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“I Don’t Know Why I Should Use This App”: Holistic Analysis on User Engagement Challenges in Mobile Mental Health

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Bogoan Kim*

Kyungsik Han

*Both authors contributed equally to this research

HANYANG UNIVERSITY

Hanyang Human Centered Computing Lab

Research Background

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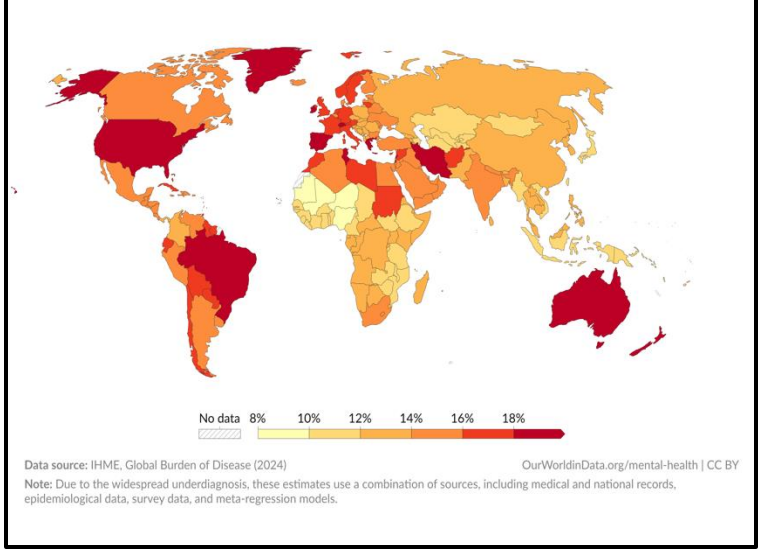
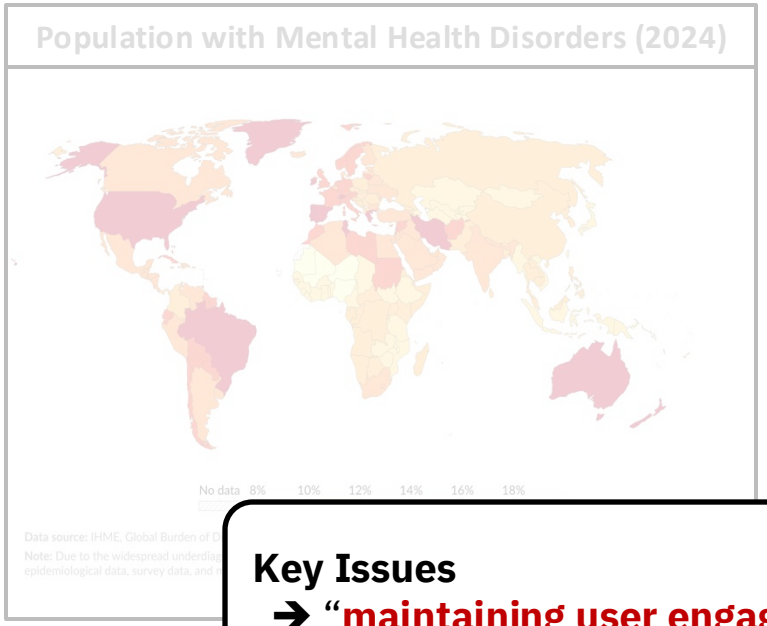
Population with Mental Health Disorders (2024)

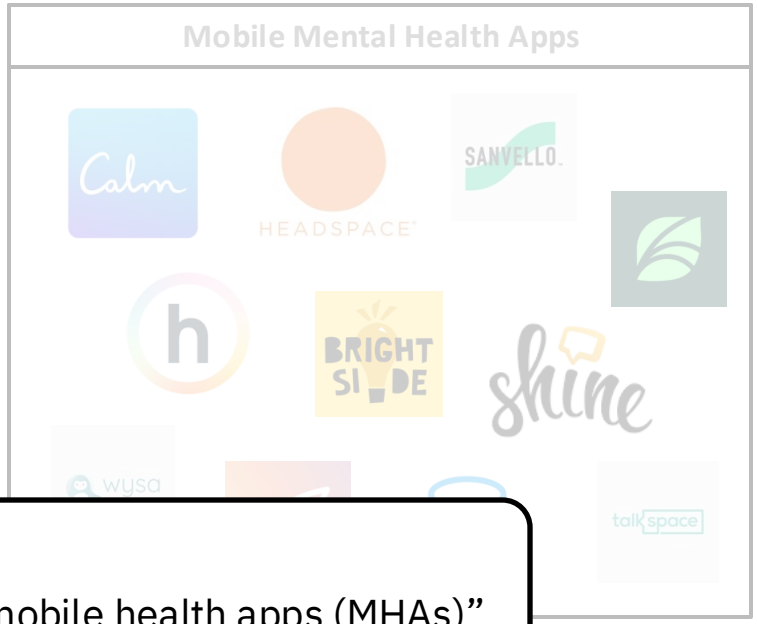


Mobile Mental Health Apps

Calm
HEADSPACE
SANVELLO
BRIGHT SIDE
shine
wysa
7 Cups
talkspace

Research Background



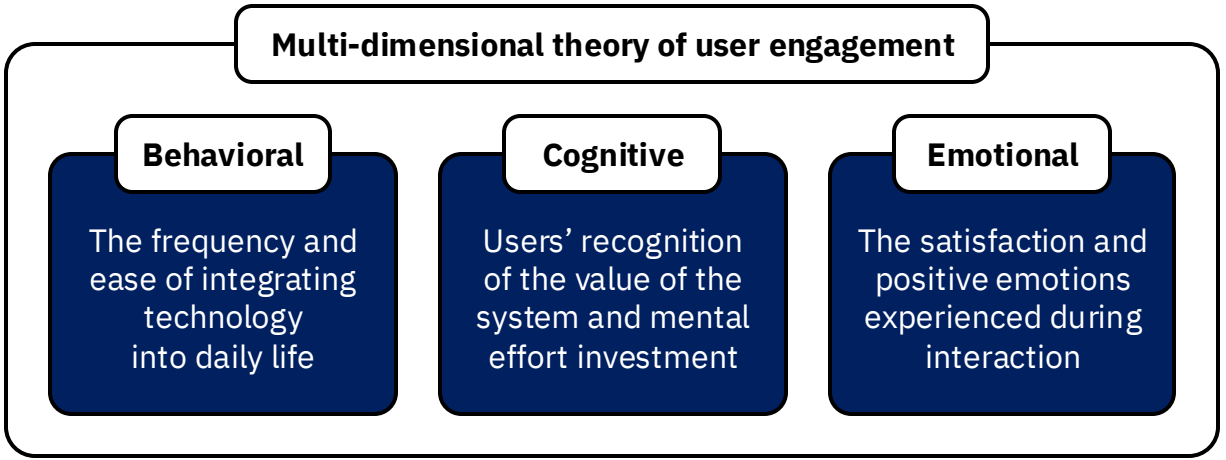


Key Issues

➔ "**maintaining user engagement** in mobile health apps (MHAs)"

Research Background

- What is the **definition of engagement** used in this study?
  - An integrated concept that encompasses **behavioral, cognitive, and emotional components**, viewing these three elements **as part of a dynamic process involving temporal changes (O'Brien et al., 2008; Kelders et al., 2020; Perski et al., 2017, Nahum-Shani et al., 2018)**.



