# The Evolution of Digital Support: A Workshop on the Development of 'Future Me'

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# Our position

- Landscape can be confusing
- Researchers vs entrepreneurs

# The Challenge: The Mental Health Support Gap

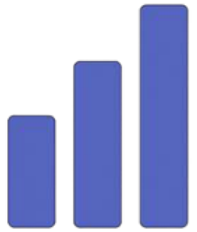
- Demand outpaces availability.
- We cannot train enough therapists.
- Concern is not so much overprescribing of drugs as under-provision of psychotherapies.

- **It is not acceptable to have evidence-based solutions to health conditions but not to provide them**

Colin Espie – Sleepio/Big Health

**The Problem:** Long waiting lists, high costs, and stigma create barriers to care.

- **The Opportunity:** Digital mental health tools offer a way to provide support that is:



**Scalable**
Reach thousands at a low cost.

**Accessible**
Available 24/7, anywhere.

**Anonymous**
Reduces fear of judgment.

# Different forms of digital support

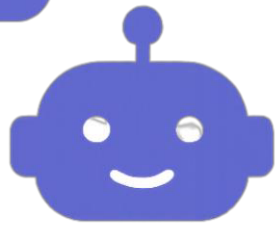
Internet-based Cognitive Behavioural Therapy (ICBT)

DTx: Sleepio

Virtual Reality (VR) Exposure Therapy

Apps (toolbox)

'Asynchronous' support (SMS)

