Flight Plan for Success
Adapting to Change and Building Healthy Workplaces

AI FOR BEHAVIORAL HEALTHCARE:
What is it? What's Possible? And
What Should We Watch Out For?

tamho
tennessee association of
mental health organizations

AI for behavioral healthcare: What is it, what's possible, and what should we watch out for?

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Disclosure:

I am a co-founder with equity stake in Lyssn.io, Inc., a start-up focused on tools to support training, supervision, and quality assurance of psychotherapy and counseling.

All opinions and content are my own and do not necessarily reflect views of NIH or AECF.

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Overview

- A bit about me
- Where we are headed
  - What is AI?
  - Where is AI useful (or might be)?
  - What should we look for when considering AI solutions?

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"AI is not just about efficiency gains, it's about opening up new possibilities, unlocking human potential and **solving some of society's biggest challenges**."

Yoshua Bengio

"Artificial intelligence is extending what we can do with our abilities. In this way, it's letting us **become more human**."

Yann LeCun

AI will make everything better!

"AI will be the **most transformative technology of the 21st century**. It will affect every industry and aspect of our lives."

Jensen Huang

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"AI doesn't have to be evil to destroy humanity - if AI has a goal and humanity just happens in the way, **it will destroy humanity** as a matter of course without even thinking about it."

Elon Musk

"The development of full artificial intelligence could spell the **end of the human race**."

Stephen Hawking

AI will destroy everything!

"Mitigating the risk of **extinction from AI** should be a global priority alongside other societal-scale risks, such as pandemics and nuclear war."

Open letter on dangers of AI

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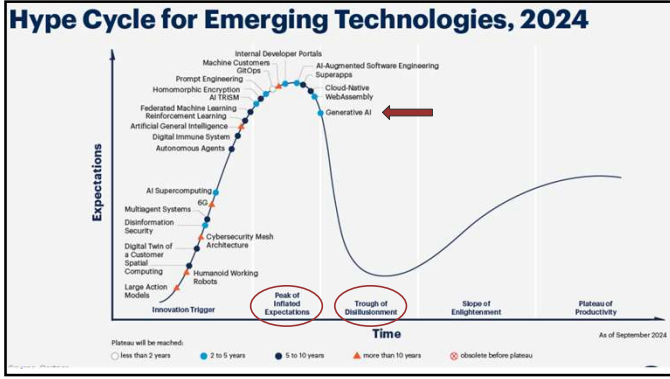Hype Cycle for Emerging Technologies, 2024
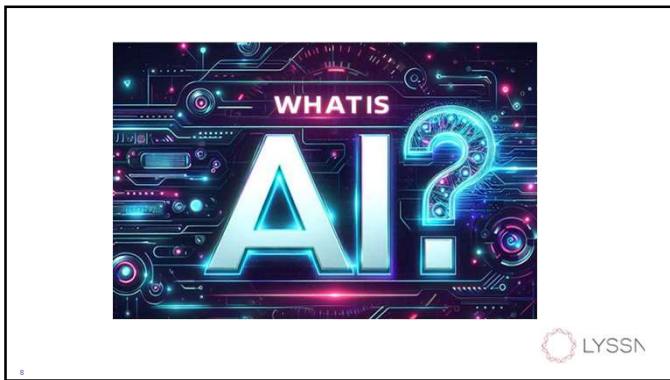
What AI is *not*... if-then rules

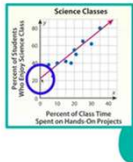- Software is often built around 'if / then' rules

- AI is fundamentally different

AI "learns from data" (aka, machine learning)

$y = mx + b$

- What is m?
  slope
- What is b?
  y-intercept
- How do we find the y-intercept for the graph?

1.76 trillion parameters

Rumors claim that GPT-4 has **1.76 trillion** parameters, which was first estimated by the speed it was running and by George Hotz.
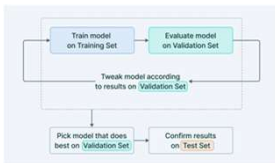

AI Development example: Suicide risk assessment

AI workflow
- Human eval: 471 crisis calls
- AI model development

Train model on Training Set → Evaluate model on Validation Set

Tweak model according to results on Validation Set

Pick model that does best on Validation Set → Confirm results on Test Set

Train AI models on 183,735 unique utterances…

Test AI models on 23,295 utterances not included in development

Answering the question:

How close is the AI to an expert human evaluator?