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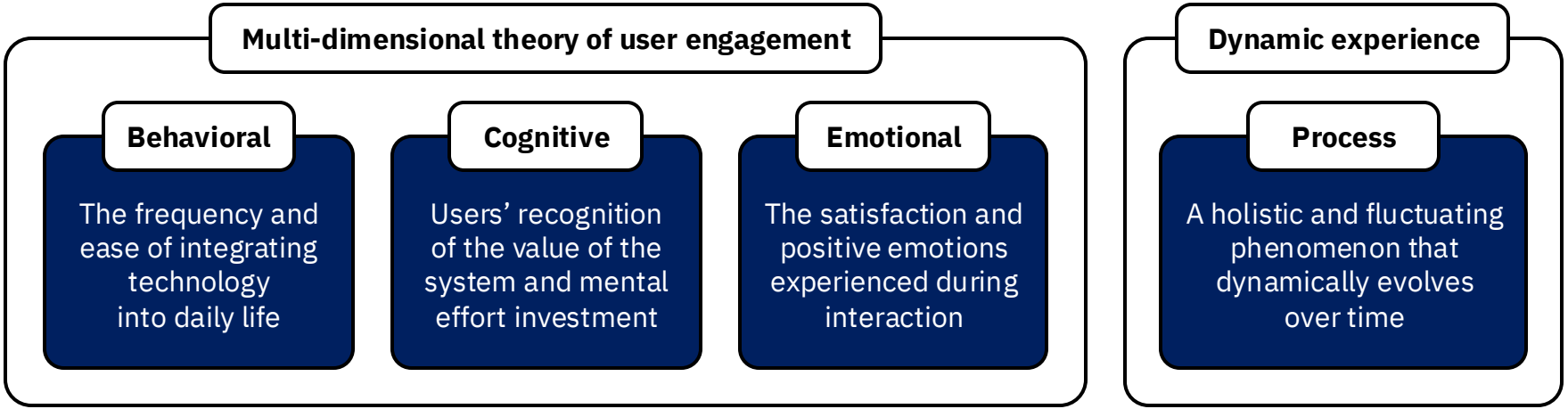

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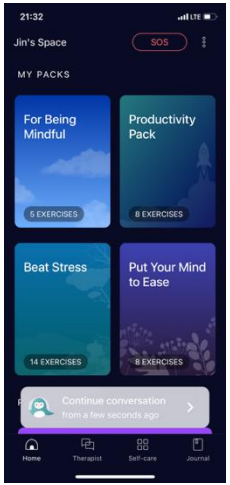
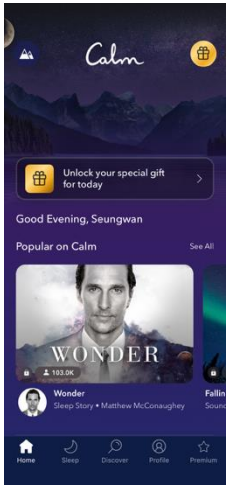


Rysa



Calm

AIMS

Engagement Challenges in Previous Work

- Technical and usability issues
- Personalization and content issues
- Psychological and social barriers
- Privacy, security, and trust concerns
- Mental health condition-specific challenges

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Limitations
➔ Few prior literature reviews have holistically examined both user- and system-centered intervention perspectives.

Research Motivation

- Why should we distinguish between user-centered and system-centered intervention approaches?

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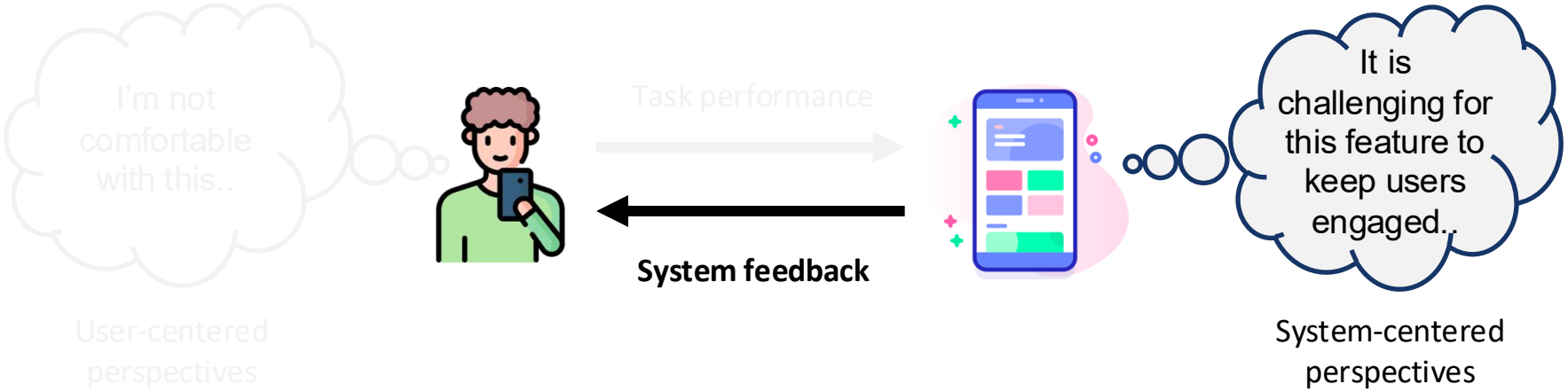
  - **Without analyzing the challenges in terms of both user-centered and system-centered functionalities, it is challenging to propose balanced strategies for enhancing user engagement.**



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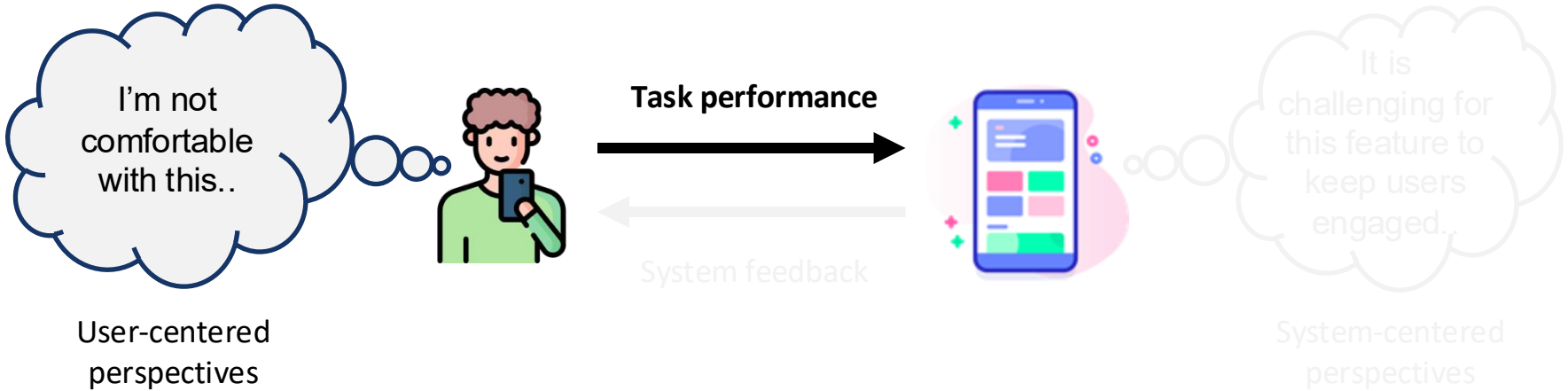

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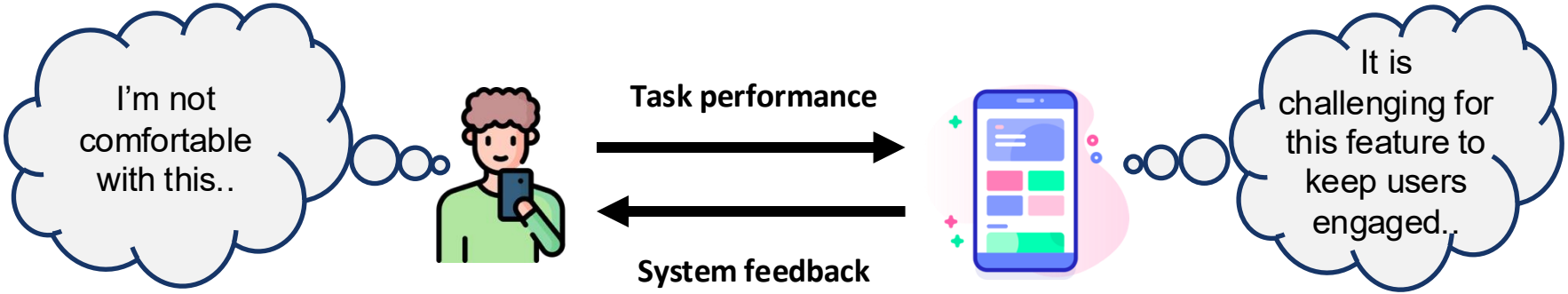