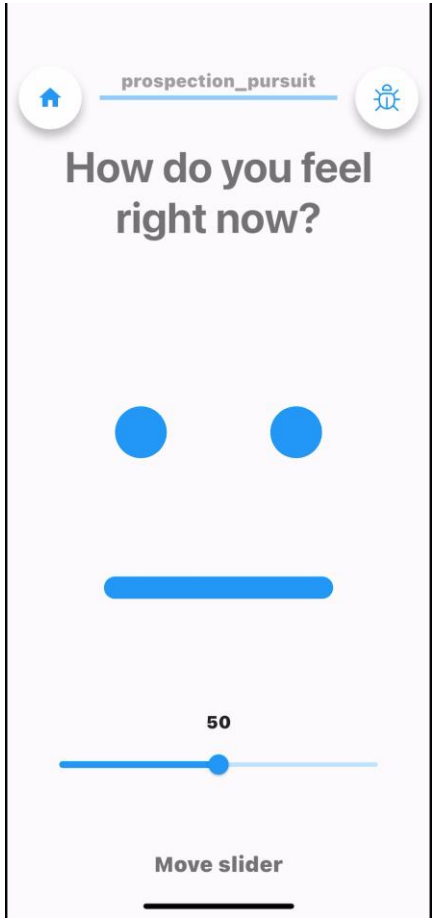


Chatbots

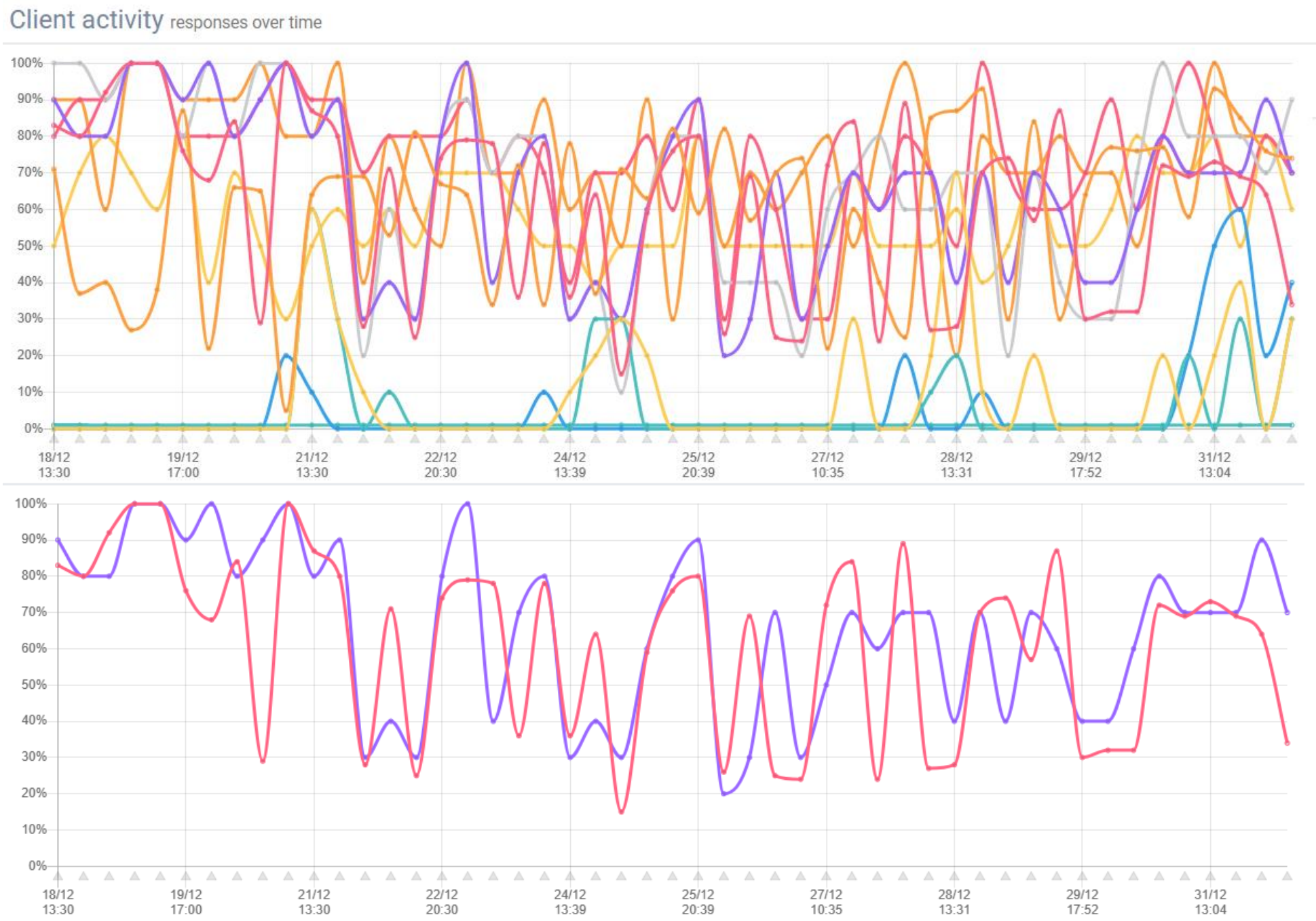
Nudges-prompts

# Ecological Momentary Assessment

But how do we provide support that is *genuinely helpful* in the moments people need it most?



# EMA


Client activity responses over time
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
18/12 13:30
19/12 17:00
21/12 13:30
22/12 20:30
24/12 13:39
25/12 20:39
27/12 10:35
28/12 13:31
29/12 17:52
31/12 13:04

# Ecological Momentary Intervention

- This EMI approach uses a “less is more” philosophy, focusing on developing specific skills through repeated practice embedded in daily life.
- Micro-interventions not therapies.
- To supplement not replace therapy.
- By focusing on single, achievable goals, help the individual perceive the task as manageable and increase the willingness to engage.

# The Problem

# Goal pursuit

- Intentions do not translate into action: medium-to-large changes in intentions only lead to small-to-medium changes in behaviour.
- Most interventions focus on altering specific behaviours within specific contexts, and the results are not conclusive.
- Pursuing goals depends on how we're feeling, what's going on around us (like other goals or demands), and the resources we've got (like skills or chances).
- In the real world, we've got to be able to decide which goals to focus on, figuring out how much effort to put in and when to switch to something else.  Some goals are harder than others, and how well we can work toward them depends on what we have going for us.
- This is even more difficult for people experiencing anhedonia or amotivation.

# Goal pursuit

- Intention-behaviour gap: We don't do what we say we're going to do. large changes in intention only lead to small changes in behaviour
- Pursuing goals depends on how we're feeling, what's going on around us (like other goals or demands), and the resources we've got (like skills or opportunities).
- In the real world, we juggle goals.
- Which goal to focus on now? How much effort to give it? When is it time to switch?
- Success depends on our resources vs. the goal's difficulty.
- This is even more difficult for people experiencing anhedonia or amotivation.

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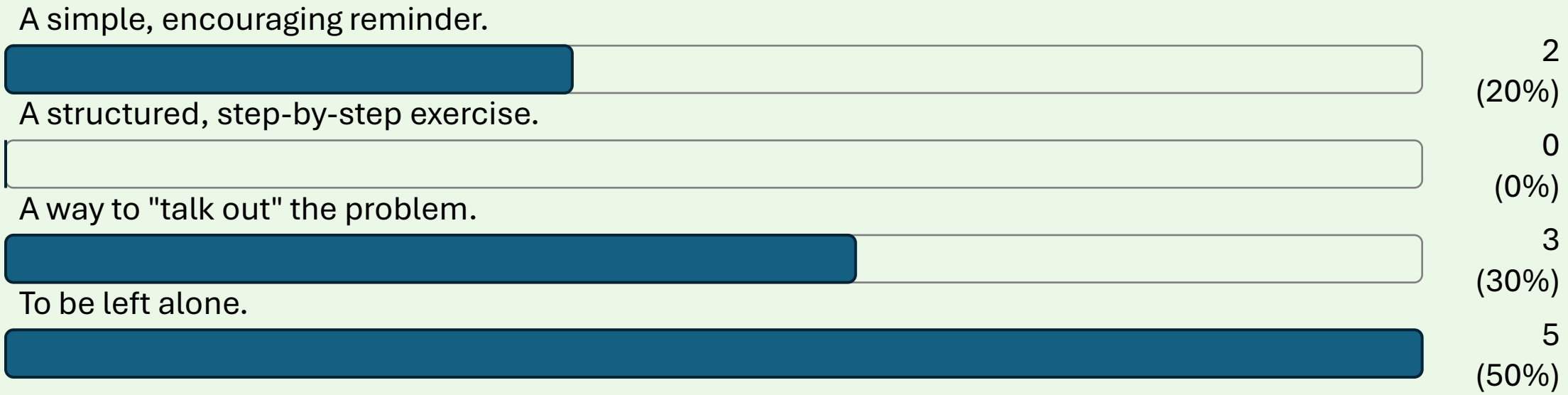
Preparing Results