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Challenges with models built from data

Example: *Framingham cardiovascular risk score*

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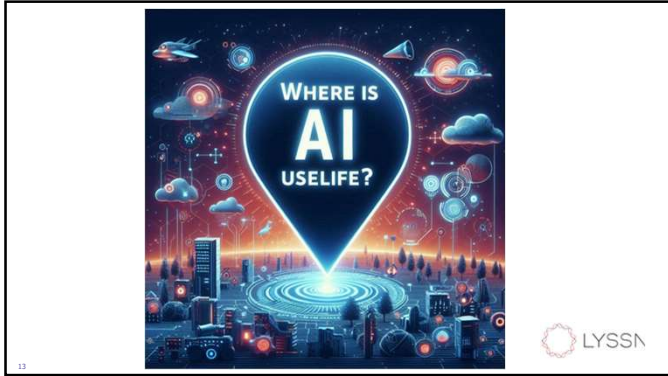
Brief clinical story

How a suicidal client... and Marsha Linehan... shaped my thinking about AI

Where is AI useful?

Dave's BH rule of thumb: Where an expert (trained) human can do the task, and the AI has access to the same information as our expert human.

- Examples... what do we think?
  - Fidelity coding of therapy quality (with a standardized assessment)
  - Current depression diagnosis
  - Future likelihood of suicidality

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AI example: Quality assurance and supervision

We know empathy is foundational to the helping professions

Psychology of Addictive Behaviors
2013, Vol. 27, No. 3, 878 - 884

© 2012 American Psychological Association
0893-164X/13/$12.00 DOI: 10.1037/a0030274

BRIEF REPORT

Is Low Therapist Empathy Toxic?

Theresa B. Moyers and William R. Miller
The University of New Mexico

One of the largest determinants of client outcomes is the counselor who provides treatment. Therapists often vary widely in effectiveness, even when delivering standardized manual-guided treatment. In particular, the therapeutic skill of accurate empathy originally described by Carl Rogers has been found to account for a meaningful proportion of variance in therapeutic alliance and in addiction treatment outcomes. High-empathy counselors appear to have higher success rates regardless of theoretical orientation. Low-empathy and confrontational counseling, in contrast, has been associated with higher drop-out and relapse rates, weaker therapeutic alliance, and less client change. The authors propose emphasis on empathic listening skills as an evidence-based practice in the hiring and training of counselors to improve outcomes and prevent harm in addiction treatment.

Keywords: empathy, therapist effects, listening skills, training

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We know how to measure provider empathy

Empathy				
Low				High
1	2	3	4	5
Clinician has no apparent interest in client's worldview. Gives little or no attention to the client's perspective.	Clinician makes sporadic efforts to explore the client's perspective. Clinicians' understanding may be inaccurate or may detract from the client's true meaning.	Clinician is actively trying to understand the client's perspective, with modest success.	Clinician shows evidence of accurate understanding of client's worldview. Makes active and repeated efforts to understand client's point of view. Understanding mostly limited to explicit content.	Clinician shows evidence of deep understanding of client's point of view, not just for what has been explicitly stated but what the client means but has not yet said.

Moyers et al., *Motivational Interviewing Treatment Integrity* system manual, v3.1

We know how to reliably identify empathic communication

CLIENT | Yeah. I think I'm sad that I haven't seen my kids in a couple days. Like I really miss them and I'm pretty pissed that my neighbor like called the cops. I mean I was only gone for 10 minutes. Like I'm not I'm not a bad mom. Like I'm not one of those moms that like leaves her kids at home all day while she goes to work or like. Doesn't. Like I care about my kids a lot and I love them. And I just like I'm not a bad mom.

PROVIDER | Mm hmm (affirmative). Yeah. It sounds like you've got some conflicting emotions going on. `EMPATHIC` you're sad that they're not around but you're also frustrated that this would even happen in the first place. `EMPATHIC`

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Okay, so what's the problem? *Scale*

Crisis Hotline Has Answered 10 Million Calls, Texts and Chats

Mental health experts have said that the 988 hotline for mental health emergencies is still a work in progress, in need of more funding, coordination and awareness.

988
Call or text 988

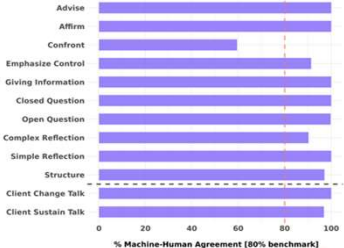| Training | Hiring | Treatment | QA | System Outcomes |

?

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Fundamental question: Can an AI/ML technology replicate expert humans?