Research Questions

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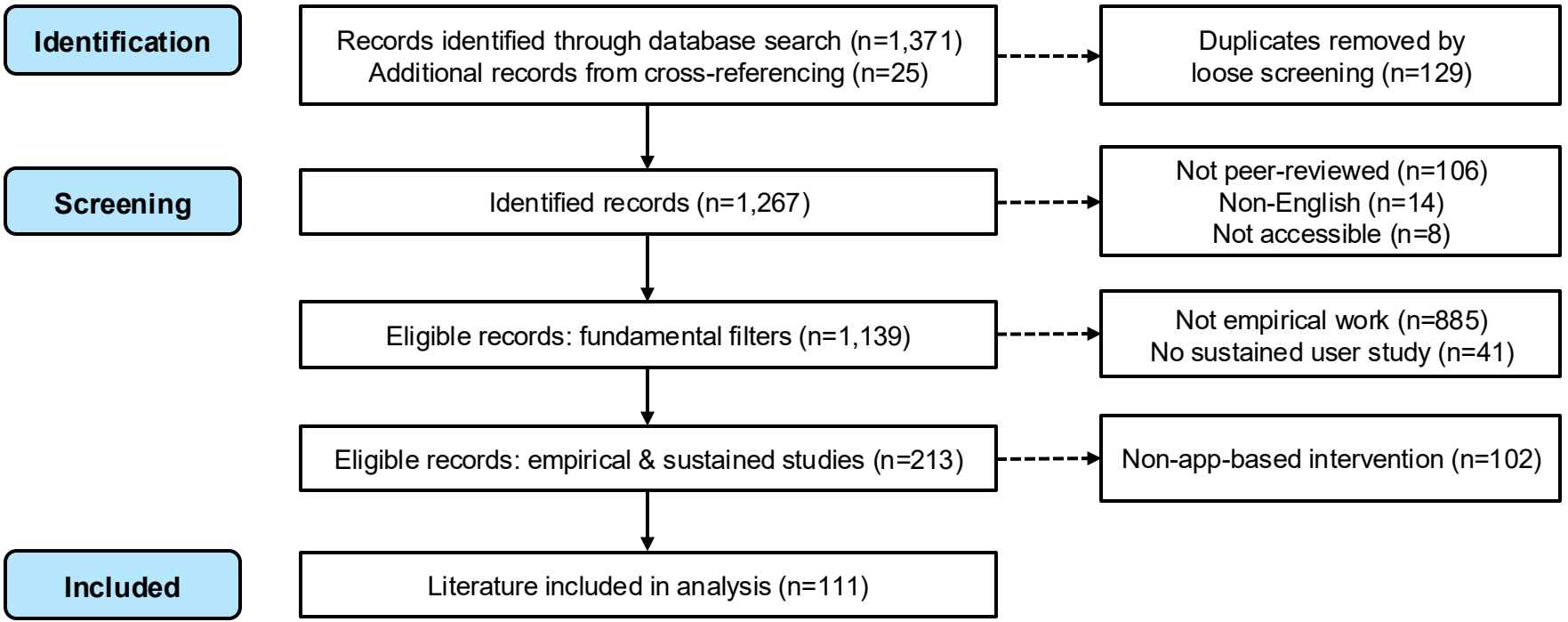
RQ1. What are the barriers to sustained user engagement in MHAs, and how do they manifest in user- and system-centered approaches?

RQ2. What research directions can effectively address the barriers to engagement identified in user- and system-centered approaches?

PRISMA Flow Diagram



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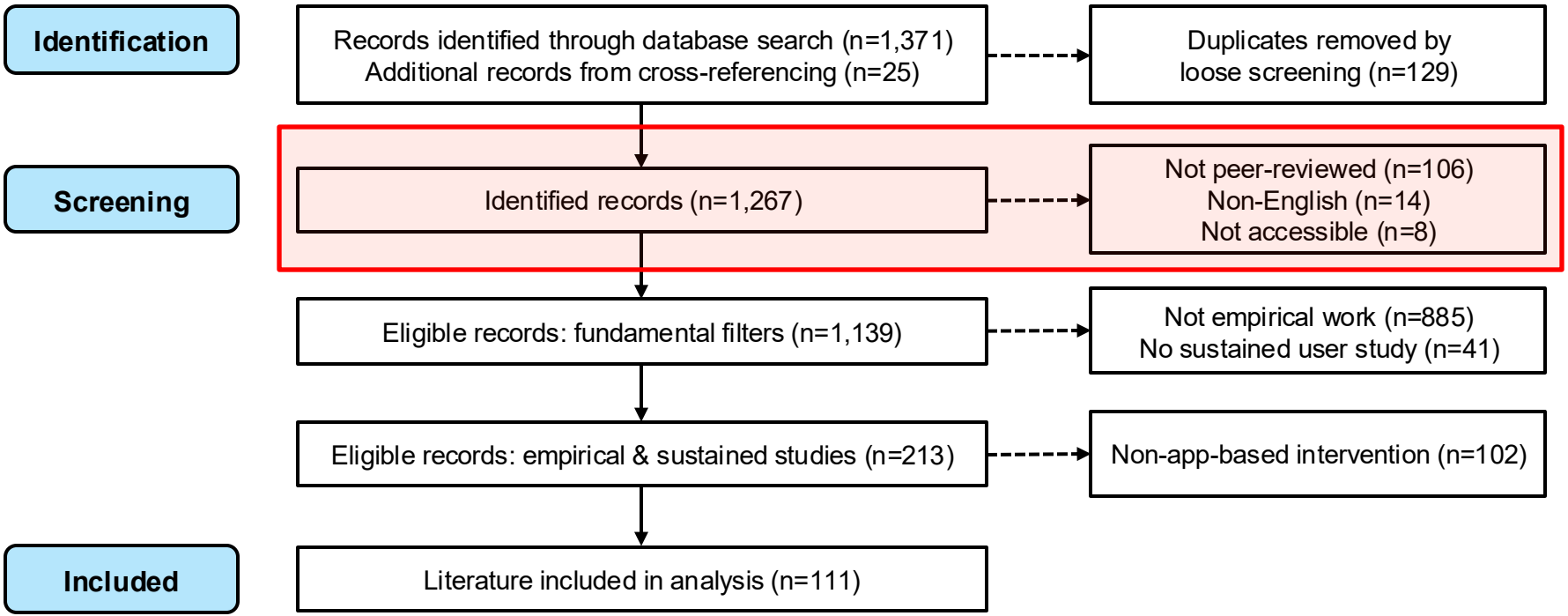

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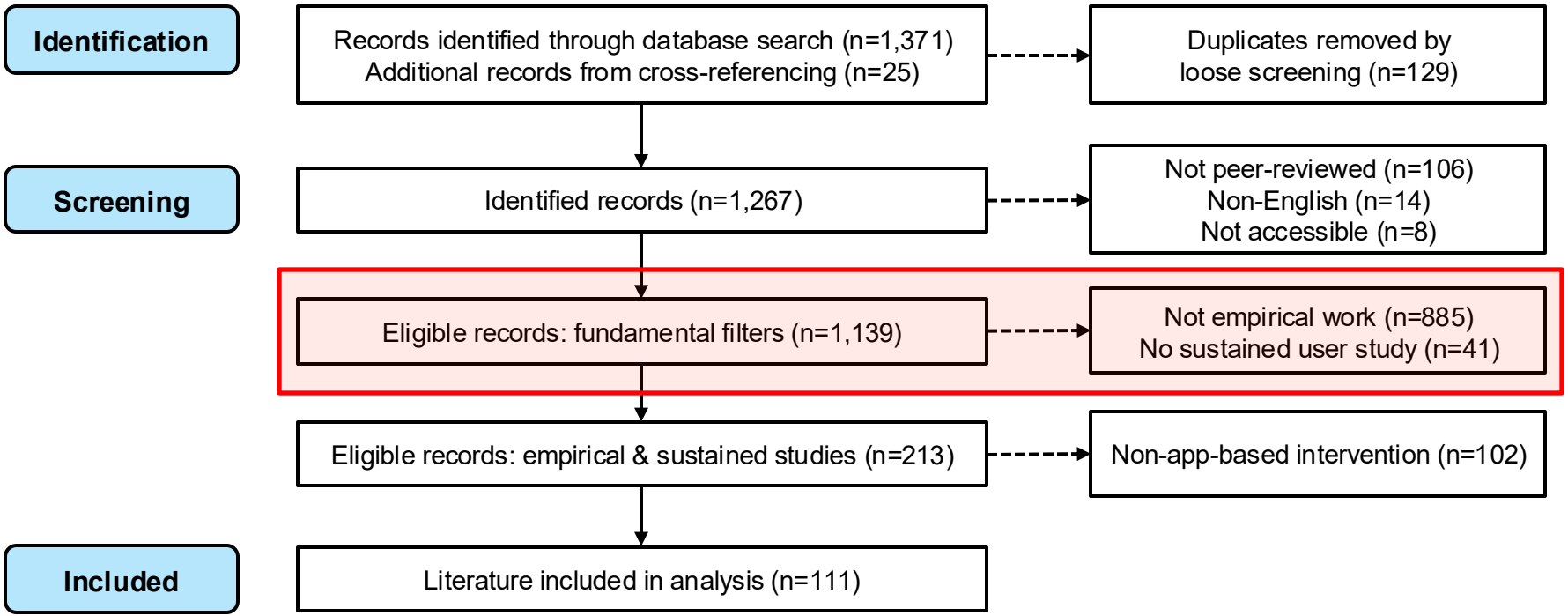

