reflection from therapists, who can misinterpret these cues."

Both T2 and T3 attributed the absence of perceived challenges to the therapeutic approaches they used: Reality Therapy [131]

and Person-Centered Theory [100], which emphasize verbal communication. Consequently, they described that AR filters' role in facilitating clients' self-disclosure from earlier sessions (e.g., opening up about body image issues in the first session, typically a sensitive topic disclosed after trust is established) was immensely beneficial to carry out the therapy throughout. T3 further noted that even when faces were obscured by AR filters, other nonverbal cues like hand movements and posture still provided sufficient visual presence to maintain a connection with clients. T1 and T4 also pointed out that this visual presence was helpful in fostering a sense of co-existence despite concealed faces. T1 stated: *"Having AR filters was much better than turning off the video because I was able to still observe whether a client is paying attention or distracted by their phone."*

However, T1 and T4 noted that their therapeutic methods, which rely heavily on interpreting immediate facial expressions to gauge emotions and engagement, often required more than seeing their visual presence. T1, who practiced Gestalt Therapy—an approach that includes role-playing and demands quick recognition of client emotions [91]—found that the challenges deriving from the lack of visual cues varied among clients. For instance, with his client, C1, who was adept at verbally expressing his emotions, T1 experienced minimal challenges with reduced nonverbal cues even when his client was wearing the highest coverage filter. However, for clients who were less comfortable verbalizing their feelings, the inability to see subtle facial expressions made Gestalt Therapy difficult to employ. For instance, his client, C8, described when she was *"on the verge of tears,"* AR filters obscuring her face led the therapist to *"move on without recognizing"* her distress. Consequently, T1 reported switching to Reality Therapy [131] and CBT [14], which rely less on nonverbal cues and more on verbal communication.

T4, who practices Rational Emotive Behavior Therapy (REBT)—a method that involves questioning clients' irrational beliefs [36]—faced difficulties when clients did not verbally express their discomfort as their beliefs were challenged. He explained, *"This approach relies on observing subtle facial cues, like furrowed eyebrows, to gauge clients' comfort levels or agreement with the therapy."*

When unable to read these cues due to AR filters, T4 often shifted his approach to a more traditional CBT style, which focuses on conducting tasks together and relies more on verbal communication.

T4 acknowledged that while AR filters sometimes made it difficult to read clients' facial emotions during the REBT technique, these challenges did not prevent him from achieving the therapeutic goals set with clients because he adapted his methods dynamically to suit the specific needs of the therapy. T1 echoed this sentiment, noting that the limitations posed by the reduced nonverbal cues from AR filters largely depend on the therapist's ability to dynamically adapt methods and approaches during sessions.

6 Discussion

Our research highlights the varied role of AR filters in therapy, contributing to both positive therapeutic outcomes and challenges. While AR filters foster safety, comfort, and engagement and strengthen the therapeutic alliance, they also present difficulties, particularly in interpreting non-verbal cues and deepening client-therapist connections. In our discussion, we explore the roles of AR filters in therapy based on insights from our findings (Section 6.1). We then examine the potential of integrating AR into psychotherapy, focusing on anonymity, stigma, and privacy and expanding these insights to other populations (Section 6.2). Lastly, we provide in-depth reflections and considerations on AR-mediated therapy (Section 6.3).

6.1 The Role of AR Filters in AR-Mediated Therapy

Our study explored the role of AR filters in psychotherapy from both clients' and therapists' perspectives on its implications, identifying two distinct phases: the Novelty Phase (1-3 sessions) and the Habituated Phase (3-6 sessions) as illustrated in Figure 7.

Our findings suggest that self-disclosure tendencies shaped how AR filters were used in psychotherapy, alongside individual factors such as evolving comfort levels, therapeutic relationships, and session context. Since self-disclosure is central to therapeutic engagement, rapport-building, and treatment effectiveness, it provides a valuable lens for examining how AR filters facilitated or hindered clients' ability to open up. To explore this relationship, we grouped participants based on their self-reported ease or difficulty with self-disclosure, assessed uniformly during interviews: Group A (C1, C2, C3, C9) reported low difficulty with self-disclosure, and Group B (C4, C5, C6, C7, C8) reported high difficulty with self-disclosure.