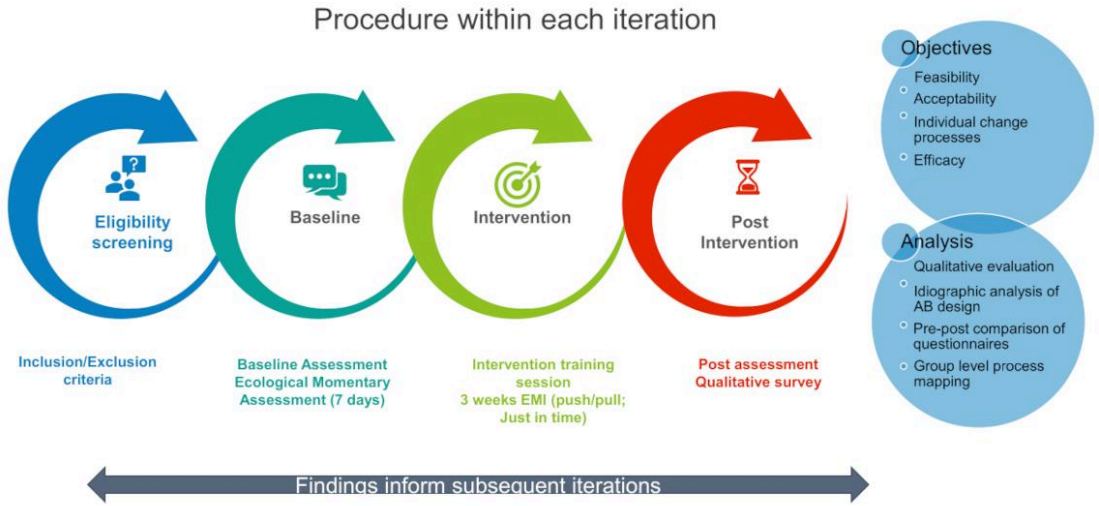
# When you are stressed, unmotivated, or stuck on a goal, what kind of "in-the-moment" support would you *actually* want from your phone?




RESULTS SLIDE

# Solution

- The extent to which we can imagine, plan for, and enjoy thinking about the future affects the decisions we make now.
- EMA: frequent self-monitoring, shown to improve goal attainment
- EMI: mental contrasting with implementation intentions (MCII)
- Trigger: goal pursuit variable (falling 1 SD below your rolling average)



# MCII – micro-intervention

- It looks like you may benefit from a little booster. Take a moment to work through the strategy.

Take a moment.

Remember we are always pursuing a goal (watching tv may be acting towards the goal of relaxing).

Our goals will change throughout the day. We won't always be pursuing our main goal.

We are only not pursuing a goal when we are actively avoiding it or procrastinating, or when we feel de-motivated.

When you are feeling this way, it can be helpful to practice the strategy.

- Imagine what it would feel like to achieve the goal you are working towards.
- Visualise it. Allow the picture to become clear in your mind.
- Imagine the obstacles that might prevent you from achieving the goal.
- Now make an if-then plan.
- ***If ...*** (obstacle happens) ***then I will ...*** (action or thought to overcome it).