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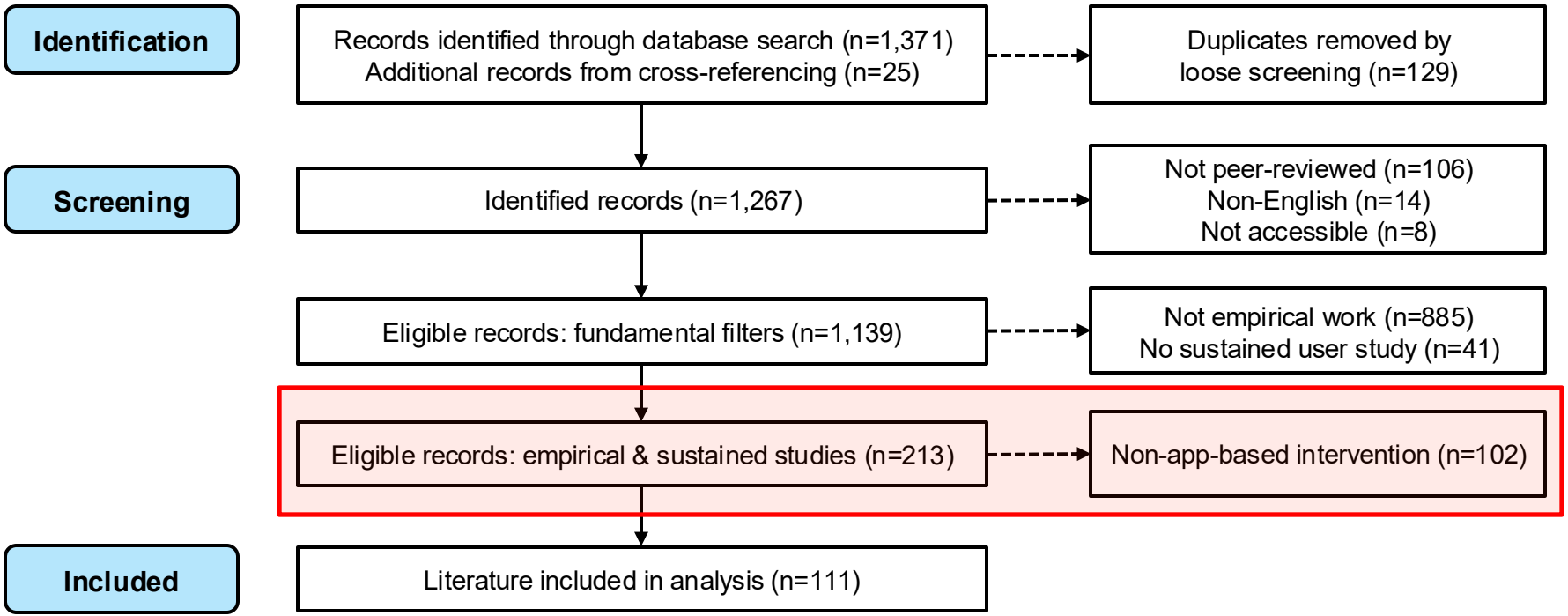
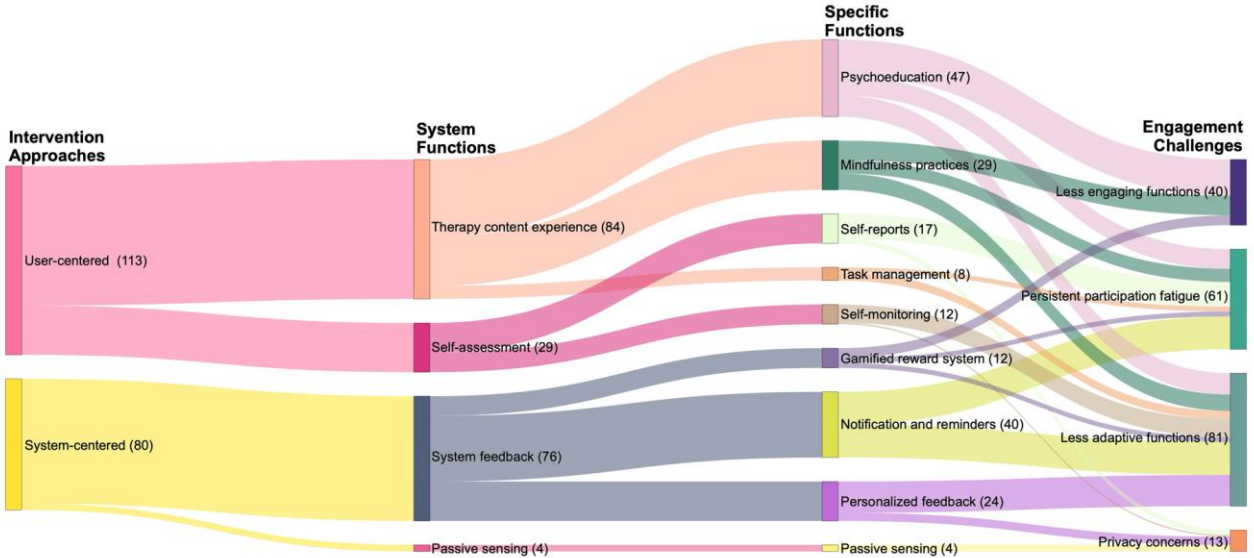


Results (Sankey diagram)

- Mental health support system functions
  - Classified the functions of MHAs into user- and system-centered approaches based on their intervention methods and derived four *engagement challenges* (Sankey diagram).



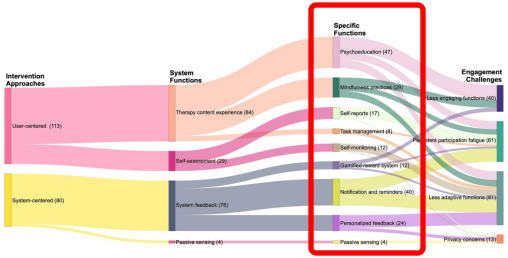
Results

Main Content (49)

- Stress literacy
- Daily planning
- Activity and lifestyle logging
- ⋮
- Motivational messages
- Location sensors
- Progress tracking

Specific Functions (9)

- Psycho-education
- Mindfulness practices
- Self-reports
- Task management
- Self-monitoring
- Gamified reward system
- Personalized feedback
- Notifications and reminders
- Passive sensing



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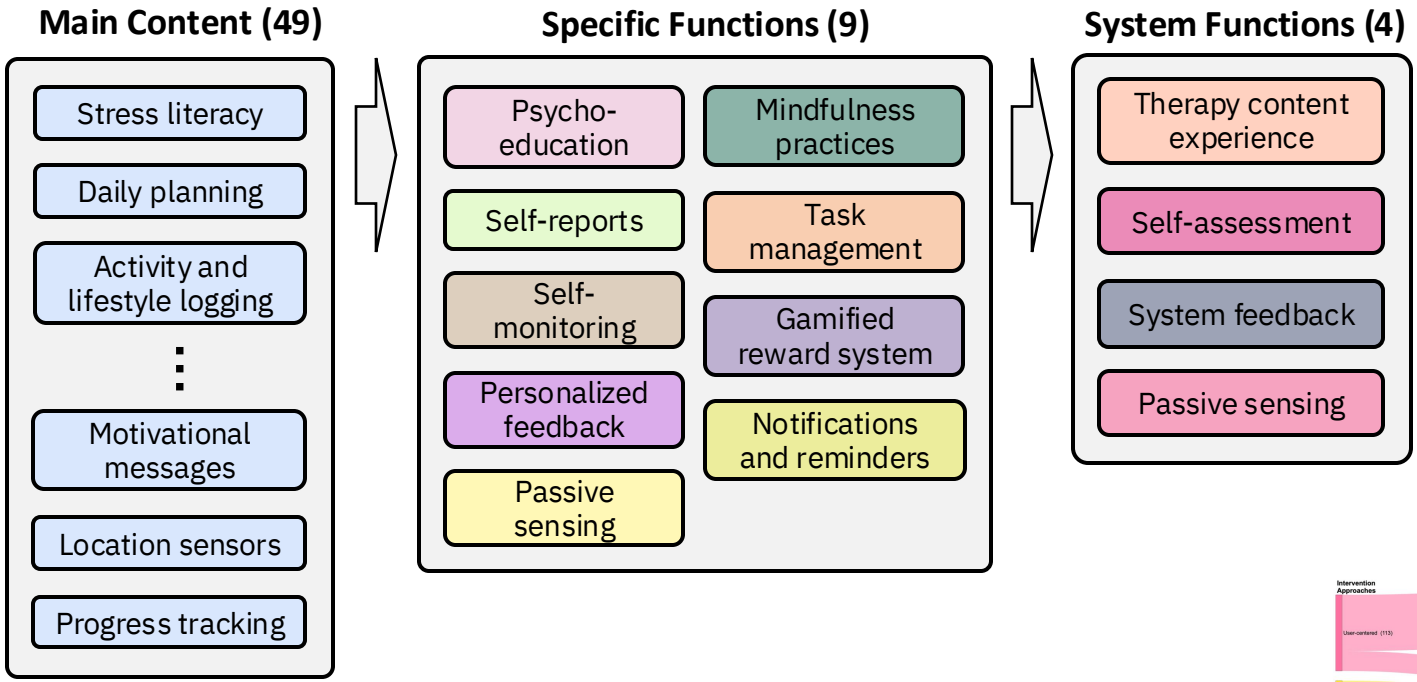
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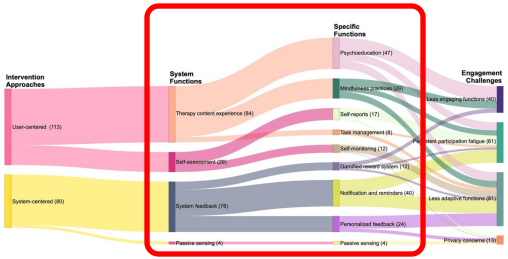
System Functions (4)
Therapy content experience
Self-assessment
System feedback
Passive sensing