However, this classification does not imply a fixed trajectory for AR filter use, as even clients within the same group engaged with filters in highly individualized ways. This exploration provides a broader understanding of how AR filters shape telepsychotherapy—examining self-disclosure tendencies as a factor while accounting for individual variations rather than assuming a rigid classification.

6.1.1 Novelty Phase (1-3 weeks). Our findings suggest that AR filters significantly enhanced the early stages of therapy by easing initial discomfort and encouraging engagement. The Novelty Phase refers to a period of heightened interaction when users first encounter new technology, fostering exploration and positive engagement [54]. Establishing open communication is critical for building a strong therapeutic alliance, yet self-disclosure can be difficult due to fears of vulnerability, judgment, or emotional intensity [29, 34, 65].

During this Novelty phase, AR filters helped lower these initial barriers. Group A used them for comfort and to reduce awkwardness, while Group B relied on them for a sense of safety. This supports existing research showing that video-mediated therapy can reduce intimidation and enhance physical comfort compared to in-person sessions [71]. Our findings further add to this, suggesting that AR filters offer similar benefits to clients even in contexts where visual anonymity and limited nonverbal cues are present. This reduction in barriers enabled clients to open up earlier in therapy, a stage typically characterized by gradual trust-building and acclimation to the therapeutic environment [65]. Additionally, our findings suggest that this accelerated self-disclosure contributed to the rapport-building process, reinforcing the link between self-disclosure and strong therapeutic alliances [37, 129].

The Novelty Phase led to positive implications for therapy from the therapists' perspectives. Firstly, it helped establish a safe therapeutic environment from the outset, critical since early sessions