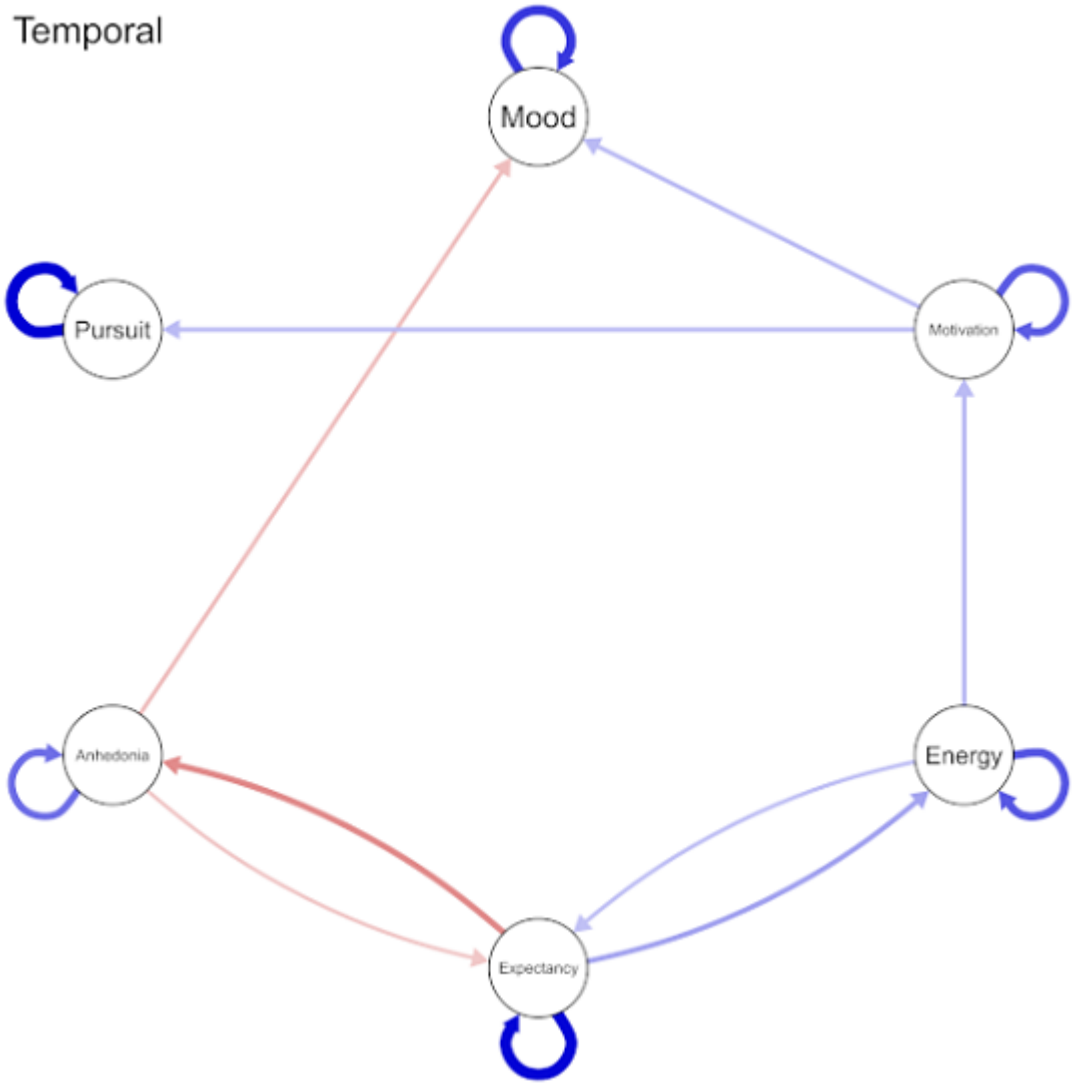
Good work!