AI predictions relative to human experts

Atkins et al. 2014
Can et al. 2015
Cao et al., 2019
Pace et al. 2017
Tanana et al. 2016
Xiao et al. 2016; 2018

Advise
Affirm
Confront
Emphasize Control
Giving Information
Closed Question
Open Question
Complex Reflection
Simple Reflection
Structure
Client Change Talk
Client Sustain Talk

0   20   40   60   80   100

% Machine-Human Agreement [80% benchmark]

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Reliable, ethical AI can now take evaluation of BH services to scale

Each dot is the average **empathy** for a provider across all clients

5,000 providers
176,000 clients
22M text conversations

Imel et al. (2024). Outcomes in mental health counseling from conversational content with transformer based machine learning. *JAMA OPEN*

For these providers, median engagement = 6 weeks

For these providers, median engagement = 23 weeks

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Poor   Fair   Good   Great

Provider Empathy

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AI example: Training

Typical online provider education emphasizes access to content

Slides and written content

Watch lectures and role play examples

CME quiz

Outcomes:

1. What content was offered
2. How many providers accessed content
3. Demonstration of knowledge via quiz

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How we train *other* skills

1. Practice (lots)
    2. Feedback
        3. Practice small components

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Training where practice is the focus

Skill Module 2: Existing Motivation and Exploring Questions

Practice with your clients.

Trainees get to practice with immediate and specific feedback on their practice

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Practice + skills = documented skills too…

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AI example: Documentation

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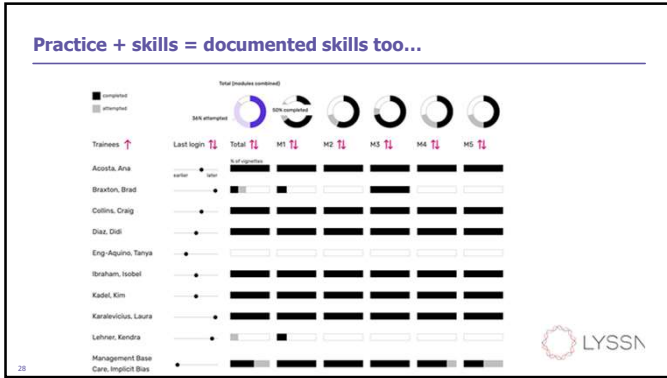
Clinical notes are time-consuming and painful

- On average, 5-10 minutes per note, or 3-5 hours per week for typical caseload
- Common for notes to be done after hours or later in 'catch up'
- More than 85% of providers feel that administrative burden contributes to provider burnout.

And… **critical** for clinical documentation

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The single most active AI application in medicine

DeepScribe	Augmedix, Inc.	Suki AI
Ambience	Nabla Technologies	Abridge
Butterfly Network	Enlitic	Nuance Communications
Nuance DAX	Abstractive Health	Aidoc
Atomwise Inc.	DeepMind	Hank AI
MarianaAI	Crosby Health	Healthee

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With rise of generative AI, automated documentation rapidly becoming a commodity

Lyssn genAI note

Client reports that she has been feeling down for a long time. She feels that she is doing well at work, but is feeling lonely and bored at home. She doesn't know what to do about it. She would like to change her meds and see if she can get back on her birth control pills. She is concerned that if she changes her medication, she will not be able to feel better. She also wants to see if there is a better way to manage her depression.

Features of AI scribe solutions

- Chief complaint
- History of present illness
- Assessment and Plan
- Medications
- PROs

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Looking for an AI solution?

What questions to ask... what things to consider

Skepticism is warranted… it's the wild west of AI right now

AI Psychotherapy [4+]
AI Mental Health Support
Infisecurity
Designed for iPad
★★★★★ 3.9 • 9 Ratings
Free - Offers In-App Purchases
[View in Mac App Store ↗]

At the core of AI Psychotherapy is its advanced AI system, developed to understand and adapt to your individual mental health needs. This app goes beyond simple mental health tracking; it delivers real-time, personalized support based on your conversations and emotional state, helping you feel heard and supported at all times.

Choose Your AI Therapist: Everyone's journey toward mental well-being is unique, which is why AI Psychotherapy offers a variety of AI therapists. Each AI therapist specializes in different areas of mental health, offering tailored approaches to managing stress, anxiety, depression, or emotional distress. Whether you need a calm, nurturing voice, a more structured approach, or a source of empowerment, you'll find the perfect AI therapist for your needs.

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A *few* thoughts on questions and considerations

1. Step 1: Develop an AI Governance Policy

1. Regulations
   a. We do not have them in the US (yet)
   b. Key principle: Transparency

1. Basic rubric for clinical applications
   a. Valid
   b. Reliable
   c. Unbiased

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Thank you! What questions can we discuss?

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                                        EVENT
                                        WEBSITE

TAMHO Annual Conference
and Awards and Recognition Ceremony