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System Functions (4)

- Therapy content experience
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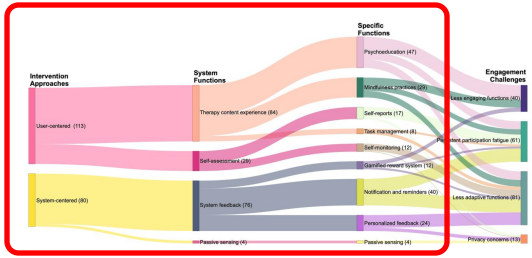
- System feedback
- Passive sensing

Intervention (2)

- User-centered intervention
- System-centered intervention



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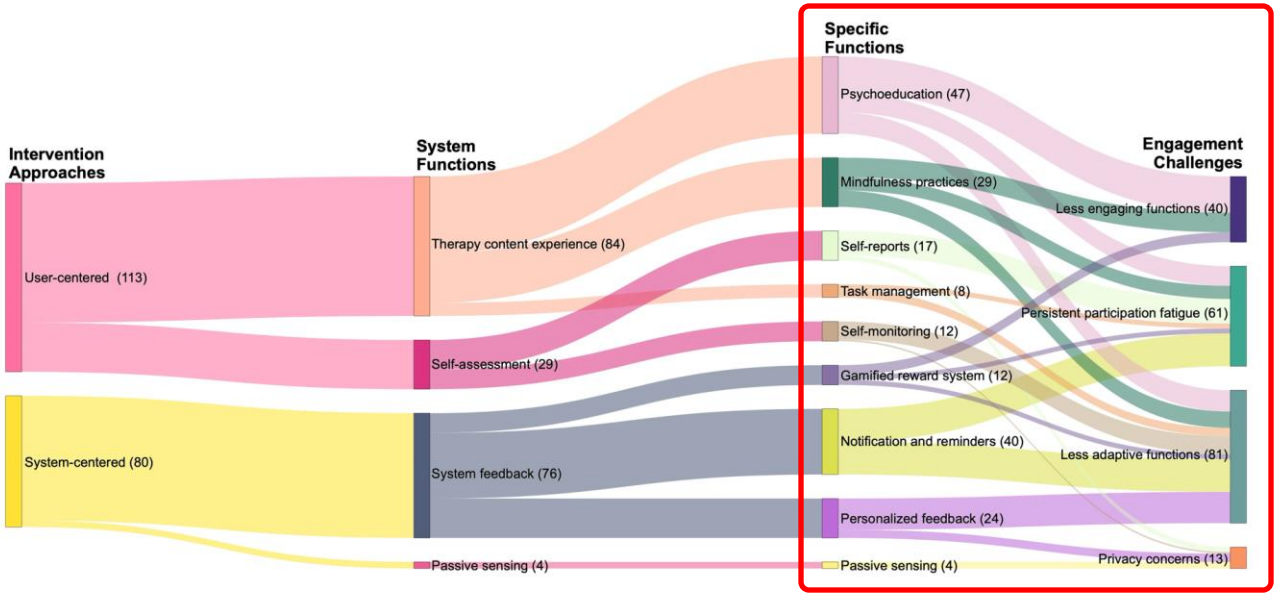

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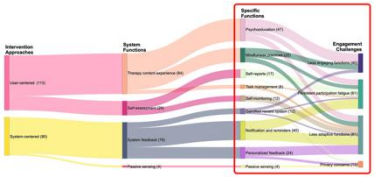

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Engagement-Prompting Features

User-centered main content

- Integrated self-management features promoting sustained engagement
- Complex feature combinations targeting holistic engagement

System-centered main content

- Personalized mental health support through data-driven features
- Adaptive features enhancing personalized mental health support

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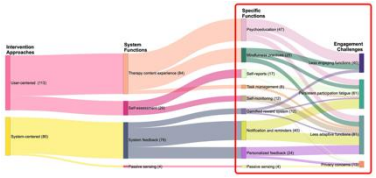

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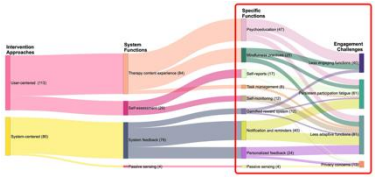
Sustained Engagement Barriers

- Burden of continuous tasks
- Time constraints on participation
- Low attention
- Monotonous design
- Surveillance apprehensions
- Loss of control
- Evolving needs
- Diminished gamification effects
- Digital literacy
- Frequent notifications

User Engagement Challenges



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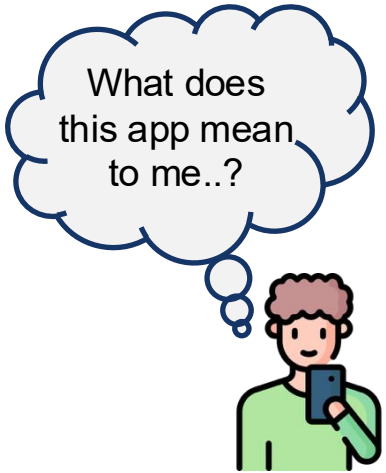
Engagement Challenges

- Persistent participation fatigue
- Less engaging functions
- Privacy concerns
- Less adaptive functions

Results



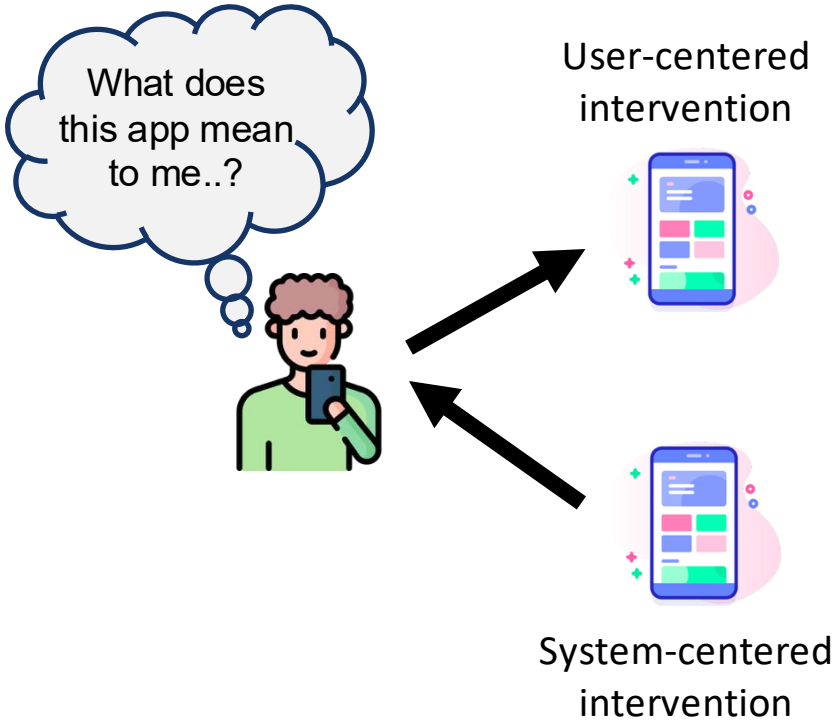
User-centered intervention

User effort & Tension

- Self-reporting, goal setting, task performance, …

- Repetition and time burden, user fatigue
- “Why should I keep using this app?”