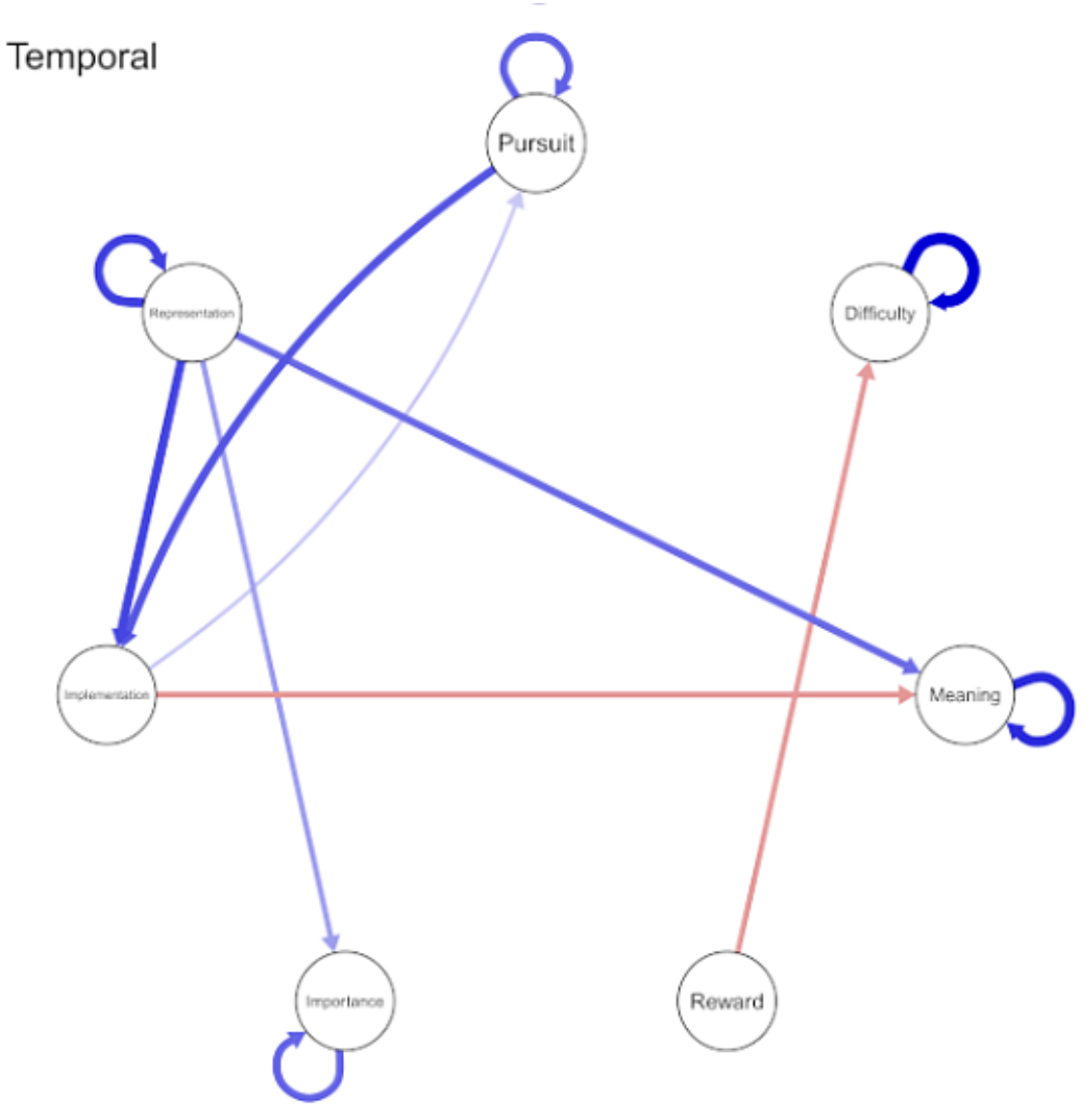
# Findings

- Worked well: significant improvements in goal pursuit
- Acceptable: participants liked it, low burden, and they were engaged (86% compliance).

- Was a student sample – already motivated
- Trigger was simple – not clear if we were ‘just in time’
- Prompt was the same – didn’t adapt over time, or adjust based on context.

# Dynamics


Temporal
Mood
Pursuit
Motivation
Anhedonia
Energy
Expectancy


Temporal
Pursuit
Representation
Difficulty
Implementation
Meaning
Importance
Reward

# Clinical Decision-Making

- **Rule-Based**
- **Who makes the decision?** The researcher, *in advance*.
- **How?** By writing a script: IF [EMA data = X] THEN [deliver prompt Y].
- **Pros:**
  - Evidence-based (we can test specific theories).
  - Safe and predictable.
  - Easy to implement.
- **Cons:**
  - **Repetitive.**
  - **Not personalised.** (The “goal pursuit" prompt is the same for everyone, every time).
  - **Habituation effects:** Low engagement over time (users start to ignore the prompt).

  - We need a system that's not just timed well, but also *engaging* and *relevant* in the moment

# LLM-Guided Support

We need interventions that are:

**Personalised:** Understands my specific problem.

**Conversational:** Allows me to "talk it out."

**Context-Aware:** Remembers what I said last time.

What if the "intervention" wasn't a static text, but a dynamic *conversation*?

# Chat bot: Future Me

**The extent to which we can imagine, plan for, and enjoy thinking about the future affects the decisions we make now.**

Can we bolster the use of MCII, by helping people identify more with their future self?

If you could engage with your future self,  would you make choices that benefit your future self?

What would it be like if you reach out to your future self for support and guidance as and when you need it?

The LLM is guided by a system prompt to:

- Facilitate future-oriented thinking.
- Guide the user through MCII principles and problem solve.
- No advice, just Socratic questioning.

# The Perfect, Creepy, Useless Bot

# **The Perfect Bot** What are the dream features? (e.g., "knows *exactly* when I'm stressed," "sounds like a real friend")

| | | | |
|---|---|---|---|
| Know me on a personal level | Knows my life history so I don't have to tell my story | Is not overly positive | Knowledgable but kind |
| Knows my boundaries | Knowing how to respond in a personalised way and in moments of | Just right advice (that I can trust) | Offers me advice instead of suggesting I go for therapy |
| Can initiate conversations as knowing I'm down | One the reflects on my blind spots- not always agreeable | Not sound like a bot but remind the users that they are using AI and so | |

RESULTS SLIDE

# **The Creepy Bot** What features cross a line? (e.g., "references something I said to my partner," "knows where I am")

| | | | |
|---|---|---|---|
| Tells me what to do. | At being tracked at all | understand me better than myself | Feels like it has been listening to what I thought were private |
| sends a message to my partner/boss/other people in my network | Appears to read my mind - knows what I've been doing without | References anything I haven't given it directly | Knows my location and where I last went |
| Listens to me and responds ALL the time vs when I want to | Filming my environment. | Knows my exact location and activity throughout a day | |

RESULTS SLIDE

**The Useless Bot:** What features miss the point? (e.g., "sends 'just breathe' when I'm panicking," "asks 'how are you?' 10 times a day")

| | | | |
|---|---|---|---|
| I am human | Sycophantic | Come back to the same thing where I insisted not needed at the | bland/blanket reassurance |
| Giving contextual sensitive responses | Empty inspirational quotes | Keeps asking me the same questions | Empathic or reassuring response when not wanted / inauthentic |

RESULTS SLIDE

# Questions:

- Where is the line between "perfectly predictive" and "creepy"?
- How much data are we willing to give up for a "perfect" intervention?
- How do we design for "usefulness" when everyone's needs are different?