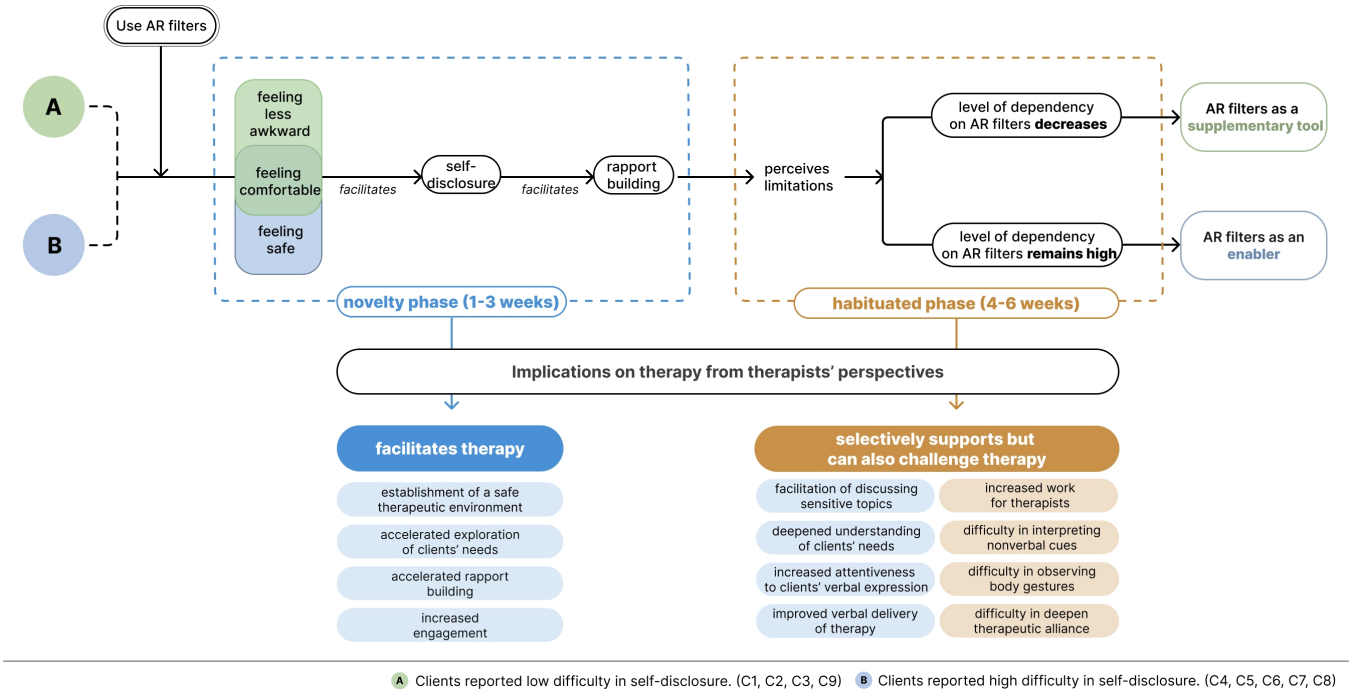

Figure 7: Phases and Roles of AR Filters in AR-Mediated Therapy Over Six Weeks

often predict therapeutic success [34, 102]. Typically, therapists invest significant effort to foster a safe environment for open communication and build therapeutic bonds [40, 100]. AR filters supported this process by promoting rapid self-disclosure, allowing therapists to assess clients' needs early on, thereby strengthening rapport-building and increasing overall engagement. These insights support existing research indicating that maintaining confidentiality and anonymity can reduce social inhibitions and fears of judgment, enhancing openness in therapy [66, 116].

6.1.2 Habituated Phase: (4-6 weeks). Although AR filters initially supported psychotherapy by providing visual anonymity, as clients became accustomed—or habituated—to the AR-mediated environment, this feature occasionally became a barrier to communication. Habituation refers to the point where users become used to technology, leading to a decrease in the initial heightened engagement experienced during the Novelty Phase [110].

Clients in Group A, who found self-disclosure easier, started to recognize communication challenges and adjusted their use accordingly. Some phased them out, while others used them flexibly and selectively based on the topic or need. For instance, C9 used AR filters to conceal physical fatigue and reduce social pressure rather than to enable sharing. This shift suggests that for Group A, AR filters served as **supplementary tools**, easing initial discomfort and enhancing engagement in therapy rather than being essential for self-disclosure.

Conversely, clients in Group B, who experienced greater difficulty with self-disclosure, relied on AR filters throughout therapy. Even after recognizing their limitations, clients in Group B found discontinuing AR filters neither desirable nor feasible, as they were crucial in maintaining a sense of safety for open self-expression. This indicates that AR filters were not merely a supplementary tool to ease therapy at the beginning but an **enabler** that facilitated self-disclosure. This ongoing dependence highlights the crucial role AR filters play in providing a secure environment for clients who fear judgment or stigmatization [40, 99].

Despite their differing roles for clients—the continued use of AR filters in the Habituated Phase had both benefits and challenges from therapists' perspectives. A notable drawback was that the limited nonverbal cues began to cause miscommunications and challenges in therapy after the novelty effects wore off [11]. This subsequently increased the efforts of therapists to adjust their therapeutic approaches accordingly and occasionally hindered the deepening of the therapeutic alliance [31].

However, despite these communication challenges, AR filters still facilitated therapy by supporting discussions on sensitive topics, offering insight into clients' evolving needs, increasing therapists' attentiveness to verbal expressions—a direct result of reduced reliance on nonverbal cues—and improving the overall delivery of therapy for therapists. These varied experiences reflect the mixed findings in the literature on telepsychotherapy versus face-to-face sessions. Some studies report no significant difference in outcomes between online and traditional methods [18, 47], while others suggest that in-person therapy may foster stronger therapeutic alliances and better results [73, 84].

6.2 Integrating AR into Psychotherapy: Anonymity, Privacy, and Stigma

Our study examined young adults in South Korea, a group experiencing acute mental health challenges, yet they struggle to seek mental health support due to deep-seated cultural and societal stigma and fears of structural and social discrimination, underscoring the urgent need for mental health care approaches that prioritize anonymity and privacy [69].

Our findings suggest that AR-mediated therapy helped address some of these nuanced socio-cultural barriers by providing a semi-anonymous space for self-disclosure and expression in a therapeutic context. However, we anticipate that its effectiveness may vary across different sociocultural contexts. For instance, older adults in South Korea, who tend to have stronger reservations toward mental health care, may not experience the same facilitative effects of AR filters, as stigma-related barriers could override their potential benefits.