Results



User effort & Tension

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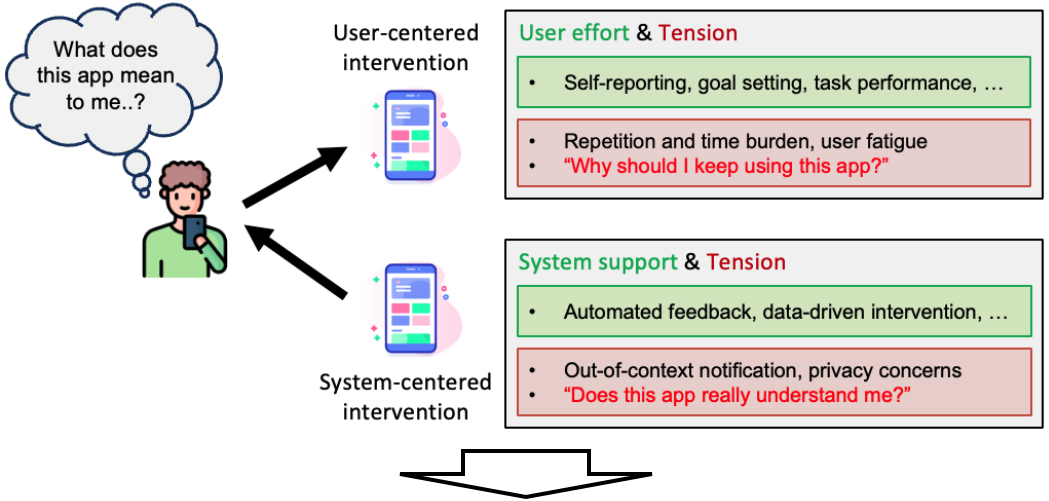
System support & Tension

- Automated feedback, data-driven intervention, …

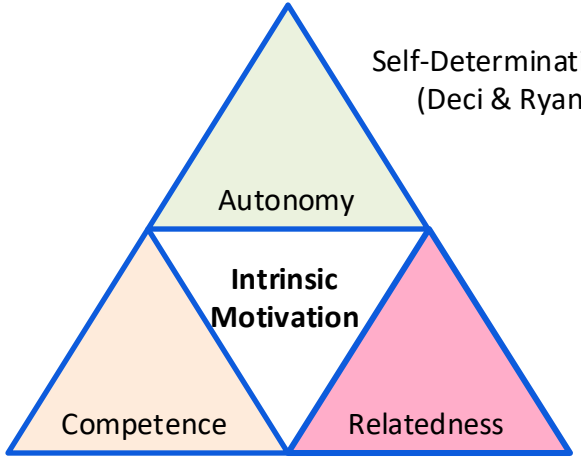
- Out-of-context notification, privacy concerns
- "Does this app really understand me?"

Discussion



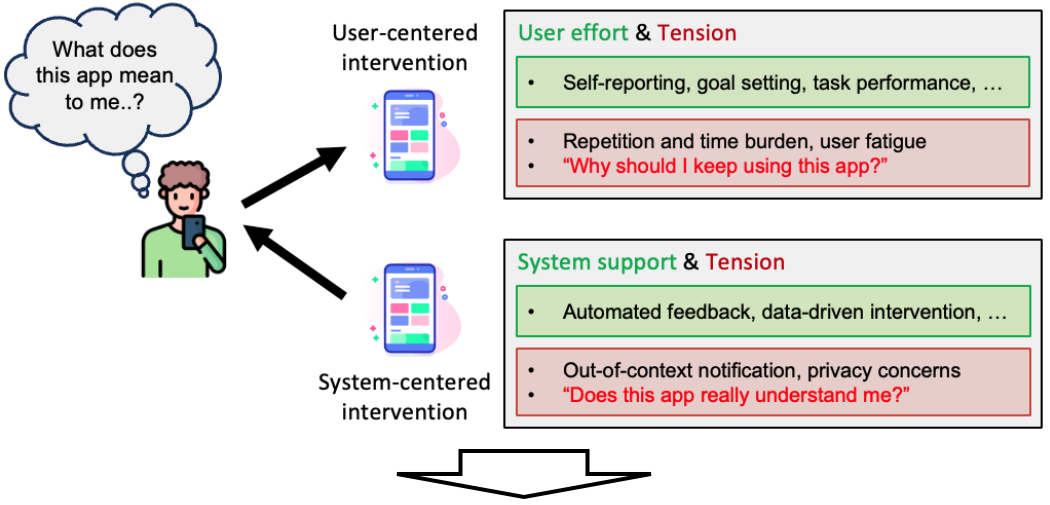
"What are we missing at the motivational level?"

Discussion



Self-Determination Theory (Deci & Ryan, 2000)

- **Autonomy:** Feeling a sense of volition – the desire to self-organize one's behavior
- **Competence:** Feeling effective and capable in dealing with challenges
- **Relatedness:** Feeling connected, of being understood, cared for, and belonging with others



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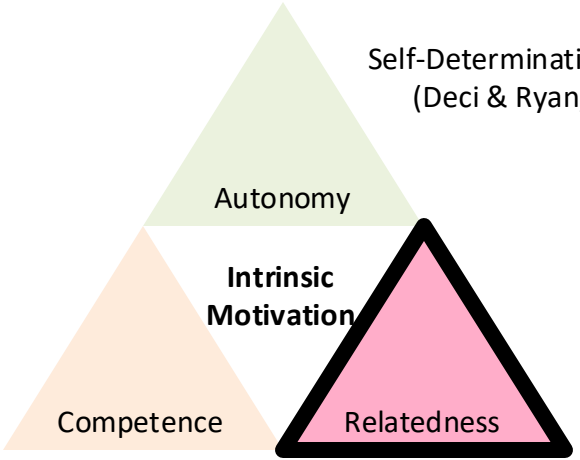

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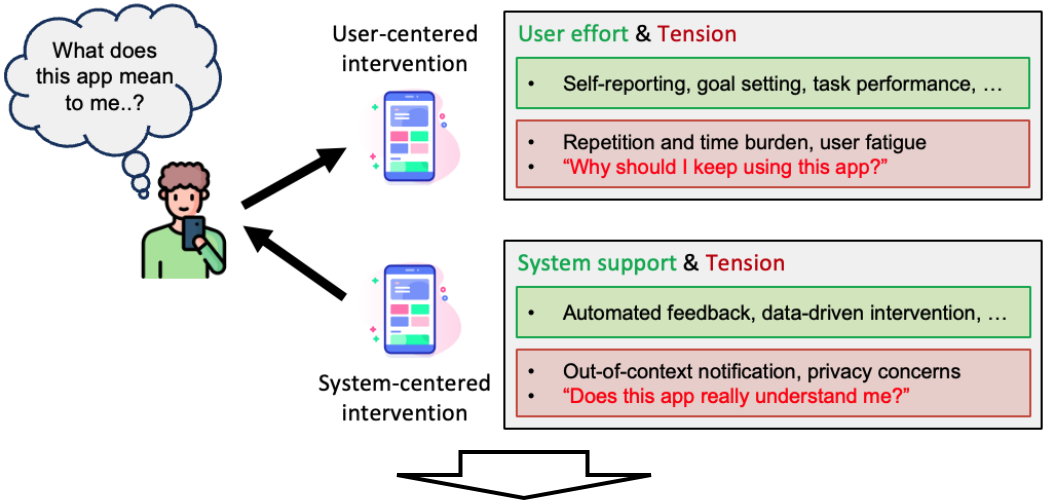

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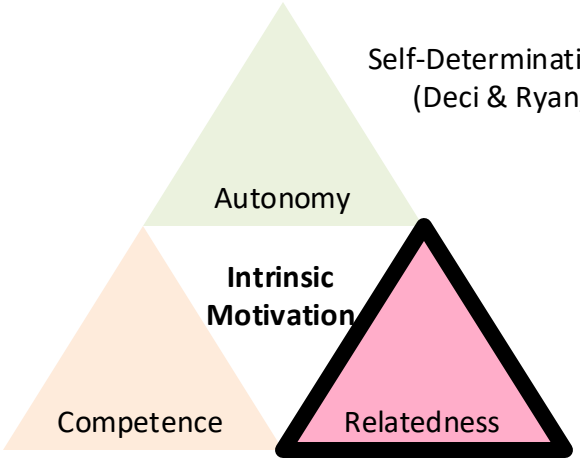