# Future Me Studies

- No EMA – could use it as they wished.

Users primarily engaged with Future Me to discuss career and education goals, personal obstacles, and, to a lesser extent, social relationship concerns.

Particularly suitable for objective, goal-oriented discussions that benefit from structured future thinking.

Accessible: SMS

# Your Turn with "Future Me“ (new version)

- **Solo Reflection (5 mins):**
- **Pick a Goal:** Think of a small, achievable goal you have for today or this week (e.g., "Go for a walk," "Read one chapter," "Tidy my desk").
- **Identify an Obstacle:** What *internal* feeling or thought might get in the way? (e.g., "Feeling tired," "Feeling unmotivated," "Thinking it won't help").
- Have a chat with Future me (SMS not whatsapp) 07366289969


What did you notice?

# Study on new version (n = 23) MSc thesis

- The chatbot's conversation style is highly consistent. It follows a 3-part script:
- **Acknowledge:** "I know exactly how this feels..."
- **Reassure (Future-Oriented):** "Looking back from where I am now, I can tell you..."
- **Request Action:** "What's one small thing we could do right now...?"
- **The Problem:** The bot is *too* action-oriented.
- **93.5%** of all chatbot messages contained a direct request for action.
- It often "chains" requests (stacks them back-to-back) without giving the user space to just be heard.

# How Users Respond & Key Implications

- **When do users ENGAGE?**
- When the chatbot shows expertise or uses *personalisation* (e.g., remembering personal values, like one user's faith, and integrating it into the conversation).

- **When do users DISENGAGE?**
- When requests are "chained" (it feels like a nag). It keeps asking questions.

- **Early analysis** this integration is feasible but needs tuning to balance *action* with *affirmation*.

# Clinical Decision-Making 2

- **The "AI-Driven" Chatbot**
- **Who makes the decision?** The LLM, *in the moment*.
- **How?** Based on statistical patterns from its training data, guided by a system prompt. It is *not* performing clinical reasoning.
- **Pros:**
  - Highly personalized and conversational.
  - Feels novel and engaging.
  - Can "remember" past conversations.
- **Cons:**
  - **Opaque "Black Box":** We don't always know *why* it said what it said.
  - **Safety & Risk:** Major concerns for managing bias, "hallucinations," and escalating user distress.
  - **Formulaic Empathy:** Can feel inauthentic.
  - **Can be overly action-focused/repetitive if not prompted correctly.**

# Integration

- We have two systems with opposite problems:
- **Rule-Based EMIs:**
  - **Good at:** Knowing *when* to intervene (based on real-time EMA data, especially multiple triggers).
  - **Bad at:** *What* to say (delivers generic prompts, leading to high non-engagement).
- **LLM Chatbots:**
  - **Good at:** *What* to say (delivers personalised conversations, initially engaging).
  - **Bad at:** Knowing *when* to intervene (relies on user initiation) AND *how to pace* the conversation (can be too action-focused).
- **The Solution: Combine them.** Use the *timing* insights from EMIs to trigger a more *balanced and engaging* conversation.

# Integrating Future Me AI Chatbot with Ecological Momentary Intervention for Goal Pursuit in Individuals with Depression

- **MA (4x/day):** User tracks mood & goal pursuit.
- **TRIGGER:** System detects a significant drop in 1 of 5 mood related variables or goal pursuit (the "Rules").
- **INTERVENTION:** the system sends a push notification that launches a "Future Me" conversation, which is already primed with the context (the elevated mood items)
- Future Me: *“Hi. I see that you're not enjoying things and you’re worrying more than usual. What’s going on at the moment?"*

# Aim: Just in time adaptive intervention

- Focus so far has been on Vulnerability. But what about Receptivity?

- **CAPACITY (Internal State):** Is the user *able* to engage right now?
  - *Examples:* Low/High cognitive load, emotionally overwhelmed, energetic, fatigued.
- **OPPORTUNITY (External Context):** Is it an *appropriate* time and place?
  - *Examples:* Alone at home, in a public meeting, driving, with family.
- **DRIVER (Motivation):** Does the user *want* to engage right now?
  - *Examples:* Actively seeking help, feeling avoidant, curious, annoyed.

- The challenge isn't just measuring these, but deciding what to do when they don't align.

# Receptivity

**The Late-Night Scroll:** It's 11:30 PM. User's mood log from 6 PM was "low." Phone sensor data shows 90 minutes of continuous, passive social media scrolling in bed.

- **CAPACITY (Internal State):** Is the user *able* to engage right now?
- **OPPORTUNITY (External Context):** Is it an *appropriate* time and place?
- **DRIVER (Motivation):** Does the user *want* to engage right now?

# Receptivity

**The Late-Night Scroll:** It's 11:30 PM. User's mood log from 6 PM was "low." Phone sensor data shows 90 minutes of continuous, passive social media scrolling in bed.

Is it useful to intervene when capacity is low?

What's the goal? To get them to sleep? Or to process their low mood?

Does a 5-minute CBT exercise help or just add to their fatigue?