While privacy concerns and the fear of stigma are particularly acute for this population, these challenges are not exclusive to this demographic but resonate with individuals in other cultures where mental health remains highly stigmatized. For example, recent HCI research on mental health in Saudi Arabia highlights how technology-enabled privacy and anonymity can reduce the stigma in a society where mental health issues are heavily branded due to social, cultural, and religious factors [2]. Saudi women, for instance, typically refuse to turn on their cameras or wear a Niqab (a face veil that reveals only the eyes) during therapy sessions, posing challenges for therapists in conducting effective consultations.

Despite socio-cultural differences, our findings and the needs identified among Saudi women suggest that AR filters can serve as a promising tool for addressing stigma-related privacy concerns in therapy by providing a controllable level of visual anonymity. While technology-mediated privacy alone cannot eliminate discrimination or fully prevent negative experiences in therapy—as these issues are rooted in broader sociocultural and sociopolitical factors—greater control over visual disclosure may help lower psychological barriers to seeking mental health care [32, 92, 115, 126]. By reducing stigma-related anxieties and easing the initial fear of discrimination, AR filters may encourage engagement among individuals who might otherwise avoid therapy. This suggests that AR filters are not just anonymity tools but can be culturally responsive interventions that can adapt to different social norms and therapy practices.

Beyond reducing stigma linked to sociocultural factors, AR-mediated therapy could also benefit individuals struggling with low self-esteem related to appearance, heightened social anxiety, or those whose public recognition makes anonymity a necessity. Added layers of privacy and control offered by AR filters can create a safe space for discussing sensitive or stigmatized topics like trauma, abuse, or gender identity, where anonymity is crucial for fostering trust and openness [16, 76]. This observation supports the findings from HCI studies, which demonstrate the supportive role of anonymity in encouraging self-disclosure and support-seeking on social media [5, 7].

6.3 Considerations and Reflections

Recent developments in technology and growing demand for accessible mental health care have advanced telepsychotherapy, with the COVID-19 pandemic accelerating global adoption. VR therapy has especially become a prominent trend, adopting evidence-based approaches like CBT and DBT and emphasizing cultural competence and inclusivity [42, 106], as well as in exposure-based therapies [23]. However, telepsychotherapy's inherent heterogeneity—its diverse platforms, approaches, and client populations—remains both a strength and a challenge. This limitation extends in particular to AR-mediated therapy, which is still in its relative infancy as a therapeutic modality.

6.3.1 Designing AR for Beyond Binary Anonymity and an Intermediate Mental Health Modality. Evidence suggests that mixed reality, such as AR, can enhance engagement, reduce avoidance, and deliver flexible, contextually relevant interventions tailored to individual needs [13]. However, less is known about how the "light touch" application of AR might bridge gaps in traditional psychotherapy by offering semi-anonymous entry points into talking therapy beyond phobias or cue-dependent disorders. If video-based telepsychotherapy is the closest approximation to face-to-face interaction, combining it with AR filters should allow users to "maintain a sense of presence" in the "non-synthetic world" [17] *even* in long-term therapy sessions, and *even* when the filters are lighthearted and somewhat "comical" in appearance.

Our findings showed that "comical" AR filters did not undermine the credibility of therapeutic interactions, while preferences for filter style and coverage widely varied among clients. This underscores AR filters' dual role in concealment and expression, prompting future AR-mediated telepsychotherapy to offer a wider range of AR filters or even allow users to customize their own.

This contributes to ongoing HCI discussions on designing digital mental health tools that balance privacy and presence [10, 122], demonstrating that AR can function as a 'light-touch' intervention—offering users control over visibility without fully removing nonverbal cues, unlike traditional avatar-based anonymity. By positioning AR as an intermediary between fully immersive VR and traditional video-based therapy, our study highlights new possibilities for hybrid mental health interventions that integrate elements of both digital and in-person therapy.