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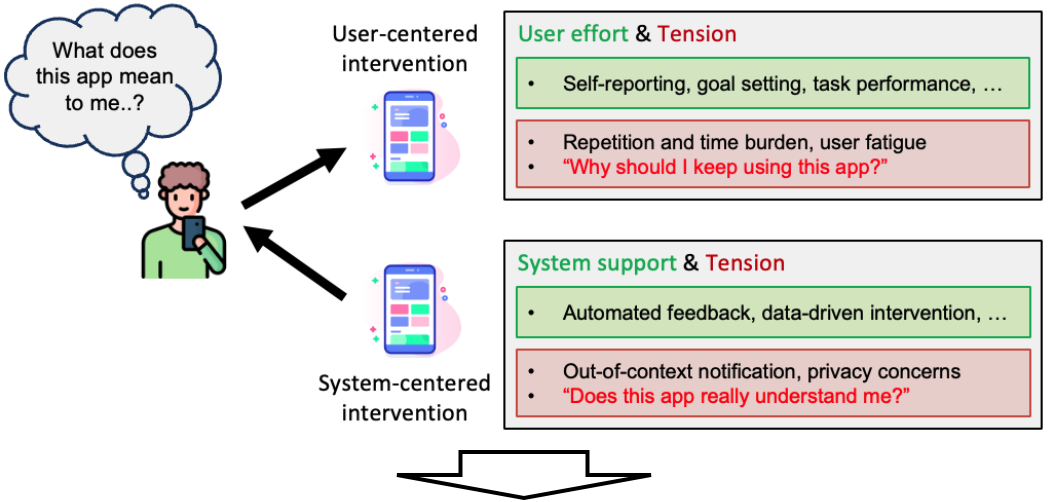
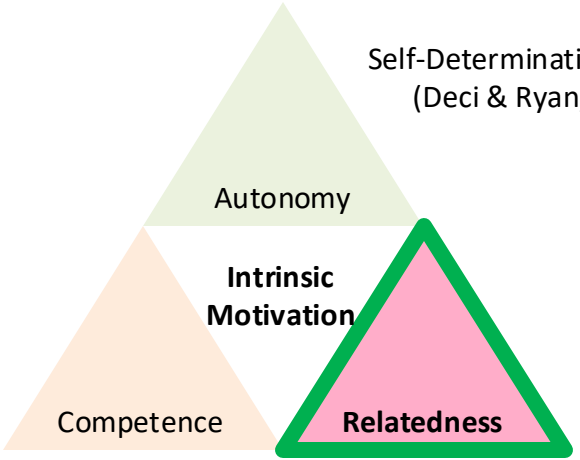


Key Takeaway

➔ Suggest that strengthening relatedness in MHAs may create opportunities to **enhance users' intrinsic motivation** across both user- and system-centered sides.

Discussion



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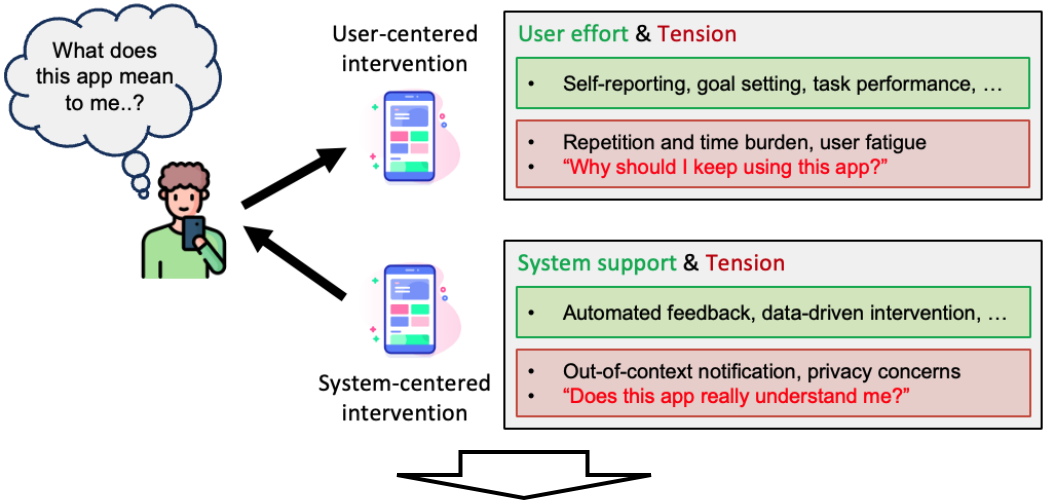
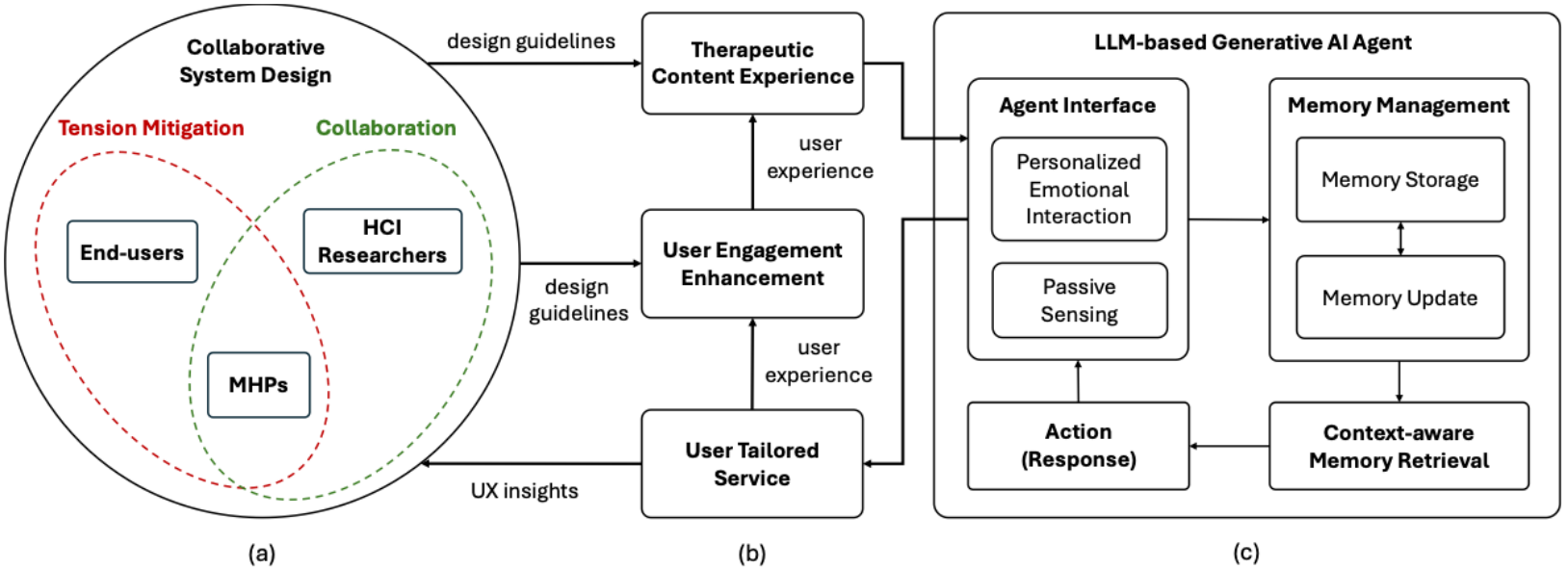


"How can making users feel more connected boost their motivation to use MHAs?"