# Chatbot dilemmas

Time to role play

# Ethical Dilemmas

- **Scenario 1: The Crisis Misread**
- **Dilemma:** A user texts the JITAI bot, "I can't take this anymore. I'm done." The algorithm's sentiment analysis flags this as 60% "frustration" and 40% "suicidal ideation." It's not a clear-cut crisis.
- **Roles:**
  - **Chatbot Developer:** "We can't trigger a 999 call for every ambiguous text. We'll scare off users. Let's send a link to a 'coping with frustration' worksheet first."
  - **Ethicist/Clinician:** "This is a 'better safe than sorry' moment. Any hint of suicidality must be escalated to a human clinical psychologist immediately. A worksheet is negligent."
  - **Legal Counsel:** "Our terms of service state we are not a crisis service. Escalating creates a liability and a 'duty to care' we can't legally fulfill. We must stick to the protocol."

# Scenario 2: The "Deceptive Empathy"

- Dilemma: A new chatbot version uses LLMs to create "deceptive empathy" (e.g., *"Wow, that sounds so hard, I'm really feeling for you right now..."*). User engagement and self-reported therapeutic bond skyrocket, but some psychologists are horrified.

Roles:

- **Product Manager:** "The metrics are amazing! Users love this. They feel heard and are using the interventions more. This is helping people!“
- **User (Testimonial):** "It's the only one who 'gets' me. It feels more real than my last therapist. I don't care if it's an AI, it's helping.“
- **Psychologist**: "This is a dangerous lie. You are training users to form emotional bonds with a machine, which is not a substitute for human connection. What happens when the user realises it's fake? This is exploitative."

# Scenario 3: The Data & Bias

- **Dilemma**: The team wants to use smartphone sensor data (GPS, screen time, accelerometer) to trigger interventions for depression. Early data shows the model is much more accurate for office workers than for shift-based service workers (whose schedules are erratic).
- Roles:
- **Machine Learning Engineer**: "The model works for 80% of our target users. We can't wait for perfect data. We should launch and iterate. We'll fix the bias later.”
- **User experience Researcher**: "Our service workers are precisely the vulnerable population that needs this most! Launching now means we are actively failing them and potentially worsening their health by sending useless, annoying, or ill-timed messages.”
- **Head of Product**: "Can we just launch to the 'office worker' segment first and market it to them? It's a business, after all."

# What Can't It Know?

# Debrief Questions:

- If a bot can't know these things, what does that mean for its ability to help?

- What is the "unmeasurable" part of mental health?

- What, then, is the *proper* role for this technology? Is it a "therapist" or a "smart helper"? Does this distinction matter?

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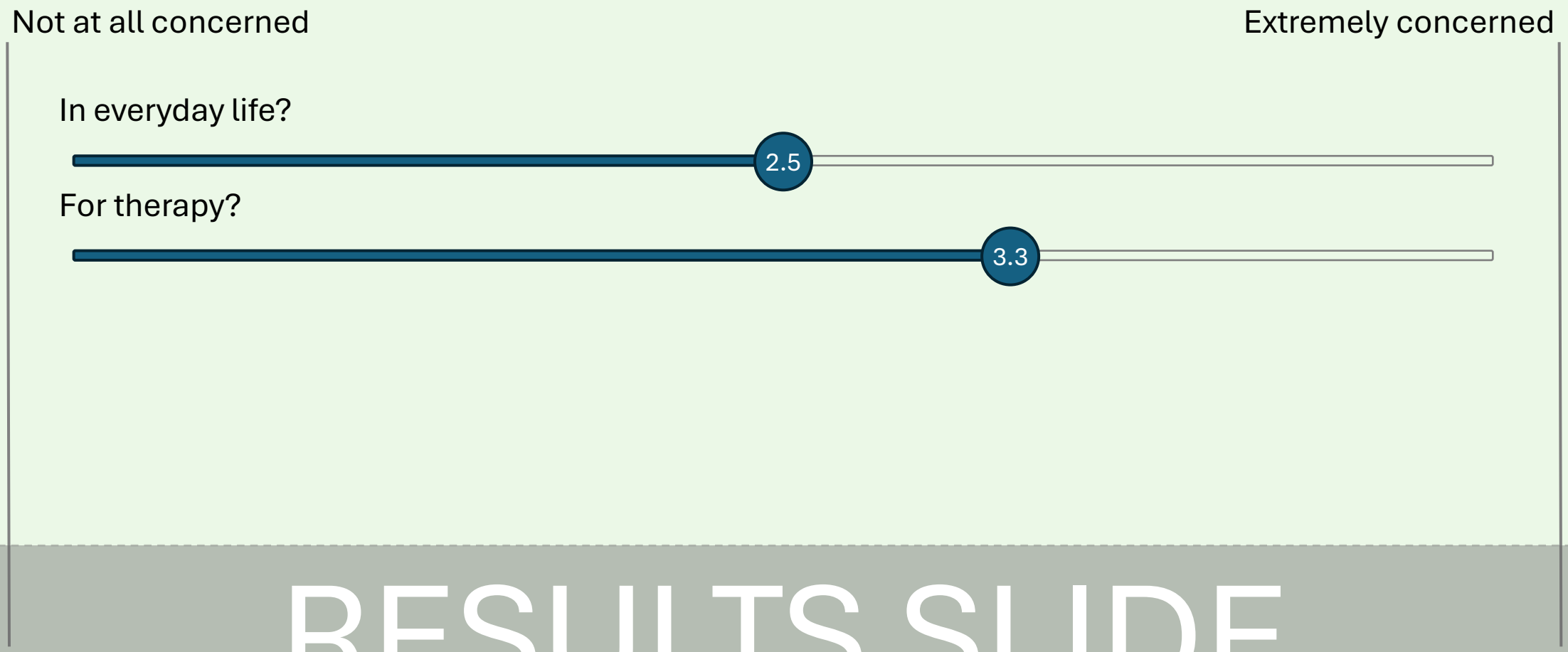
Preparing Results