6.3.2 Navigating Imperfections in AR-Mediated Therapy. Our findings reveal that varied levels of anonymity provided by AR filters create bespoke therapeutic environments for clients. However, "bespoke" does not equate to "idealized" or "perfect." While AR filters provide more visual information than text or audio-based methods, limited facial visibility impedes the reading of non-verbal cues and subtle emotional shifts. Moreover, technical glitches, such as momentary filter failures caused by internet instability, can alarm those who prioritize full anonymity. However, we propose that these imperfections should not be viewed as fundamental flaws that require elimination by introducing more technology (e.g., emotional recognition tools). A perfect therapeutic environment does not exist, just as errors and misinterpretations occur in face-to-face therapy due to the very nature of interpersonal interaction. Therefore, we propose that the focus in AR-mediated therapy should remain on creating a

safe space where clients can explore and express emotions, aligning with the therapist's duty of care.

6.3.3 Building a Foundation for AR in Therapy: Training, Research, and Best Practices. As our study showed, therapists applied existing frameworks and training as they would in non-AR sessions while also developing new strategies to navigate the unique challenges of AR-mediated therapy. This underscores the importance of drawing on emerging communities of practice to develop new ways of working online. Similar to workarounds they have found in other telepsychotherapy environments, such as protocols for internet failure and screen-mounted cameras to visualize cognitive cycles, AR-mediated therapy will also require new methods and protocols. Crucially, early therapy sessions should include explicit discussions about the potential effects of using AR filters as well as what steps to be taken by both parties to create a therapeutic environment within AR settings.

Drawing on existing and emerging communities of practice of AR-mediated therapy amongst therapists will build a collective knowledge base, promoting best practices and challenging assumptions around who AR-mediated therapies are (and are not) "for." For example, our research challenged the expectation that a client removing their AR filter is not necessarily a "successful" therapeutic outcome and should not necessarily be viewed as a therapeutic goal. As AR technologies become more widely available, there will be a growing need for good quality training and research to understand what makes AR effective, for whom, and in what contexts it is appropriate for clinical use [77].

7 Limitations and Future Works

This study has several limitations that future work can address. First, the sample size (N=9) is small. While typical in qualitative research aimed at understanding user experiences, larger samples in future studies would help validate our findings and allow for more robust statistical analysis. Second, our study was limited to young adults in South Korea. Future research should broaden its scope to include diverse populations, varying in age, cultural backgrounds, and specific mental health conditions or therapeutic approaches. For example, examining CBT delivery to teenagers—a group familiar with AR technology but with low treatment rates [107]—could yield different insights. Additionally, studying populations facing mental health stigmatization, such as Saudi women, would provide more diverse perspectives on AR-mediated therapy.

Lastly, our study was not designed to evaluate the efficacy of AR-mediated therapy. Conducted in a naturalistic "in the wild" setting, it did not involve controlled experiments, as its primary aim was to explore the feasibility of incorporating AR filters into therapy in short-term six-week therapy. In that, the use of standardized measures was intentionally limited to pre- and post-therapy within this timeframe, without conducting follow-ups after the six-week therapy had ended. This approach reflects some real-world practices, where the primary aim of brief interventions is to address immediate concerns rather than achieve long-term symptom reduction [44, 53, 74]. Considering these limitations, future research can assess the efficacy of AR-mediated therapy in a controlled environment to evaluate its therapeutic effectiveness both in the short term and over the long term, as well as the sustained impact of AR filters on therapeutic dynamics.

8 Conclusion

To explore how AR filters can facilitate psychotherapy sessions, we conducted a six-week field deployment study using CounselAR, developed collaboratively with stakeholders. Through an examination of clients' and therapists' experiences, we provide empirical evidence on AR-mediated therapy in real-life settings from both perspectives, focusing on their roles and implications in the short-term therapeutic setting. Our research underscores the potential of AR-mediated therapy in addressing mental health challenges, particularly among young adults facing barriers to traditional care. The anonymity and control offered by AR filters fostered a safe and empowering environment, leading to positive outcomes. However, challenges in interpreting non-verbal cues and potential technical glitches highlight the need for careful implementation and further research. Overall, AR-mediated therapy represents a promising avenue for improving mental health care accessibility, especially for individuals who struggle with self-disclosure or face pervasive stigma around mental health.

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