Discussion

❑ Conceptual Framework Proposal



Discussion

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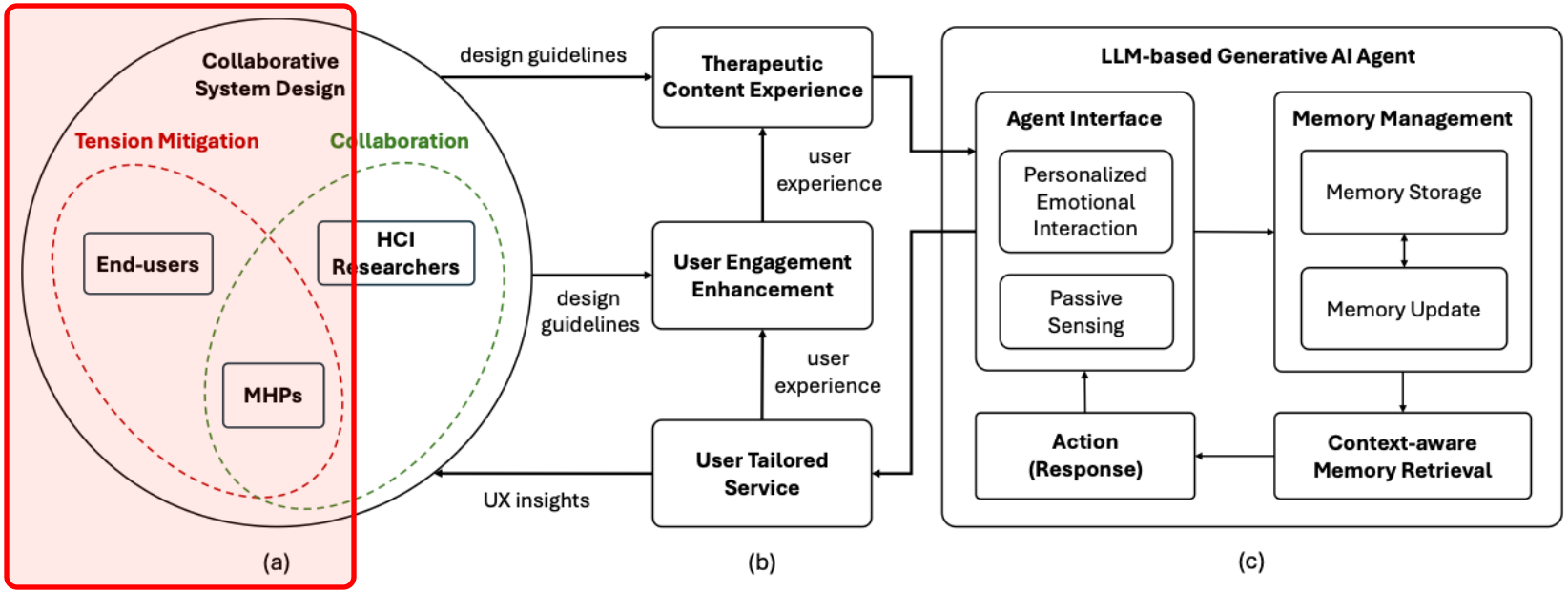

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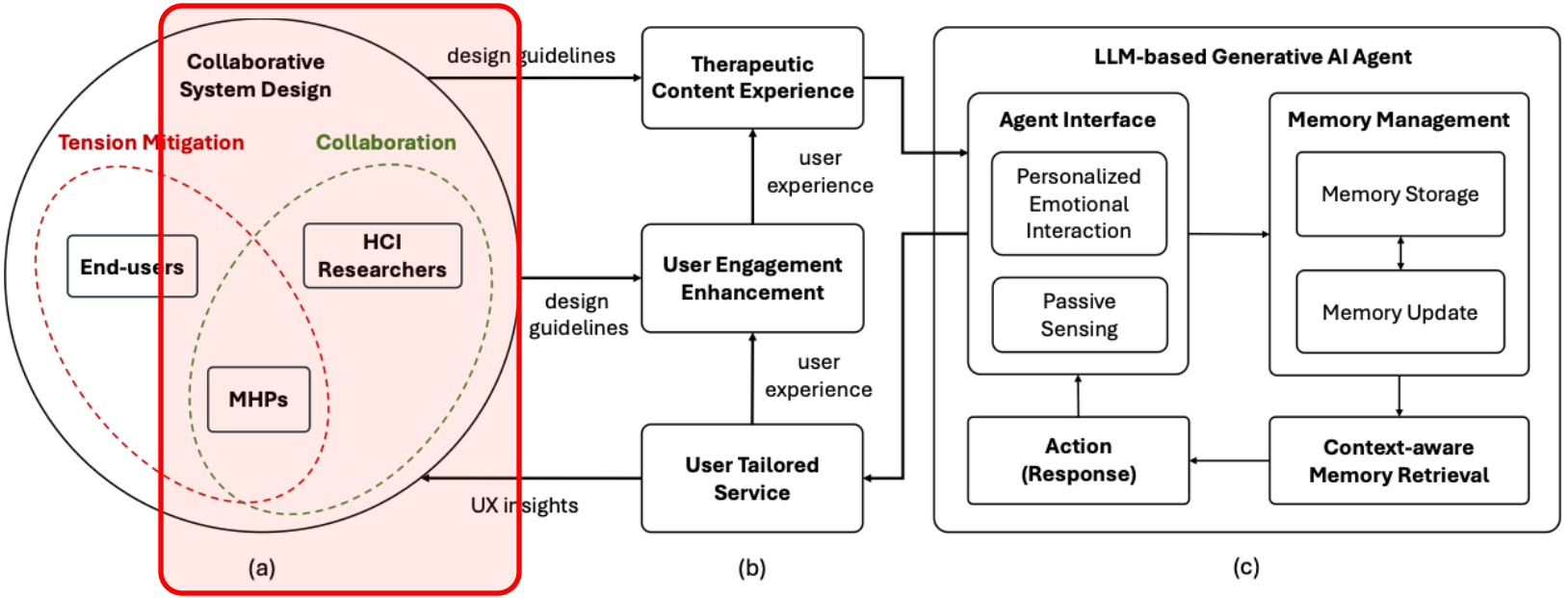

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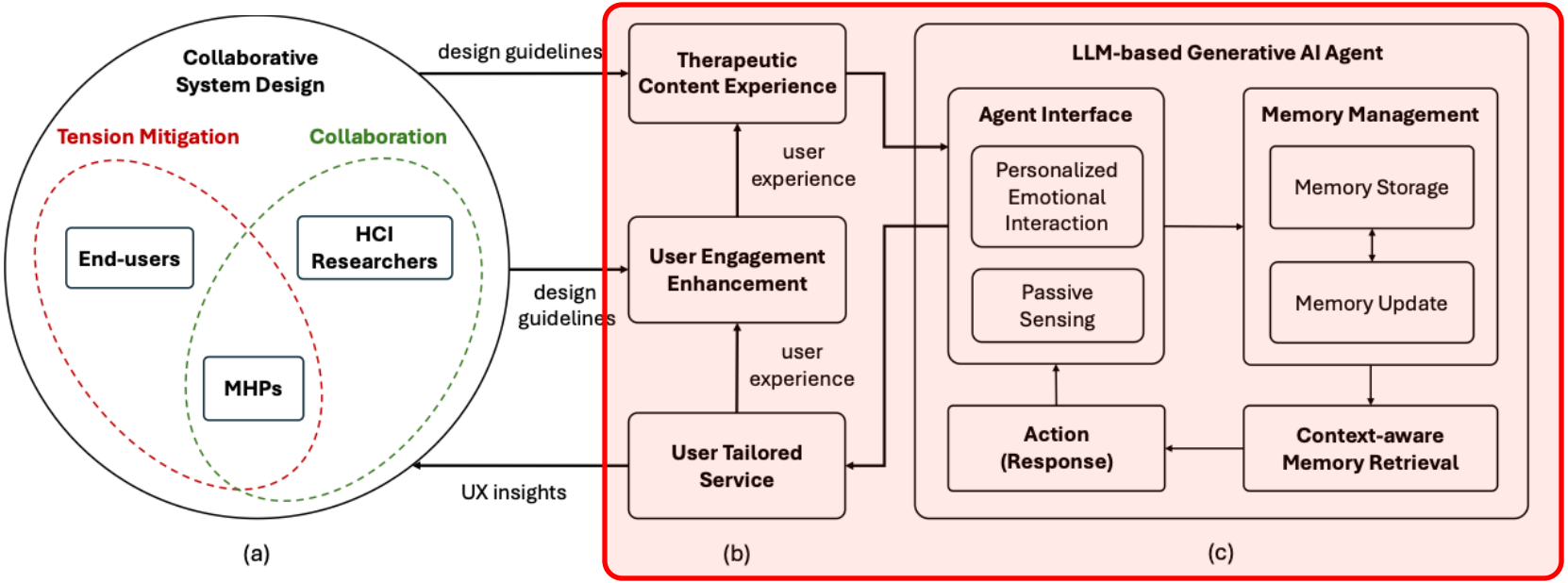

Discussion

- **Integrating literacy education and adaptive AI: Enhancing user privacy**
  - Privacy concerns, especially around passive data collection and self-reports, hinder engagement with MHAs.
  - Clear privacy education and adaptive AI methods (e.g., federated learning) can build trust and improve retention.
- **Expert-guided safety enhancements: Ethical considerations in LLM integration**
  - LLM-based mental health interventions pose ethical risks such as generating misleading information or inappropriate responses.
  - Expert-guided approach can enhance the safety and reliability of LLM-based mental health interventions.
- **Limitations and future work**
  - Engagement challenges vary among users due to differences in mental health conditions, digital literacy, and personal preferences.
  - Future research should focus on personalized engagement strategies and adaptive interventions to address diverse user needs.

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Thank you