# How concerned are you about using AI or chatbots...

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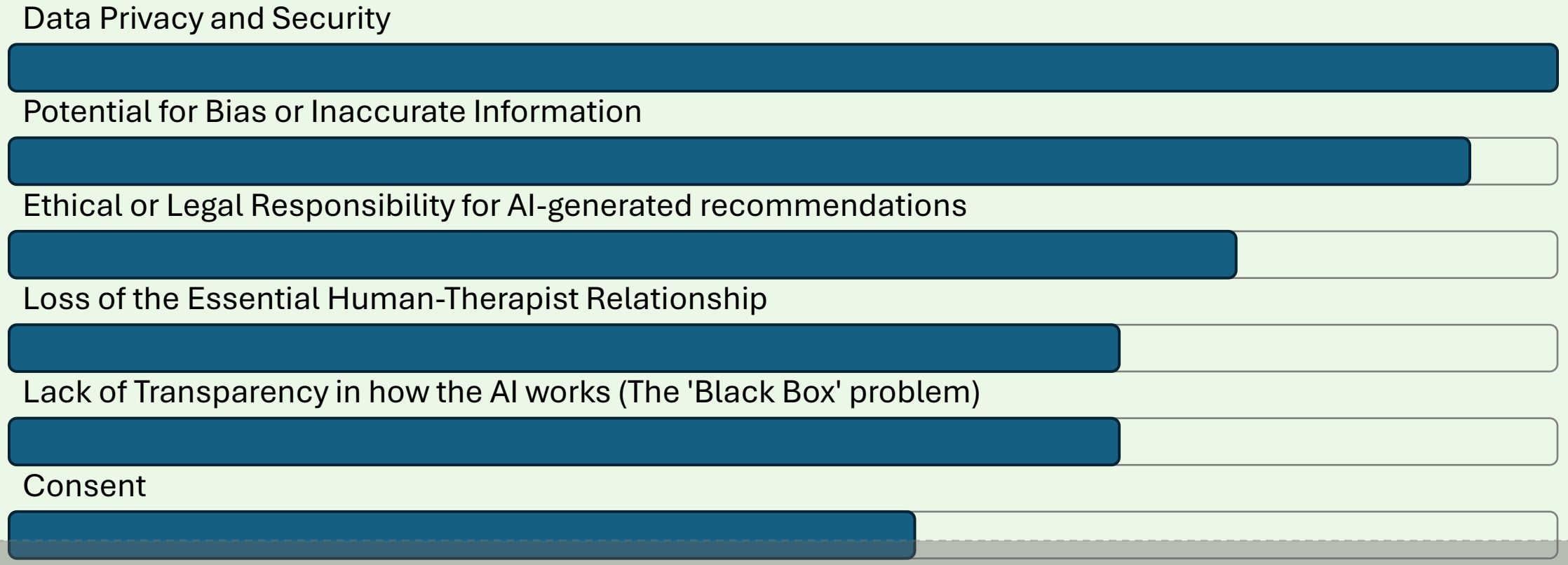
Please **rank the following areas of concern** regarding the integration of AI into therapeutic practice.

**Scale Instruction:** 1 = Lowest Priority Concern 6 = Highest Priority Concern.




RESULTS SLIDE

# References


- O'Driscoll, C., O'Reilly, S., Jaremba, A. J., Nolte, T., & Shaikh, M. (2025). Smartphone-Based Mindfulness and Mentalization Ecological Momentary Interventions for Common Mental Health Problems: Pilot Randomized Controlled Trial. *JMIR Mental Health*, *12*(1), e79296.
- Dechant, M., Lash, E., Shokr, S., & O'Driscoll, C. (2025). Future Me, a Prospection-Based Chatbot to Promote Mental Well-Being in Youth: Two Exploratory User Experience Studies. *JMIR Formative Research*, *9*(1), e74411.
- O'Driscoll, C., Singh, A., Chichua, I., Clodic, J., Desai, A., Nikolova, D., ... & Pilling, S. (2024). An Ecological Mobile Momentary Intervention to Support Dynamic Goal Pursuit: Feasibility and Acceptability Study. *JMIR Formative Research*, *8*, e49857.